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## GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN

Report of the webinar on

### THE EXPERIENCE OF THE AQUACULTURE SECTOR THROUGH BEST PRACTICES AND MITIGATION MEASURES FACING THE COVID-19 CRISIS

1 July 2020



General Fisheries Commission  
for the Mediterranean  
Commission générale des pêches  
pour la Méditerranée





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## **PREPARATION OF THIS DOCUMENT**

This report contains the proceedings of the webinar entitled “The experience of the aquaculture sector through best practices and mitigation measures facing the COVID-19 crisis”. The webinar was held online on 1 July 2020 and it was organized by the General Fisheries Commission for the Mediterranean (GFCM) of the Food and Agriculture Organization of the United Nations (FAO) in cooperation with the Regional Commission for Fisheries (RECOFI). These proceedings accurately reflect the statements and interventions made by participants during all the sessions and the conclusions were agreed between all participants.

**ABSTRACT**

The webinar on “the experience of the aquaculture sector through best practices and mitigation measures facing the COVID-19 crisis” took place on July 1 2020 and was conducted over the internet and hosted on the Zoom platform. It was organized by the General Fisheries Commission for the Mediterranean (GFCM) of the Food and Agriculture Organization of the United Nations (FAO) in cooperation with the Regional Commission for Fisheries (RECOFI). The webinar aimed to address the pandemic’s effects on aquaculture production as well as on supply chains, demand, local markets and trade, and to identify best practices and mitigation measures adopted by aquaculture farmers and countries. During the first thematic session, the experts highlighted the difficulties faced by the aquaculture sector due to the effects of the COVID-19 pandemic. Furthermore, several mitigation approaches were pointed out: i) specific financial support programmes designed through the European Maritime and Fisheries Fund (EMFF); ii) a strong national aquaculture strategy guaranteeing self-sufficiency along the entire supply chain of shrimp farming in Saudi Arabia; iii) the timely provision of subsidies and credit loans to help producers in Turkey; iv) the development of an online platform for fish auctioning to boost fisheries supply chain in Oman; v) the opening of direct communication channels between the government and the farms in the United Arab Emirates; and vi) solidarity between the sector and the consumers, which allowed for the achievement of 50 percent of trade and marketing goals for the fish feed and larvae industry in Tunisia. Other topics addressed during the second thematic session included specific measures, such as the focus on different aquaculture final products (e.g. frozen fish) and the establishment of local hatcheries and fish feed factories. The question and answer session that followed concluded the webinar.

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**ABBREVIATIONS AND ACRONYMS**

ADC	aquaculture demonstrative center
AFO	aquaculture farmers organization
ANDA	National Agency for the Development of Aquaculture, Morocco
B2B	business to business
CFIA	Canadian Food Inspection Agency
COVID-19	Coronavirus disease 2019
EMFF	European Maritime and Fisheries Fund
FAO	Food and Agriculture Organization of the United Nations
FDA	Food and Drug Administration, United States of America
FEAP	Federation of European Aquaculture Producers
GAA/BAP	Global Aquaculture Alliance, Best Aquaculture Practices
GDP	gross domestic product
GFCM	General Fisheries Commission for the Mediterranean
HORECA	Hotel, restaurant and catering
OTF	Oman Technology Fund
PL	post larvae
RECOFI	Regional Commission for Fisheries
SAMAQ	Saudi Mark of Aquaculture Quality
SME	small and medium sized enterprise



## **BACKGROUND**

1. Throughout the world, the aquaculture sector is facing the consequences of the Coronavirus disease 2019 (COVID-19) pandemic. In an effort to share information among its member countries and to facilitate discussion of future responses, the General Fisheries Commission for the Mediterranean (GFCM) of the Food and Agriculture Organization of the United Nations (FAO), in cooperation with the Regional Commission for Fisheries (RECOFI), organized a webinar on the experience of the aquaculture sector through best practices and mitigation measures facing the COVID-19 crisis. Its objectives were to address the pandemic's effects on aquaculture production as well as on supply chains, demand, local markets and trade, and to identify best practices and mitigation measures adopted by aquaculture farmers and countries.

2. The webinar took place on July 1 2020 and was conducted over the internet and hosted on the Zoom platform for webinars. More than 240 participants from 41 countries attended the event. The agenda, list of participants and profiles of panellist and keynote speakers are provided in Appendix 1, Appendix 2 and Appendix 3, respectively.

3. The webinar was structured around two thematic sessions. The first session highlighted the different impacts of COVID-19 on aquaculture production, market and supply chain, as well as the best practices adopted by the producers. The second session addressed the measures supporting the aquaculture sector and the national strategies regarding the resilience of the sector. The two thematic sessions were followed by a Question & Answer session with the audience and the panellists about the topics stemming from both thematic discussions.

