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THE IMPACT OF COVID-19 ON FISHERIES AND AQUACULTURE FOOD SYSTEMS - POSSIBLE RESPONSES

Executive Summary

This information paper provides a global overview on the COVID-19 pandemic's impact on the fisheries and aquaculture sector to date and informs on the measures and responses taken by seafood providers and governments to counteract the negative impacts on fish and seafood supply chains.

FAO is supporting countries through this COVID-19 pandemic, by providing policy recommendations as well as technical advice and support. This paper also provides an overview of some of the on-going responses or recommended actions by FAO and/or partners.

Further information can be found in an extended and more detailed version of this information note of the same title produced by FAO "The impact of COVID-19 on fisheries and aquaculture food systems - Possible responses" and available on the FAO webpage *COVID-19 and its impact on the fisheries and aquaculture sector*¹.

¹ www.fao.org/fishery/covid19/en

I. INTRODUCTION

1. The purpose of this information paper is to provide information on the COVID-19 pandemic's impact on the fisheries and aquaculture sector and the measures taken, to inform on the ongoing impact on the fisheries and aquaculture food systems, and responses from seafood providers and governments to counteract the negative impacts on fish and seafood supply chains.
2. In the first half of 2020 there have been many adjustments by governments and the private sector to the evolving situation of the coronavirus pandemic. There have been new challenges, as well as innovations by governments and actors along the fish value chain. Already some lessons are emerging on ways to build back better, to ensure that the resilience of fish value chains are strengthened to endure future crises', so that sustainability, livelihoods and food security are not compromised, and that food loss and waste of high-value and perishable food is reduced to meet SDG 12 targets.
3. This paper relies on information collected through interviews,² secondary sources (e.g. media articles), and publicly available data.

II. KEY MESSAGES

4. Food itself is not responsible for the transmission of the disease to people. According to both the World Health Organization (WHO) and the OIE, the COVID-19 pandemic is being sustained through human-to-human transmission and not through international trade in animals and animal products. There is currently no evidence that people can catch COVID-19 from food or food packaging.
5. It is important to note that food itself has not been identified as being responsible for the transmission of the disease to people. The application of sound principles of environmental sanitation, personal hygiene and established food safety practices further decreases the likelihood of cross-contamination.
6. Each stage of the fisheries and aquaculture supply chain is susceptible to being disrupted or stopped by measures arising from COVID-19 restrictions. Only by protecting each stage of the supply chain can the continued availability of fish and fish products be ensured. In aquaculture there is growing evidence that unsold production will result in increasing levels of live fish stocks, creating higher costs for feeding as well as risks of fish mortalities.
7. Disruptive border restriction measures on trade in food should be minimized for food security. The dissemination of information on food-related trade measures is fundamental to avoid food shortages.
8. Consumer demand for packaged and frozen products increased from the second quarter of 2020 as households looked to stock up on non-perishable food. High-value fresh fish and seafood demand has fallen as restaurants and hotels have closed, or partially closed, owing to COVID-19 and related restriction measures.
9. In developing countries with large informal sectors, the lockdown measures and social distancing have especially impacted vulnerable small-scale and artisanal workers and communities. Many of these workers do not belong to producer organisations that represent their combined interests, making it challenging to access government support. Adequate coverage of the fisheries and aquaculture sector, including informal workers, should be provided.

² FAO regional and subregional fisheries and aquaculture officers, FAO field offices, project partners as well as regional organisations are gratefully acknowledged for their most valuable inputs to this paper.

10. It is important to work with sectoral and regional organizations to develop a range of adaptations to manage fisheries and aquaculture during the pandemic, that support job protection and ensure a fast recovery of the sector without compromising sustainability, including by assessing and adjusting transport and market development options.
11. Online distributors report increased use of web orders and home delivery services, as house-bound consumers accelerated their adoption of e-commerce alternatives during lockdowns.
12. Recognizing their specific vulnerability, as food producers, processors, vendors and carers, the impact of COVID-19 on women should be considered, and access to government support should be secured for women along the fish value chain.
13. Levels of Monitoring, Control and Surveillance (MCS) of fishing activities need to be maintained to ensure management control measures are enforced and Illegal, Unreported and Unregulated (IUU) fishing activities do not increase. The most common impact on MCS activities being reported is the disruption to at-sea observer programmes.
14. Uncertainty continues to dominate the outlook for the fisheries and aquaculture sectors, particularly with regard to the duration and severity of the pandemic. Investment in the fisheries and aquaculture sector will be impacted by the pandemic. The availability of investment funds for future production may be limited by the falling demand and lower prices. This is likely to bring long-term transformations to the sector.
15. Transformation of the sector should always bear in mind the principles outlined in the Code of Conduct for Responsible Fisheries³ to ensure that fisheries remain sustainable and support the needs of people for years to come.

