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Review Article

The Impact of COVID-19 on the Seafood Industries of India, Japan and Malaysia and a Global Assessment

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Abstract - *The seafood industry is vital for enhancing the economies of countries globally. The COVID-19 pandemic disrupted the seafood trade, causing serious economic losses worldwide. This article examines the effects of the SARS-CoV-2 outbreak on seafood exports in India, Japan, and Malaysia. The study compares the volume (metric tons) and value (US dollar (billion), Indian rupee (million), and Malaysian ringgit (billion) of seafood exports around the Fiscal Year (FY) of the outbreak. As the virus spread, exports decreased in Japan and India, but after it ended, they rose again. Malaysian seafood exports increased slightly in 2022 but did not reach pre-pandemic levels. During the fiscal year 2022-2023, India's export value hit an all-time high of 8.09 billion US dollars, and the volume reached 1,735,289 metric tons. Japan's exports decreased from 287.31 billion yen in 2019 to 227.6 billion yen in 2020. After the pandemic ended in 2023, it reached a record high of 390.09 billion yen. The Malaysian fishing sector's contribution to GDP dropped from 12.12 billion ringgit in 2019 to 11.29 billion in 2020. In 2021, it nearly remained the same (11.25 billion ringgit). Production has decreased over the past two years because of the outbreak. In 2022, it recovered to an amount of 11.53 billion ringgit. Regional Fishery Bodies (RFBs), which include Regional Fisheries Management Organizations (RFMOs) and Regional Fisheries Advisory Bodies (RFABs), evaluated the effects of COVID-19 on the aquaculture and fishing sector worldwide. The survey was conducted in April and November 2020. More participants expressed concern in April than in November about the pandemic affecting the management and research of the fish industry. In general, more than 60% of respondents expressed concern about decreasing employment levels and conditions in the fisheries and aquaculture sector. The demand for seafood might have decreased in the range of 36% to 82% in domestic and export markets. The expected impact of COVID-19 on price remained low, ranging from 26.3% to 36.4%.*

Keywords *- COVID-19, Impact on economy, Seafood trade, Indian seafood, Human and illness, Human and disease, Healthy lifestyle.*

1. Introduction

The COVID-19 pandemic started with the emergence of pneumonia [1, 2], which is a similar symptom in individuals and developed in Wuhan City (China) on December 31, 2019. The disease was termed COVID-19 by the World Health Organization (WHO), and the virus causing the disease was the SARS-CoV-2 virus of the coronavirus group. The WHO declared the disease a pandemic (global public health emergency) on January 30, 2020 [3]. The pandemic changed [4, 5] the lifestyle of the people, including their eating behavior. Several studies were conducted to contain the pandemic [3]. In India, the first COVID-19 case was reported in the state of Kerala on January 30, 2020. The virus spread increased in March, with many people testing positive. To curb the outbreak, the Central Indian government declared a nationwide lockdown for three weeks starting from March 25, 2020. The entire Indian population stayed in their homes, the same situation as occurred in other countries. All business activities were stopped. Religious places, educational institutes, and government offices all over the country remain closed. All kinds of transportation came to a standstill. Lockdowns were repeated until 31st May, 2020. The country was unlocked stepwise from June 1, 2020 [6]. In addition to other activities, fish landings and the global seafood trade also faced obstacles. The fish landings were lower on the production side due to the reduced fishing days. Logistics faced difficulties due to factors such as the availability of containers and the shortage of labor. The increased freight costs, restricted flight numbers, and unstable markets all contributed to the decreased exports of seafood products. Apart from the logistics issues, hotel, restaurant, supermarket, and retail closures related to COVID-19 also affected seafood demand. Approximately 15 million people work in India's fishing industry. There were job losses because of the shutdown of processing plants and the halt in fishing operations. Strong efforts were made by the management and

employees related to the seafood industry, both inland and coastal fish farming (fish landings), resulting in smooth movement again after the pandemic. International and domestic supply chain logistics were restored, and the sector was revived, which led to record production of seafood items in India.

Review articles [7, 8] contain a detailed assessment of COVID-19's impact on the global seafood industry. The effects of COVID-19 span the economic, social, and environmental dimensions of the seafood sector, which continue to evolve depending on factors such as ongoing government response strategies, vaccination rates, and the emergence and spread of new virus variants. The COVID-19 pandemic has revealed significant weaknesses in healthcare systems worldwide and substantial structural and functional challenges in food and trade systems at local, regional, and global levels. Measures have been suggested to help the seafood industry emerge as a more resilient, responsible, and sustainable sector in the future. Apart from the direct impacts on individuals' health, the initial effects of the pandemic on the global seafood industry were due to the government restrictions on movement and trade. Travel bans and lockdowns contributed to waning tourism numbers, ongoing disruptions in global supply chains, and employee shortages. Decreased landing revenue and concerns about virus contamination discouraged fishers from fishing. New seafood trading methods, including online purchasing and digital monitoring, control, and surveillance tools, were developed. The main issues were outbreaks in plants, reorganization of processors to ensure social distance, and health services for workers. Globally, restaurant food delivery increased by 47%, with 95% in the US, 89% in Russia, and 69% in Canada. Several studies have worked out [7, 8] recommendations for how the research, development, industry, and civil society communities can work together to help turn the challenges of COVID-19 into the change needed to ensure an ecologically sustainable, socially responsible, and economically viable wild capture seafood industry.

