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The impact of the COVID-19 on China’s fisheries sector and its countermeasures

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ABSTRACT

The COVID-19 pandemic has affected China’s economic development, international exchanges and other aspects to varying degrees, among which the impact on China’s fishery development should not be underestimated. The fishery is a traditional and vast industry in China. The ongoing COVID-19 outbreak has also exposed potential problems in China’s fishery development, such as the lack of specialised aquatic product quality and safety supervision and testing institutions. New problems have also arisen, such as the decline in the market demand for fish and aquatic products, affecting fishers’ income, livelihood and so on. These deficiencies require China to establish a matching legal system to correspondingly solve the current legal and political problems. This paper will systematically discuss the impact of the COVID-19 on China’s fisheries sector from the perspectives of ‘fishers’ and ‘aquatic products’ after the outbreak of the COVID-19 pandemic and analyse how to deal with various problems by referring to relevant experience in light of China’s national conditions and characteristics.

1. Introduction

China is one of the largest fishing states, because it possesses a significant number of fleets and thus the capacity to fish in a lot of different areas (Sua et al., 2021); it is also considered as world’s largest aquaculture producer with over 60% of global world production in volume (Little et al., 2021). To administer these resources and make them sustainable, China has formulated and promulgated a series of fishery laws, regulations, and rules since 1979. These include, for example, the Fisheries Law of the People’s Republic of China in 1986 (hereinafter referred to as the ‘Fisheries Law’) (MoEE-PRC, 1986), the Marine Environmental Protection Law in 1982 (MoEE-PRC, 2020), and the Regulations on the Protection of Aquatic Resources Breeding in 1979 (MoARA-PRC, 1979). By the end of the 20th century, China aggregated promulgated more than 600 fishery laws and regulations, covering a myriad of areas such as fishery production, fishery resources, marine and freshwater environment, fishing boats, aquatic seedlings, aquatic product circulation, fishery administration law enforcement, offshore fisheries, the quality of aquatic products, the protection of aquatic wild animals and plants, and many other fishery fields, as well as fishery-related fields (Huang and Y., 2010).

Amongst all the fishery-related laws and regulations, the ‘Fisheries Law’ and the ‘Detailed Rules for the Implementation of the Fisheries Law of the People’s Republic of China’ are playing a pivotally guiding role, which aims “to protect the legitimate rights and interests of fishery producers and operators and promote the development of fishery production in China” (MoEE-PRC, 1986).

The development of the fisheries sector is closely related to people’s livelihood in China and the aquatic production in China contributes to around half of the global aquatic production (Hu et al., 2021). After the outbreak of the COVID-19 pandemic, the impact of the COVID-19 and its aftermath on China’s fishery industry entails further policy protection and legal measures (UN-FAO, 2020a). During the pandemic period, starting from early 2020, the volume of aquatic product transactions in China has decreased significantly (Kakoolaki et al., 2020; Yang et al., 2021). The wholesale fish market was shut down in large numbers (Wang and Yu, 2020), the rework of workers, the delay in the resumption of fishery work, and the shutdown or production reduction of enterprises have caused serious economic losses to China’s fishery industry in the short term (Aday and Aday, 2020; Minahal et al., 2020). It even includes cancelling major aquatic product trade events due to the cancellation or postponement of fishery conferences and activities. The

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25th China International (Qingdao) Fishery Expo is one of examples. Although the aforesaid conference is held remotely online, failing to obtain the latest national and international fishery information and the inability to communicate the latest fishery development results on time have caused varying degrees of adverse impact (Zhang and Chen, 2020). The pandemic has not yet vanished, and the situation is still volatile. Further evaluation is in need in order to develop a comprehensive understanding of the impact of the COVID-19 pandemic on China’s fishers and aquatic products.

The primary purpose of this article is to research and analyse the impact of the COVID-19 pandemic on China’s fisheries sector including ‘fishers’ and ‘aquatic products’ since the outbreak of the COVID-19 pandemic. This article provides an analysis of the existing relevant measures and regulations and recommends ways on how further policies and legal countermeasures might be constructed to mitigate the adverse impact of the COVID-19 on China’s fisheries sector. For the above purpose, this article draws references from China’s own fishery-related operating experience after the outbreak of the Severe Acute Respiratory Syndrome (hereinafter referred to as ‘SARS’) in 2003 as well as other countries’ responses to the COVID-19 in their fishery industries. Overall, the main research questions that this article aims to address are: (1) what kind of new policies should be adopted for fishery protection after the outbreak of the COVID-19 pandemic? and (2) is it necessary for these policies to be legalised in order to better protect China’s fishers and aquatic product trade?