III. WHAT MAKES FISHERIES AND AQUACULTURE FOOD SYSTEMS VULNERABLE TO COVID-19 RELATED SHOCK?

16. Fisheries value chains are experiencing greater demand from consumers coupled with a declining trend in the sustainability of some fish stocks; capture production has slowed and stabilized, and the proportion of fish stocks sustainably exploited has declined to below 70%-90% in the 1970's. The full range of activities that are required to deliver fish and fish products from fisheries and aquaculture production to the final consumers are complex, and technologies employed to manage these value chains vary from artisanal to highly-industrial.
17. Key activities in a fisheries or aquaculture supply chain are fishing, aquaculture production, processing, transport of inputs, distribution, wholesale and retail marketing. Each of these activities are of equal importance to the success of the supply chain. Each stage of the chain is susceptible to being disrupted or stopped by impacts arising from COVID-19 and related measures. If one of these buyer-seller links is ruptured by the disease or containment measures, the outcome will be a cascading chain of disruptions that will affect livelihoods and food security.
18. Households experiencing financial distress may slow down their spending⁴. The reduction of household demand, also influenced by containment measures (e.g. closure of food services, places of tourism, etc.) affects production, processing and distribution, and cause disruption in international and domestic supply chains. The fact that live, fresh or chilled fish, which represent 45 percent of fish consumed, are highly perishable presents additional logistical challenges in the supply chain.

³ www.fao.org/3/v9878e/V9878E.pdf

⁴ Initial estimates of the International Labour Organization (ILO) indicate a significant increase in unemployment and underemployment in the wake of the pandemic (draft HLPE Issue paper, dated 24 March 2020).

19. Furthermore, the reduction in domestic demand and widespread containment measures affects both a nation's imports and reduces foreign income, with significant consequences on a sector highly dependent on international trade. Finally, financial distress in businesses can lead to a reduction in wages, working hours or labour layoffs. As the financial sector is in difficulty, it has fewer resources to sustain the economic losses incurred. In addition, many insurers do not cover business interruptions due to events such as the COVID-19 disease.

20. In summary, a flow disruption anywhere in the supply chain causes a slowdown everywhere else. Only by protecting the buyer-seller links and each stage of the supply chain can human consumption of fish and fish products, and therefore the successful and continuing completion of the supply chain, be achieved. It is therefore of paramount importance to provide all possible protection to each stage of the fisheries and aquaculture food chain. In the longer term, bottlenecks identified during the pandemic, and the apparent need to shorten some fish supply chains, can guide improvements that increase the sustainability of fish supply and demand, including reduction of food loss and waste

IV. HOW IS THE PANDEMIC AFFECTING FISHERIES AND AQUACULTURE FOOD SYSTEMS

21. The Corona Virus Disease 2019 (COVID-19) started as a locally circulating infection. On 11 March 2020, the World Health Organization (WHO) characterized the COVID-19 outbreak as a pandemic.⁵ In the first half of 2020, the pandemic entered all regions of the world, some worse than others, including many major fish producing and/or fish consuming countries and global suppliers of fish feed.

22. While fishing and aquaculture and the distribution of their products are considered an essential activity in most countries, the measures adopted to contain the spread of infection caused significant direct and indirect challenges to the sector, as explained below.

Capture fisheries production

23. The drop in demand, which in some cases has resulted in reduced prices of fish and fish products, have stopped or reduced activity for many fishing fleets, as their work has become unprofitable. In some cases quotas have not been filled due to low demand and lack of storage for a perishable product. Fleets relying on export markets are likely to be more impacted than those serving domestic markets. Sanitary measures (physical distance between crew members at sea, facial masks, etc.), and lack of necessary equipment (e.g. masks and gloves) are making fishing difficult (and in some cases more dangerous) and can also cause a cease of activity. Limitations of input supplies (e.g. ice, gear, bait) due to suppliers being closed or unable to provide inputs on a credit basis is yet another constraint on the fishing industry.