Regional Fishery Bodies (RFBs), composed of Regional Fisheries Management Organizations (RFMOs) and Regional Fisheries Advisory Bodies (RFABs) that conduct fisheries research around the globe, studied the impact of COVID-19 on fisheries and aquaculture [8]. In November 2020, 50% of the RFMOs reported a negative impact of COVID-19 on the fisheries management compared to 44% reported in April 2020. Capture fisheries monitoring, control, surveillance, and the changes in the price resulting from the pandemic have also been studied in the above review article. However, in terms of the exports, the year-on-year data, including the pandemic years, in terms of volume and money, have not been covered. COVID-19 spread globally in early 2020, affecting Southeast Asian nations, including Malaysia, Singapore, Indonesia, Thailand, Vietnam, the Philippines, Brunei, Myanmar, Cambodia, and Laos. Singapore was the first to report a case of the virus. The emergence of the new variant further affected the economies of the region's countries. The review [9] examines the challenges posed by COVID-19 on aquaculture and fisheries, along with the mitigation strategies from the perspectives of various countries, with a particular focus on Malaysia, where the pandemic has had a substantial impact on its vast aquaculture and fishing sectors. Fluctuating prices and new management strategies can impact various communities differently, particularly stressing fish culturists and fisher-folk communities. Food supply chain disruptions caused by COVID-19 and subsequent contracting market have adversely affected all stakeholders, especially small-scale fishermen who are particularly vulnerable to these changes. Chowdhury et al. [9] have compared the data of international trade of Southeast Asian countries for the Q1 part of the financial years 2020 (pandemic) and 2019 (pre-pandemic) in terms of volume and value. Exports of fish and fisheries products in 2020 were higher in Indonesia, Malaysia, and Myanmar despite the pandemic year, while Singapore and Brunei reported a decline. Imports of the seafood mentioned dropped in Indonesia and Brunei but rose in Myanmar and increased slightly by 0.26% in Malaysia. As previously mentioned, Indonesia's fishery product exports grew during the COVID-19 outbreak in 2020. The exports of Indonesian fishery products increased by 5.2%-5.7% billion USD [10] compared to 2019. During the COVID-19 pandemic, most of the world's major fisheries exporters experienced large declines compared to 2019, including China (7.8%), Norway (7.5%), Vietnam (2.1%), India (15.1%), Thailand (2.2%), and Ecuador (1.5%). Fishing companies worldwide developed new measures to ensure the viability of the fishing sector during the COVID-19 epidemic. The main objective of this review article is to examine the impact of COVID-19 on the seafood industry in India, Japan, and Malaysia. Based on government agencies' information, the data have been analyzed and reviewed. Volume- and value-wise losses resulting from COVID-19 have been discussed in the article. The data covering the global evaluation of COVID-19's impact, as reported by Regional Fishery Bodies (RFBs), has also been included.

2. Methodology

The seafood volume and value-wise annual data were obtained from the respective government reports in *Section 3* (Results and Discussion). The global evaluation of the impact of COVID-19 outlined in section 3.2 was obtained from the Regional Fishery Bodies (RFBs), comprising Regional Fisheries Management Organizations (RFMOs) and Regional Fisheries Advisory Bodies (RFABs), through questionnaires. The study was conducted for the Food and Agriculture Organization of the United Nations as a second evaluation in November 2020. A Chi-squared test was conducted for each quantitative result to evaluate the significance of changes between the April and November 2020 evaluations, accounting for the variation in the number of RFBs answering each question. No statistically significant changes were seen between April and November in the 23 quantitative responses collected.

3. Results and Discussions

3.1. Impact of COVID-19 on the Value and Volume of Seafood Industries of India, Japan, and Malaysia

3.1.1. Seafood Industry in India

Due to the COVID-19 outbreak, people's dietary patterns have changed. Researchers have studied in detail [11] the dietary habits of youths in China during the outbreak. Poelman et al. [12] reported the eating behavior and food purchases during the COVID-19 lockdown in the Netherlands. There was a need for intervention to decrease the snack food intake during the pandemic [13]. Shrimp demand, both frozen and fresh, has significantly declined globally, including in India's overseas markets.

The seafood exports were most affected in India during 2020-21 due to several pandemic-related factors. As a global health emergency, the pandemic also affected India's trade, which exports seafood primarily to Southeast Asian countries, the USA, China, the European Union, Japan, and the Middle East.