## **OPENING OF THE WEBINAR**

4. The webinar was opened and moderated by Mr Houssam Hamza, Aquaculture Officer, GFCM, and by Mr Philippos Papageorgiou, Director of Aquaculture National Fisheries Development Programme, Saudi Arabia. The moderators presented the objectives of the webinar and stressed the importance of coordination in initiating a process of dialogue and cooperation that will reinforce the aquaculture sector's resilience to similar crises, maintain its competitiveness, sustain livelihoods and ensure prompt and adequate market supply in support of food security.

5. Mr Philippos Papageorgiou also set the stage with a short presentation summarising the main impacts of COVID-19 on aquaculture, citing various reviews on the subject, including those produced by the GFCM. In addition, a short video was presented, summarising the efforts of the GFCM toward sustainable aquaculture, with a focus on the aquaculture demonstrative centre (ADC) capacity-building programme conducted during the COVID-19 period.

6. Mr Abdellah Srour, GFCM Executive Secretary recalled that the COVID-19 crisis demands a re-evaluation of a number of developmental approaches and a re-prioritisation of food security, the mandate of FAO. With an increase in demand for fish products, aquaculture must play an active role in contributing to food security, especially in the Mediterranean region, which is marked by significant disparities between countries, both in production and per capita consumption.

7. Mr Ahmed Al Mazroui, Secretary of the Regional Commission for Fisheries (RECOFI), stressed that the webinar provides a good indication of the importance of cooperation and exchange of experiences in successfully rising to the challenges, of which all stakeholders collectively share the burden. Though the sector was negatively affected at first, the crisis has made clear the importance of coordination and adapting to changes in order to build a more reliable and sustainable sector based on responsible investment.

## **THEMATIC DISCUSSION 1: IMPACTS OF COVID-19 ON THE AQUACULTURE SECTOR AND SHARING BEST PRACTICES BY PRODUCERS (PRODUCTION AND MARKET)**

8. During this first thematic discussion, the panellists answered the questions related to the impacts of the COVID-19 pandemic on the aquaculture sector. The interventions are hereunder summarised.

**With widespread lockdowns, transport bans and the measures that were taken to reduce the spread of COVID-19, can you briefly describe how the sector has been affected and what has been the initial response by the Federation of European Aquaculture Producers (FEAP)?**

9. Mr Javier Ojeda, General Secretary of FEAP, recalled that food-producing sectors, such as aquaculture, were deemed essential and have therefore been allowed to continue operations throughout the crisis. However, complications stemming from the preventative measures in effect on the general population, as well as from decreased financial liquidity and increases in live biomass beyond planned amounts, made business decisions difficult. Fresh fish sales in Spain, Italy and France have fallen on average by 30 percent, mainly due to the total closure of the tourism and food service sectors, including hotels, restaurants and catering (HORECA). However, sales of frozen and canned fish have increased, indicating that people's appetite for highly nutritious food remains strong, though they may dedicate less time to the purchasing act.

10. Reductions in revenue have followed from diminished sales, while restrictions in working conditions due to compulsory distancing between workers and other safety measures have resulted in higher operational costs, and larger biomass in farming has led to higher feed consumption. In addition, maximum feeding rates have been reduced in an effort to limit the damage in case the crisis lasts long into the future. Lastly, hatcheries have greatly reduced their activity due to the minimal rotation of fish at the on-growing farms.

11. In the European Union, specific financial support programmes have been designed through the European Maritime and Fisheries Fund (EMFF) to compensate for the above-mentioned effects of the crisis. However, these compensation measures have not yet reached farmers. A further risk awaits aquaculture in the aftermath of the crisis: as soon as the markets open completely, a tsunami of fish overstock will be harvested and moved into the markets, driven by companies in need of cash. This shift will cause a strong drop in prices, which will take many months to rebound. Ways to prevent this crash need to be found at the Mediterranean level. Overall, aquaculture is not the sector hit worst by this crisis (compare to tourism, for example), but countries should start to value more the role of primary producers in supplying food to markets.

**How has the shrimp farming sector been affected in terms of production and market supply in Saudi Arabia?**

12. Mr Ali Alshaikhi, Chief Executive Officer (CEO), National Fisheries Development Programme, and Director General for Fisheries, Ministry of Environment, Water and Agriculture, Saudi Arabia, reported that aquaculture, a rapidly emerging sector in Saudi Arabia, represents a pillar of the Vision 2030, the national plan to reach sustainability objectives that is transforming Saudi Arabia. Production from domestic aquaculture farms has been increasing, and the national output reaches around 80 000 tonnes of shrimp, marine and freshwater fish.

13. Saudi Arabia boasts one of the biggest shrimp-producing companies in the world. This company did not face serious problems in terms of production as it is fully vertically integrated with a good inventory of raw materials for feed. The main challenge lay in market supply, especially since China is its biggest client. The drop in demand from China forced the company to explore the potential of other export markets, and now it has diversified its international clientele. It also became clear that the local market had not been fully capitalized upon, and that the domestic seafood market is worth exploring.

