Food and Agriculture Organization of the United Nations

The impact of COVID-19 on fisheries and aquaculture

A global assessment from the perspective of regional fishery bodies

Second assessment

November 2020

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Food and Agriculture Organization of the United Nations
Rome, 2021

Required citation:
FAO. 2021. *The impact of COVID-19 on fisheries and aquaculture – A global assessment from the perspective of regional fishery bodies: Second assessment – November 2020*. Rome. https://doi.org/10.4060/cb5269en

ISBN 978-92-5-134600-6

Preparation of this document

This second assessment of the impact of coronavirus disease (COVID-19) on the work of regional fisheries management organizations (RFMOs) and regional fisheries advisory bodies (RFABs) was prepared by the Fishing Operations and Technology Branch (NFIFO, Jon Lansley and Haraldur Einarsson) and the Regional Fishery Body Secretariats' Network (RSN, Piero Mannini and Aurora Mateos). This technical paper was edited by Dr Sarah L. Poynton.

This assessment, undertaken in November 2020, is a follow-up to the initial assessment undertaken in April 2020, and used the same methodology. This present paper provides a summary of responses to questionnaires circulated to RFMOs and RFABs to determine the impacts of restrictions imposed by COVID-19, upon the management, production and supply of fisheries products from capture fisheries and aquaculture. Comparisons are made between the responses given in April 2020 in the early phase of the pandemic, and those given in November 2020, some seven months later. The objective is to provide a global overview of the impacts of COVID-19 from the perspective of the secretariats of regional fisheries management organizations (RFMOs) and regional fisheries advisory bodies (RFABs), and collate examples of good practices and suggestions to guide development of mitigation measures.

This assessment would not have been possible without the cooperation and participation of the RFMO and RFAB secretariats through the RSN Secretariat, whose prompt responses to this request for information is much appreciated. The authors also would like to acknowledge the funding provided through the project "Improved Fisheries Management for Sustainable Use of Marine Living Resources in the Face of Changing Systems" funded by the Government of Japan.

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1 Introduction

1.1 The role of regional fishery bodies

Regional fisheries management organizations (RFMOs) and regional fisheries advisory bodies (RFABs), collectively referred to as regional fishery bodies (RFBs)[1], play an important role in contributing to management and scientific research for many fisheries around the world.

The RFMOs have the mandate to adopt legally binding conservation and management measures in relation to use of fisheries resources and associated activities within their respective convention areas. The RFABs provide for collaboration and coordination, and promote sustainable use of fishery and aquaculture resources, by recommending specific actions and providing advice to members on fisheries conservation and management. Some RFBs also have aquaculture included in their mandates.[1]

The RFMOs in particular, also have an important role in contributing to monitoring, control and surveillance (MCS), and combating illegal, unreported and unregulated (IUU) fishing for many important fisheries sharing stocks, and this role is achieved through convening regular dedicated compliance committee meetings. The compliance committee will make recommendations to the decision-making body on actions to be taken in respect of *inter alia* non-compliance, and development of new measures

1 For more information about RFMOs and RFABs, see FAO Fisheries and Aquaculture Technical Paper No. 651 http://www.fao.org/3/ca7843en/CA7843EN.pdf

to address non-compliance. A lack of monitoring and enforcement of the regulated fisheries may encourage some States to revert to a less responsible level of management of their fishing operations.

Cancellation and postponement of RFBs science (including fishery resources appraisal surveys), and compliance and management meetings, for reasons including emergencies such as the COVID-19 pandemic, will hinder implementation, assessment and enforcement of measures affecting the conservation and management of many shared fish stocks globally. The capacity to hold these international meetings and make decisions in an online format may be limited for many reasons, including prescribed legal and procedural requirements, which may not have anticipated the need for business continuity in emergencies.

1.2 Second assessment

In seeking to understand the impact of COVID-19 on the functioning of RFBs, and how this is changing over time, questionnaires were sent to the secretariats of all RFMOs and RFABs in April 2020, within the first months of the pandemic, and to all RFMOs and RFABs in November 2020 using the same methodology. Results from the initial assessment were published in May 2020 (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).

The present report: (i) compares the results of the first and second assessments, with simple chi-squared tests used to determine where significant differences exist between the first and second assessments, (ii) provides an updated and more informed overview of the known impacts of COVID-19 on the work of the RFBs, and on fisheries products supply and employment, and (iii) offers further guidance on possible mitigation actions and measures that may be considered.

To compare the April and November assessments, a standard statistical test (Chi-squared test) was run for each quantitative result to test the significance of any change, taking into consideration the change in the number of RFBs

responding to each question. The result of this test is provided as a footnote to each quantitative response.

There were no statistically significant changes between April and November in any of the 23 quantitative responses. However, the qualitative written responses in the November assessment showed that adjustments were being made to the changing consequence of COVID-19.

To understand the full impact of COVID-19 on fisheries and aquaculture, further assessments both at the regional and country level will be necessary.

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2 Regional fisheries management organizations

In November 2020, a questionnaire was distributed to all 22 RFMOs through the RSN Secretariat. All RFMOs[2] (Figures 1 and 2) responded, and answered the questions posed. Their responses are compared with those of the initial assessment of April 2020, to which 19 RFMOs responded, and the results are presented below.

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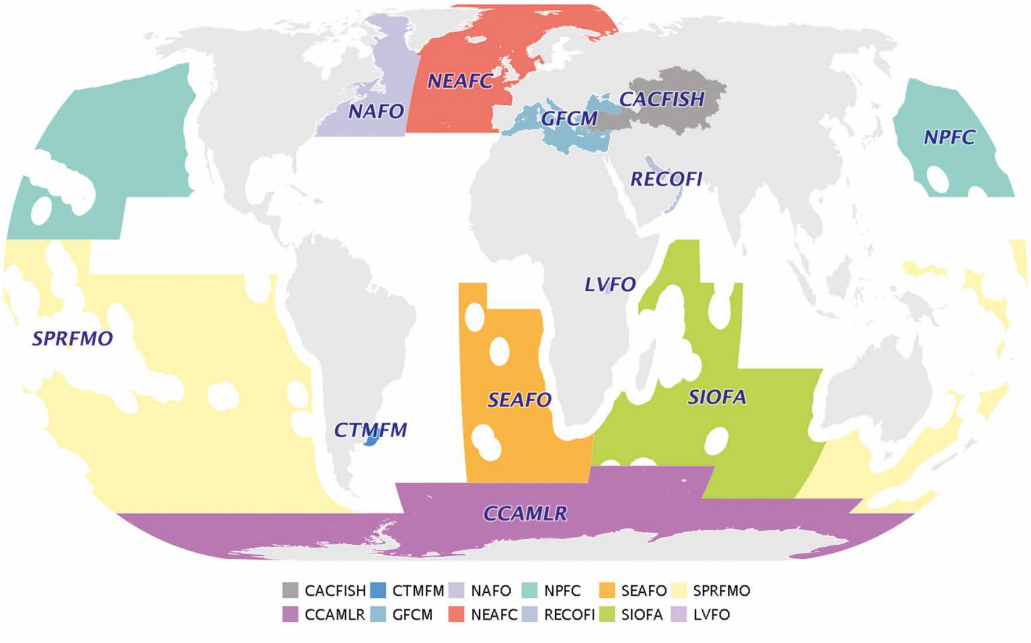
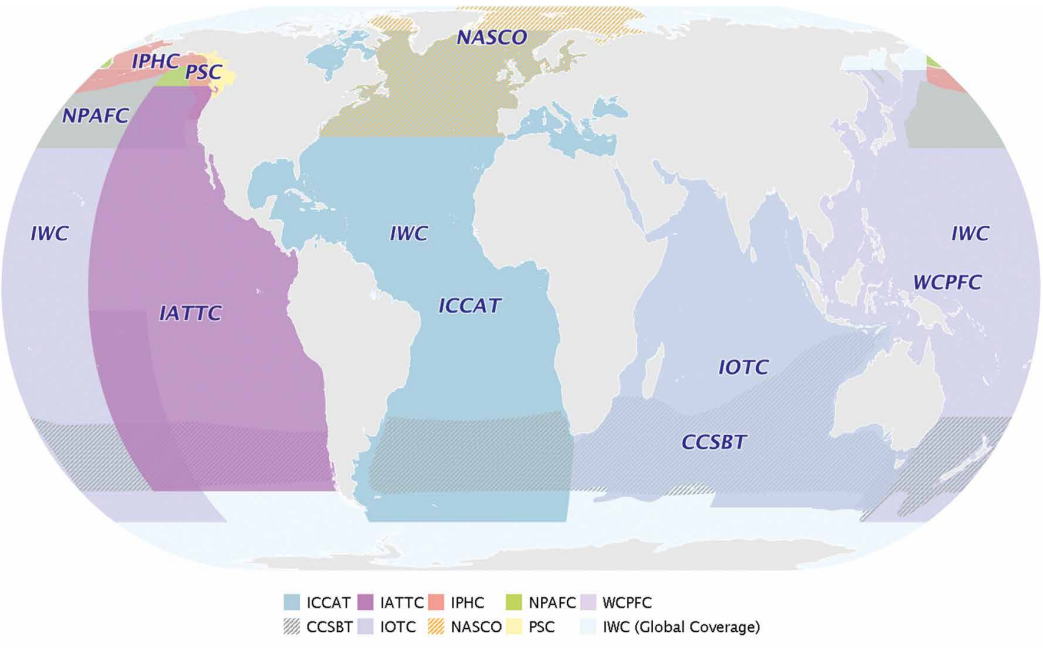
2 Central Asian and Caucasus Regional Fisheries and Aquaculture Commission (CACFish); Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR); Commission for the Conservation of Southern Bluefin Tuna (CCSBT); General Fisheries Commission for the Mediterranean (GFCM); Inter-American Tropical Tuna Commission (IATTC); International Commission for the Conservation of Atlantic Tunas (ICCAT); International Pacific Halibut Commission (IPHC); Indian Ocean Tuna Commission (IOTC); International Whaling Commission (IWC); Joint Technical Commission of the Maritime Front (CTMFM); Lake Victoria Fisheries Organization (LVFO); Northwest Atlantic Fisheries Organization (NAFO); North Atlantic Salmon Conservation Organization (NASCO); North-East Atlantic Fisheries Commission (NEAFC); North Pacific Anadromous Fish Commission (NPAFC); North Pacific Fisheries Commission (NPFC); Pacific Salmon Commission (PSC); Regional Commission for Fisheries (RECOFI); South East Atlantic Fisheries Organization (SEAFO); South Indian Ocean Fisheries Agreement (SIOFA); South Pacific Regional Fisheries Management Organization (SPRFMO); and Western and Central Pacific Fisheries Commission (WCPFC).

Figure 1 **Generic regional fisheries management organizations (RFMOs)**



Source: FAO/Statistics and Information Branch, FIAS.

Figure 2 **Species-specific RFMOs**

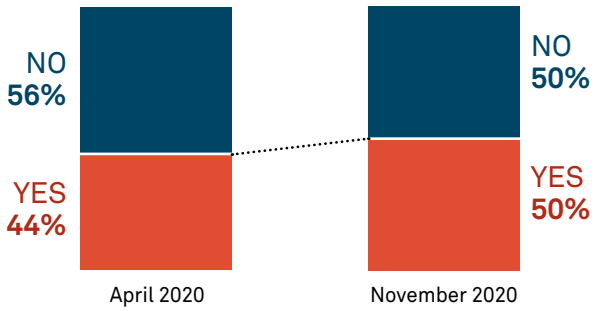


Source: FAO/Statistics and Information Branch, FIAS.

2.1 Fisheries management

Is the impact of COVID-19 having, or expected to have, negative consequences on the management of shared fish stocks?

Figure 3 **Impact on management of shared fish stocks (RFMOs)**



In November, 50 percent of the RFMOs (compared to 44 percent in April), were experiencing, or expecting to experience, negative consequences of COVID-19 on the management of fish stocks within their area of competency (Figure 3).[3]

The main impacts reported in November were how meetings, and subsequent decisions on conservation and management measures (CMM), have been affected. Some organizations have had more success than others in holding meetings virtually, and the current environment has accelerated the development and acceptance of online meeting platforms, with these experiences being shared among the network. It has been reported that the pandemic had resulted in enhanced focus on key tasks.

Some examples of negative impacts were:

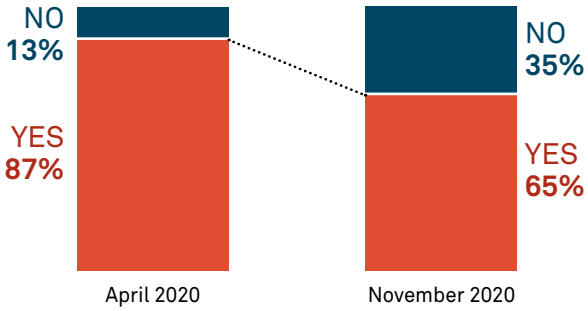
- disruptions to meetings and reduced agendas have presented difficulties in taking decisions on some key issues, with some decisions possibly being addressed intersessionally or delayed;
- postponement of meetings;
- virtual meetings restricted the proper discussions required for decision making;
- deferred discussions on CMMs;
- extension of management measures, such as total allowable catch (TAC), from previous governing bodies decisions;
- postponement of trainings and workshops;
- field work has been negatively impacted.

3 Chi-square test showed no significant difference, $X^2(1, N=34) = 0.13, p > .05$

2.2 Fisheries monitoring, control and surveillance

Is the impact of COVID-19 having, or expected to have, negative consequences on the MCS of fishing activities and the fight against IUU fishing globally?