This article presents comprehensive knowledge about the impact of the COVID-19 on the fisheries sector in China and the countermeasures which the Chinese government has taken so far, including laws, policies and various regulations. In addition to examining and exploring how the COVID-19 has impacted the fisheries, the article adopts qualitative and various regulations. In addition to examining and exploring how the pandemic. This article provides an analysis of the existing relevant measures and regulations and recommends ways on how further policies and legal countermeasures might be constructed to mitigate the adverse impact of the COVID-19 on China’s fisheries sector. For the above purpose, this article draws references from China’s own fishery-related operating experience after the outbreak of the Severe Acute Respiratory Syndrome (hereinafter referred to as ‘SARS’) in 2003 as well as other countries’ responses to the COVID-19 in their fishery industries. Overall, the main research questions that this article aims to address are: (1) what kind of new policies should be adopted for fishery protection after the outbreak of the COVID-19 pandemic? and (2) is it necessary for these policies to be legalised in order to better protect China’s fishers and aquatic product trade?

This article presents comprehensive knowledge about the impact of the COVID-19 on the fisheries sector in China and the countermeasures which the Chinese government has taken so far, including laws, policies and various regulations. In addition to examining and exploring how the COVID-19 has impacted the fisheries, the article adopts qualitative means of content analysis to investigate the significance of fisheries, examine patterns of influence of the COVID-19 over the fisheries, analyse existing relevant laws and policies in China—finding gaps in these policies—and conduct a brief analysis over the introduction and implementation of new policies; specific attention has been paid to provide the recommendations and policy implications based on the discussion, analysis and observation made in this article. The second section of this article provides an in-depth analysis of the adverse impact of the COVID-19 on China’s fishery industry. The third section of this article presents an overview of the existing relevant laws and policies, highlighting the gaps in terms of appropriate and applicable suitable laws for the updated COVID-19 situations and then briefly analysing the new policies and countermeasures. Similarly, the study details the observations and recommendations in the forth section of this article for better solutions to the subject matter and appropriate policy implications to the various stakeholders. These components are scrutinised cohesively in the aforementioned sections, followed by the concluding remarks in the fifth section of this article.

2. Analysis of the adverse impacts of the COVID-19 on China’s fishery industry

The COVID-19 has impacted China’s fishery industry profoundly. For example, when aquaculture farmers in the north of China step into a new production cycle, they must prepare for the new season of production, such as clearing fishponds or aqua farms, disinfecting, testing water, releasing seedlings, and feeding. However, all of the above production steps have been affected by the COVID-19, which may jeopardise the entire production season (Shi et al., 2020). The COVID-19 has impacted not only China’s fishers and aquatic product trade, but also a series of other issues that entail further consideration. For instance, home isolation and other nationwide strict control and preventive measures in China may adversely impact fishery processing, breeding, and fishing operations and come up with severe issues such as shortage of labour.

2.1. Impact on China’s aquatic product trade

Aquatic products are well recognised as one of the healthy foods in the world (UN-FAO, 2020b). The Food and Agriculture Organisation of the United Nations released a new report in June 2020, revealing that the global per capita consumption of aquatic products has set a new record of 20.5 kg per year, and is expected to increase further in the next decade (UN-FAO, 2020b). It highlights the importance of aquatic products in the global food industry and nutrition security. According to statistics, the per capita consumption of aquatic products in China (including non-food/eatable items) is about 41 kg/year (China Blue Sustainability Institute, 2019). China’s aquatic product trade has been affected by the COVID-19 pandemic in the following aspects.

2.1.1. A decline in market demand and sales

Since the outbreak of the COVID-19, the Chinese government has adopted comprehensive, strict, and thorough prevention and control measures, which have been proved as responsible attitude towards not only the life safety and health of the Chinese people but also globally (Shen et al., 2020). In order to efficaciously respond to prevention and control measures such as ‘home isolation’, ‘road closure’ and ‘suspension of work and production’, China’s aquatic product market, mid-to-high-end restaurants and other related places were closed for a considerable period (Cadell, 2020), while crowd gathering activities such as dinner parties and entertainment were also cancelled (Zhang et al., 2020).

According to the COVID-19 pandemic consumer survey report released by the research agency Kantar on February 12, 2020, during the pandemic period, about 75% of consumers globally cancelled their spending on travel, catering, and outing entertainment, and about 17% of consumers reduced their spending (Kantar, 2020). The development of China’s fishery industry is inseparable from the food processing industry, and the aforementioned prevention and control measures may adversely affect the production, processing and sales of fish products to varying degrees. For instance, domestic salmon companies are facing many challenges in deep waters during these transactions (Siyang and Fenglan, 2020). Referring to the situation back in February and March 2020, the sales revenue of most companies was almost zero. About 30% of sales revenue were recovered in April 2020, which increased to about 50% in May 2020 (Siyang and Fenglan, 2020). In addition to the decline in consumer demand for aquatic products, prices for aquatic products have also dropped considerably. At present, the price of domestic salmon has dropped significantly (Ito, 2021), exerting great pressure on the cash flow of salmon companies.