14. Within the domestic seafood market, the consumption of local aquaculture products increased, especially after initial logistical problems between different regions were resolved. Seafood consumption per capita is below the global average, but the seafood market is growing at a high rate, as the lifestyle of the population trends towards healthy eating. Reduced imports due to international transport restrictions meant that more could be offered to the domestic market. Prices of local aquaculture products increased slightly, without any effect on demand.

15. The national strategy to support the industry along the entire supply chain had a positive impact during the crisis, guaranteeing self-sufficiency in terms of both post-larvae shrimp and juvenile shrimp. Local hatcheries produce high-quality post-larvae and juvenile shrimp following strict biosecurity controls and standards. Production planning was not disrupted by the crisis.

16. However, if the restrictions on international transport continue, problems will arise, mainly connected to the supply of raw materials for feed. Though this threat is minimised by the gradual return to normal operations at the moment, it has prompted the decision to move towards more local development and production of sustainable feed ingredients, such as insect-based feeds, algae-based oils and proteins, and bacteria-based proteins. The crisis reinforces this shift as a priority, as well as moving raw material supplies closer to feed mill facilities and reducing dependence on imports.

**How is the COVID-19 situation affecting the Turkish strategy on aquaculture? Have there been any successful initial reactions by companies to at least mitigate the short term impacts?**

17. Ms Buket Yazicioglu Altintas, General Secretary, Central Union of Turkish Aquaculture Producers, Turkey, reported that the aquaculture sector in Turkey has been growing, especially over the last 15 years. For example, in 2019 the fisheries and aquaculture sector increased by 33 percent (production in 2017 reached 276 502 tonnes). Aquaculture production itself grew by 19 percent. Production in Turkey is export-oriented, with almost 60 percent of production exported. While Turkey's main market remains Europe, both Russia and Japan have become increasingly relevant in recent years.

18. The production strategy is based on continuous production, with controlled growth and production of high-quality, healthy and environmentally friendly products. Production has not stopped during the pandemic. As the sector deals with live creatures, the growth, maintenance and harvesting of fish has continued. In Turkey, the only sector that has continued to produce steadily has been agriculture, as food is an essential need.

19. The Ministry of Agriculture and Forestry took the necessary precautions and informed the sector about how to ensure safe production and delivery to the consumers without any drawbacks due to the virus. Circulars that allowed producers and farmers to continue their operations during the national lockdown have also helped to maintain continuous production. Subsidies and credit loans were issued in a timely manner to help producers survive the period with minimal damage. An example of this kind of assistance is a support package that was prepared and offered for the packaging, processing and marketing of fresh products to the domestic market.

**Ministry of Agriculture and Fisheries in Oman launched an online platform for fish auctioning as an effective response to the COVID-19 situation. Could you please describe how this platform helped the local aquaculture industry and the domestic seafood market supply?**

20. Mr Abdulaziz Al-Marzouqi, Director General, Fisheries Resources Development, Ministry of Agriculture and Fisheries, Oman, explained that with coastlines spanning 3 165 km along the Gulf, the Sea of Oman and the Arabian Sea, fisheries are considered one of the major economic non-oil sectors in the Sultanate of Oman. The country's total fish production increased by 24 percent in the first quarter of this year compared to the first quarter of 2019. As were all sectors, fisheries – including aquaculture – was affected by the pandemic. The effects include, but are not limited to, the closure of all fish markets

and fish ports, no exports due to closed borders, the impacts of quarantine on the marketing of fish, no imports of feed, juveniles or equipment, no hiring of experts and foreign technicians, disruptions in the construction of aquaculture projects and the closure of shops selling fishing equipment.

21. Despite these setbacks, the Ministry of Agriculture and Fisheries was able to maintain the fish marketing system and ensure that all stakeholders were minimally affected. This mitigation was achieved through the following measures: (i) an online platform (named “Behar”) for the marketing of fish and a digital directory of all fish processing companies and fish outlets were launched; (ii) fish processing companies were encouraged to buy fish from fishers; (iii) companies were informed about how to take advantage of the opportunity of exporting via sea transport; (iv) all services for fishers and fish companies provided by the Ministry were digitalized; and (v) the movement of fish transport trucks through the regions of Oman was facilitated by coordination with competent authorities.

22. Behar, the integrated online platform for fish auctioning, was launched by the Oman Technology Fund (OTF), in coordination with the Ministry of Agriculture and Fisheries, to convert the usual fish auctions to remote online auctions, in order to reduce the risks of transmission and contact, and to deal with the closures of the fish markets. OTF launched an investment opportunity in March 2020 to financially support electronic initiatives from young Omanis to deal with the effects of COVID-19 on different sectors. Many proposals were received, among which the online platform for the fisheries sector stood out. The initiative was extremely helpful and opened the door for fishers, companies, fish transporters and consumers to buy and sell fish remotely.