24. In addition, movement restrictions for professional seafarers and marine personnel who have not been permitted to disembark in ports and transit through national territory (i.e. to an airport), has prevented crew changes and repatriation. This has resulted in cases where fishing crews have been stranded for many months at sea on vessels⁶ or in foreign countries and without wages, thus becoming a human rights crisis, especially for migrant and transitory workers. This is an area that needs building back better, to insure in future situations these vulnerable workers have social protection.

25. Pauses in production and in the operation of fleets is also linked to potential upsides, in resting overfished fish stocks that could speed their recovery⁷. However, most studies suggest that as much as 10-15 years of reduced fishing is required to permit depleted stocks to recover so, in the absence of

⁵ www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020

⁶ www.latimes.com/world-nation/story/2020-09-08/philippine-fishermen-stranded-at-sea-by-the-pandemic-we-think-about-jumping-overboard

⁷ www.smithsonianmag.com/science-nature/fish-stop-covid-19-180974623/

governance and management reforms that sustain reduced pressure, such recoveries to date seem unlikely⁸. Also the decreasing fossil fuel use⁹ might be a potential upside, resulting in reducing Green House Gas releases, as required under climate change mitigation scenarios.

Aquaculture production

26. The economic environment of aquaculture production and markets remains highly volatile and uncertain, which necessarily impacts on the activities.¹⁰

27. The sector will possibly struggle to sustain its activity or maintain its planned production cycles, as it might find that markets, supplies of production inputs (e.g. seeds, feeds), but also access to credit, are stopped or significantly reduced due to the current lockdown and economic slowdown¹¹.

28. Labour layoffs may also increase, due to confinement measures in the short-term, but also because of financial or cash flow issues facing farmers, or travel barriers for seasonal or migrant workers, in the medium to long-term¹². Some countries have exempted the aquaculture sector from lockdown measures¹³ or established guidelines to regulate the exercise of the free movement of workers during COVID-19 outbreak¹⁴.

29. During lockdowns, the farmers supplying the live fish markets have been struggling with growing live fish stocks that cannot be sold but still must be fed for an undetermined period¹⁵. Farmers can reduce costs slightly by feeding at maintenance and not growth rates, however some feed needs to be provided to keep fish alive. Cash flow and access to credit may be another challenge because of the additional costs incurred in the absence of revenue, especially if aquaculture clients are also affected by the crisis and they delay payment for past deliveries¹⁶.

Post-harvest, market and trade

30. Fresh fish processing is affected by worker health and resulting staff shortages due to COVID-19 illness and required quarantine of staff. Fish processing factories in many countries have closed due to COVID-19 positive workers¹⁷. Processing operations may also be disrupted due to worker demand for better health and safety conditions. This reduces processing capacity and output. Furthermore, the low demand for fish leads to production disruption and a need for processors to increase storage capacity to cope with incoming raw material and finished product. Proactive processors have reacted by putting stringent controls in place, including the spacing out of workers and temperature tests.

31. In the area of international trade, in a joint effort to ensure that trade flows continue to be as free as possible, the heads of FAO, the World Trade Organization (WTO) and the World Health Organization (WHO) called for the prevention of disruptive border restriction measures on trade in

⁸ www.undp.org/content/undp/en/home/blog/2020/the-ocean-and-covid-19.html

⁹ www.forbes.com/sites/rtrapier/2020/07/12/will-covid-19-hasten-the-demise-of-fossil-fuels/

¹⁰ www.oecd.org/coronavirus/policy-responses/fisheries-aquaculture-and-covid-19-issues-and-policy-responses-a2aa15de/

¹¹ <https://chinadialogueocean.net/13453-coronavirus-hits-sustainable-aquaculture/>

¹² www.ares.vt.edu/ares/virginia-seafood/research/Impacts_of_COVID19.html

¹³ www.undercurrentnews.com/2020/04/13/india-exempts-aquaculture-from-lockdown-with-extension-to-measures-expected/

¹⁴ [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020XC0330\(03\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020XC0330(03))

¹⁵ Idem.

¹⁶ www.aecoc.es/articulos/c84-javier-ojeda-tenemos-que-dar-salida-a-la-acumulacion-de-stock-de-peces-y-asegurar-la-liquidez-de-las-empresas/

¹⁷ <https://news.cgtn.com/news/2020-06-23/Why-have-meat-factories-become-hotbeds-for-coronavirus-outbreaks-RyERNDEg1O/index.html>

food to avoid food shortage, emphasizing that the dissemination of information on food-related trade measures is fundamental¹⁸.