2.1.2. Overstock of aquatic products in aqua farms

During the outbreak of the COVID-19 in early 2020, the problem of overstock (mainly due to the closure of markets and trade activities) of aquatic products in aqua farms was severe and aquatic products such as tilapia, prawns, crayfish, and bulk freshwater fish were significantly affected (MoARA-PRC, 2020a).

According to statistics, as of March 14, 2020, about 410,000 tons of fish products were overstocked in aqua farms throughout Hubei Province due to the COVID-19 (Hubei Daily, 2020a); the Zhongshan City of Guangdong Province had more than 10,000 tons of meat fish overstocked in aqua farms. As far as Dongsheng Town of Zhongshan City is concerned, the breeding area of crispy carp was 17,000 mu (mu refers to a unit of area, 1 mu equates to 0.0667 ha), with an annual output of 35,000 tons, and the overstock was estimated to be about 8000 tons (Zhongshan Agriculture and Rural Affairs Bureau, 2020). Similarly, according to the statistics from the Department of Rural Agriculture of Hainan Province, as of March, 45,000 tons of tilapia were overstocked in aqua farms, which is one of the main freshwater aquaculture species in Hainan Province (MoARA-Hainan Province, 2020). As for the main species of marine fish aquaculture, there were about 15,000 tons of grouper, 15,000 tons of golden pomfret and 25 million tons of shrimp.
overstocked in aqua farms. Hunan Province, Henan Province, Zhejiang Province, and other places also reported a significant amount of overstock of aquatic products in their aqua farms (Renyi, 2020).

According to the traditional custom and pattern of the aquaculture business, the post-Chinese Spring Festival period (January–February) is deemed as a critical time to arrange, clean and sun fishponds and aquafarms. However, aquatic products prepared for winter sale could not be sold in time due to the outbreak of the COVID-19, which resulted in the excessive pressure of overstock of aquatic products in aqua farms and thus rendered it impractical for many to commence a new cycle of seedlings.

2.2. Impact on Fishers in China

2.2.1. Working environment on the sea

The severity of the COVID-19 and its uncertainty have affected all fronts and led to the situation where the rights and interests of fishers cannot be protected sufficiently. In order to prevent and control the COVID-19, many governments have adopted measures such as restricting entry and closing borders (UN-Stats, 2020). As a result, personal protective equipment and medical services onboard become limited and insufficient, and fishers working on ships cannot easily access the medical services and social welfare services as those who work onshore. Furthermore, mental stress, feelings of isolation and social pressure increasingly hit on fishers working on the sea (Lucas et al., 2021; Plopa et al., 2020). Due to the COVID-19, it is notable that ship operators are unable to replace crew members, which has caused crew members to spend more time on the ship. Challenges confronted by seafarers and fishers include the unilateral or illegal extension of working hours, prolonged closure of ships ordered to drop anchor or moored at remote berths, and unilateral termination of contracts. Some crew members cannot leave the ship due to travel restrictions, be repatriated or seek emergent medical assistance (United Nations, 2020).

Incidents such as abandonment of seafarers occurred continuously, and numerous measures taken—for example, UN’s initiative to protect seafarers’ human rights amid the COVID-19 crisis (United Nations, 2021)—to prevent the COVID-19 and solve abandonment incidents (United Nations, 2020). For example, after the Spring Festival, it is the time when fishing boats and fishers are put out to sea for fishing activities concentratively. In general, the staff turnover ratio of marine fishery workers is high, and the staff composition of marine fishery workers is complex (Yuen et al., 2018). Therefore, a large number of marine fishery workers with narrow workspaces might not be rescued in the first instance if they were unfortunately infected with the COVID-19. It will then be likely to trigger a spread of the COVID-19 on the whole ship, leading to a series of more serious problems, such as how to enforce labour contracts of fishery workers and arrange voyages of ships.

2.2.2. Income issues of Fishers

After the outbreak of the COVID-19, the market demand for aquatic products in China has declined, and the order quantity of related restaurants has considerably decreased whilst the prices of products have also been affected (Miao et al., 2021). At the beginning of January 2020, the price of turbostandard fish (500 g–750 g) was 25 yuan/500 g, and the price of beyond-standard fish (over 750 g) was 23 yuan/500 g. During the COVID-19, the price dropped to 13 yuan/500 g for standard fish and 9.5 yuan/500 g for beyond-standard fish (China Aquatic Products, 2020). In light of the above observations, reducing fishers’ income is inevitable; the average income of such workers has reportedly decreased by ten to twenty percent in China (Marchisio, 2020).

2.2.3. Issues concerning the validity of Fishers’ certificates

According to the first paragraph of Article 5 of the Administrative Regulations on Coastal Ship Side Prevention and Safety (MoPS-PRC, 2020), it is stipulated that ‘Persons and fishers who have reached the age of sixteen and who do not hold the “People’s Republic of China Seaman Certificate” or “Crew Service Book” shall apply for the “Vessel People’s Permit”, which is valid for four years.’ In light of the above regulations, one issue that must be considered is whether or not fishers can validly continue to utilise their permits if relevant documents expire and cannot go through the relevant extension procedures in due time. It is a point of concern because almost all industries have responded to the call of the state to suspend production and business during the pandemic period.