Figure 4 **Impact on MCS of fishing activities and the fight against IUU fishing globally**



In November, for those **RFMOs with an MCS role**, 65 percent were experiencing, or expecting to experience, the impact of COVID-19 as having negative consequences on the MCS of fishing activities and the fight against IUU fishing. This November percentage was lower than the 87 percent reported in April (Figure 4).[4]

Although commercial observer programs have been reduced, according to one organisation this has been offset in some areas by reduced fishing effort due to lower consumer demand. The work of compliance committees has continued through virtual meetings and correspondence.

Some examples of negative impacts were:

Meetings

- Postponed meetings have delayed important decisions such as implementation of vessels monitoring schemes (VMS), further development of compliance monitoring schemes (CMS), and other MCS tools under consideration. These gaps in the MCS scheme are expected to result in an increase in IUU fishing.

4 Chi-square test showed no significant difference, $X^2(1, N=35) = 2.11$, $p > .05$

Observers and inspections

- High seas boarding and inspections are expected to be impacted, and possibly reduced in scope, due to concerns over the possible transmission of COVID-19 to boarding parties and personnel aboard the vessels being inspected.
- Reduced levels of physical port inspections in some regions during some periods.
- Inability to deploy observers in many regions has led to suspension, or reduced levels, of deployment of at sea observers on catching and transhipment vessels.
- According to a preliminary analysis undertaken by one organisation, during the COVID-19 pandemic there is a higher risk of alleged IUU fishing activities caused by a significant decrease in controls being conducted (e.g. inspections at sea or at port).
- Observer and training programmes have been postponed.

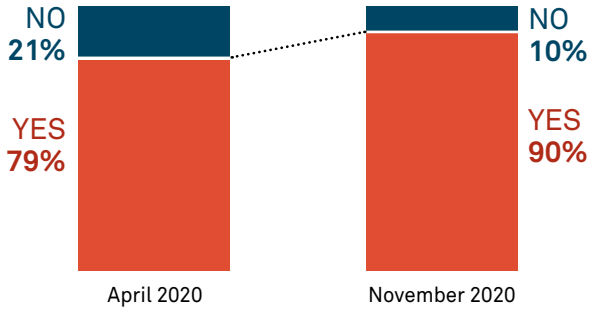
Electronic monitoring

- Electronic monitoring has increased.

2.3 Fisheries research

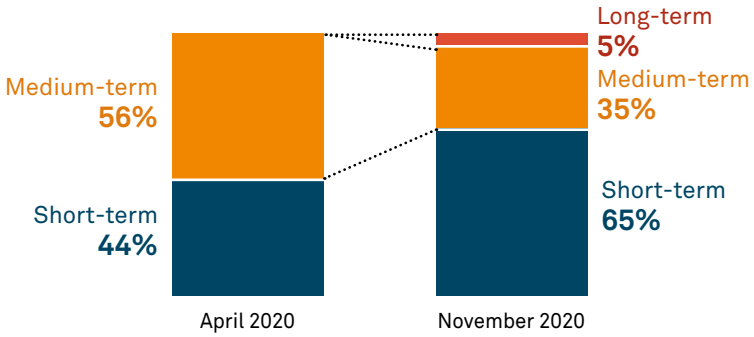
Is the impact of COVID-19 having, or expected to have, negative consequences on the research on fish stocks?

Figure 5A **Impact on research on fish stocks**



In November, among the **RFMOs with a research and fishery resources assessment role**, 90 percent were experiencing, or expecting to experience, that COVID-19 has negative consequences on the research on fish stocks; this percentage compared with the 79 percent reported in April (Figure 5A).[5]

Figure 5B **Short to long-term impacts on research on fish stocks**



A further question for those organizations reporting negative impacts of COVID-19 on research on fish stocks, concerned the time-frame in which the negative impacts were expected. In November, 60 percent of respondents considered that the impacts would be short term, 35 percent medium term, and 5 percent long term (Figure 5B). This contrasted with the results for April, when 44 percent reported short-term impacts, and 56 percent reported medium term impacts, and none reported expecting long term impacts.[6]

5 Chi-square test showed no significant difference, $X^2(1, N=40) = 1.04, p > .05$
6 Chi-square test showed no significant difference, $X^2(2, N=38) = 2.23, p > .05$

Some examples of negative impacts were:

Meetings

- Complex issues and processes have been difficult to address in virtual meetings as opposed to in-person meetings.
- In some cases, time restrictions resulting from holding scientific committee teleconference meetings across several time zones meant that the technical body was not able to address all the requests for advice. Often only high priority requests were fully addressed, with lower priority items being deferred.
- Where postponement of meetings was necessary, subsidiary bodies were unable to provide formal advice. The lack of scientific advice may have negative consequences for sustainability of short-lived species in particular.
- Where scientific committees could not meet this year, some proposed research activities may not now be ready to commence in 2021.
- A number of scheduled scientific or science-support meetings were postponed or held by video conferencing. Some meetings needed to be shortened, and managing the time zones of all RFMO members was challenging.

Expeditions, cruises and observers

- Research, field work, sampling and tagging programmes, and work at laboratories, has been impacted at varying levels. This will have some impacts to the quality and quantity of data available for assessments. In some cases, this impact is expected to be short-term, as many researchers are finding alternative methods of data collection.
- Some international research expeditions were postponed, impacting the timeline and development of subsequent research plans. Additionally, training programmes were postponed.
- Some tuna tagging cruises have been suspended, resulting in a hole (for 2020) in time-series data.
- Some scientific surveys at sea were cancelled, such as the Dr Fridjof Nansen survey.
- Reduced at sea observer coverage is expected to have a negative impact on the volume and quality of data collected, and result in information gaps important for decision making.

- Suspension of observer coverage will interrupt an important source of data for estimating purse seine catch species and size composition, and bycatch estimation for purse seine and longline. Collection of biological information from catches may also be affected.
- Reduced observer deployment and in-port transhipments has meant reduced observer and port sampling data for work on stock assessments, harvest strategies and management strategy evaluation.

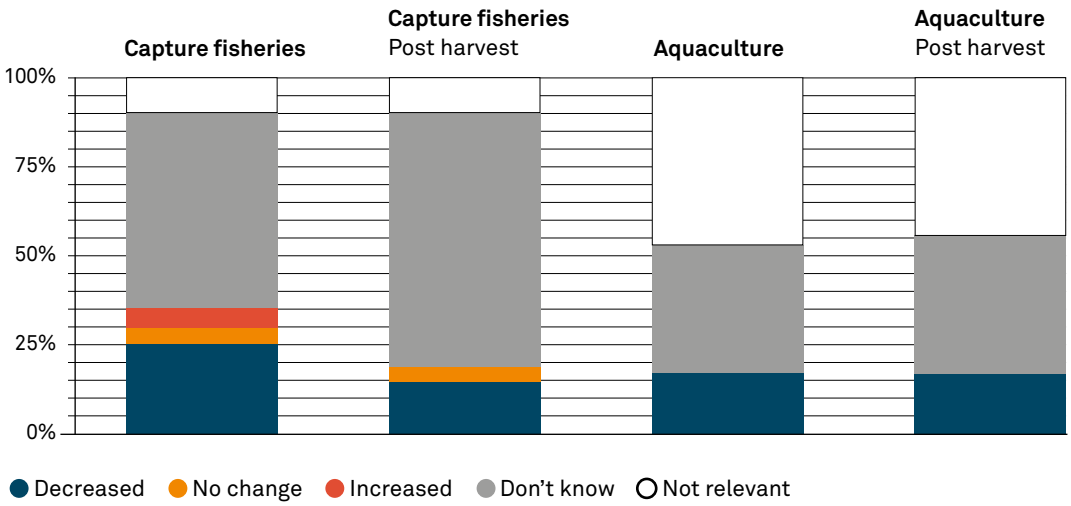
Funding

- Funds dedicated to research vessels were reduced.

2.4 Employment

Owing to the impact of COVID-19, have levels and conditions of employment suffered?

Figure 6 **Impact on employment**



Information about the effects of COVID-19 on employment was sought from all 22 RFMOs in November, and 13 RFMO's responded. However, very limited information was obtained because most RFMOs did not collect this information, and therefore most responses were "don't know" or "not relevant". The initial assessment in April did not seek information about employment.

Where information was available, the dominant change was decreased employment across all four sectors: capture fisheries, capture fisheries – post harvest, aquaculture, and aquaculture – post harvest (Figure 6). Increased employment as a result of COVID-19 was reported only within the capture fisheries sector, and only by one responding RFMO (Figure 6).

Some examples of responses were:

- For long distance fisheries, there is no evidence of reduced vessel activity or catches as stocks go to international markets, and do not necessarily rely on fresh/restaurant trade.
- Early in the COVID-19 crisis, both capture fisheries and aquaculture experienced sharp initial declines in activity, negatively affecting employment with many fishers and aquaculture farmers being placed

under furlough or other unemployment measures. However, after this early decrease, fishing and aquaculture operations have since partially or fully recovered.

- Restrictions to free movement of people across borders has reduced regional fish trade. The requirement for physical distancing particularly affects the activities of women, who represents most workers in artisanal fish processing and marketing.

2.5 Other impacts

Other reported negative and positive impacts of COVID-19 included:

Negative impacts

Trade

- Decline in trade.
- Inland water fisheries harvesting shared stocks have been affected. For instance, most Nile perch exports from Lake Victoria are to the European countries, and the biggest percentage is chilled products. Lockdown and restrictions in Europe have led to reduced orders for fish from the region and reduced demand for chilled products. Some fish processing factories are exporting less than 30 percent of what they used to export before the COVID-19 pandemic. Less exports results in reduced employment in processing plants and reduced prices paid for fish landed. This affects the livelihood of fishers. High cost of flights has increased the cost of production.
- Some RFMO member countries have indicated that there were significant negative impacts on fish supply logistics, consumption and prices. In some countries, the implementation of different protocols has increased transportation costs and schedules (due to quarantines). There has been significant reduction in the demand for most of the products that are exported, and prices plummeted for most products, for example reaching the lowest prices of the last 20 years for products such as shrimp.

Modelling

- For certain fisheries such as salmon fisheries, the medium-term impacts of the reduced sampling and tagging programs in 2020 could include reduced precision/accuracy of run-size forecast models, as under-sampled juvenile cohorts recruit to the salmon fisheries in coming years.

Administration

- To some extent, the pandemic is causing economic distress as countries' budgets are focused on health and food security. This change in focus is having a detrimental impact on contributions to at least one RFB from member governments, making it difficult to ensure financial viability of the Secretariat. Furthermore, voting is hampered, as, in accordance

with established RFMO rules, only countries up to date with payment of contributions may be permitted to vote. Some intersessional voting has occurred (postal vote and/or silent procedure), but the number of countries with overdue contributions has caused difficulties in attaining a quorum for voting purposes, has made intersessional voting a challenge.

Staff

- Delays and difficulties with international staff selection and recruitment.

  COVID-19 has had a particular impact on observers, some of whom are not able to work. Some observers have been stuck in foreign countries awaiting repatriation. This situation has also negatively impacted revenues from transhipment in ports, and port inspections coverage.

  There is a negative impact on the implementation of secretariat internship programs.

Positive impacts

Meetings

- Short-term positives can be attributed to expenditure reductions due to cancellation of physical meetings.
- Longer term positives will be the familiarity that most people have gained with video conferencing, and the demonstration that video conferencing has the potential to supplement or even replace some physical meetings in the future.
- In terms of global collaboration, it has been possible to attend many more meetings (virtually) than would have been possible to attend physically during a normal year.

Electronic monitoring

- Additional positives, such as earlier and more widespread adoption of electronic monitoring, might also arise.

2.6 Scale of impact

Overall have you found the impacts of COVID-19 to be greater or less than expected at the beginning of the pandemic?

Figure 7 **Expectations of impact of COVID-19**

In November, while half of the RFMOs reported that the impacts of COVID-19 had been as expected, 41 percent found that impacts were greater than expected; only 9 percent found that impacts of the pandemic were less than expected (Figure 7).

2.7 COVID-19 impact mitigation measures that organizations are currently undertaking, or planning to undertake

For 18 of the 22 RFMOs, mitigation measures and operating protocols were already being applied in November 2020. For the remaining four RFMOs, mitigation measures and operating protocols were still under discussion in November 2020.

Examples of active mitigation measures and operating protocols are:

Meetings

- Move to virtual/remote meetings online, postponement of all in-person meetings.
- Teleworking, online meetings and correspondence processes for discussion and adoption of decisions.
- Correspondence meetings to address the most important issues for the compliance committee, administration and finance committee, and the commission. Meetings and workshops have taken place virtually as much as possible.
- Annual meetings to be preceded by preparation meetings, included video presentations by the secretariat, to allow material to be viewed when convenient and help focus meeting discussions.
- Continuing contingency planning for meetings in case face-to-face meetings are cannot take place.
- Use of state of the art conference facilities to allow plenary and group discussions, and coordination within meetings.

Health policies and procedures

- Following local health policies and procedures at Secretariat offices, and development of protocols.
- COVID-19 impact mitigation measures for at sea boarding and inspection, to protect both inspectors and fishing crew are under discussion.
- Some RFMOs have developed non-mandatory COVID-19 operating protocols, and encouraged their use as guidelines, to minimize the risk of transmitting COVID-19 in the fisheries sector at sea or in ports in the

Pacific. These protocols are based on international guidance, including from World Health Organization (WHO) and International Maritime Organization (IMO), and set out general COVID-19 risk mitigation protocols for all those involved in vessel operations, as well as activity-specific COVID-19 risk mitigation and control protocols for activities such as entering port, transhipping catch, unloading catch, boarding or disembarking a vessel, bunkering, provisioning and managing COVID-19 cases on board.

Compliance policy guidelines for extraordinary circumstances

- Introduction of enhanced electronic MCS measures to balance the lack of physical inspection.
- New compliance policy guidelines on principles for action and steps to be taken in relation to extraordinary circumstances have been developed and agreed by at least three RFMOs. The purpose of this policy is to ensure, as far as practical, that extraordinary circumstances (such as COVID-19) do not undermine conservation and management measures, and that all Parties understand how to respond if, and when, extraordinary circumstances arise.
- Review and assessment of exemption procedures for observers on board vessels currently in force, and its implementation.