32. Demand for packaged, canned¹⁹ and frozen products has spiked as households look to stock up on non-perishable food. At the same time, online distributors are reporting increased interest as house-bound consumers explore retail alternatives. Overall, demand for many species has sharply reduced and prices have fallen, particularly those that are targeted at the food service industry, e.g. hotels, restaurants and catering.

33. Transportation by road or sea must contend with closed or restricted borders and customs and health inspection delays, while the large-scale cancellation of flights has directly affected trade in some high-end fresh products that are transported by air. All these aspects have increased transport costs. Despite the falling global demand for air transport, the cost of air shipment has risen significantly²⁰.

34. Fish supply, consumption and trade revenues are all expected to decline this year due to the impact of containment restrictions on demand, logistics, prices, labour and business planning.

Vulnerable groups, working conditions, health & safety and gender

35. Gender inequalities persist in fisheries and aquaculture, where women represent half of the workforce, predominately in processing and trade activities²¹ which can be unstable and poorly or non-paid positions. They are particularly at risk to job loss - especially for those informally engaged and migrant workers in the seafood processing factories²². They are thus very unlikely to be eligible for/ have access to social protection benefits offered by some governments to handle the COVID-19 outbreak.

36. Working conditions and safety of fishers at sea are affected where the number of available fishers to crew vessels are reduced, or required to spend longer periods at sea leading to increased risk of on-board accidents. In addition, it is difficult for fishermen to be more than a metre apart from each other on board a fishing vessel.

37. Crew on large scale industrial vessels which stay at sea for long periods are unable to travel home due to flight restrictions and quarantine periods which increases fatigue and stress. Additionally, where crew are confronted with COVID-19 while far away at sea, the virus is likely to spread quickly and medical assistance is not always readily available.

38. The wide informality in the sector constitutes an added barrier for fishers and fish farmers to access protection from labour market policies and contributory social protection mechanisms. These might exacerbate the secondary effects of COVID-19, including poverty and hunger.

Research and management implementation

39. Surveys for collecting data necessary for stock assessments have been postponed or cancelled for some fisheries. Whilst efforts may be made to conduct scientific meetings remotely, cancelled or postponed agendas and other meetings dealing with stock assessment, will have negative impacts on the data collection and the subsequent management decisions of many shared fish stocks globally. Additionally, the nature of virtual meetings can present challenges to making progress on matters that require negotiation.

¹⁸ www.wto.org/english/news_e/news20_e/igo_26mar20_e.htm

¹⁹ www.fao.org/flw-in-fish-value-chains/resources/articles/a-rennaissance-in-canned-fish-consumption/en/

²⁰ <https://theloadstar.com/air-freight-rates-on-the-up-again-driven-by-more-demand-for-less-capacity/>

²¹ https://insights.careinternational.org.uk/media/k2/attachments/CARE_Gender-implications-of-COVID-19_Full-Report_March-2020.pdf

²² <https://womeninseafood.org/why-using-a-gender-lens-to-analyse-covid-19-impacts-on-the-seafood-industry/>

40. FAO conducted two surveys on the impact of COVID-19 on activities of Regional Fisheries Bodies (RFBs)²³ in April²⁴ and November 2020, these are available on the FAO Fisheries webpage dedicated to the impacts of COVID-19 on the fisheries and aquaculture sector²⁵.

41. Regarding aquaculture research, challenges will be to either compensate or maintain ongoing indoor or field research, since movement restrictions on some places could possibly destabilize or delay ongoing research, either by lack of personnel or needed supplies.

Monitoring, Control and Surveillance (MCS)

42. Lockdowns could be leading to reduced capacity in Fisheries Monitoring Centres (FMCs). Fishers who are “safely out at sea” may keep operating or adapt their operations to benefit from the MCS shortcomings to engage in illicit activities, including fishing in closed areas which may have long term impacts on the habitat and stocks they are designed to protect.

43. Regional Fisheries Management Organizations (RFMOs) have an important role contributing to MCS of fishing effort and combating Illegal, Unreported and Unregulated (IUU) fishing for many shared fisheries around the globe. The majority of RFMOs have experienced disruptions to MCS functions at some level. The most common negative impact is disruption to “at sea” observer programmes. More details can be found in the RFB surveys mentioned above. Reduced capacity of Compliance Committees and levels of associated activities will have negative consequences on the MCS of fishing activities and the fight against IUU fishing globally.