In response to this issue, this article points to Article 1 of the ‘Notice on Doing a Proper Job in Fishery Ship Management and Other Related Matters During the Period of Pandemic Prevention and Control’ issued by the Ministry of Agriculture and Rural Affairs (MoARA-PRC, 2020h), to extend the provisions of the fishery fishing license. It states that “nationality certificate of the fishing vessel, fishing license of the fishery, fishery crew certificates and other relevant fishing vessel and crew certificates that expire or will expire shortly, need to be reissued, annually reviewed, or other fishing vessels and crew related businesses that need to be handled in the near future, fishery authorities at all levels can postpone until the end of the COVID-19 pandemic. During this period, if fishers have production and living needs such as shipping operations, they can still use the existing certificate. Suppose the certificate expires or becomes invalid due to overdue certificate renewal, non-annual review. In that case, the fishery law enforcement department shall impose no penalty upon fishers, except for those involved in the international performance of ocean-going fishing vessels” (MoARA-PRC, 2020b).

Therefore, this research observes that the above Notice has effectively addressed issues concerning the validity of fishers’ fishing certificates or permits.

3. Analysis of the current legal safeguard measures and policy recommendations

3.1. Existing laws and policies

3.1.1. China’s measures taken to protect fisheries after SARS

In response to the impact of the SARS on China’s fisheries sector in 2003, the Ministry of Agriculture and Rural Affairs issued the ‘Prevention Plan for the SARS in the Fishery Industry’ (hereinafter referred to as the ‘Pre-plan’) (MoARA-PRC, 2003) in April 2003 (Knobler et al., 2004). The Pre-plan stipulates terms including strengthening the cleaning and disinfection of fishery law enforcement vessels, maintaining the seaworthiness of fishery law enforcement vessels, conducting necessary temperature measurement and inspection of sailing personnel, preventing crew members from going out to sea with illness, prohibiting idlers from boarding the ship, and specific measures such as isolation of 3–5 days before putting out to sea.

Article 4 of the Pre-plan stipulates: ‘In response to possible epidemics in marine operations, formulate marine atypical pneumonia prevention and treatment measures and emergency medical treatment procedures for fishing vessels and crews’ (MoARA-PRC, 2003). The COVID-19 pandemic spreads faster than the SARS and is more contagious (Swai, 2020). After the outbreak of the COVID-19, it has become more challenging for fishing vessels and seamen to operate at sea, but their protective equipment and medical services have improved compared with those during the SARS epidemic. The current situation of preventing and controlling the COVID-19 in China is steering towards a positive direction. The recovery and safety of life of fishers and production of fisheries have accelerated at the same time. However, pandemic prevention and control at sea are still unstable due to uncertain and volatile pandemic situations. Also, if the spread of the COVID-19 occurred on foreign ships, maritime safety would inevitably face new challenges; if new cases are found in the foreign ships coming to China, it may adversely impact future normal transactions and head towards the closure of certain fishing activities.
It is recommended in this article that relevant fisheries departments can learn from the relevant measures stipulated in Article 4 of the Pre-plan in order to effectively analyse and respond to specific issues arising from the COVID-19, in light of the COVID-19’s own features and related conditions. For instance, establishing specialised medical teams for prevention and treatment of the COVID-19 on the sea and such medical teams will bear responsibilities for obtaining the latest COVID-19 data and conducting imperative temperature measurement and inspection for sailing personnel. Moreover, the medical teams can also conduct 14-day intensive medical observation for sewing personnel from medium and high-risk areas, run two nucleic acid tests, distribute virus prevention materials at the end of the isolation period, etc.

3.1.2. Legal protection mechanisms for safe consumption of aquatic products

At present, China’s laws and regulations on the quality and safety of aquatic products comprise the Fisheries Law, the Food Safety Law (Standing Committee of NPC, 2021), and the Special Provisions of the State Council on Strengthening the Supervision and Administration of the Safety of Food and Other Products (State Council, 2007). Relevant laws and regulations have not been only controlling product qualification standards, production and operation requirements, but also illegal acts and corresponding legal liabilities. Similarly, their impact during the pandemic time is obvious. For example, consumers’ confidence in the quality and safety of marine fish products was affected to a certain extent, which caused a decrease in demand (Yang, 2020). Article 15 of the emergent notice stipulates that:

“Goods entering aquatic products wholesale markets must be within the scope of wholesale business approved by the government. Goods entering the market must comply with the health and fishery authorities; goods that are spoiled, toxic, or otherwise harmful to human health, and aquatic products caught illegally shall not enter the market” (MoARA-PRC, 2008).