Strategies for mitigation

- Putting in place a detailed COVID-19 mitigation strategy, which is kept as a living document to be able to respond in a dynamic way to any local changes in the COVID-19 environment.
- Formation of electronic working group to discuss issues relating to the COVID-19 pandemic.
- The General Fisheries Commission for the Mediterranean (GFCM) is in the process of preparing its next strategy. This process is participatory and incorporates the views of GFCM contracting parties and cooperating non-contracting parties, as well as relevant partner organizations and stakeholders. It is clear that a priority will be strengthening the resilience of the fisheries and aquaculture sectors and promoting the sector's recovery.

2.8 Recommendations on actions FAO could take to address identified challenges

The following recommendations were provided for actions FAO could consider taking to address these issues:

Meetings

- Create and maintain a centrally compiled calendar of fisheries related workshops/meetings.
- It would be extremely helpful if the FAO's RSN could help with coordinating scheduling of virtual meetings during the pandemic, and also later when the vaccination is available, and in person meetings will resume. Many long overdue meetings will be scheduled, so some coordination would be helpful.

New technologies

- Support transitions to new technologies to overcome COVID-19 hurdles and to facilitate:
  - fisheries and aquaculture value chains and marketing methods (e.g. e-commerce, direct selling)
  - remote MCS
  - innovative data collection methods
- FAO to assist with maximizing use of electronic telecommunications tools to address the above suggestions and establish such teams.

Staff training and support

- Training and mentoring teams. COVID-19 is expected to create staffing gaps in many countries. To promote timely recovery, FAO could consider early establishment of training/mentoring programmes and teams to address gaps in staff/losses in historical knowledge and experience in pre-identified priority areas. Training packages could be developed to be immediately available for implementation in the above identified priority areas to restore gaps in staffing and management experience.
- Additional assistance to ensure effective port state control during lockdowns.
- Facilitate sharing of good practice.

Inter-organizational communications

- FAO, together with the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO/IOC) should coordinate the RFMOs' activities in a framework of the UN Decade of the Ocean Science. Keeping inter-organizational activities on the highest possible level is the best response to COVID-19 crisis. Supporting inter-organizational communications is also critically important. Any actions directed to strengthen partnerships between RFMOs and RFABs are appropriate where connections are weakening due to travel restrictions.

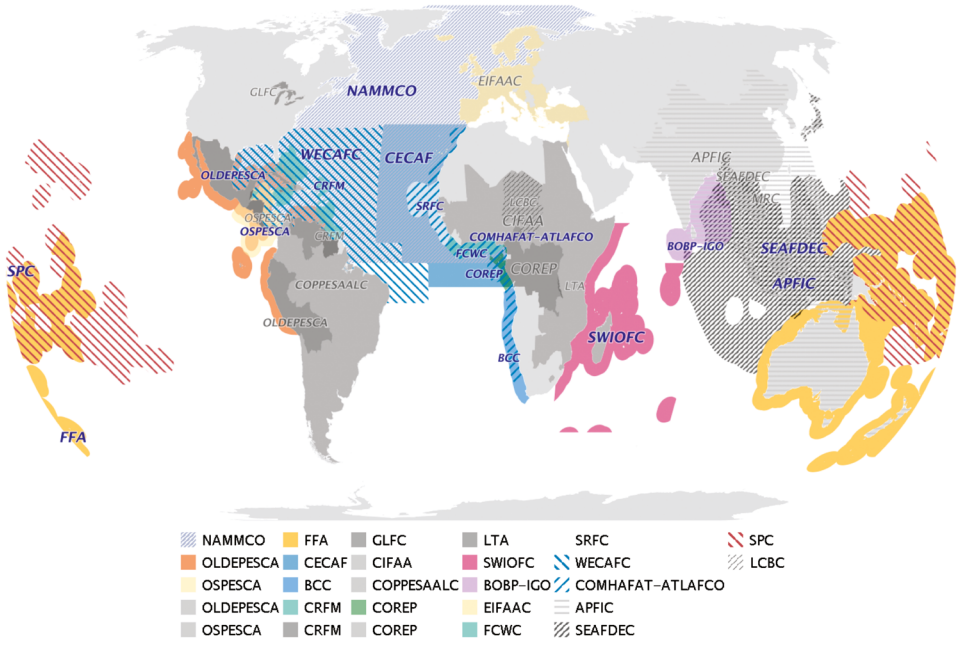
Building back better

- Strengthen resilience through better access to social protection programmes for fishers and aquaculture farmers.
- Strengthen local structures, such as small-scale fishing cooperatives, and engage stakeholders in management decisions to facilitate better decision-making and improved adaptability in the face of future shocks.
- Conduct a study to better understand effects of COVID-19 on the international fish trade.
- To bring such emergency issues to FAO Regional Conferences.

3 Regional fisheries advisory bodies

In November 2020, a questionnaire was distributed to RFABs through the RSN. In total, 19[7] out of 22 organizations (Figure 8) responded to the questions posed. Their responses are compared with the initial impact survey that took place in April (in which 12 organisations responded), and the results are presented below.

Figure 8 Regional fisheries advisory bodies (RFABs)



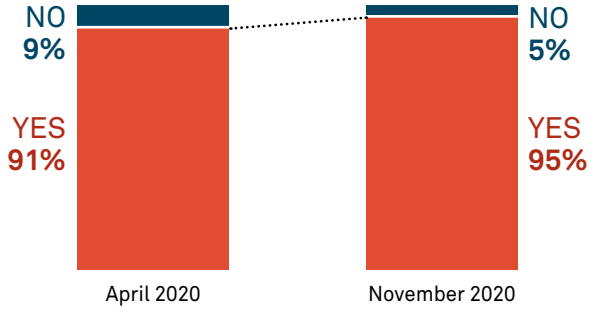
Source: FAO/Statistics and Information Branch, FIAS.

7 Asia-Pacific Fishery Commission (APFIC); Ministerial Conference on Fisheries Cooperation among African States Bordering the Atlantic (ATLAFCO); Benguela Current Convention (BCC); Bay of Bengal Programme – Intergovernmental Organization (BOBP-IGO); Caribbean Regional Fisheries Mechanism Secretariat (CRFM); Fishery Committee for the Eastern Central Atlantic (CECAF); Committee for Inland Fisheries and Aquaculture of Africa (CIFAA); Commission for Small-Scale and Artisanal Fisheries and Aquaculture of Latin America and the Caribbean (COPPESAALC); European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC); Fishery Committee for the West Central Gulf of Guinea (FCWC); Lake Chad Basin Commission (LCBC); Lake Tanganyika Authority (LTA); North Atlantic Marine Mammal Commission (NAMMCO); Organization for the Fishing and Aquaculture Sector of the Central American Isthmus (OSPESCA); Southeast Asian Fisheries Development Center (SEAFDEC); Secretariat of the Pacific Community (SPC); South West Indian Ocean Fisheries Commission (SWIOFC); Sub Regional Fisheries Commission (SRFC); Western Central Atlantic Fishery Commission (WECAFC).

3.1 Fisheries management and aquaculture production/management

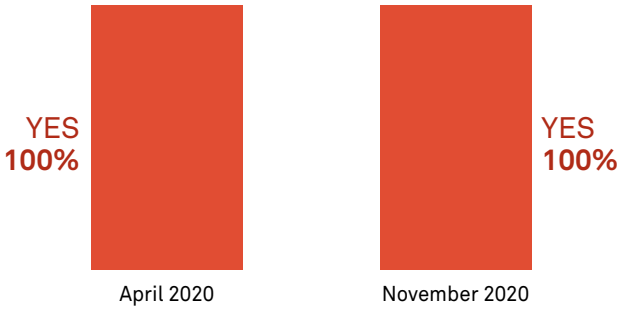
Is the impact of COVID-19 having, or expected to have, negative consequences on the management of fish stocks or on the production and management of aquaculture?

Figure 9A **Impact on management of fish stocks (RFABs)**



In November, for those **RFABs concerned with capture fisheries**, 95 percent reported they were experiencing, or expecting that, the impact of COVID-19 will have negative consequences on the management of fish stocks within their area of competency (Figure 9A). This percentage was not significantly different from the situation in April when 91 percent of RFABs concerned with capture fisheries reported negative consequences of COVID-19.[8]

Figure 9B **Impact on production and management of aquaculture**



8 Chi-square test showed no significant difference, $X^2(1, N=29) = 0.13, p > .05$

In November, for those **RFABs concerned with aquaculture**, 100 percent (the same percentage as in April) were experiencing, or expecting that, the impact of COVID-19 will have negative consequences (Figure 9B). These consequences were primarily due to: (i) shortages in supplies of inputs such as seeds, feeds, chemicals, drugs, and finance/credit, (ii) delays/disruption and declines of production cycles, (iii) reduced capabilities, and (iv) reduced demand for fish and reduced staff.

Some examples of negative impacts were:

Meetings

- Postponement of meetings led to delays in the development of some regional instruments (management plans, strategy) in support of sustainable management and conservation of economically important and vulnerable species. While the timely rescheduling of meetings has had a positive impact, (in terms of turnout compared to in-person gatherings), it is felt that the virtual nature of the meetings with recording has suppressed the expression of some positions, and been a deterrent to in-depth discussion. Another drawback is the loss of networking opportunities, the human value of physical meetings cannot be met by virtual events.
- COVID-19 is already having a negative impact on earlier (pre-COVID-19) scheduled activities. Meetings and implementation of activities have been postponed, and subsequently productivity is low, and rural communities are the most affected due to restricted travel in the Benguela Current Convention (BCC) region. Mitigation includes the use of the virtual meeting platforms (for which licences had to be purchased) to reach national project teams for ongoing communication. Also, the implementation of field projects was delayed or almost stopped.
- The main impact of COVID-19 on the Fishery Committee for the Eastern Central Atlantic (CECAF)'s functions has been the inability to host physical meetings. Most notably, various CECAF working groups that provide the scientific revisions on fish stocks from CECAF member countries have been postponed. Whilst much of the efforts are desk-studies and computer focused, mitigation measures were discussed under the assumption the pandemic would limit travel for some time. CECAF and its related projects have drafted a new plan that will host all events online, including flagship events where needed going into 2021. Certain activities and trainings at the national level (where possible) have been conducted in compliance with national health recommendations.

- In the North Atlantic, due to postponement of the meetings of the North Atlantic Marine Mammal Commission (NAMMCO) Management Committees, advice on conservation and management of marine mammals will not be given to member countries in 2020, but has been referred to rescheduled meetings in 2021. Meetings have been postponed, for example that of subsidiary bodies of the commission, scientific working group meetings postponed from spring to fall, and the annual meeting of the Scientific Committee postponed from fall 2020 to January 2021. All the postponed meetings took place as online meetings.
- Face-to-face meetings are either cancelled or postponed to later dates. As a result, development and/or implementing of certain fisheries management and surveillance measures are delayed. This is the case with the consultation on the limitation of catches of the Mako shark which was postponed owing to the inability to hold a face-to-face meeting. This is the also the case of the Sub-Regional Fisheries Commission (SRFC) Ministerial Conference, which was postponed several times and attempts by video conference failed to bring all the ministers together to take urgent decisions on IUU fishing issues, and on the Secretariat for better functioning of the SRFC.

Observers

- Reduced ability to monitor tuna fisheries because of suspension of the observer program, due to inability of observers to travel. For the purse seine fishery, we estimate a decline in observer coverage from 100 percent to around 30-40 percent at this stage.

Management and production

- Generally speaking, the COVID-19 has affected the fisheries sector by having negative consequences on the management of fish stocks, and on the production and management of aquaculture in several countries in Atlantic Africa.
- Will likely result in reduced tuna production if travel restrictions continue for a long period. It seems that there have been no impacts, or only slight impacts, related to COVID on fishing activity/catch in the purse seine fishery so far in 2020, and certain components of the longline fishery where there are negligible constraints in getting the product to their markets. Increased global market demand for extended shelf life albacore products, for example, has contributed to the latter.

Marketing

- In some cases, in the initial period of the pandemic, activities in the fishing and aquaculture value chain were affected by 75 to 80 percent, this was mainly in marketing.

Travel restrictions

- For aquaculture production, there are significant supply chain issues (importing and distribution of feeds, supply and distribution of fingerlings) due to international and domestic travel and transport restrictions and lockdowns.
- Reduction in demand from fresh (sashimi) fish, and inability to get tuna to markets due to the impacts of flight restrictions, are the main factors affecting the longline fishery in particular.

Port Access

- Restricted access of vessels to ports has negative implications for purse seine vessels for re-supply, maintenance, crew rotation and other services, while ability to tranship catch will depend on national decisions.

Specific regional examples

- The following are impacts of COVID 19 on capture fisheries in the Lake Tanganyika Region:
  - i. At the regional level, COVID 19 reduced cross-border fisheries trade due to the closing of land and air borders as a preventive measure set by respective countries to reduce and avoid transmission of the disease.
  - ii. Preventive measures prevented staff from conducting mission trips to attend organizational activities.
  - iii. Cost of testing for COVID 19 and staying in quarantine.
  - iv. Delay in project implementation.
  - v. Due to poor connections, there was a delay in virtual meetings related to the implementation of fisheries activities.
- Impacts in Europe are mainly associated with capture fisheries, where regional meetings had to be cancelled due to travel restrictions. In Europe, major problems have been caused by COVID-19 infections and quarantine measures:
  - to the personnel working in different phases of the fisheries and aquaculture chain from water/farm to table; and

- negative influences on the financial status of companies. Especially hard hit are Small and Medium Enterprises (SMEs) and the tourism related industries.