As a result of the novel coronavirus outbreak, the US Department of Health and Human Services (HHS) declared a public health emergency on January 31, 2020. By mid-March 2020, all EU member states had either declared states of emergency or restricted human rights. India reported the first COVID-19 case (in the state of Kerala) on January 30, 2020. Many people tested positive in March 2020. To stop the spread of the virus, the Indian government imposed a lockdown on March 25, 2020. Normal activities resumed on June 1, 2020. The original Wuhan variant (first wave) hit India and peaked on September 11, 2020, with 97,655 daily new infections registered.

The outbreak of this magnitude resulted in halting all activities, from fish landings to storage and transportation. Thus, the seafood trade declined in FY 2020-2021. During 2016-17, India exported 1,134,948 Metric Tons (MT) of seafood worth 5.78 billion US dollars (378,709.0 million Indian rupees). The previous year, it was 945,892 tons and 4.69 billion dollars [14]. The export value of seafood reached 6.68 billion US dollars in 2019-20.

Figures 1–3 show the Indian export volume and revenue generated in the mentioned years. The COVID pandemic and sluggish overseas markets caused by the blockade of people and goods inside and outside the country hampered the growth of the Indian seafood industry. Consumer purchasing habits have changed due to the restrictions imposed by the governments of the importing countries.

They preferred other foods or locally produced items. Bars and restaurants had to close due to labor shortages and a decrease in the number of customers. During the fiscal year 2020-2021, there was a decrease in fish caught in both inland and coastal regions. Due to logistical challenges, fuel shortages, and increased fuel prices caused by the first original Wuhan pandemic wave that hit India, India's sluggish exports of seafood items were affected. Apart from the production aspect, the closure or limited work capacity of food processing factories due to a shortage of workforce in India and importing countries contributed to the decrease in exports in the above fiscal year. During FY 2020-21, India exported 1,149,341 MT of marine products worth 437,172.6 million Indian Rupees (INR) (US$5.96 billion), down 10.88% from the year before due to the COVID-19 outbreak [14].

India exported seafood worth 465,893 million INR (6.70 billion US dollars) with a volume of 1,392,559 MT during the FY 2018-2019. A growth rate of 1.1% quantity-wise and 3.28% value-wise (INR) was registered compared to the previous year. Both quantity- and value-wise, frozen shrimp was the largest export item, followed by frozen fish, frozen cuttlefish, frozen squid, dried, chilled, live items, and others [15]. Despite several obstacles in export markets, India shipped 1,735,286 MT of seafood worth 639,691 million INR (8.09 billion US dollars) in FY 2022-2023. It was a record high in both volume and value.

The exports increased by 26.73% in terms of volume (MT), 11.08% in terms of rupees, and 4.31% in US dollars. India exported 1,369,264 MT of seafood in 2021–2022, valued at INR 575,864 million (7.76 billion US dollars).