**COVID-19 pandemic is expected to affect supply chains. Has this disruption of supply chain been capitalised by the local aquaculture companies in the United Arab Emirates? Are the impacts different for companies using modern RAS technology compared to companies using cage culture technology?**

23. Ms Rumaitha Abdulaziz Alshehhi, Aquaculture research assistant, Ministry of Climate Change and Environment, United Arab Emirates, stressed that the COVID-19 pandemic has affected supply chains globally and that, when discussing supply chains, both sides have to be taken into account: exports and imports. In terms of exports, the pandemic had no impact on aquaculture farms in the United Arab Emirates, since most of them depend on the local market to sell their products. In terms of imports, however, the crisis had an impact on some aquaculture farms, delaying materials or components and pieces of equipment that are not produced or manufactured locally. On the other hand, the impact of the pandemic in this regard was mitigated by proper planning by companies, in addition to continued open direct communication channels between the government and the farms, as well as by the flexibility of customer service teams in responding and finding solutions to the challenges facing the farms.

24. She explained that aquaculture farms in the United Arab Emirates target the local market. This dynamic may lead one to assume that farmers would benefit from the restrictions and delays on the competing imported products. But on the ground, the results of the restricted imports are not so straightforward. Some farms have benefited from the reduced competition, because there the imported alternative was only available in reduced quantities. One of the farms, for example, sold all their fish reaching marketable size or weight in record time. On the other hand, some farms, while witnessing an initial increase in sales with the introduction of precautionary measures in March, then faced a decline again during the month of Ramadan (23 April to 23 of May) 2020. This follows the expected pattern of consumption in the United Arab Emirates, as food habits change and consumption of marine products decreases with Ramadan every year.

25. Another example comes from a farm whose product satisfy the particular tastes of a niche market. The leading market site for the product were hotels and restaurants, rather than fish markets or stores. As expected, the percentage of sales from this farm decreased as a result of the precautionary measures affecting the restaurant and hotel sector. However, the farm owner responded to the challenge by diversifying the marketing channels of his product and started targeting different marketing sites. Currently, the Ministry of Climate Change and Environment is working with the farmer and with the

concerned authorities to facilitate the export of his products, offering them greater opportunities for future growth.

26. In summary, a decrease in imports does not automatically lead to an increase in sales or an increase in the local farms' market share. Many factors interact with each other and produce different results. If the product belongs to the luxury sector or is sold at a high price, it is natural that its sales will decrease under current conditions, even without any competition. Many factors must be taken into account, such as the type of product being cultivated or produced, marketing channels and their locations, product price, consumption patterns and food habits, among others.

**Which were the main challenges faced by fish feed producers and suppliers of eggs and fingerlings during the COVID-19 pandemic? What were the initial responses to the situation to mitigate the impact at this level of the supply chain?**

27. Mr Mustapha Bendag, Aquaculture Expert (supply chain for feed and fingerlings), Tunisia, explained that in North Africa and especially in Tunisia, the pandemic posed a major challenge to activities by inhibiting the normal functions of providing customers (fish farmers) with the necessary products.

28. At the feed level, the slowdown of banks and financial institutions in approving lines of credit, due to the lack of preparedness for remote work and subsequent difficulties in adapting to the situation, resulted in a stagnation of orders coming in. Feed consumption declined as result of the difficult financial situation most of the productive units faced: reduced liquidity, a decrease in fish prices, a decrease in demand within the domestic market due to the lower purchasing power of citizens and the closure of hotels and restaurants, and the lack of exports following border closures. The logistical system for delivering feed to consumers was disrupted; transportation presented a particularly big challenge due to a lack of containers and of available drivers, difficulties in assigning transportation licences and so on. Port procedures took a long time to complete due to an unpreparedness for remote work and difficulties in switching from written to electronic documents. These obstacles presented major concerns to the fish farmers, who faced difficulties in managing live stocks with no clear vision of how the situation would evolve.

29. With regards to fingerlings, there were difficulties in obtaining supply licenses and office concessions from regional administrators. The slow-down of consumer orders and difficulties in completing port procedures also affected the fingerling supply level. The supply of fry was reduced due to a lack of empty cages ready to host new fingerlings. This issue was mainly the result of the inability to sell large fish of marketable size, due to low prices and weak demand. Veterinary and animal health monitoring on board the larvae vessels was also disrupted. Solidarity within the industry and consumer understanding of the special circumstances allowed for approximately 50 percent of the programmed goals to be achieved in the fields of fodder sales and larvae marketing.

**THEMATIC DISCUSSION 2: BUILDING RESILIENCE THROUGH MITIGATION MEASURES**

30. During this second thematic discussion, the panellists answered the questions related to the specific measures taken in order to mitigate the COVID-19 impacts on the sector. The interventions are hereunder summarised.