In response to the COVID-19, China has adopted various measures to prevent the COVID-19 to ensure the health and safety of business owners and consumers, such as strengthening the supervision of the seafood market and strictly preventing the entry of seafood from infected areas and/or seafood with no quarantine access. For example, the headquarters of the COVID-19 Prevention and Control Work Leading Group of Yulin City issued an emergency notice on strengthening prevention and control measures preventing the pandemic from re-spreading (Dongmei, 2020). Article 3 of the emergent notice stipulates that:

“The supervision of key places such as farmers’ markets will be further strengthened, and relevant departments shall regularly carry out nucleic acid testing of environmental samples in farmer’s markets, seafood markets, large supermarkets, dining establishments, especially collective canteens such as schools and medical institutions, frozen fresh food processing, storage places, and transportation vehicles, etc., and strengthen the supervision of the live poultry and seafood market, and strictly prevent live poultry and seafood from animal infected areas and/or without quarantine access from entering Yulin City from abroad through the port.”

Another example is Henan Province’s comprehensive investigation of the province’s edible agricultural products centralised trading market and special inspections on salmon seafood products simultaneously (Admin-Henan Province, 2020). The entry-exit inspection and quarantine department shall not allow the enterprises to enter the market for sale if imported aquatic products do not possess any relevant inspection and quarantine certification documents. At the same time, restaurants and hotels are prohibited from utilising aquatic products and raw food materials of unknown origin (Admin-Henan Province, 2020).

3.2. Flaws in current measures

3.2.1. Policy implementation is not in place

The target group is the object directly affected by the implementation of the policy. The policy makers should consider whether the target group trusts or accepts a certain policy; it may directly affect the implementation of such policy. Generally speaking, if the target group understands and trusts the policy, they will fully cooperate with the implementation of the policy (Hudson et al., 2019). Otherwise, they may adopt an unsupportive approach. After the outbreak of the COVID-19, although China has issued plenty of fisheries-related policies, the fishers’ awareness of the policies is not high (Zhao and Jia, 2020). In light of the above situation, it is recommended that all provincial fisheries authorities should—in combination with national policies—focus on the characteristics of fishery operations in a manner that is acceptable to the majority of fishers groups, such as strengthening publicity and guidance, so that fishers can realise the importance of policies in connection with their pertinent rights and duties.

Another example is the organisation of regular training; it can help the relevant key personnel of the target group of a certain policy to understand and realise their own responsibilities towards such policy through in-depth study. At the same time, actively publicising knowledge about the prevention and control of the COVID-19, so that the broad masses of fishers and government cadres and employees will enhance their awareness of protection, improve their self-protection capabilities, and implement policies in place.

3.2.2. Quality and safety supervision of aquatic food lacks professional supervision departments and inspection agencies

China has not yet established a thoroughly aquatic product supervision and management system. Some standards have defects, such as duplication of regulations and poor coordination, and there is a lack of systematic and orderly standard formulation planning in the system (Liu, 2015). In terms of the supervision and inspection of aquatic products, simple random inspection and monitoring is still the most common approach in China (FOA-China, 2017; Li et al., 2011). Most of the relevant information regarding the origin of the product appears blank, which makes the traceability system impossible to implement effectively, and safety management of the source only stays on paper (CYAE, 2014). On the other hand, the aquatic product quality supervision and inspection agency is not very effective, as demonstrated by ineffective inspection activities in recent years, which seriously restricts the improvement and progress of China’s aquatic product quality supervision and inspection system (Sun, 2021).

In the face of the current pandemic, the quality and safety of aquatic products have become particularly important in all aspects. It is recommended that fishery administrative departments at all levels and their subordinate fishery administration and fishing port supervision and management agencies adopt remote monitoring technologies, such as the use of the latest wireless communication technology, digital sensing technology, and monitoring equipment. Furthermore, the aquatic product quality and safety traceability system in the “Modern Fishery Technology Remote Service Management System” combined with traditional fishery monitoring and management methods, might be utilised to render certain traceability to the source of each type of aquatic product in order to ensure its quality and safety (Cooke et al., 2021).

3.3. Introducing and implementing new policies

In light of the adverse impact that the COVID-19 has caused on China’s fisheries sector, the state bears the responsibility to introduce and implement relevant policies to aid the sector in recovery. In order to effectively implement relevant policies to benefit the current and long-term development of the fishery, local governments must fully cooperate with the implementation of all relevant policies. During the
outbreak of the COVID-19, the Ministry of Agriculture and Rural Affairs issued the ‘Notice on Doing a Proper Job in Fishery Ship Management and Other Related Matters during the Period of Pandemic Prevention and Control’ (hereinafter referred to as the ‘Notice’) (MoARA-PRC, 2020c). In March 2020, the General Office of the Ministry of Agriculture and Rural Affairs issued the ‘Key Points of Fishery and Fishery Administration Work in 2020’, requiring that full efforts should be made to stabilise the production and supply of aquatic products during the prevention and control of the COVID-19, and to continuously strengthen the construction of the rule of law and law enforcement supervision of the fisheries sector (MoARA-PRC, 2020d). In April 2020, the Ministry of Agriculture and Rural Affairs issued the ‘Notice on Further Doing a Proper Job in Fishery Production Safety During the Resumption of Work and Production’, requiring that fishers’ pandemic prevention and control should be carried out carefully and persistently, and the hidden dangers of fishing boats should be investigated continuously, and fishery emergency duty should be fulfilled unerringly (MoARA-PRC, 2020e).