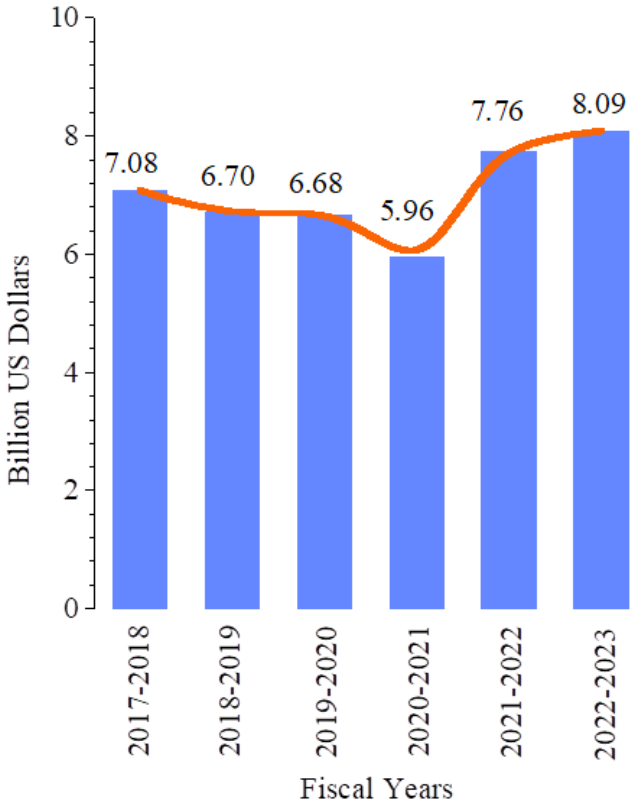

Fig. 1 India's seafood export (billion US dollars) around the COVID-19 period

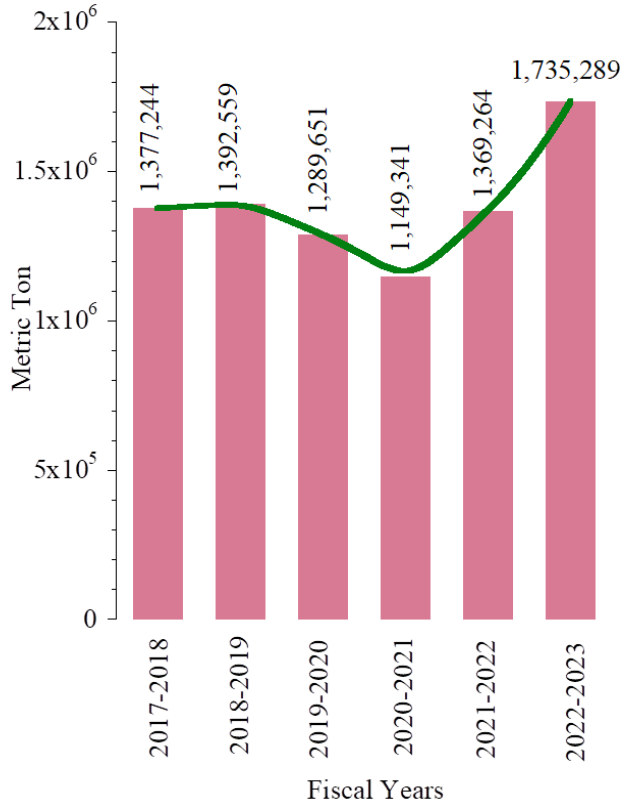

Fig. 2 India's seafood export (metric ton) around COVID-19

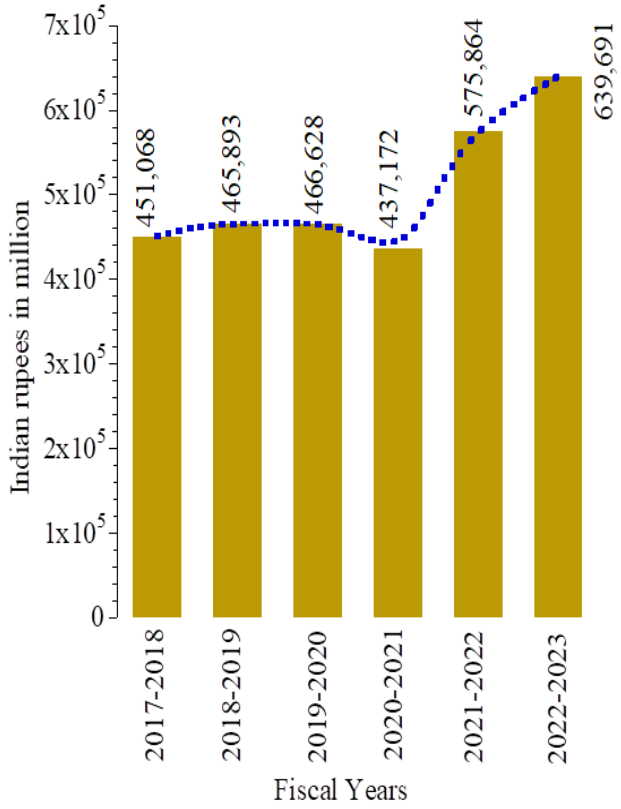

Fig. 3 India's seafood export (Indian rupees in million) around the COVID-19 period

3.1.2. Seafood Industry in Japan

Bars in Figure 4 show the export value (billion Japanese yen) of the fisheries and aquaculture industry [16] from Japan for the period 2014 to 2023, which includes the years the COVID-19 pandemic hit the country. Exports increased from 2014 (233.67 billion yen) to 2018 (303.1 billion yen). A decline was reported in 2019-2021, but the trend started to rise in 2022 and continued until 2023, the last data available at the time of writing this article.

The reduction from 2019 to 2021 is due to a limited emergency declaration during this timeframe. During the pandemic, volunteer restrictions were imposed. Activities and logistics related to fish catch suffered. Japan's seafood exports declined marginally to 287.31 billion yen in 2019 from the previous year's 303.1 billion yen. Japan reported a further decline in 2020 (227.6 billion yen). However, in 2021, exports recovered to a level of 301.53 billion and continued to rise in the following years (2022, 387.3 billion, and 2023, 390.09 billion), as the pandemic was under control due to the strong vaccination drive the Japanese government undertook. The borders of the market countries opened.