**What are the main lessons learned from the producer point of view –or their regional or national associations and organisations? How can the resilience of the sector in light of this pandemic and such future threats in the future be improved?**

31. Mr Javier Ojeda presented the main lessons learned from the crisis. Firstly, he pointed out the reputation of primary producers in Europe has certainly improved. The perception that farming is “the art of losing money while working 16-hour days to feed people who think you are trying to poison them while destroying the environment” is not as strong anymore. Secondly, weaknesses in the value chain

were exposed. In European supermarkets, shelves were emptied, a highly unusual situation, and an indication of the difficulties markets and supply chains went through. Value chains need to become more resilient as a whole and rely more on locally produced food. Food security has acquired a new perspective. Thirdly, the value of sound customer information sources has increased. Misinformation on a broad range of issues, including food safety and health, have paused for the moment, as people are concerned about this topic.`

32. Lastly, an important lesson learned lies in the crucial role that aquaculture farmer organizations (AFOs) can play. For fish farmers, isolated in remote places and severely overwhelmed by the circumstances of COVID-19, these associations have been their umbilical cord and direct source of reliable information on the situation in these times of turmoil characterised by a constantly changing legal framework. Governments have been producing a daily flow of new legal regulations and their updates, ranging from covering the risks of transmission of COVID-19 through food, to transportation rules, working conditions, requirements of Individual Protection Equipment and where to purchase it, etc. The AFOs have played the role of keeping farmers well informed on all these changes. At the same time, these associations have been collecting information from their members on their situation and needs and sending it to their governments in an effort to better tune the new legal framework. Continued reinforcements of the associations must be a priority.

**In terms of food security as well the ambitious plan of VISION 2030 in Saudi Arabia, can the COVID-19 pandemic be used as an opportunity for the realisation of the country's objectives or will it delay plans?**

33. Mr Ali Alshaikhi, explained that Saudi Arabia is focusing on the positives that can be drawn from this situation. The shift in focus to the domestic market is of paramount importance, as the domestic market has great potential for growth, providing big opportunities for new and existing local producers.

34. The Red Sea provides an ideal environment for future aquaculture development due to the quality of its waters and the availability of many areas protected from strong waves and currents. The national plan is to ultimately produce 500 000 tonnes of seafood from aquaculture, to contribute to the country's food security strategy as well as to the initiative for more healthy eating, to reduce the imports of seafood and to create a globally competitive aquaculture sector.

35. To achieve these goals, extensive foundational work has been done over the past few years. This work includes a very tight national biosecurity surveillance programme and an emphasis on sustainable practices based on global standards. All aquaculture facilities are required to be certified by the Global Aquaculture Alliance/Best Aquaculture Practices (GAA/BAP) scheme. Currently, 95 percent of the national output is BAP certified. The aim is to achieve 100 percent BAP certification compliance by the end of 2020 and thus become the first country in the world with national level GAA/BAP certification for its products.

36. A Saudi national aquaculture product certification and labelling scheme has been developed under the acronym "SAMAQ" (Saudi Mark of Aquaculture Quality). SAMAQ is based on international guidelines and responsible aquaculture practice requirements. The aim is for all Saudi Arabia aquaculture products to be certified and marketed with the SAMAQ label, indicating their local origin and assuring their quality. A generic national marketing campaign will be executed to increase public awareness of the health benefits of increased seafood consumption and to communicate the advantages of national aquaculture products: locality, freshness, safety, nutritional value. Supported by the initiative of the Ministry and collaboration from other relevant authorities, the implementation of a transparent and clear labelling programme for all seafood traded within the country is being promoted. Customers should feel assured of the products they buy, in terms of proper naming of the species, country of origin and type of production, among others.

37. Lastly, the aim is to ensure product quality along the entire supply chain. For this reason, in the same way SAMAQ was created, a relevant certification and labelling scheme for the products of the

capture fisheries sector, and a business to business (B2B) quality certification scheme for all players along the seafood distribution and retail chain is being launched.

38. The aim is to increase transparency in the market and to improve traceability and quality assurances for the products traded. Producers and their products should compete at a level playing field. The COVID-19 crisis further justifies the above-mentioned actions, as consumers do prefer local products, and their uninterrupted supply in the domestic market can be guaranteed under such conditions.

39. In conclusion, the pandemic did not delay the implementation of the strategy. Instead, it offers an opportunity to garner further government support for the strategy.

**This pandemic and the measures taken so far show us that aquaculture companies need to rethink their business approach; in terms of markets targeted and/or the actual product offering (from ice chilled whole fish to more convenient and longer lasting forms). Do you see any such opportunities, being part of the mitigation -or rather- adaptation measures in the long term?**

40. Ms Buket Yazicioglu Altintas explained how the difficult situation revealed the limitations of Turkey's production range and shone light on its deficiencies in processing. Over the first three months of the pandemic, the shutdown of restaurants and halts on passenger transportation caused a 40 percent decrease in aquaculture exports. Sales of fresh fish were also limited over that period. Companies began giving increased attention to the sale of shock-frozen fresh fish, which was not an area of focus before.