In order to respond to the state’s call, various local governments introduced relevant fishery policies to tackle local problems, developing appropriate solutions to existing problems. Before proceeding to the discussion of relevant policies, a major premise must be stated hereby first, and that is the introduction of local policies must be based on the interests of all fishery workers and must not deviate from the direction of national policies.

Various policies made by the local government departments have made further contributions to the development of China’s fisheries sector during the pandemic prevention and control period. Taking Hubei Province as an example, after the outbreak of the COVID-19, strict traffic control measures were implemented, and aquatic products were unsalable. Prior to the Spring Festival, the province’s aquatic products stored in aqua farms reached 500,000 tons, but the daily sales volume was less than 200 tons (Hubei Daily, 2020b). The agricultural and aquatic products departments at all levels in the province build information exchange bridges, establish a batch of WeChat groups to bridge the direct connection of production and sales, actively connect with e-commerce platforms such as Hema Xiansheng, assist in the application of transportation certificates for fresh transportation vehicles, and connect with major hospitals canteens and various local community group-buying groups. Consequently, the province’s fresh fish sales boosted from 200 tons per day to about 9000 tons per day on March 15, 2020 (Hubei Daily, 2020b).

In addition, the ‘Jingchu Aquatic Products Purchasing Network’ was officially launched, and Hubei, the province of thousands of lakes, introduced the ‘Selling Fish on Cloud’ model officially (Hubei Radio and Television Financial Media, 2020). The system provides an information platform for the supply and demand of aquatic products in Hubei Province, as well as liaison services for provincial-level industry associations and special personnel to promote the point-to-point production and sale of aquatic products in Hubei Province during the pandemic prevention and control period. The introduction of the above policies by Hubei Province managed to mitigate the overstock issues of fishery products in aqua farms (Hubei Daily, 2020b).

3.3.1. Overstock issues of aquatic products

The ‘Key Points of Fisheries Administration Work in 2020’ requires that the difficult sales of aquatic products in aqua farms be highlighted in various ways. It includes strengthening the ‘point-to-point’ contact mechanism, accelerating the resumption of work and production of aquatic product processing enterprises, increasing the sale of aquatic products in aqua farms, dispatching and releasing information on the supply and marketing of aquatic products in a timely manner, intensifying the expansion of e-commerce, direct supply and other aquatic product circulation models, alleviating the problem of unsalable aquatic products, preventing and controlling the diseases of aquatic products in storage aqua farms, and preventing the quality and safety risks of aquatic products (Zhang and Chen, 2020).

The COVID-19 is under closed-off management, restricting the movement of people and traffic, and the problem of overstock of fishery products in aqua farms cannot be underestimated. Local governments ought to effectively solve the problem of the overstock of aquatic products in aqua farms in light of the objective conditions of the local area. For example, after completing various pandemic prevention measures and registration work, the ‘green transportation system’ for the transportation of fish products can be implemented to achieve the long-run sustainable developments in the fisheries sector; the World Bank also recommends it for environmentally friendly shipping (Lawrence, 2016). When consumers confront difficulty in travelling during the home isolation period, they can opt for non-face-to-face purchase models such as online sales.

3.3.2. Management of utilisation of fishery certificates

Article 1 of the Notice requires the management of fishing vessels during the pandemic prevention and control period and other related matters (MoARA-PRC, 2020c). One of them includes the appropriate extension of the business processing time limit for fishery fishing licenses, fishery crew certificates and other related fishery certificates, and stipulates that there will be no penalties imposed for failing to renew the certificates during the pandemic period. During the pandemic, the policy was issued to solve the validity issue of fishery workers’ certificates.

3.3.3. Subsidy policy for Fishers

The Notice stipulates that fishery authorities at all levels should accelerate the issuance of subsidy funds. For example, the Notice notes that the overstock of aquatic products in aqua farms China was severe since the outbreak of the COVID-19.In order to solve this problem, the Department of Agriculture and Rural Affairs and Department of Finance of Hainan Province jointly issued the ‘2020 Hainan Aquatic Products Purchase and Storage Emergency Subsidy Program’ (hereinafter referred to as the ‘Program’) (MoARA-Hainan Province, 2020). Article 2 and Article 3 of the Program provide that from the date of issuance of the Program to the end of March 2020, aquatic product processing enterprises that purchase and store aquatic products of more than 100 tons which are overstock in aqua farms in Hainan Province, shall be granted a subsidy of 1000 yuan per ton; when the overstock pressure on aquatic products is relieved, the relevant departments can suspend the subsidy policy as the circumstances may require (MoARA-Hainan Province, 2020).