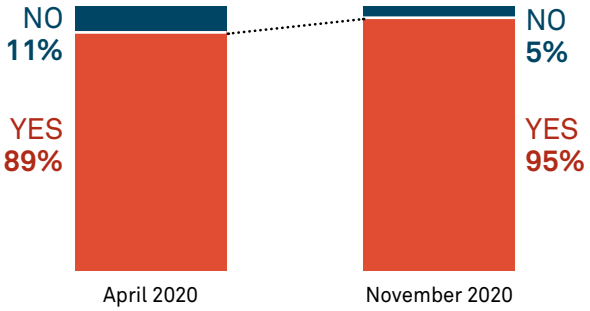
In some countries, inland fisheries (sport fishing and small-scale fishers) harvest/production were not impacted in spring 2020, as lockdown measures corresponded with closed fishing season on the lakes. However, eco-tourism in the West Balkans has been negatively impacted by border restrictions, preventing foreign tourism that supports inland fishers and related sport fishing industries in lakes and rivers.

- Increased risk in the Atlantic region to nearshore stocks as there is a shift to more efficient and damaging fishing methods (such as night-time spearing, and increased net use). Relocation of people from urban areas back to rural communities/outer islands due to loss of jobs (e.g. crash of tourism sector; government shutdowns; business closures) increasing subsistence and artisanal fishing pressure on coastal and nearshore areas (reefs, mangroves, seagrass beds)—where stocks are already under heavy pressure—with related challenges for management (both legislated and customary management). Relaxing of some management measures (such as reducing duration of spawning seasonal bans, or opening of some coastal commercial fisheries without conducting resource surveys to understand stock status, or opening fisheries where stocks are known to be low), has occurred when the short-term economic benefits has been determined by political leaders to outweigh the long-term negative impacts.

3.2 Capture fisheries monitoring, control and surveillance

Is the impact of COVID-19 having, or expected to have, negative consequences on the MCS of fishing activities, management of fish stocks and the fight against IUU fishing?

Figure 10 **Impact on MCS of fishing activities, management of fish stocks and the fight against IUU fishing**



For those **RFABs concerned with capture fisheries**, 94 percent of those reporting in November, (compared to 89 percent in April), were experiencing, or expecting that the impact of COVID-19 will have negative consequences on the MCS of fishing activities, management of fish stocks and the fight against IUU fishing (Figure 10).[9]

Some examples of negative impacts were:

Meetings

- In particular cases such as SRFC, the ministerial meeting for the decision making on the system for monitoring and surveillance has been postponed several times due to COVID-19. The meeting has been rescheduled to January 2021 but the predicted second wave of COVID-19 risks jeopardizing this process. This very important meeting should allow a consensus on a sub-regional MCS system to fight effectively against IUU fishing.

9 Chi-square test showed no significant difference, $X^2(1, N=27) = 0.27$, $p > .05$

Administration

- Physical distancing and lockdown measures, diversion of resources to support urgent priorities, and other restrictions imposed to minimize movement and reduce the transmission of the virus, have negatively impacted fisheries administrative and management activities including MCS.

Staff

- Personnel problems have been caused by COVID-19 infections and quarantine measures. Most public personnel had stayed home for a long period, while some fishing activities continued. This situation has created a gap in data collection and monitoring.

Observers, monitoring, control and surveillance

- In some cases, observer coverage schemes were at first suspended temporarily and then subsequently the suspensions were extended until early 2021, although observer activity is continuing for some domestic fleets. Observer coverage of high seas transhipment by longline vessels has also been suspended. While initially suspended in some countries, purse seiners have recommenced transhipments in port.
- Reduced observer deployment and in-port transhipment has meant a reduced flow of observer and port sampling data for work on stock assessments, harvest strategies and management strategy evaluation.
- Concerns about the lack of independent monitoring of both high seas transhipments and the exclusive economic zone (EEZ) transhipments which were previously conducted in port but are now required to take place offshore.
- Monitoring, control and surveillance in many countries have been irregular or suspended, and some organizations postponed planned activities until 2021. There are examples of no control, fewer control trips, and changes from on-board inspections to only land-based inspections. In Norway the sealing vessels did not have inspectors onboard for the first time in many years.
- The restrictions imposed by the authorities in different member countries, especially the confinement, has contributed to reducing capabilities to ensure and maintain biosecurity, MCS and environmental management measures.

- Joint IUU operations (involving representatives of two or more member countries) could not take place as planned and have been postponed.
- The restrictions may slow down the initial development of new MCS programs in some countries, and there is the risk that some trained fisheries officers or staff are seconded to other areas due to changing priorities.
- Government fisheries agencies unable to travel to undertake monitoring and enforcement, and/or government staff stand-downs, are negatively impacting MCS and enforcement.
- Monitoring, Control and Surveillance in many countries has been irregular or suspended.

Funding

- Shift in aquaculture operational budgets in some countries toward addressing containment and humanitarian response issues.

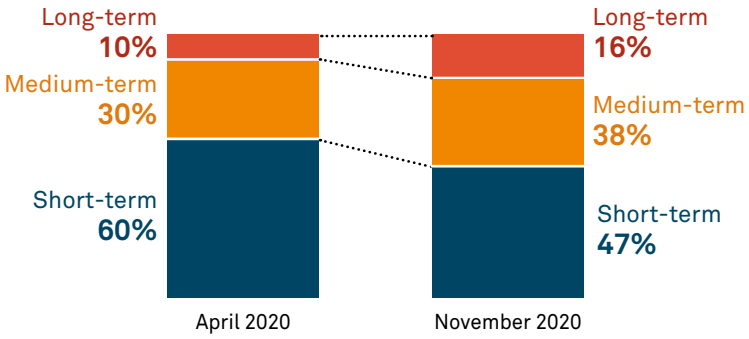
Coastal areas

- The pressure on the coastal marine resources will increase as more people return to their villages to wait out periods of isolation and use fish and shellfish to provide regular protein and also as a source of income.

3.3 Fisheries research

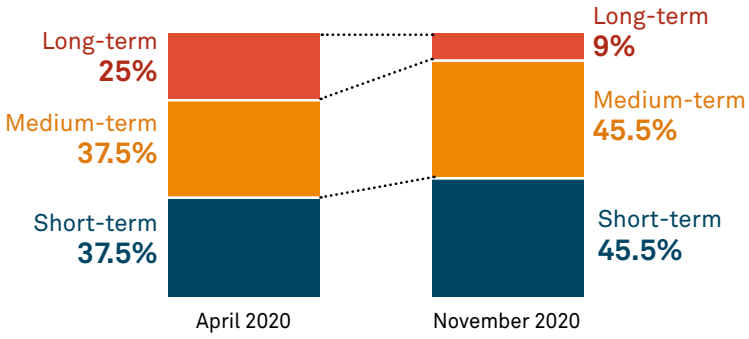
Is the impact of COVID-19 having, or expected to have negative consequences on research on fish stocks?

Figure 11A **Impact on research on fish stocks**



In November, of the **RFABs conducting research concerned with capture fisheries**, 47 percent, (compared with 60 percent in April), considered that research would be negatively affected in the short-term; 38 percent, (compared with 30 percent in April), considered research would be negatively affected in the medium-term; and 16 percent (compared to 10 percent in April), considered research would be negatively affected in the long term (Figure 11A).[10]

Figure 11B **Impact on research on aquaculture**



Of the **RFABs conducting research concerned with aquaculture**, 45.5 percent, compared with 37.5 percent in April, considered research would be negatively affected in the short-term; the same percentages were reported for the

10 Chi-square test showed no significant difference, $X^2(2, N=42) = 0.55$, $p > .05$

medium-term; and 9 percent, compared with 25 percent in April considered research would be negatively affected in the long term (Figure 11B).[11]

Some examples of negative impacts were:

Meetings

- Statutory meetings of regional committees of experts in fisheries and aquaculture, and also meetings with some strategic partners on fisheries, had to be suspended due to restrictions.

  The inability to meet on the usually regular basis has impacted communications of stock assessment of vital fish stocks in CECAF member countries. The outcomes of 2020 stock assessments across the various working groups will be negatively impacted due to the movement restrictions at the national and regional level; i.e. certain countries during March 2020 limited movement of small fishing vessels. The true extent of this impact is not fully understood for the stocks that CECAF investigates.

- Meetings were cancelled, some regional stock assessment surveys were put on hold, and some socioeconomic studies were put on hold. Field data collection activities, and meetings have been cancelled, or postponed.

Field work and research projects

- Information and data collection are being severely affected due to restrictions, and also lack of resources and priority allocated for this. Many studies are being conducted remotely with limited direct interactions with research institutions. Civil servants are not able to conduct their work as usual.
- Travel limitations have restricted fieldwork, research cooperation continued to be carried out online to the extent possible.
- Delays of some planned research projects. Face-to face meeting have been cancelled or postponed and caused problems, especially for projects where there is compulsory work or sampling in the field. Most projects have been able to quickly adapt to electronic equipment and video meetings.
- Virtual meetings have been carried out with national authorities, fisherfolk and aquaculture producer organizations and universities, but the activities in the field are delayed due to the pandemic, in some cases for several months, there has been no research work conducted as scientists could not work from the office, and have restricted conditions for working from

11 Chi-square test showed no significant difference, $X^2(2, N=30) = 1.28, p > .05$

home. No vessels went out to sea for research purposes, and cooperative surveys with development partners have been postponed.

Training

- In some cases, field work to undertake fish and invertebrate surveys and training are on hold, as are follow-up data analysis and report writing training attachments. For instance, SPC has adapted by identifying ways to provide remote/internet and video-conference-based training, analysis and report writing training.
- Capacity building work has been impacted, in particular, training courses on fisheries science/assessment that require face to face interaction have been on-hold for all 2020. Travel restriction extending into 2021 will require development of remote training options, that will not be as effective as in-person training.

Funding

- Budgetary resources regularly destined to fisheries research, have been reduced drastically in many cases, or re-oriented towards the national health system. Some national budgets for trainings, conferences, workshop and others have been given up and reallocated back to the government for health-related priorities.

Fish stocks

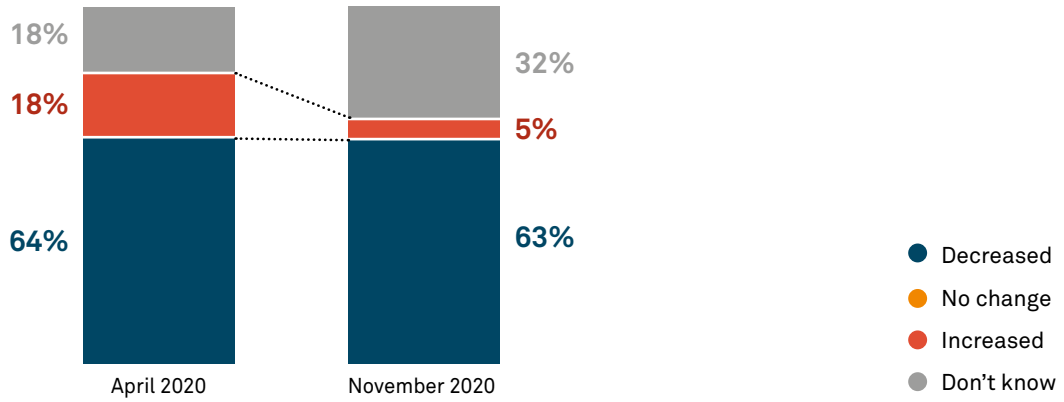
- More data need to be collected to understand the impacts of the COVID-19 pandemic on the global fishing effort; moreover, the relationship between fishing effort and stock state is sometimes hard to predict. The possible impact of the crisis on commercially important fish stocks thus remains largely unknown. In Atlantic Africa the Ministerial Conference on fisheries cooperation among African States bordering the Atlantic Ocean (ATLAFCO) are requesting and encouraging the Network of Institutes of Fisheries Research and Marine Sciences (RAFISMER) to be involved in such activities to assess the impacts.
- In some regions (SRFC) for fisheries research, there are cases where the impacts of COVID-19 have, and will have, negative consequences at the sub-regional level because the monitoring of fisheries is either stopped or slowed down. Likewise, sea cruises are also stopped, which jeopardizes the collection of crucial data to characterize the state of stocks and its evolution in space and time. In addition, the regional meetings with recommendations for the sustainable management of resources and consultations on research activities to be carried out at the sub-regional level are cancelled or postponed.

3.4 Socio-economics

3.4.1 Employment

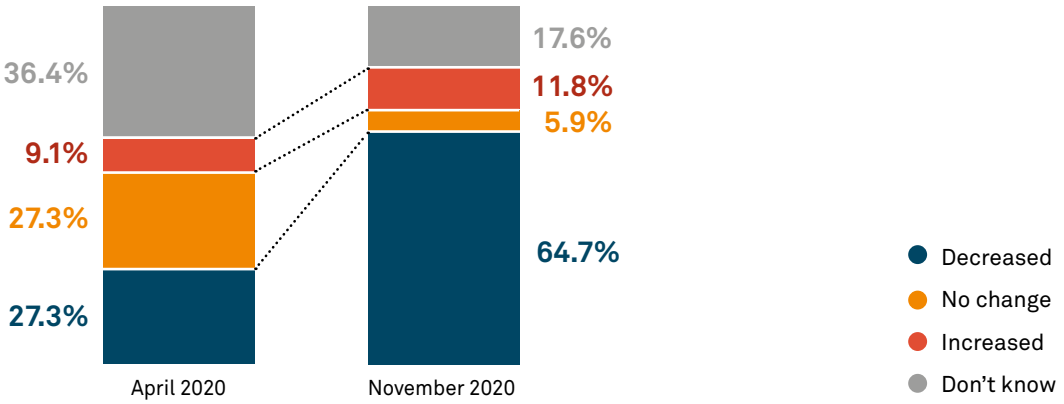
Owing to the impact of COVID-19 have levels and conditions of employment suffered?