41. Turkey's consumption of fish and seafood lies significantly below the worldwide average and consists mainly of fresh fish. The pandemic revealed that the domestic market should become an object of greater focus. Campaigns to promote seabream, seabass, trout, and trout salmon were carried out in this regard. The Ministry has supported these efforts. The campaign yielded positive results, and producers are in the process of also providing frozen fish to chain supermarkets domestically.

**Apart from establishing and operating the Behar platform, the online fish auction platform, what other measures do you think would help the local aquaculture sector to increase its production and overcome this crisis, and any other future crisis?**

42. Mr Abdulaziz Al-Marzouqi suggested some measures for the future to maintain aquaculture production and to minimize the effects of the crisis on aquaculture projects. Financial incentives and soft loans need to be provided for fish farmers and companies to implement mitigation measures and to overcome the consequences of the crisis. Companies need to be encouraged to establish local hatcheries. The private sector needs to be encouraged to establish fish feed factories.

**Responsible investment is a concept that goes beyond sustainable technical practices, as it establishes the future role of the sector not only as a contributor to food security, but also as a driver of positive societal growth. Do you think that responsible investment can help build resilience of the sector to face crises like the current COVID-19 pandemic?**

43. Ms Majida Marouf, Director General, National Agency for the Development of Aquaculture (ANDA), Morocco, pointed out that the crisis revealed how important aquaculture is. Deficiencies in value chains, production and marketing techniques have been identified, as well as ideas of how to develop them in forthcoming years.

44. Contrary to expectations, the aquaculture sector did not take advantage of the situation by stepping up to supply local markets. In the shellfish sector, producers were unable to market products of commercial size, even as experts stressed the importance of shellfish consumption during the pandemic, promoting shellfish as a source of vitamin D, zinc, and iodine, which can help the body to respond to the virus's symptoms. The post-COVID-19 phase presents the opportunity to better develop aquaculture,

to diversify production and to enhance the supply, in order to increase the consumption of aquaculture products.

45. New investments in marine livestock supplies are needed to maintain the various value chains, secure existing jobs, and create new opportunities for young people. An investment strategy must be developed that should not be confined to merely achieving food security, but should also target environmental performance, bioremediation and fish storage, as well as enhancing the productive fabric of industrial units by incorporating breeding products in several value chains.

46. Most of the current marine livestock production is directed toward food sectors that are subject to globalization and intense competition, resulting in total or partial disruption of the value chains in the event of slow demand and consumption. Thus, it has become necessary to diversify the uses and markets of aquaculture products to achieve sufficient balance for the sector and to enhance its flexibility in addressing this type of crisis in coming years.

47. Current value chains also provide many opportunities for the integration of the marine livestock sector and other industries within the framework of a technology-based approach, with high added value and effective returns. This transition can provide significant opportunities for investment and enhance the flexibility of the sector.

48. Morocco has become a frontrunner in these regards by incorporating seafarers' cooperatives for traditional fishing into mariculture activities with short production cycles and low investment costs. This system provides an alternative to the continued overexploitation of declining fish stocks and improves the material income of this vulnerable group.

49. During the pandemic, indicators have shown the strength and resilience of this model, which continued to supply the local market with marine livestock products. An example comes from the cooperative "Marchika," located on Lake Marchica on Morocco's Mediterranean coast and producing red algae (*Gracilaria* spp.), which is directed to the manufacturing industry to produce agar-agar. The cooperative continued to produce marine algae despite the health restrictions imposed by the pandemic and, with concerted efforts, managed to market most of its products. This activity played a large role in providing synthetic fabric, from inputs that rely less on natural resources or imports from abroad.

50. Compared to other sectors that will see a decrease in production, the seaweed sector is in fact expected to experience an increase in production this year, as well as an increase in sales compared to last year.

### **How can scientific research improve the competitiveness of the national aquaculture sector and improve its ability to overcome crises like COVID-19? "**

51. Ms Rumaitha Abdulaziz Alshehhi explained that research represents one of the main pillars of the farming sector in the United Arab Emirates. The establishment of the Marine Environmental Research Center in 1984 marked the beginning of this trend. One of the most significant achievements and services of the centre has been its success in cultivating several economically prominent local species such as grouper and in restocking fingerlings for local species. The restocking activities aim to support recreational fishing and small-scale fishers. A partnership initiative also exists with the private sector in an effort to develop the first commercial hatchery. The centre plans to study the potential of producing other local species in the United Arab Emirates. In addition to the research centre, there are several other aquaculture facilities in the country, which serve to improve the productivity and quality of fingerlings. These include hatcheries of the Sheikh Khalifa Center for Marine Environment Research, the Aquaculture and Marine Studies Center at Abu Al Abyad Island, and facilities for the private sector.