The Program also states that since fishers’ income was impaired during the period of the pandemic, the provincial fishery authorities shall, in accordance with relevant fund management regulations, cooperate with relevant departments and complete the fund review and appropriation in a timely manner based on the actual situation of the local fishery; guide and urge the fishery authorities within their jurisdiction to intensify their work, speed up the issuance of subsidy funds and effectively alleviate the burden on fishers.

3.4. Reviews and recommendations

Since the outbreak of the COVID-19, the Central Government of China has united and led the people of all ethnic groups across the country and made tremendous efforts to achieve major strategic accomplishments in the combat against the COVID-19. Work and production have been gradually resumed and recovered across the country promisingly. The adverse impact of the COVID-19 on China’s fisheries sector has enlightening and instructive significance for China’s current and future fishery development. This article in the following section proposes recommendations and countermeasures for China’s future fisheries development from four aspects.

3.4.1. Legalisation of policies

As far as policies are compared with laws, laws are more stable while
policies are more flexible. The legalisation of a policy refers to the transformation of a policy to a legal level, so that it has legal effect, has the power to execute, and has the national coercive force to guarantee its implementation. Policy legalisation does not translate all policies into laws, but generally only transforms policies with certain conditions into laws. First, the policies are related to major issues of people’s livelihood, and they are universal and need to be legalised. Second, the policy is relatively mature and stable (Chen, 2001).

At present, regulations on the quality and safety of aquatic products are scattered in some related laws and regulations, such as the Fisheries Law, the Agricultural Product Quality and Safety Law of the People’s Republic of China, the Food Safety Law of the People’s Republic of China, and the State Council’s Special Provisions on Strengthening the Supervision and Administration of the Quality and Safety of Food and Other Products (Order No. 503 of the State Council).

China has not formulated corresponding quality and safety regulations specifically for aquatic products, but this does not mean that it is unable to deal with the food safety of aquatic products, nor does it mean that China does not pay attention to its quality and safety, nor does it mean that its quality and safety cannot be followed. Nevertheless, if there are special laws and regulations specifically formulated for aquatic products, the food safety of aquatic products can be regulated more precisely and cohesively, and there is no need to apply analogy in accordance with other relevant laws and regulations, making the food safety issues of aquatic products more coherent.

Considering the various policies formulated by China after the outbreak of the COVID-19 as well as the lack of specialised aquatic product quality and safety regulations, it is deemed pressing for China to formulate special laws and regulations to regulate aquatic product quality and safety. For example, clarifying the food safety standards of aquatic products, which can be divided into national standards and local standards; clearly stipulating legal responsibilities for violations of aquatic product food safety issues; clearly stipulating that relevant enterprises and departments shall establish aquatic product food safety traceability systems.

3.4.2. Providing free legal advice and support to Fishers

China has successively introduced relevant policies for its fisheries sector after the outbreak of the COVID-19. In addition to implementing relevant policies by fishery departments, it is also imperative and essential to raise the legal awareness of fishers groups. There are multiple ways to provide free legal advice, such as offering online or offline legal advice, popularising fishery legal knowledge and national policies related to the fishers themselves and answering fishers’ legal questions pertaining to their own interests. The above measures can alleviate the panic caused by the COVID-19 to fishery workers, consumers, and the food industry, and also help raise the awareness of the rights of fishers groups and help fishers obtain pandemic-related information and legal knowledge from the correct channels.

At the moment of the pandemic, fishers should proactively take practical actions to respond to the government’s call and undertake their social responsibilities. It is considered that providing free legal advice and knowledge to fishers will further encourage them to undertake their social responsibilities and strictly abide by the regulations and initiatives of the fishery authorities and the government, which will in turn help strengthen the management of the fishery industry and implementation of various epidemic prevention and control measures.

3.4.3. Establishing a specialised fishery product monitoring agency

The National Aquatic Product Quality Supervision and Inspection Centre is China’s earliest and only national-level aquatic product quality supervision and inspection agency. However, local aquatic products supervision departments and testing institutions have varying and inconsistent working competencies, and the testing personnel lack professional knowledge with relatively weak testing capabilities.

First of all, it is recommended that local food supervision and management departments should attach further importance to the establishment of inspection and testing departments, especially the establishment of rapid inspection teams. Simultaneously, various departments should consider increasing the penalties imposed on those who breach rules or regulations pertaining to the quality and safety of aquatic products. Moreover, it is recommended to innovate monitoring technology, encourage the bring-in and training of professional and technical personnel with high comprehensive quality, and clarify their main responsibilities, and drive the improvement of the detection capabilities of grassroots technical departments, and perform supervision and inspection methods and measures such as inspection and surveillance, law enforcement supervision, publicity guidance etc. Last but not least, it is recommended to promote the sharing of information and resources among aquatic product regulatory agencies, so as to achieve aquatic product quality and safety supervision in a more efficient manner.