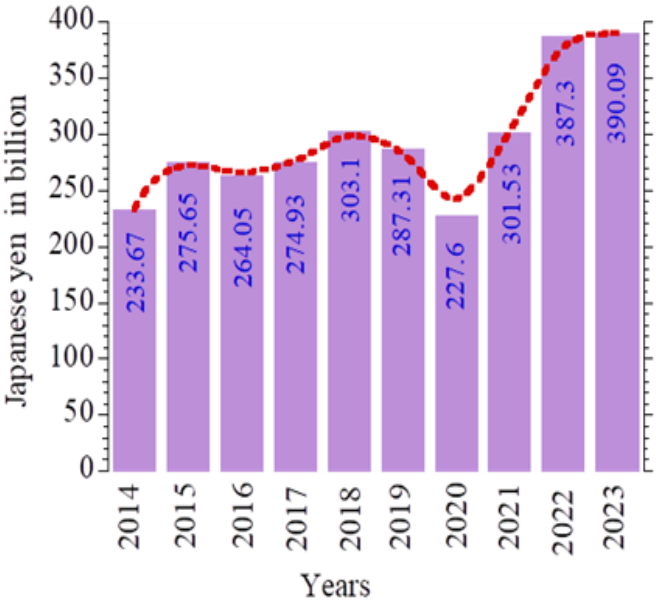

Fig. 4 Japan seafood industry export value from 2014 to 2023

Figure 5 shows the bars showing the export volume (10,000 tons) of fish and fisheries products for the years 2007-2022. The export volume reached its highest point in 2018 at approximately 756,000 tons. Due to the pandemic, it declined to 640,000 and 630,000 tons in the following years. However, it rebounded in 2021, reaching a volume of 660,000 tons once the pandemic was under control. Due to the 2011 Great East Japan earthquake and tsunami, exports were at their lowest (448,000 tons in 2011 and 457,000 tons in 2012). After that, exports increased year by year until the emergence of the novel coronavirus outbreak (Figure 5).

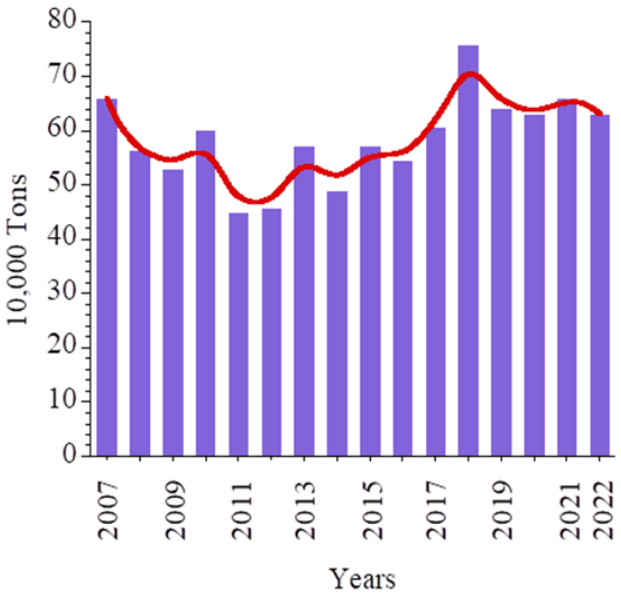

Fig. 5 Japan seafood industry export volume from 2007 to 2022

3.1.3. Seafood Industry in Malaysia

In Malaysia, to control the spread of COVID-19, the Movement Control Order (MCO) was declared on 18 March 2020 [17, 18] when COVID-19 cases were below 800. MCO was extended several times. The last one was until August 31, 2020. In 2019, Malaysia's aquaculture sector produced 391,000 tons of cultivated organisms valued at over 700 million US dollars [19].

The SARS-CoV-2 outbreak also affected Malaysian aquaculture, as it did in other countries. Food security depends on seafood catches. Malaysia has the highest fish consumption rate in the world. In 2016, the per capita consumption was 59 kilograms. The Malaysian coastal community depends heavily on aquaculture as its primary source of income. In 2016, the aquaculture sector contributed 9% to Malaysia's Gross Domestic Product (GDP). Together, the aquaculture and fisheries sectors employed over 130,000 people in 2017 (Table 1).

In Malaysia, the fishing sector's GDP dropped to below 12 billion Malaysian Ringgit in 2020 (Table 2). In the years 2016–2019, the figure remained above 12 billion. The decrease was due to the SARS-CoV-2 outbreak. It remained below 12 billion marks till 2022. The number of fishermen engaged in the industry declined from 126,000 in 2019 to 119,830 and 114,980 in 2020 and 2021, respectively. Fishermen in the fishing industry increased slightly (116,610) in 2022 [20] compared to the COVID-19 pandemic. Malaysian farmers were aware of the virus and were able to remain indoors to avoid infection [21]. During the pandemic, seafood revenue decreased due to various factors, including changes in consumer purchasing patterns, bar and restaurant closures, and a decline in the tourism sector. Due to the lockdown and awareness of the infection, the number of fishermen going for the catch fell. In addition, diminished exports led to a decrease in the share of fisheries in GDP. Logistics' difficulties and blockages in transport routes affected seafood distribution, resulting in a decline in seafood production.

Table 1. Number of fishermen in Malaysia (2017 to 2022)

Year	Number of fishermen (thousands)
2017	130.65
2018	128.15
2019	126.6
2020	119.83
2021	114.98
2022	116.61

Table 2. Gross domestic product (2016 to 2020) from the fishing sector in Malaysia

Year	Billion Malaysia Ringgit
2016	12.43
2017	12.33
2018	12.23
2019	12.12
2020	11.29
2021	11.25
2022	11.53

3.2. A Global Assessment of COVID-19 Impact as Reported from the Perspective of Regional Fishery Bodies RFB that Includes RFMOs and RFABs through Questioners

3.2.1. Effects of COVID-19 on Fisheries Management and Research

Figure 6 illustrates the responses to the questionnaires regarding the impact on fish and aquaculture management and production during the 2020 pandemic, comparing April and November. The data were reported by the RFB, which includes the organizations RFMOs and RFABs. In April 2020, 44% expressed concern that the impact of COVID-19 would affect the management of shared fish stocks. The proportion of individuals sharing a similar opinion rose to 50% in November.