Food security and nutrition

44. Many processing and transport businesses have reduced, stalled or completely shutdown operations due to lockdown measures, potentially contributing to food insecurity and increased malnutrition. Many developing countries and Small Island Developing States (SIDS) are reliant on fish for animal protein and essential micronutrients. The reduction in fish consumption could further exacerbate issues related to the “triple burden of malnutrition”²⁶ which has already affected over 200 million children globally and over 2 billion adults and cost society up to USD 3.5 trillion per year²⁷.

45. As many countries are restricting movements outside of the home, vulnerable fishing communities are becoming even more vulnerable - not only due to reduced supply of affordable animal protein, micronutrients and fatty acids through direct consumption of fish caught, but also through reduced income from limitations on livelihood activities, further reducing their purchasing power to afford a diverse range of foods to meet their dietary needs. Globally, 59.7 million people work in the primary sector of fisheries and aquaculture, with even more working in the secondary sector, including post-harvest activities²⁸.

²³ RFBs includes both Regional Fisheries Management Organisations (RFMOs) and Regional Fisheries Advisory Bodies (RFABs).

²⁴ FAO. 2020. The impact of COVID-19 on fisheries and aquaculture – A global assessment from the perspective of regional fishery bodies: Initial assessment, May 2020. No. 1. Rome. <https://doi.org/10.4060/ca9279en>

²⁵ COVID-19 and its impact on the fisheries and aquaculture sector <http://www.fao.org/fishery/covid19/en>

²⁶ www.fao.org/news/story/en/item/1199760/icode/

²⁷ Global Nutrition Report, 2018. Chapter Two: The Burden of Malnutrition. Accessed from: <https://globalnutritionreport.org/reports/global-nutrition-report-2018/>

²⁸ www.fao.org/state-of-fisheries-aquaculture

Food safety

46. Although early reports associated with the emergence of COVID-19 focused on fish and traditional markets, subsequent studies have increasingly demonstrated that COVID-19 is spread primarily through human-to-human transmission of the virus either through droplets or direct contact with an infected person²⁹. It is important to underline that there is no evidence for any virus causing fish disease being pathogenic to humans³⁰.

47. At present, there is no evidence that COVID-19 can be transmitted through fishery or aquaculture products^{31,32}. However, as before the current pandemic, any food can potentially be contaminated with pathogens through contact with contaminated equipment, surfaces or environments, including people's hands, gloves or aprons. The application of sound principles of environmental sanitation, personal hygiene and established food safety practices remain important ways to reduce the likelihood of cross-contamination. Likewise, thoroughly cooking fishery and aquaculture products before consumption can also reduce food safety risks.

48. Enhanced food safety practices at this time, such as those recommended in the Codex Alimentarius Commission³³, FAO and WHO documents, will reduce the likelihood of contamination of foods with pathogens, and help lower the public health burden caused by established foodborne infections³⁴.

V. WHAT CAN FAO AND PARTNERS DO

49. FAO is supporting countries through this COVID-19 pandemic, by providing policy recommendations as well as technical advice and support. The below provides an overview of some of the on-going responses or recommended actions by FAO and/or its partners.

Management and policy

50. Collect data, as well as support research, on the impact of the COVID-19 pandemic on fisheries and aquaculture systems. FAO has compiled a Guidance Document on best practices for developing surveys and questionnaires on the impacts of COVID-19 on fisheries and aquaculture³⁵

51. FAO has produced some global and regional fishery specific policy briefs, available on the following webpage *COVID-19 and its impact on the fisheries and aquaculture sector*³⁶.

52. FAO conducted two surveys on the impact of COVID-19 on activities of Regional Fisheries Bodies (RFBs) in April and November 2020, which may inform and guide the development of mitigation measures and is available on the FAO Fisheries webpage mentioned above.