Figure 12A **Impact on employment in capture fisheries**



In November, for those **RFABs concerned with capture fisheries**, 63 percent, compared to 64 percent in April, considered that employment would decrease; none considered there would be no change; 5 percent, compared with 18 percent in April, considered employment would increase; and 32 percent, compared with 18 percent in April, did not know if employment would suffer as a result of COVID-19 (Figure 12A).[12]

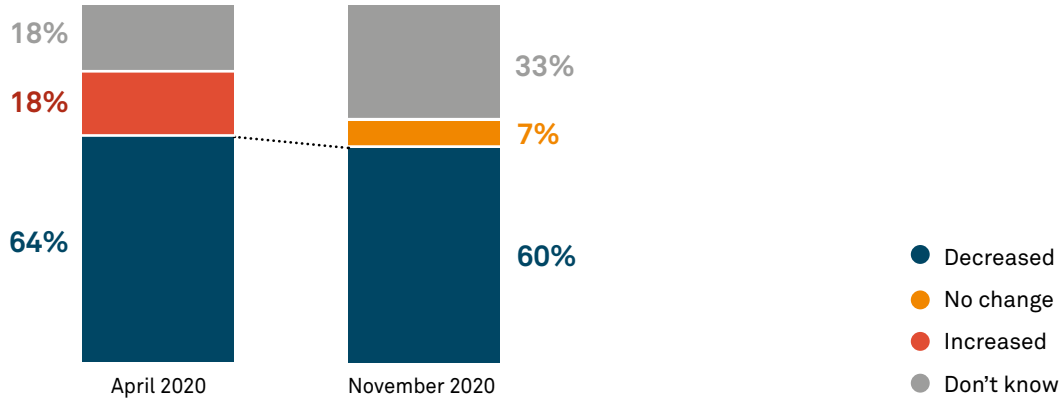
Figure 12B **Impact on employment in capture fisheries (post-harvest)**



12 Chi-square test showed no significant difference, $X^2(2, N=30) = 1.63, p > .05$

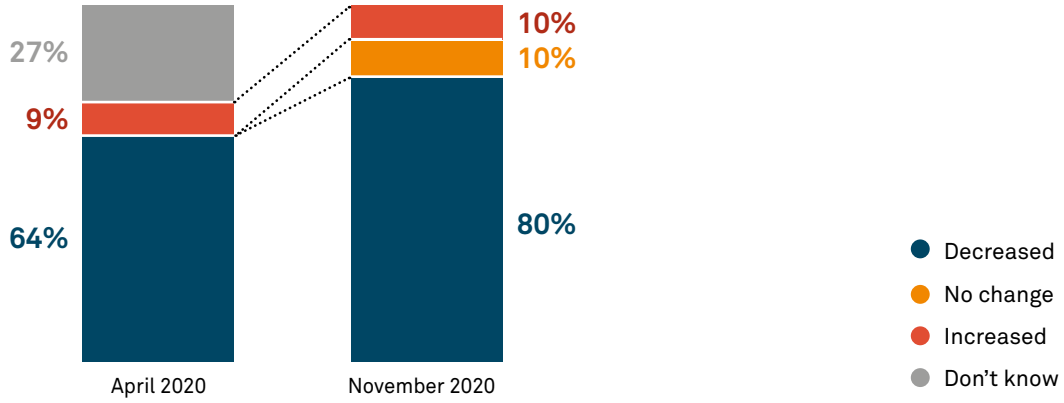
In November, for those **RFABs concerned with capture fisheries – post-harvest activities**, 64.7 percent, compared to 27.3 percent in April, considered employment would decrease; 5.9 percent, compared to 27.3 percent in April, considered there would be no change; 11.3 percent, compared to 9.1 percent in April, considered employment would increase; and 17.6 percent, compared with 36.4 percent in April, did not know if employment would suffer (Figure 12B).[13]

Figure 12C **Impact on employment in aquaculture**



In November, among **RFABs concerned with aquaculture**, 60 percent, compared with 64 percent in April, considered employment would decrease; 7 percent, compared with 0 percent in April, considered there would be no change; 0 percent, compared to 18 percent in April, considered employment would increase; and 33 percent, compared with 18 percent in April did not know if employment would suffer (Figure 12C).[14]

Figure 12D **Impact on employment in aquaculture (post-harvest)**



13 Chi-square test showed no significant difference, $X^2(3, N=28) = 4.99$, $p > .05$
14 Chi-square test showed no significant difference, $X^2(3, N=26) = 4.02$, $p > .05$

In November, among **RFABs concerned with aquaculture – post-harvest activities**, 80 percent, compared to 64 percent in April, considered employment would decrease; 10 percent, compared with zero percent in April, considered there would be no change; 10 percent in both surveys considered employment would increase; and 0 percent, compared with 27 percent in April, did not know if employment would suffer (Figure 12D).[15]

Some examples of negative impacts were:

Personnel

- Due to COVID-19 infection and quarantine measures, there has been an increasing need for short term personnel to run the processing systems.
- Employment levels across the capture fisheries value chain were reported to have decreased due to a number of factors such as restriction of movement, decreased demand for fish, decreased trade due to closed borders and disrupted air and sea transportation logistics and supply chain among others. Significant reduction in employment, harvesting and post-harvest activities have been reported in several countries.
- Observers have suffered from reduced work opportunities during the suspension of observer activities.
- Reports of loss of jobs in tourism, fishing, transport, naval maintenance, pearl farming and aquaculture from a number of countries in the Pacific region.
- The COVID-19 pandemic has greatly affected employment at sea and ashore in SRFC region. At sea, contracts are drawn up to avoid contamination between employees. On land, women processors see their activities decline due to low landings; this is the case for all activities related to catches.
- Some crew members and workers have been infected on fishing vessels and in factories, reducing the number of staff available for work, and resulting in the closure of fish factories owing to physical distance measures.
- Maintenance of tuna supplies has helped maintain employment within the supply chain (e.g. employment in processing facilities), but COVID outbreaks have led to some canneries in other parts of the world temporarily suspending or reducing activities.

15 Chi-square test showed no significant difference, $X^2(3, N=21) = 4.03$, $p > .05$

Work routines and conditions

- Fishers are allowed to go out to sea to fish, but they must abide by the curfew, which severely limits work routines and distances to which they can sail. They can no longer fish in the waters of neighbouring countries. Risk of suppression of jobs is very high.
- COVID-19 has restricted/limited the possibility of hiring new personnel. It continues to impact people's work conditions. Full-time employees have worked less days in the office from mid-July, resulting in extended use of home office and online meetings.

Limited access to markets

- In some regions, due to restrictions/lockdown and closure of national boundaries in the region, there was limited access to market and fisheries traders could not continue with movement of fish products. So most of fishers and fish post-harvest workers suffered a lot with the situation, especially women and children working for post-harvest processing to earn their living.

Movement restrictions

- Mobility restrictions certainly would have a negative impact on fisheries that are dependent on migrant workers.
- The impact on land-based aquaculture has been severely impacted due to transportation and marketing infrastructure which, though intact, is inoperable due to lockdowns and fears of virus transmission, resulting in lost income and employment.

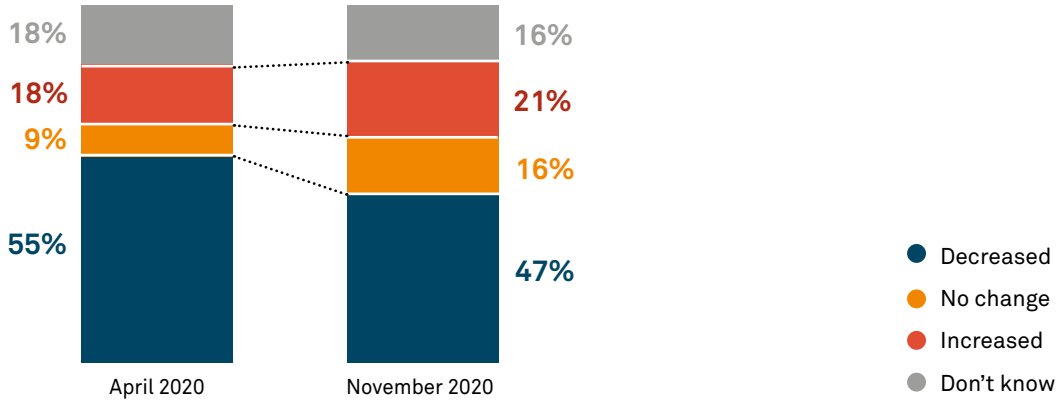
Safety measures

- RFBs have oriented efforts towards putting in place health protocols, guides, awareness, best practices, bio-security trainings, screening campaigns for fishing operators at national level.

3.4.2 Demand for fisheries products

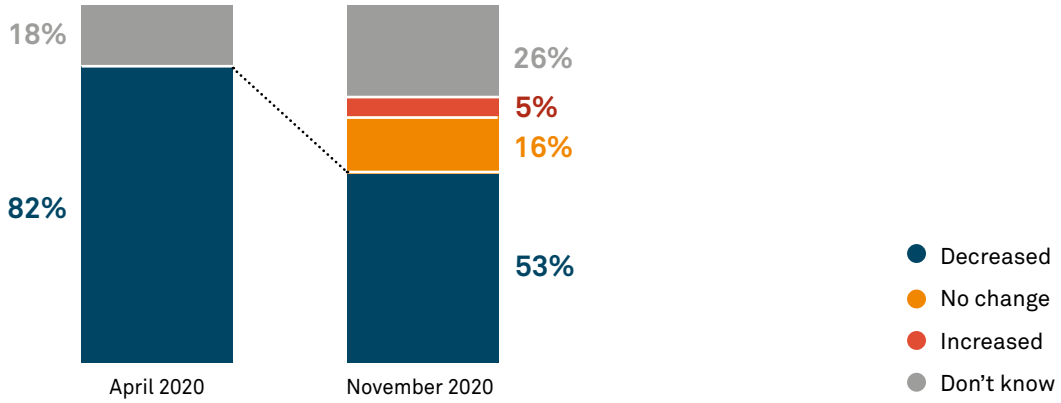
Owing to the impact of COVID-19, has demand for fish harvested in your region been affected?

Figure 13A **Impact on fish demand in capture fisheries-domestic market**



For those **RFABs concerned with capture fisheries – domestic market**, responses provided in November illustrated that 47 percent considered demand would decrease, 16 percent considered there would be no change, 21 percent considered demand would increase, and 16 percent did not know if demand would be affected (Figure 13A). These results were not significantly different from those in April.[16]

Figure 13B **Impact on fish demand in capture fisheries-export market**

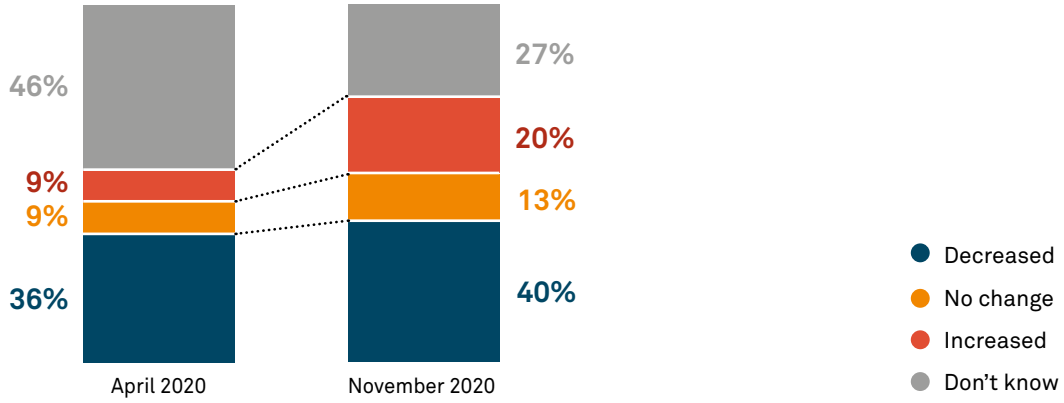


For those **RFABs concerned with capture fisheries – export market**, responses in November reported that 53 percent of respondents, compared with

16 Chi-square test showed no significant difference, $X^2(3, N=30) = 0.36$, $p > .05$

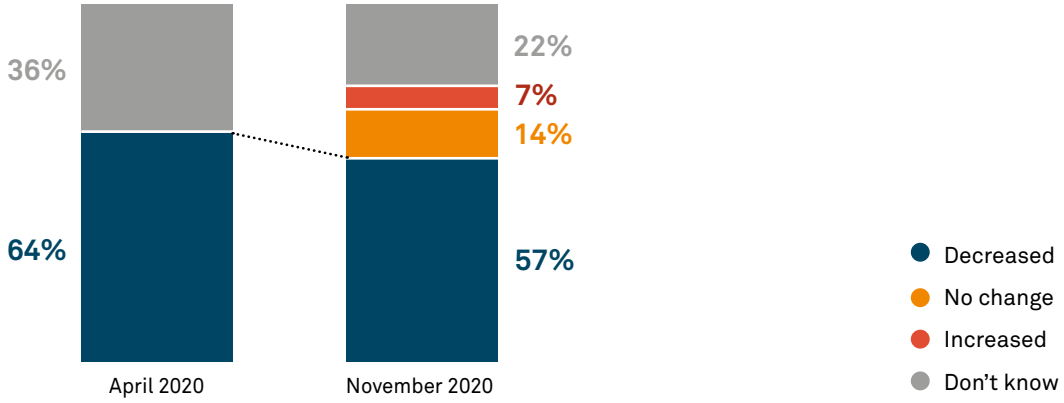
82 percent in April, considered demand would decrease; 16 percent, compared with 0 percent in April, considered there would be no change in demand; 5 percent, compared to 0 percent in April, considered demand would increase; and 26 percent, compared with 18 percent in April, did not know if demand would be affected (Figure 13B).[17]

Figure 13C **Impact on fish demand in aquaculture-domestic market**



For those **RFABs concerned with aquaculture – domestic market**, in November 40 percent, compared with 36 percent in April, considered demand would decrease; 13 percent, compared with 9 percent in April, considered there would be no change; 20 percent, compared with 9 percent considered demand would increase; and 27 percent, compared to 46 percent in April, did not know if demand would be affected (Figure 13C).[18]

Figure 13D **Impact on fish demand in aquaculture-export market**



17 Chi-square test showed no significant difference, $X^2(3, N=30) = 3.45$, $p > .05$
18 Chi-square test showed no significant difference, $X^2(3, N=26) = 1.26$, $p > .05$

Among the **RFABs concerned with aquaculture – export market**, in November 57 percent, compared to 64 percent in April considered demand would decrease; 14 percent, compared with none in April considered there would be no change; 7 percent, compared with none in April, considered there would be an increase; and 22 percent, compared with 36 percent in April, did not know if demand would be affected (Figure 13 D).[19]

Some examples of negative impacts were:

Demand

- The fisheries industry in several member countries has been devastated by problems, such as decreased demand from large-scale buyers, particularly restaurants, and by the shutdown of markets. Sales and prices of premium seafood products that are sold to restaurants have been hit hard.
- Domestic demand is reduced because of negative impacts of COVID-19 on the tourist industry, restaurants, etc.
- Demand for locally caught pelagic species has declined due to loss of tourist related market outlets. Decline in prices for these pelagic species has resulted.