In November 2020, 90% were experiencing or anticipating the adverse impact of the pandemic on fish stock research, whereas this figure was 79% in April. According to the November survey, 95% of people expected or faced a negative impact on fish stock management. The percentage did not change greatly from the scenario in April, when only 91% were concerned with captured fisheries owing to COVID-19-associated impacts.

In November, 95% acknowledged a negative impact of the pandemic on the monitoring, control, and surveillance of captured fisheries, including efforts against Illicit, Unreported, and Unregulated (IUU) fishing, compared to 89% in April.

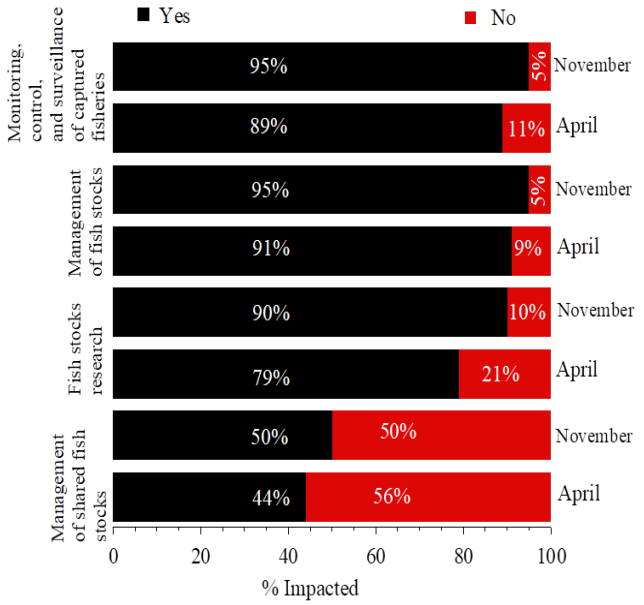

Fig. 6 The impact (%) of COVID-19 on fisheries and aquaculture management as reported by regional fisheries bodies for the year 2020 in April and November. The data are the responses to the questionnaires.

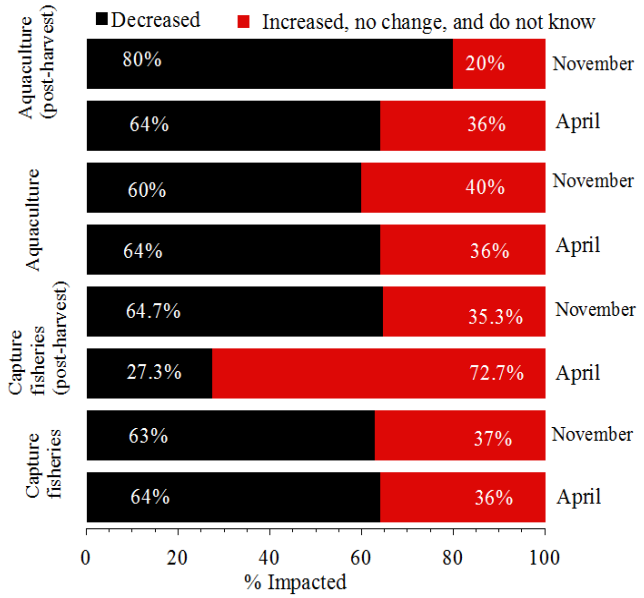

Fig. 7 The impact (%) of COVID-19 on fish and aquaculture sector employment levels and conditions as reported by regional fisheries bodies for the year 2020 in April and November. The data are the responses to the questionnaires.

3.2.2. Impact on Employment in Capture Fisheries and Aquaculture

The effect of COVID-19 on employment levels and conditions, as reported by RFABs, is shown in Figure 7. According to the questionnaire responses, 63% of respondents in November, compared to 64% in April, believed that employment would decline with the capture of fisheries, while 37% in November believed there would be no change, an increase, and no idea, compared to 36% in April.

In November, 64.7% of respondents to postharvest activities related to capturing fisheries believed employment would decline compared to 27.3% in April. In contrast, 35.3% and 72.7% believed employment would increase, there would be no change, and they were uncertain (do not know). In the aquaculture sector, 60% of respondents in November believed that employment would decline, compared to 64% in April. However, 40% and 36% of respondents believed that employment would not change, would rise, and were unsure whether it would be affected during the months, respectively. Compared to 64% in April, 80% in November of post-harvest aquaculture activities would result in a decline in employment. However, 20% and 36% in the months, respectively, believed nothing would change, it would rise, and they were unsure if employment would be affected altogether.