4. Conclusion

The significance of China’s fisheries sector in society, economy and people’s livelihood is becoming increasingly pivotal. This article has discussed and analysed that the current policies are insufficient to entirely disperse the adverse impact of the COVID-19 on China’s fisheries sector from the root, and underlying issues are in urgent need to be resolved with further policy and legal mechanisms. As for recommendations for the future development of the fisheries sector in China, this article has proposed the following in essence. Regarding the food safety of aquatic products in China, it is not only imperative to issue policies to solve it, but also to establish a comprehensive legal system with the ‘Food Safety Law’ as the basic law. In response to the monitoring of the quality of aquatic products in China, it is required to speed up the establishment of specialised monitoring departments, improve the level of law enforcement and increase penalties. In response to the problem of fishers’ income, it is recommended to accelerate the implementation of the existing subsidy policy to each fisher in order to better protect the legitimate rights and interests of the fishery group. The COVID-19 is not eradicated yet, and the current prevention and control situation is still complicated and in grave difficulties. Conquering challenges arising from the adverse impact of the COVID-19 on China’s fisheries sector is a long-term and complex systematic project, which requires the prolonged cooperation and support of relevant fishery departments and workers. Overall, on the one hand, based on policy flexibility, it is perceived that relevant policies must be issued in response to the actual situation of the adverse impact of the COVID-19 on China’s fisheries sector. On the other hand, based on the legal coercive force and enforcement, it is contended that the establishment or improvement of relevant laws and regulations must be accelerated to promote the development of China’s fisheries sector towards a new era of higher legalisation, policy orientation, and efficiency.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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UN-FAO, 2020a. The Impact of COVID-19 on Fisheries and Aquaculture Food Systems Possible Responses. Food Agric. Organ. United Nations. URL http://www.fao.org/3/cb2537en/CB2537EN.pdf.

UN-FAO, 2020b. The State of World Fisheries and Aquaculture 2020. Food Agric. Organ. United Nations. URL http://www.fao.org/state-of-fisheries-aquaculture.

UN-Stats, 2020. How COVID-19 Is Changing the World: a Statistical Perspective. United Nations Comm. Coord. Stat. URL https://unstats.un.org/unsd/ccsa/documents/covid19-report-ccsa.pdf.

United Nations, 2020. Report of the Secretary-General of the 75th Session of the United Nations General Assembly, Oceans and the Law of the Sea, A/75/340. United Nations. URL https://www.un.org/depts/los/general_assembly/general_assembly_reports.htm.

United Nations, 2021. UN Launches Key Initiative to Protect Seafarers’ Human Rights amid COVID-19 Crisis. United Nations News. URL https://news.un.org/en/story/2021/05/1091372.

Wang, V., Yu, E., 2020. Beijing Shuts Down Seafood Market after Dozens Test Positive for Coronavirus. New York Times. URL https://www.nytimes.com/2020/06/13/world/asia/beijing-market-coronavirus.html.

Yang, Z., 2020. The Impact of Covid-19 on Fisheries and Aquaculture in East Asia. Food Agric. Organ. United Nations. URL http://www.fao.org/3/cb2362en/cb2362en.pdf.

Yang, G.Y., Lin, X.L., Fang, A.P., Zhu, H.L., 2021. Eating habits and lifestyles during the initial stage of the covid-19 lockdown in China: a cross-sectional study. Nutrients 13, 1–13. https://doi.org/10.3390/nu13030970.

Yuen, K.F., Loh, H.S., Zhou, Q., Wong, Y.D., 2018. Determinants of job satisfaction and performance of seafarers. Transp. Res. Part A Policy Pract. 110, 1–12. https://doi.org/10.1016/j.tra.2018.02.006.

Zhang, Z., Chen, X.J., 2020. The Impact of the COVID-19 on global fisheries and countermeasures. Aquat. Sci. Technol. Inf. 47, 346–349 (in Chinese).

Zhang, S., Wang, Z., Chang, H., Wang, C., Xu, X., Yu, L., Tsamlag, Y., Dong, H., Wang, Cai, 2020. COVID-19 containment: China provides important lessons for global response. Y. Front. Med. 14, 215–219.

Zhao, X., Jia, P., 2020. Towards sustainable small-scale fisheries in China: a case study of Hainan. Mar. Pol. 121, 103935 https://doi.org/10.1016/j.marpol.2020.103935.

Zhongshan Agriculture and Rural Affairs Bureau, 2020. The Zhongshan CPPCC Office Organises Enterprises and Media in the Circulation Field to Seek Countermeasures. The Content of the Relevant Officer in Charge of the Agriculture and Rural Bureau. Zhongshan Agric. Rural Aff. Bur. URL http://nync.zs.gov.cn.