Movement restrictions

- Fish trade was affected due to the closure of the borders in the region for both aquaculture seeds and products. Traders were not able to cross boundaries and transport fish products to the market, so demand for products from capture fisheries was reduced.
- There were some restrictions in movement of seafood, especially for export markets, however the demand for seafood products did not change significantly.
- During quarantine periods established by countries, fishery and aquaculture products could not reach the markets at normal levels due to measures restricting the mobility of people and vehicles. Furthermore, buyers preferred not to leave their houses if not necessary.
- High valued commodities such as shrimp, pearls and ornamental species are severely impacted due to lack of export from flight closures, and the huge drop in sales to hotels and restaurants due to the drop in tourism.

19 Chi-square test showed no significant difference, $X^2(3, N=25) = 2.89, p > .05$

- Some countries have stopped the export of reef fish, for others exports of reef fish stopped indirectly through closure of international flights (especially impacting the aquarium trade).
- Demand for export has reduced due to increase of charges and delay of fish products at the exit points, and whereby delays lead to deteriorate of fish species.
- Closure of the land borders is a major constraint to demand for fisheries products.

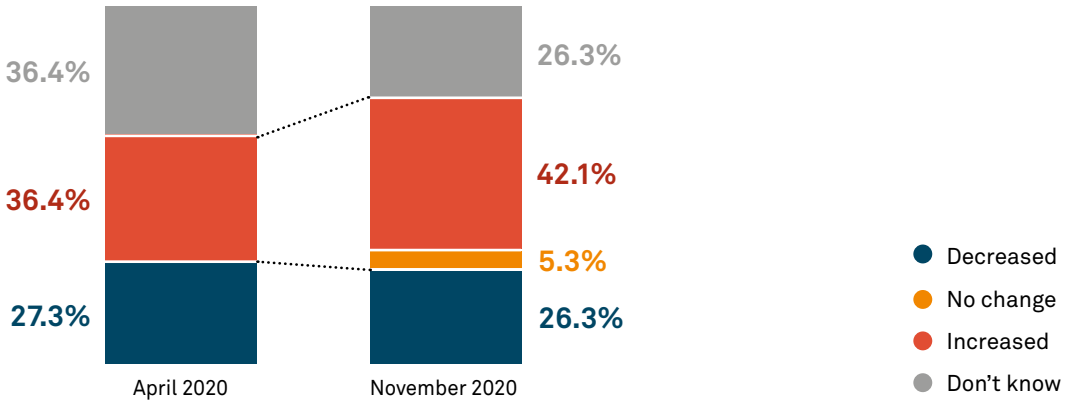
Some examples of adjustments were:

- As the global transportation system for fish has changed, the local and nearby countries market has become more important. In aquaculture, different companies have had different possibilities to adjust their production cycles and store their products such as using long term freezing.
- Fisherfolk, aquaculture producers and sellers were forced to diversify with online sales through social networks and home delivery of products.
- An increasing demand towards home grown cultivation, in aquaculture this is mainly tilapia farming for small-scale backyard farming, with tilapia identified as an immediate response plan in some countries.
- Emergence of innovative approaches to marketing with digital platforms, diversification and robust promotion of domestic fish consumption, especially the nutritional benefits of fish in the context of COVID-19. Strong trend towards regional arrangements between countries having a better control of the pandemic.
- Some Organizations reported increased demand for export tuna products, with product destined for canning and pouches positively affected by COVID-19, but that for fresh product negatively affected.
- Local supply chains were disrupted by COVID-19 restrictions in the early stages of the pandemic. However, fishers were gradually allowed to resume fishing and marketing activities with some restrictions in place, such as limits on the hours of operation and number of persons allowed on fishing boats, and reopening or reduced restrictions at local produce/fish markets. While demand for locally harvested fish remained high, supplies were sometimes either not available or were not easily accessible to consumers.
- There is more demand for both the domestic and export markets, partly due to disrupted operations, which resulted in low productivity as well as non-affordability of other sources of protein due to price increases, and reduced/loss of income as a result of retrenchments or reduced working hours.

3.4.3 Price for fisheries products

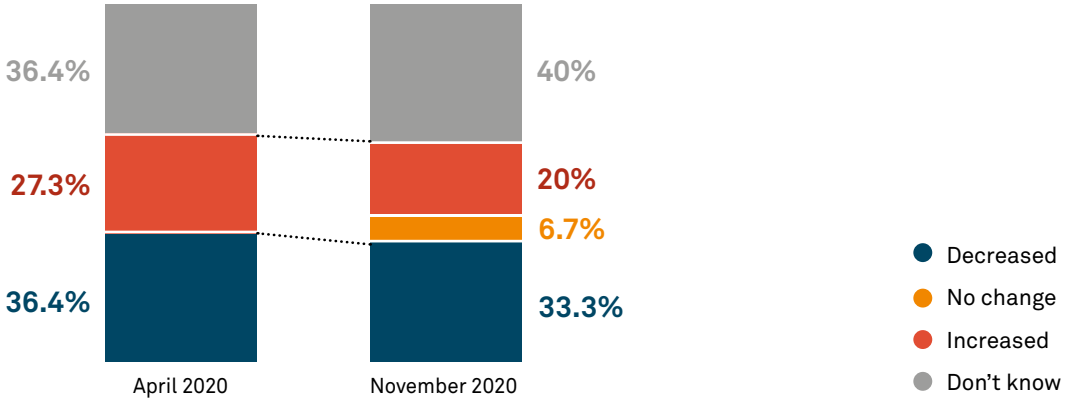
Owing to the impact of COVID-19 has the price paid for fish been affected?

Figure 14A **Impact on price for fish from capture fisheries**



For those **RFABs concerned with capture fisheries**, responses provided in November showed that 26.3 percent reported that the price of fish had decreased, compared to 27.3 percent in April; 5.3 percent reported no change to price paid; 42.1 percent reported that the price of fish had increased, compared to 36.4 percent in April; and 26.3 percent didn't know if the price was affected, compared to 36.4 percent in April (Figure 14A).[20]

Figure 14B **Impact on price for fish from aquaculture**



For those **RFABs concerned with aquaculture**, responses provided in November showed that 33.3 percent reported the price of fish had decreased, compared to 36.4 percent in April; 6.7 percent reported no change in price;

20 Chi-square test showed no significant difference, $X^2(3, N=30) = 0.87, p > .05$

20.0 percent reported that the price of fish had increased, compared to 27.3 percent in April; and 40.0 percent didn't know if the price was affected, compared to 36.4 percent in April (Figure 14B).[21]

Some examples of impacts were:

Price decreases

- Salmon and trout originally produced for other markets have lowered prices in Northern Europe.
- In some countries, prices were decreased by about 20 to 30 percent. However, it is important to highlight that the behaviour of prices depends on the markets, and specifically by the pandemic, due to the availability of transportation.
- Prices of mud crab, lobsters and reef fish were reduced due to loss of tourist markets.

Price increases

- In some regions price increase was observed in the first months of the pandemic, but had been returning to normality.
- ATLAFCO noticed that disruptions in the seafood supply chain, falling production and decreased consumer demand in some countries of our region were pushing up the price of fish and aquatic food.
- Southwest Indian Ocean Fisheries Commission (SWIOFC) pointed out that the increased cost of transport/logistics for moving fish resulted in a price increase of products.
- Decreased supply of fish due to COVID restrictions increased prices.
- Prices have decreased in some places, but have increased in others due to reduction in supply and easier access to more expensive imported fish.
- Demand in different markets remained the same while supply decreases, resulting in a sharp increase in prices. This is impacting populations at both national and sub-regional level whose incomes have fallen due to the COVID-19 pandemic.

Consumption switch

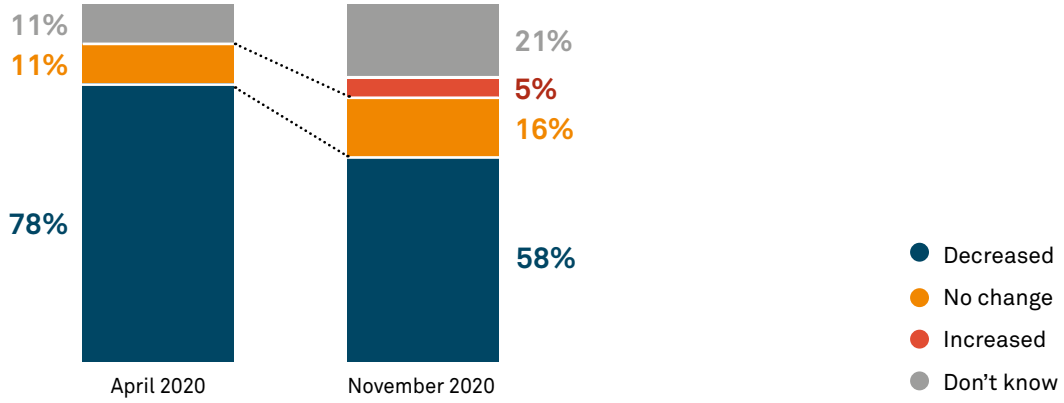
- With employment losses and relocation away from urban areas, people no longer have the cash to purchase fish and are resorting to subsistence and artisanal fishing.

21 Chi-square test showed no significant difference, $X^2(3, N=26) = 0.92, p > .05$

3.4.4 Supply

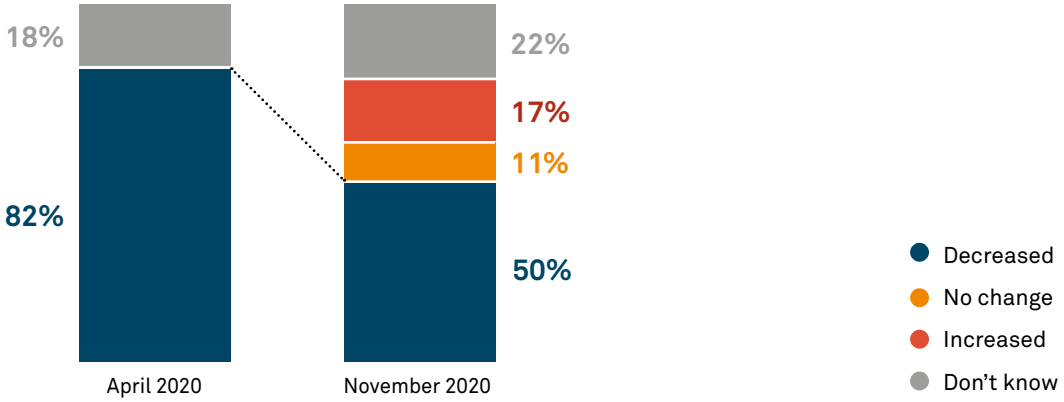
Owing to the impact of COVID-19, how has the supply of fish to the domestic markets changed from the following supply markets?