52. All these efforts are aimed at supporting and facilitating investment in aquaculture. Laying the foundations for investment in turn promotes diversity and food security, which has become an undeniable necessity in light of the COVID-19 pandemic.



## QUESTION AND ANSWER SESSION

53. The points raised during the question and answer session are hereunder summarized.

**How has the COVID-19 crisis affected the aquaculture sector in Italy and what measure are planned to build resilience to such situations in the future?**

**Ms Ilaria Ferraro, Expert, Directorate General for Maritime Fisheries and Aquaculture, Ministry of Agricultural, Food and Forestry Policies, Italy**

54. The impacts of the pandemic on Italian aquaculture have been as diverse as the sector is itself, in terms of both production and geography. All aspects of the value chain, as well as the cost of production, were impacted. Mediterranean aquaculture as a whole has been strongly affected at various levels, supply chains were disrupted, and consumer movement was restricted. Fish farms generally continued their daily operations.

55. Large fish markets recorded drops in sales of 20 to 25 percent compared to the previous year. This drop was primarily due to the suspension of the HORECA sector, which offers an important sales channel for fish products. Measures taken at the national level to contain the spread of the epidemic included the closure of these activities, with a very strong impact on the sector.

56. Italy produces freshwater fish – mainly trout, but also eels and sturgeons. In the case of trout, the fact that the majority of trout fish farms are family-owned must be considered, meaning that the impacts of the pandemic need to be evaluated along the value chain as a whole, not only at the level of market consumption. It is important to have a detailed understanding of how the market will respond within each segment once COVID-19 has passed and not to generalize. The trout market has slowed down sharply, especially so for companies supplying the HORECA sector.

57. In terms of marine fish, seabass and seabream are farmed, as well as some species of bivalve molluscs, such as mussels, clams and oysters. Italy also leads all European countries in the production of caviar, and boasts a number of marine hatcheries selling juvenile seabass and seabream to domestic and foreign breeders.

58. Between freshwater and marine farmed fishes, differences in the pandemic's impacts on sales were noted. National seabass and seabream breeders have recorded strong resilience of sales, supported, in particular, by channels of large-scale distribution, which have kept market shares more or less unchanged.

59. Shellfish experienced commercial losses averaging around 70 percent. Domestic consumption has also decreased; this shift can be attributed to a large portion of products being sold fresh, which in turn discourages consumers who wish to shop less frequently from purchasing the goods.

60. Frozen product sales peaked in April, probably due to their high potential for long-term storage. Many aquaculture companies have been faced with a decrease in market outlets, resulting in significantly reduced liquidity of Italian fish farms. One of the main problems involves the management of stocks and the growing volume of live biomass, which can cause many issues in terms of risk and cost management.

61. It is not yet possible to evaluate how the market is recovering, as the reopening of activities only began in early June. Even upon total recovery from the immediate effects of the pandemic, radical changes to the market will remain. As far as consumer preferences go, there may be a shift towards frozen products, which showed a significant increase in sales during the lockdown due to their storage capabilities.

62. In order to address all these issues, the Italian government released decree-law No 18 "CuraItalia" on 17 March 2020, which provides an allocation of EUR 100 million in a fund designated

for the agriculture and fisheries sector. Circular No 6485 of 27 March 2020 established the procedure for implementing a temporary closure of fishing activities due to the force majeure resulting from the public health emergency. The Decree also provides support for workers and companies, such as the possibility to increase the percentage of advances due to companies with the right to access contributions from 50 percent to 70 percent.

63. Thus, the fund at the Ministry of Agricultural, Food and Forestry Policies was established, useful for ensuring business continuity of agricultural, fisheries and aquaculture companies. It covers interest expenses on bank loans and costs incurred for interest on mortgages, as well as for the temporary halt on fishing. Cooperation in the Mediterranean can play an important role during this time, and the exchange of information is extremely important, not only for the current moment, but also for the post-COVID-19 period.

**In view of possible emergence of new trends in the market for more convenient product forms, what can be the response of the research community?**

**Mr Ilhan Aydin, Deputy Director General, General Directorate for Agricultural Research and Policies, Ministry of Agriculture and Forestry, Turkey**

64. The culture of larger-sized fish has recently increased in popularity in Turkey. Fast growing times and efficiency are the most important advantages that come with the greater size. The reddish colour of trout offers another advantage, as it meets the consumer demand for exports. The larger-sized fish are consumed in many different forms on the market (e.g. cleaned, head on gutted, filleted or sliced).

65. In order to meet these different types of consumer trends in raw fish, research in areas such as high efficiency and meat quality, late maturity, disease-resistant fish, fish tolerant to different environmental conditions, feed improvement studies and sustainable production should be a priority. Research in all these areas will be helpful in achieving better and more eco-friendly production. It is also useful to encourage smart food packaging, which could report spoilage or increase the shelf life of processed seafood products.