²⁹ Chih-Cheng, L., Tzu-Ping, S., Wen-Chien, K., Hung-Jen, T., & Po-Ren, H. (2020, February). Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. *International Journal of Antimicrobial Agents*, 55.
doi:<https://doi.org/10.1016/j.ijantimicag.2020.105924>

³⁰ Scientific Committee on Animal Health and Animal Welfare. (2000). Assessment of Zoonotic Risk from Infectious Salmon Anaemia virus. European Commission, Health and Consumer Protection Directorate General. Retrieved from https://ec.europa.eu/food/sites/food/files/safety/docs/sci-com_scah_out44_en.pdf

³¹ www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19-food-safety-for-consumers

³² www.oie.int/scientific-expertise/specific-information-and-recommendations/questions-and-answers-on-2019-novel-coronavirus/

³³ www.fao.org/fao-who-codexalimentarius/home/en

³⁴ FAO. (2020). Food Safety in the time of COVID-19. Rome. doi:<https://doi.org/10.4060/ca8623en>

³⁵ www.fao.org/fileadmin/user_upload/faoweb/FI/COVID19/Surveys_and_questionnairesCOVID.pdf

³⁶ www.fao.org/fishery/covid19/en

53. Prioritize the most vulnerable, such as crew members, fish workers, women processors and vendors.
54. Provide guidance on adoption of internationally recognized food safety standards such as those set by CODEX.
55. Work with the industry and regional organizations on developing a range of management options as well as on measures to protect jobs and ensure a fast recovery, including assessment of transport and market development options, while at the same time ensuring sustainability.

Hygiene and sanitation

56. Promote the application of sound principles of environmental sanitation, personal hygiene and food safety practices throughout the supply chain (vessels, landing sites, factories, markets, ect.) to reduce the likelihood of cross-contamination.

Supply chain

57. Support food supply chains and avoid disruptions in movement and trade of fish and fish products, to ensure that they function smoothly in the face of crisis and increase resilience of food systems so that they can support food security and nutrition.
58. Fisher, processor and distribution workers to be designated as “Essential Workers” as they provide food to the nation.
59. Visa expediting for temporary, seasonal foreign labor for the harvesting and processing of fish and seafood.
60. Promote use of new technologies (WhatsApp, websites, Facebook, etc.) to get fresh fish delivered directly to the consumers taking the adequate safety measures for home delivery.

Finance and social protection systems

61. The ocean economy may be a victim of the impacts of the COVID-19 crisis, but it also holds solutions for rebuilding a more resilient, sustainable and equitable post-COVID world. Investment in ‘blue’ recovery and stimulus packages, along with policy reform, can immediately create jobs and provide short-term economic relief, all the while fostering long-term economic growth, resilience and social and environmental benefits. As we look to rebuild, cooperation between government and the public and private sector as well as a departure from ‘business as usual’ can ensure this ‘blue transformation’. Solutions which will deliver jobs and significant economic benefits include investments in coastal and marine ecosystem restoration and protection, and sustainable community-led non-fed mariculture.
62. To date, many stimulus packages have overlooked the role the ocean can play in a “blue” recovery. A recent study demonstrated why policymakers should look to the ocean economy for mutually beneficial, no-regrets investments that will help the world set a course to a more resilient, sustainable and equitable future³⁷.
63. Other actions to consider are:
 - Declaration of a fisheries disaster to open up aid options.
 - Increase access for fishers and others in the fisheries and aquaculture value chain to credit and micro-finance programmes with reduced interest rates, flexible loan repayment, and options for restructuring of loans and related payment schedules.

³⁷ https://oceanpanel.org/sites/default/files/2020-09/20_HLP_Report_COVID_Blue_Recovery.pdf

- Grant programs to cover economic losses in order to maintain domestic seafood supply chains and to ensure continued operations.
- Loan forgiveness for loans used to maintain payroll, grants for maintenance to keep vessels in good working order, and low-interest loans to refinance existing debt.
- Payment relief i.e. suspension of certain financial obligations such as utilities, real estate tax, and mortgages.
- Payroll and unemployment assistance, particularly for informal workers. Additionally, many vessel crew members and small-scale producers are considered self-employed and do not currently qualify for unemployment or paid leave, so relief efforts must also be extended to these workers.

VI. FURTHER INFORMATION

64. Further information can be found in an extended and more detailed version of this information note produced by FAO Fisheries and Aquaculture COVID-19 TASK FORCE of the same title “The impact of COVID-19 on fisheries and aquaculture food systems - Possible responses” and available on the FAO webpage *COVID-19 and its impact on the fisheries and aquaculture sector* www.fao.org/fishery/covid19/en.

65. The extended paper also includes an annex providing examples of regional responses which were collected in April and November 2020.