Figure 15A **Impact on supply of fish to domestic markets from capture fisheries-domestic**



Among the **RFABs concerned with capture fisheries – domestic supply**, 58 percent, compared to 78 percent in April considered that supply would decrease; 16 percent, compared to 11 percent in April considered there would be no change; 5 percent, compared to 0 percent in April considered that supply would increase; and 21 percent, compared to 11 percent in April did not know if supply would be affected (Figure 15A).[22]

Figure 15B **Impact on supply of fish to domestic markets from capture fisheries- imports**

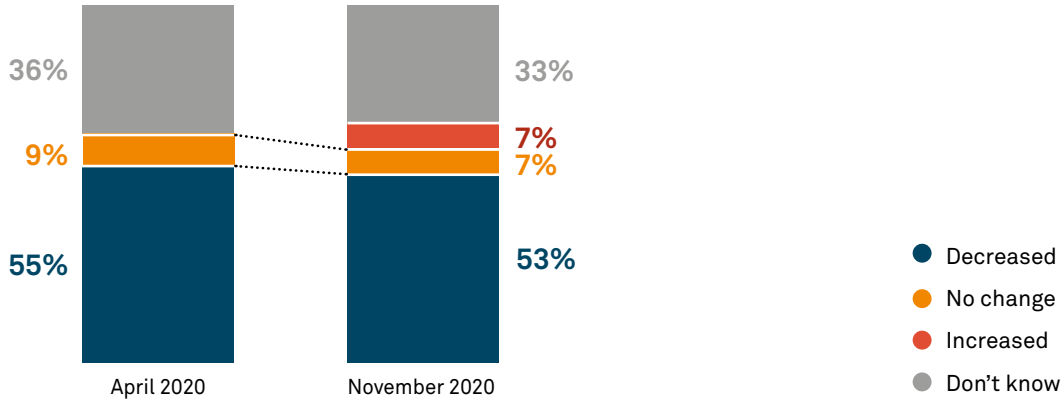


Among the **RFABs concerned with capture fisheries – imports**, in November 50 percent, compared to 82 percent in April considered that supply would decrease; 11 percent, compared to 0 percent in April considered there would

22 Chi-square test showed no significant difference, $X^2(3, N=28) = 1.28, p > .05$

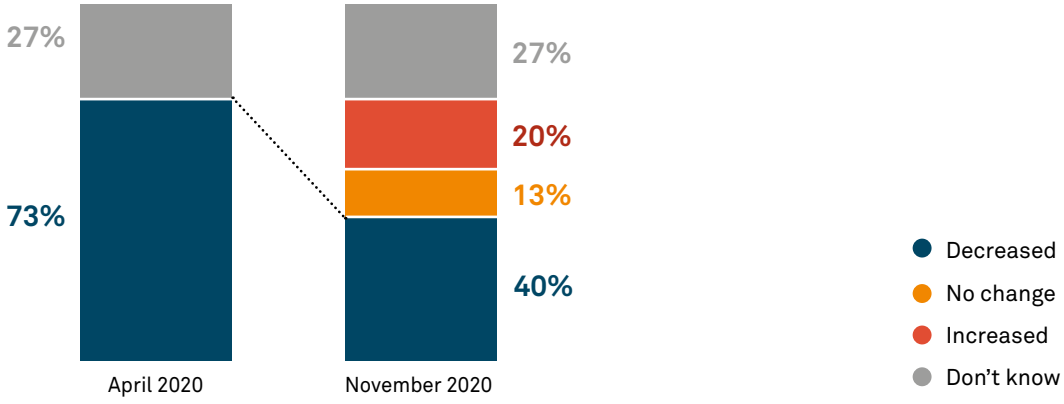
be no change; 17 percent, compared to 0 percent in April, considered supply would increase; and 22 percent, compared to 18 percent in April, did not know if supply would be affected (Figure 15B).[23]

Figure 15C **Impact on supply of fish to domestic markets from aquaculture-domestic**



For those **RFABs concerned with aquaculture – domestic**, responses provided in November showed that 53 percent considered that supply would decrease, compared to 55 percent in April; 7 percent considered there would be no change, compared to 9 percent in April; 7 percent considered that supply would increase, compared to 0 percent in April; and 33 percent did not know if supply would be affected, compared to 36 percent in April (Figure 15C).[24]

Figure 15D **Impact on supply of fish to domestic markets from aquaculture-imports**



23 Chi-square test showed no significant difference, $X^2(3, N=29) = 4.22$, $p > .05$
24 Chi-square test showed no significant difference, $X^2(3, N=26) = 0.80$, $p > .05$

For those **RFABs concerned with aquaculture – imports**, in November 40 percent, compared with 73 percent in April considered that supply would decrease; 13 percent, compared with 0 percent in April considered there would be no change; 20 percent, compared to 0 percent in April considered that supply would increase, and 27 percent (the same percent as in April) did not know if supply would be affected (Figure 15D).[25]

Some examples of comments were:

- Aquaculture producers were forced to discard or destroy products within weeks or face exceptional stock management costs, including more space and feed for grown out fish that cannot be slaughtered due to drop in demand. Purchase and transportation of fish seeds were frustrated due to movement restrictions. The rapid decline particularly affected small-scale coastal fishing operators and fish producers.
- National lockdown affected the market.
- Decreased fish supply increased price of fish.
- Mobility restrictions have affected both the fisheries and aquaculture supply chains. Restaurants and hotels have closed temporarily or reduced operations and this, in turn, has had an effect on the demand. For instance, in some countries of Central America, a significant share of the shrimp trawling production goes to restaurants and hotels, so a significant part of trawl shrimp production could not be sold. As a response, less fishing trips have been conducted and also aquaculture ponds are not being stocked, therefore affecting local supply.

25 Chi-square test showed no significant difference, $X^2(3, N=26) = 4.93$, $p > .05$

3.5 Other impacts

Other reported impacts of COVID-19 included:

- As European inland fisheries are dominated by recreational fishing, the border restrictions and lockdowns have shut down the activities of angler associations and sport fishing tourism. However, individual anglers / fishers may have increased their use of local resources to supplement home consumption.
- Video-conferencing does not allow as much networking as in-person meetings, hence broadening knowledge of experts is limited. Interaction is constrained. In a meeting of more than 100 participants, it is only possible to identify and have limited interaction with the speakers or panelists.
- The economic and social impact of lockdowns has been significant in the south western Indian ocean region in the first half of the year, and countries do not have national budgets to continue implementing precautionary measure regarding COVID-19.
- In both aquaculture and processing plants, the pandemic caused over-inventories, increase of production costs, operating expenses and risks of loss of products (particularly in concentrated feed and frozen products). The demand of fresh products was contracted, and there was limited access to inputs such as ice, baits, fuel, fingerlings, post-larvae and fertilizers, among others.
- Due to COVID-19 and lock-down for many months, the ancillary industry (ice, cold storage, transportation, packing material, crates, etc.) suffered, also impacting the supply and distribution of harvested fish and fish products.
- As stated in April, increased use of online meetings and no travelling is saving both time and money. It has also introduced new manners of structuring meetings that in many cases are positive both for the deliberations (people are more focused and prepared), and for the reporting (a full day meeting is divided into two or three shorter modules). It has also allowed participation in meetings that would not have been attended, because they were online and therefore did not cause lost time in travel days and cost.

3.6 Scale of impact

In November, 61 percent of RFABs found that impacts of COVID-19 were greater than expected, 28 percent found that the impacts have been as expected, and 11 percent found that impacts of the pandemic were less than expected (Figure 16).

Figure 16 **Expectations of impacts of COVID-19**

3.7 COVID-19 impact mitigation measures organizations are currently undertaking, or planning to undertake

The RFABs provided the following examples of mitigation measures being applied:

Meetings

- Mitigation comes in the form of video communications, but this ability is limited in CECAF regions (i.e. fisheries experts, policy makers; less so rural communities) to only those with access to devices/stable connections.
- Online consultations, combined with international expert support and national consultant support to implement consultancy work. Holding virtual meetings with reduced work programmes.

Health policies and procedures

- Through the projects carried out, fishers and aquaculture producers cooperatives and associations were supported with equipment and materials for the prevention of transmission of COVID-19 (thermometers, pedal dispensers and alcohol-based hand sanitizers). Prevention measures were also disseminated through posters and radio messages.
- ATLAFCO is calling on its Member States to apply the relevant recommendations and measures recommended by international organizations (the World Health Organization (WHO), the International Labour Organization (ILO), the International Maritime Organization (IMO), FAO) to limit the spread and direct effects of COVID-19, by:
    - Popularizing good practices for the prevention and fight against contamination by COVID-19 among the population and seafarers in order to minimize the risk of the pandemic spreading;
    - Ensuring the conduct of training sessions on the proper implementation of infection control measures and good hygiene practices in the workplace (vessels, canoes, landing sites, processing plants, markets, etc.).

Other COVID-19 mitigation measures

- To improve the presence of fishery products in the markets, national authorities established transfer permits for fisherfolk and transporters.
- Digitalization is really gaining momentum. Working together for sub-regional integration and sharing information and agriculture products (including seafood) has never been so highly promoted in the policy landscapes.
- Sensitization campaigns following WHO guidance. Compensation schemes for small businesses. Fish health and hygiene practices training. Support to fisheries management and development initiatives have been planned and implementation should not be hindered at the country level in 2021, otherwise programs/projects delivery and impacts will be severely affected.
- The Central American Integration System (SICA) has in force a Regional Contingency Plan oriented to complement the national efforts for the prevention, containment and treatment of the COVID-19.
- Additionally, SICA is planning to work on an economic, social and environmental reactivation plan for member countries with a regional perspective.
- Match the capacity of program/project partners.

Specific examples from individual Regional Fisheries Advisory Bodies

- ATLAFCO put emphasis on fisheries management policies among its Member States which must remain evidence-based in the face of growing pressures to overcome losses, and practical challenges in monitoring and enforcement.
- ATLAFCO has organized video conferences to sensitize its Member States on some relevant issues such as:
  - Keep up the fight against illegal fishing, relying as much as possible on electronic monitoring and surveillance systems supported by targeted inspections and missions at sea and in ports;
  - Support the transition from fresh fish to value-added processed seafood products where feasible, to offer new economic opportunities to those working in the sector;
  - To help fishers, especially small-scale operators, to compensate for the lack of commercial activity during the confinement period, ATLAFCO recommends that fisheries authorities in Member States extend fishing seasons when feasible.

- One of the major developments that took place in the Bay of Bengal Programme Inter-Governmental Organization (BOBP-IGO) member-countries during COVID-19 is the on-line marketing of fish and fish products and their home delivery. Though on a lower-scale, some enterprising fishers also established start-ups and created a 'boat-to-plate' delivery mechanism where the fisher on the basis of his contact with the consumers, marketed the fish directly from his boat to the consumer after carrying out the basic dressing and cleaning. Such enterprises have become very popular in metropolitan cities like Mumbai and also in smaller cities like Pondicherry. BOBP-IGO has assisted some of these start-ups.
- The "CARICOM COVID-19 Agri-Food Risk Management Framework" and the "CARICOM COVID-19 Agri-food Action Plan" were developed by the Caribbean Community (CARICOM) States including the CRFM to support Member States in effectively managing food supply and availability during the COVID-19 crisis. In addition, the CRFM conducted a fisheries sector assessment to support Member States and Regional Institutions and development partners with implementation of the above-mentioned Risk Management Framework.

  The objectives of the fisheries assessment were:

  i. To determine the impacts of the COVID-19 pandemic on the whole fisheries sector.
  ii. To inform priority actions that will minimize the impacts of COVID-19 within the fisheries sector at the national and regional levels; and
  iii. Identify and take advantage of opportunities that may arise from the pandemic to improve the fisheries sector and livelihoods of fisherfolk and fishing communities.
- At the regional level, a number of actions have already been taken to support the implementation of the CARICOM COVID-19 Agri-Food Risk Management Framework for the Region, including formation of a COVID-19 Food Security Taskforce for the Region which includes the various regional partners and Member States.
- Commission for Small-Scale and Artisanal Fisheries and Aquaculture of Latin America and the Caribbean (COPPESAALC) has organized two seminars to exchange information regarding the likely impacts of COVID19 on fisheries and aquaculture sectors, and to present examples on how different producers (fisher folk and aquaculturists) are coping and innovating to stay afloat.

- Make all CECAF events/trainings virtual.
- In addition, the CRFM assessment could be used to: (i) support the collection of supplementary information by Member States, and (ii) facilitate the implementation of the Agri-Food Risk Management Framework specifically through the Response and Recovery Phases of the risk management process as summarized below:
  - Control, contain and minimize the impact of COVID-19 and other such events on the Agri-food system;
  - Identify beneficiaries (farmers, fishers, agro-processers, traders, households, communities, businesses, institutions, etc.);
  - Implement relevant interventions based on assessed actual impacts;
  - Communicate external support needed;
  - Minimize disruptions and recovery time of the agri-food supply chain;
  - Throughout implementation of response and recovery activities, look out for secondary impacts or risk (e.g. sudden or unexpected market related shocks);
  - Document lessons learned (positive and negative) for use in future programming, planning and policy; and,
  - Incorporate 'Building Back Better' principles where applicable.

  Additionally, the assessment results could be used to guide implementation of a number of priority actions for immediate response to COVID-19 (May to December 2020) and medium to long-term response to regional food and nutrition security resilience (2021 onwards). The challenges and mitigation measures identified in the impact assessment along with the priority actions by focus area along with specific responses for the relevant fisheries sector. In moving forward, the pandemic has also provided the opportunity for strengthening and expanding the value chains which would contribute to improved resilience of the sector.
  - Increased use of video conferencing for scientific meetings;
  - Increased development, provision and access to on-line training materials, including apps and videos;
  - Quick development and provision of targeted policy and management guidance based on specific national requests/needs;
  - Increased flexibility in reallocating financial and human resources to meet changing priority needs of countries;

  - Seek to facilitate use of drones to reduce MCS costs;
  - Sensitization along with other organization's activities;
  - Finding funds for provision of health and hygiene facilities;
  - Develop projects to supply disinfectant and masks for prevention measures;
  - Some Governments have introduced: i) biosecurity measures on board fishing vessels and within fishing processing plants; ii) tax and credits relief plans and iii) Institutional purchases of fisheries and aquaculture products;
  - Small-scale fishing organizations have been distributing fresh fish for free to their communities to strengthen food security.
- The Fishery Committee for the West Central Gulf of Guinea (FCWC) provided some personal protective equipment to MCS departments of the fisheries offices in the various countries to help boost their safety at work while on fishing vessel or at port.
- Central America Fisheries and Aquaculture Organization (OSPESCA) jointly with the Executive Secretariat of Health and with the Maritime Transport Commission of the Central American Integration System (SICA), wrote the "Guidelines for biosecurity in fishing vessels against COVID-19 in SICA countries".
- The Southeast Asian Fisheries Development Center (SEAFDEC) is now planning to conduct a comprehensive regional study on the impact of COVID-19 on fisheries and aquaculture, results to be disseminated in late 2021.

3.8 Recommendations on what actions FAO could consider taking to address these issues

The following recommendations were provided for actions FAO could consider:

New technologies

- FAO can encourage / assist with the adoption of e-commerce by fisheries and aquaculture sector and fish consumers to facilitate supply chain recovery and to support to SMEs, through increased consumption of local products.
- Propose the use of drone technology for detecting fish defaulters, and reduce the time of fishermen staying close.