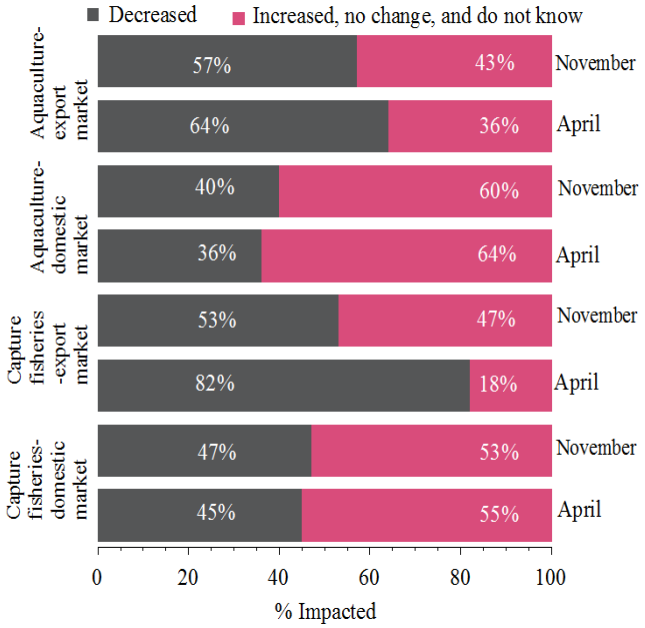

Fig. 8 The impact (%) of COVID-19 on the demand of fisheries and aquaculture products as reported by regional fisheries bodies for the year 2020 in April and November. The data are the responses to the questionnaires.

3.2.3. Demand for Fisheries Products

It was investigated how COVID-19 affected the demand for harvested fish. The effect on fish demand in the domestic capture fisheries market, as determined by the RFABs, is depicted in Figure 8. According to responses gathered in November 2020, 47% of respondents thought demand would decline, while 53% thought it would increase, remain the same, or did not know. These results were not significantly different from those in April. A proportion of 53% of respondents in November, compared to 82% in April, believed that demand would decline for capturing fisheries and the

export market. In comparison to April (18%), 47% thought in November that demand would remain the same, rise, or were unsure of any change. In November, 40% of the surveyed individuals involved in the domestic aquaculture market, as compared to 36% in April, believed that demand would decline. Although 64% in April and 60% in November responded that nothing would change, demand would rise, and they are uncertain of any effect. In November, 57% of RFABs that were involved in the aquaculture export market thought that demand would decline, compared to 64% in April. Compared with 36% in April and 43% in November, they believed there would be an impact, an increase, and they did not know.

3.2.4. Price for Fisheries Products

COVID-19 had an impact on fish prices (Figure 9). In November, 26.3% of respondents said that fish prices of captured fisheries had gone down, which is slightly less than 27.3% who reported a drop in April. In November, 73.7% of people claimed that prices did not change, went up, and were unsure of any change. In April, this figure was 72.7%. In April, 36.4% of respondents said prices of fish from aquaculture were lower, but this percentage dropped slightly to 33.3% in November. In the months mentioned, 63.6% and 66.7% of people said prices would go up, but they did not know or thought there would be no change for the respective months.

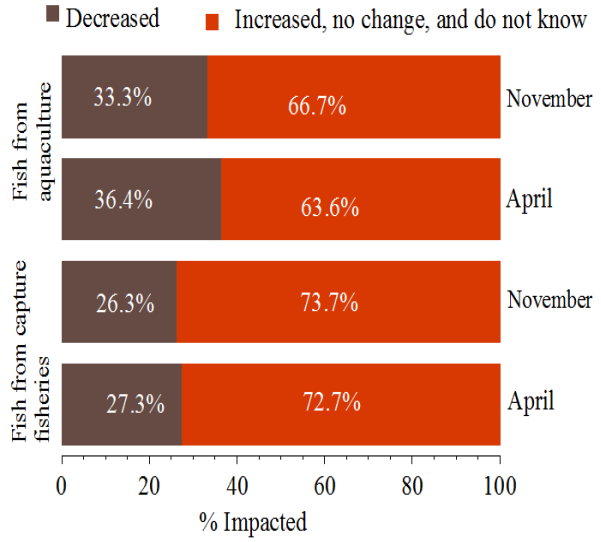

Fig. 9 The impact (%) of COVID-19 on the price of fisheries and aquaculture products as reported by regional fisheries bodies for the year 2020 in April and November. The data are the responses to the questionnaires.