Inter-organizational communications

- FAO may strengthen partnerships and build on its networks of institutions that are in the field. Global forum such as the International Year of Artisanal Fisheries and Aquaculture (IYAFA 2022) may help in the post-COVID-19 recovery and development plans.

FAO in action

- Support fisheries authorities to advocate for the importance of keeping the IUU-related commitments as part of the core activities within the post-COVID-19 recovery.
- Strengthen aquaculture for sustainable development and future food security.
- Develop policies to increase the resilience of seafood supply chains and create new ones.
- Support for the preparation and implementation of economic, social and environmental reactivation plans for the fishing sector at national and regional level.
- FAO could consider providing assistance in the identified problematic areas under permissible conditions. Hopefully, there will be no more hard lock-downs that do not allow any interaction between project staff and communities, as well as among researchers across countries.
- FAO may like to mount studies in selected areas of the world to obtain ground-level information on the impacts of the pandemic, lessons learnt,

and how these lessons could be turned into coping strategies that can be deployed in similar circumstances in the future.

- Strategy to empower citizens, especially women and youths working in fish post-harvest processing, to ensure the flow of their products to consumers even when lockdown is imposed.
- It would be important to address market access as well as innovative ways by which fishers and fish farmers may be able to link with consumers, through information and communication technologies (ICTs), among others.
- Focus on strengthening fisherfolk and fish farmer organizations and how these could assist fishers and fish farmers with accessing inputs and markets.
- Communicate guidelines/outcomes of the questionnaires developed by FAO headquarters to sub-regional colleagues to share with national/ regional partners involved in fisheries management.
- The weakness in the data collection and monitoring systems at the national level means that our understanding of the national and regional is not strongly evidence-based. This is an area that requires attention.
- Address supply chain limitations and easily connecting consumers with local fishers, particularly small-scale fishers, who do not normally market their catch through supermarkets or retail chains. Many farmers were able to develop digital marketing arrangements and made direct deliveries to consumers but it was a minority.
- Propose to support village/ local centers to facilitate COVID 19 tests to reduce MCS costs.
- Formulate contingency response guidelines for both the industry and the small-scale fisheries (SSF). This is something producers are requesting: what to do in future pandemics?
- Provide assistance on rapid sectoral damage assessment, in order to focus attention and resources.
- Provide recommendations to governments regarding possible sectoral economic recovery programs (loans, markets innovations, etc).
- Help with other relevant organization to put in place effective protective measures against COVID-19.
- Support for improving value of catches of artisanal fishermen (processing, packaging for long-term conservation of fish products).

4 Conclusions

There were no statistically significant changes between April and November in any of the 23 quantitative responses. However, the qualitative written responses in the November assessment showed that adjustments were being made to the changing consequence of COVID-19.

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4.1 Main remarks

Fisheries management

In April 44 percent of RFMOs, and in November 50 percent of the RFMOs, expected that COVID would have negative consequences for the management of fish stocks. While most Organizations are adapting to online working and meetings, the key persistent negative consequences are: meeting disruptions, reduced agendas, difficulties in decision-making, and postponement of trainings and workshops. For those RFABs concerned with capture fisheries, 94 percent, which was not significantly different from the 91 percent in April, were experiencing, or expecting that, the impact of COVID-19 will have negative consequences on the management of fish stocks. The nature of the negative consequence for RFABs was similar to that identified by the RFMOs.

Monitoring, control and surveillance

For those RFMOs with an MCS role, the percentage that were experiencing or expecting negative consequences of COVID-19 on the MCS of fishing activities and the fight against IUU fishing was 87 percent in April and 65 percent in November. During the period between assessments, there was a decrease in demand for fish. The main negative impacts of COVID-19 were delayed decision-making affecting MCS, CMS, VMS and MCS related-tools, and vessel inspections. The only positive impact was the increase in electronic monitoring. The RFABs concerned with capture fisheries had also retained a similar opinion between April and November, when 94 percent and 89 percent respectively, reported they were experiencing, or expecting negative consequences of COVID-19 on the MCS of fishing activities, management of fish stocks, and the fight against IUU fishing. The reasons reported by the RFABs were similar to those reported by the RFMOs.

Research

For those RFMOs with a research function role, the percent that were experiencing, or expecting, that COVID-19 has negative consequences for the research on fish stocks increased from 79 percent in April to 90 percent in November. The percent of RFMOs reporting different durations of impacts were:

- Short-term impact increased from 44 percent in April to 60 percent in November.
- Medium-term decreased from 56 percent in April to 35 percent in November.
- Long-term impact increased from 0 percent in April to 5 percent in November.

Among the RFABs conducting research on capture fisheries, the percent that were experiencing, or expecting, that COVID-19 has negative consequences for different durations of impact were:

- Short-term impact was 60 percent in April compared to 47 percent in November.
- Medium-term impact was 30 percent in April and 38 percent in November.
- Long-term impact was 10 percent in April and 16 percent in November.

For those RFABs conducting research on aquaculture, the percent that were experiencing, or expecting, that COVID-19 has negative consequences for different durations of impacts were:

- Short-term impacts were 37.5 percent in April and 45.5 percent in November.
- Medium term impacts were 37.5 percent in April and 45.5 percent in November.
- Long-term impacts were 25 percent in April and 9 percent in November.

The negative consequences reported by all Organizations were the same in both assessments: primarily the restrictions in sample data-collection, limited possibilities to work in laboratories, postponed scientific meetings, reduced data exchange and scientific cooperation, and capacity building activities.

Employment

Regarding the levels and conditions of employment suffered, most RFMOs did not collect this information and therefore did not answer. However, in November, decreased employment was reported by RFMOs across all four sectors: capture fisheries, capture fisheries – post harvest, aquaculture, and aquaculture – post harvest.

The RFABs also reported, in both April and November, decreased employment across all four sectors. The percent of RFABs reporting decreased employment as a consequence of COVID-19 in April and November were 64 percent and 63 percent respectively for capture fisheries, 27 percent and 65 percent for capture fisheries – post harvest, 64 percent and 56 percent for aquaculture, and 64 percent and 73 percent for aquaculture – post harvest.

Other impacts

RFMOs reported

i. Negative impacts: difficulties for internships; trade declining; fewer recruitment applications; reduced fish demand; lower prices; increased costs, particularly of transport; risk of finance viability of the secretariat.
ii. Positive impacts: expenditure reduction due to lack of meeting expenses; development of video-conferencing; and increase in meeting participation.

RFABs reported

i. Negative impacts: recreational fishing has changed from an international to local dimension; absence of opportunity for networking in online meetings; the Southwest Indian Ocean region has suffered economic-social impacts with low COVID-19 mortality; in both aquaculture and processing plants, the pandemic caused over-inventories, increasing costs of production and transportation; limited marketing of captured aquaculture products; increased operating expenses and risks of loss of products (particularly in concentrated feed and frozen products); the demand for fresh products was contracted; the ancillary industry suffered

due to difficulties in supply and distribution of harvested fish and deficits in fish production; problems in market access; economic loss that rely on the sale of tuna fishing access to exclusive economic zones (EEZs) for significant government revenue in the coming years; and boat repair limitations.

ii. Positive impacts: Restrictions and limited access to market has reduced pressure on the capture fisheries resources.

Scale of impacts

In November, half of the RFMOs reported that the negative impacts of the pandemic had been as expected, 41 percent found that negative impacts were greater than expected, and 9 percent found that impacts were less than expected. In November, among the RFABs, 28 percent found that the negative impacts had been as expected, 61 percent found that negative impacts were greater than expected, and 11 percent found that impacts were less than expected.

Demand for fishery and aquaculture products

The RFABs reported on impacts of COVID-19 on demand in four markets: capture fisheries – domestic and export markets, and aquaculture domestic and export markets. For all four markets, the single biggest change was a decrease in demand, in both April and November. The percent of RFABs reporting a decrease in demand in April and November were: capture fisheries – domestic, 55 percent and 47 percent; capture fisheries – export, 82 percent and 53 percent; aquaculture – domestic, 36 percent and 40 percent; and aquaculture – export, 64 percent and 57 percent.

Price

The RFABs concerned with capture fisheries reported price changes during the pandemic in 2020: in April 27 percent reported price decreased, and 26 percent reported this in November, whereas in April 36 percent reported price increased, and 42 percent reported this in November. Similarly the

RFABs concerned with aquaculture reported price changes: in April 36 percent reported that price decreased, compared to 33 percent reporting this in November; in April 27 percent reported that price increased, compared to 20 percent reporting this in November.

Supply

The RFABs reported decreases in supply of fish to domestic markets from four different sources during 2020. For captive fisheries domestic supply, 78 percent of RFABs in April and 58 percent in November reported a decrease; for captive fisheries imports, the corresponding values were 82 percent and 50 percent. For aquaculture domestic supply, 55 percent in RFABs in April and 53 percent in November reported a decrease; for aquaculture imports, 73 percent of RFABs in April and 40 percent in November reported a decrease.

4.2 COVID-19 – strategies for mitigation

The RFMOs are currently undertaking, or planning to undertake, measures related to setting virtual meetings; establishing online decision-making process; following relevant health policies; facilitating teleworking, developing ad hoc boarding and inspection procedures; implementing management measures, operating protocols, and risk-mitigation protocols; introduction of enhanced electronic MCS measures, following relevant health policies; facilitating teleworking, developing ad hoc boarding and inspection procedures; implementing management measures, operating protocols, and risk-mitigation protocols; and introducing enhanced electronic MCS measures.

The RFABs are currently undertaking, or planning to undertake, general digitalization; measures related to video-communications; developing strategies for monitoring, enforcement, communication and risk management frameworks; combine international expert support with national consultant support; setting up virtual meetings with reduced work programmes; develop and enhance public relations initiatives; work for the recognition of fishers as essential workers; conduct studies to quantify the contributions (and losses) of fisheries to the economy; promote exchange of information among sectors; putting in place health protocols for the prevention of risks incurred by fishing operators at the national level; developing best practices and prevention trainings; promote transfer permits for fisherfolk and transporters; boost protection for vulnerable communities; support the transition from fresh fish to value-added processed seafood products; push for fishing season extension; undertake socio-economic (including reactivation and recovery) and environmental impact studies of COVID-19 on the maritime fishing sector; assist start-ups for on-line marketing of fish products; provide personal protective equipment to MCS departments; formation of a COVID-19 food security taskforce for the region; creation of a trade platform which identifies commodities of economic and nutritional importance to Member States which can be produced and harvested in the short term (four – six months); engagement in the determination of infrastructure and production capacities (present and possible) and identifying

the supply excesses across the Region with the aim of promoting greater intra-regional trade and commerce; support small-scale fishing organizations, particularly those distributing fresh fish; encourage governments to introduce biosecurity measures on board fishing vessels and processing plans, as well as establishing tax reduction and credits relief plans, in addition to Institutional purchases of fisheries and aquaculture products.

The RFBs made the following recommendations for actions that FAO and other relevant institutions and organizations could consider to address COVID-19-related issues:

Meetings

- A centrally compiled calendar of fisheries related workshops/meetings
- RSN could assist in coordinating scheduling of virtual meetings

New technologies

- FAO could contribute to maximize the use of electronic telecommunications tools
- FAO can encourage e-commerce to facilitate supply chain recovery and support SMEs
- Promote actions to strengthen partnerships between RFMOs and RFABs, and support transitions to new technologies to overcome COVID-19 hurdles and to facilitate:
  - **i.** fisheries and aquaculture value chains and marketing methods
  - **ii.** remote MCS
  - **iii.** innovative data collection methods

Training

- Training and mentoring programmes, and teams, to work in pre-identified priority areas to promote timely recovery

Inter-organizational communications

- FAO, together with the UNESCO/IOC, should coordinate the RFBs' activities in a framework of the UN Decade of the Ocean Science, including involvement in inter-organizational large-scale projects
- FAO could strengthen partnerships and build networks of institutions that are in the field

Support

- Support fisher folk and fish farmer organizations
- Improve access to social protection programmes for fishers and aquaculture farmers
- FAO could develop strategies to empower citizens especially women and youths working in fish post-harvest processing to ensure the flow of their products to consumers
- Strengthen local structures, such as small-scale fishing cooperatives, and engage stakeholders in management decisions to facilitate decision-making and improve adaptability in the face of future shocks; chain recovery and support SMEs
- Strengthen aquaculture for sustainable development and future food security

Movement restrictions

- Encourage and assist, with other relevant organizations, COVID testing at national borders to facilitate easy moving across the region

Other actions

- Facilitate sharing of good practice
- Bring emergency issues to FAO Regional Conferences
- FAO could to play a role in port State control matters
- Conduct a study for better understanding the effects of COVID on international fish trade
- Support fisheries authorities to gradually restart and advocate for the importance of keeping the IUU-related commitments as part of the core activities within the post-COVID-19 recovery

4.3 Concluding remarks and next steps

The purpose of this November 2020 study was to track the evolving effects of the COVID-19 pandemic on the fisheries and aquaculture sector by providing a follow-up to the initial study undertaken by FAO in April 2020, with focus on multilateral governance of fisheries and regional cooperation promoted by RFBs globally. The study shows that the expectations reported by RFBs in April concerning the impacts of COVID-19, were confirmed in November, and that there are many examples of adjustments and adaptions to the changing circumstances brought about by the pandemic.

This paper shows the capacity of the RFBs to analyze, predict and react to the wide range of disruptions and impacts that the sector has faced. This achievement illustrates the crucial role that these regional organizations can play in building back better post-pandemic, to ensure a resilient fisheries and aquaculture sector, safeguarding fishers and fish farmers' livelihoods, as well as food security and nutrition for populations that rely heavily on fishery resources for animal protein.

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Food and Agriculture Organization of the United Nations

Rome, Italy

ISBN 978-92-5-134600-6

9 789251 346006

CB5269EN/1/06.21