3.2.5. Impact of the COVID-19 Pandemic on the Supply of Fish to the Domestic Markets

Figure 10 shows how the supply of capture fisheries was affected in the domestic markets. November 2020 saw a decline in supply of just 58%, and April saw a decrease of 78%. In November, 42% of people thought that supply would not be affected and did not know the answers, and no change would occur, compared to 22% in April. In November, 50% of the individuals dealing with capture fisheries and imports believed that the availability of fish to local markets would go down, compared to 82% in April. In April, 18% of people said there would be no change, a rise, or they did not know. In November, this number rose to 50%. Coming to aquaculture–domestic markets, responses provided in November showed that 53% thought that supply would decrease, compared to 55% in April. In the months mentioned, the responses indicating increased, no change, and unsure about any change in supply were 47% and 45%, respectively. Aquaculture imports supply to domestic markets have changed in the following ways. Aquaculture imports supply to domestic markets have changed in the following ways. In November, 40% of respondents believed that imports would drop, compared with 73% in April. In November, 60% of people thought there would be no change in supply, an increase, and they were not sure of any changes compared to 27% in April.

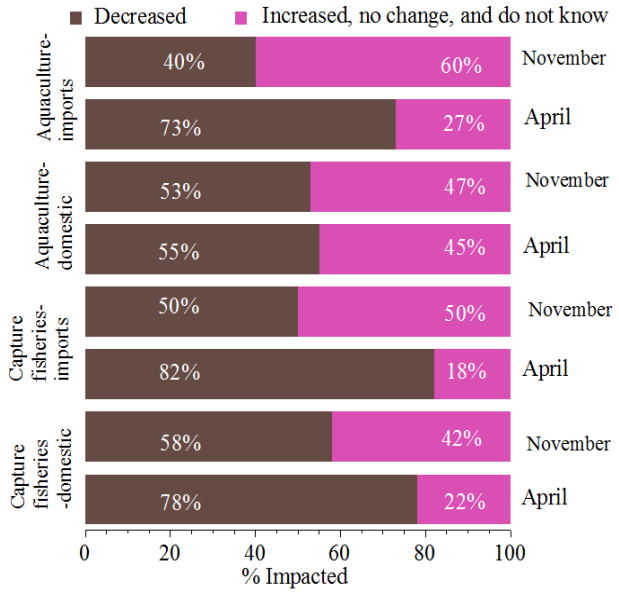

Fig. 10 The impact (%) of COVID-19 on supply to domestic markets of fisheries and aquaculture products as reported by regional fisheries for the year 2020 in April and November. The data are the responses to the questionnaires.

4. Conclusion

COVID-19 significantly affected the seafood industries in India, Japan, and Malaysia. Lockdowns or volunteer restrictions in the countries and at the international border affected both overseas and domestic markets. In response to government restrictions, consumer purchasing habits changed. They preferred other foods or items produced locally. Lack of workers and a decrease in customer numbers led to the closure or limited operation of bars and restaurants. The seafood trade during the COVID-19 pandemic in the countries mentioned above was compared with the normal pre- and post-pandemic

years. The trade volume (tons) and revenue (local currency and US dollars) were assessed. In the FY 2020-2021, the pandemic affected Indian fish exports by 0.72 billion US dollars. Volume-wise, there was an approximate decline of 140,000 metric tons. The impact was evident in Japanese exports in 2020, with a loss of 60 billion Japanese yen compared to the pre-pandemic year of 2019. The following year, exports recovered, though.

The pandemic's anticipated impact on shared fish stock management was 44% in April 2020, which increased marginally (50%) in November. In November 2020, 90% anticipated adverse effects on fish stock research, while 95% expected negative impacts on fish stock management in the above month. The pandemic also negatively affected the monitoring, control, and surveillance of captured fisheries at 89% in April and 95% in November 2020. Compared to 64% in April 2020, nearly the same (63%) in November, anticipated to be declining employment in the capture fisheries sector. Capture fisheries post-harvest saw a decline of 27.3% in April. It fell much higher, 64.7%, in November 2020. Employment in aquaculture decreased more in April (64%) than in November (60%). Aquaculture post-harvest employment declined by 80% in November compared to 64% in April 2020. In November 2020, 47%, 53%, 40%, and 57% of respondents predicted a decline in demand for capture fisheries in domestic and export markets and aquaculture in domestic and export markets, respectively. In April, capture fisheries in domestic and export markets and aquaculture in domestic and export markets saw declines in demand of 45%, 82%, 36%, and 64%, respectively. Fish prices have been negatively impacted by COVID-19, with 26.3% of respondents reporting a decrease in captured fisheries prices in November, nearly the same as in April 2020 (27.3%). Aquaculture fish prices were also expected to decrease in April, at 36.4%, and improve in November, at 33.3%. It was anticipated that captured fish imports to domestic markets would decline by 82% in April and by 50% in November. The capture fisheries supply to domestic markets was reduced by 58% in November 2020 and 78% in April. Aquaculture-domestic markets were predicted to decrease by 53% in November 2020 and 55% in April 2020.

In November and April 2020, 40% and 73% of respondents believed aquaculture imports would decrease, respectively. The review containing the above data helped to learn more about the current SARS-CoV-2 spread from a perspective other than health and medical aspects. The findings and data analysis have established a framework for other industries and enterprises affected by the current pandemic and those that will occur in future.

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