66. The importance of the ADCs should also be underlined. Two ADCs have been established in the Black Sea and are providing tailored service on how to develop sustainable aquaculture to the Black Sea coastal countries. This powerful tool improves the resilience of the sector by encouraging new aquaculture systems like recirculating aquaculture systems (RAS) or shellfish culture.

67. Turkey is working on a proposal for a research programme on turbot restocking, as restoration practices with the capacity to expand stocks naturally have been voided due to the degradation of some spawning grounds and losses of ecosystem connectivity.

**How has the COVID-19 pandemic negatively impacted the aquaculture sector in Lebanon?**

**Mr Ibrahim Haoui, Advisor to the Minister of Agriculture in charge of Fisheries and Aquaculture, Lebanon.**

68. The depth of the financial and economic crisis was already becoming obvious in the quality of life of the Lebanese people before the situation was further exacerbated by the COVID-19 pandemic and the resulting disruption. The Ministry of Finance estimates a 12 percent contraction of GDP, which is expected to continue to contract over the next three years, reaching a cumulative percentage that may exceed 30 percent. Rising prices will erode the livelihoods of residents and rapidly expand the proportions and geography of poverty already afflicting half of the total population. The percentage of people living below the extreme poverty line is increasing at an accelerated rate (22 percent).

69. A large number of small- and medium-sized enterprises, which account for more than 90 percent of the enterprises in Lebanon, are facing difficulties, due to their dependence on sales on the market, in

obtaining lost liquidity from banks threatened with bankruptcy or closure. There has been a record increase in unemployment, which exceeded the rate of 36 percent, and the dynamic may be further exacerbated by the closure of commercial and tourist facilities and some industries. It is expected that the middle class will suffer significantly from this crisis and its repercussions.

70. The economic crisis in Lebanon is connected to a lack of availability of hard currencies for import, especially with regard to the import of agricultural supplies. Lebanon and many other countries are affected by the delays in international supply chains, given that a significant share of its total supplies is imported. Still, the disruption in the supply chains has also revealed opportunities to identify and reinforce the capabilities of local industries, which can be developed to help mitigate the impact of the pandemic and the economic contraction.

71. The family enterprises have been undeniably affected by the epidemic, as they depend on their daily activities and harvest. These vulnerable groups will face great financial difficulties if they are forced to stop their work. The Lebanese currently face the dilemma of identifying the path forward that will cause the least damage while allowing them to survive the crisis. This is especially true as the coverage of social protection systems for the most deprived groups does not exceed 26 percent, and the results of a 2018 household survey recently issued by the Central Statistics Department warn that 58.7 percent of households depend on monthly, weekly or daily wages, while 9.5 percent of families depend on pensions. In other words, the sources of income of 68.2 percent of households are not flexible with regard to exchange rate changes and inflation.

72. According to a decision of the Council of Ministers, the Ministry of Social Affairs, in cooperation with the Ministries of Industry, Agriculture, Defence, Interior, Labour, Finance, Economy and Information, has developed a plan. Through coordination with municipalities and their heads, social affairs centres and the army, a solidarity basket of foodstuffs and disinfectants is to be distributed to families economically and financially affected by COVID-19. But the question remains of how to sustainably finance these initiatives if the pandemic endures and the economic downturn intensifies.

73. The immediate challenges include providing health care and accounting for the logistical and financial difficulties in addressing the complexities of the pandemic. These problems have brought out the best scientific and technical talent of the country, while demonstrating the vitality of the industry, technology and science sectors. They have shown the ability of the Lebanese to invest in high levels of science and to arrive at creative solutions, which may contribute to the complex global effort of confronting this unprecedented challenge.

74. The government's response to the pandemic was rapid, and a set of measures were immediately put into effect, including the complete closure of all educational institutions, the private sector and public institutions, the suspension of flights and the establishment of a national operation room for disaster management. The operation room is characterised by its effectiveness in improving the preparedness of public and private hospitals and laboratories and organizing the return of expatriates, tracking their health status and expanding health checks and other measures.

75. Two types of financial policies were put in place as of 25 March 2020. The first was of a fiscal nature, while the second concerned monetary and macro-financial policy. All deadlines related to paying taxes and fees were extended, a national solidarity fund was created, which accepts in-kind and cash donations, and legal judicial and contractual deadlines were extended. The Bank of Lebanon, in cooperation with the LIFE Initiative<sup>1</sup>, launched the oxygen programme, worth USD 750 million. It contributes to providing facilities for the imports of raw materials necessary to combat COVID-19 and to satisfy the needs of industry.

76. As the outbreak recedes, informed macroeconomic policies can help to restore confidence and demand, but they may not be able to offset the effects of forced closures and travel restrictions, including

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<sup>1</sup> <https://www.lifelebanon.com/promote/policy-initiative.html>

on the potential migration of people with knowledge and competence. The challenges of the near future are complex and interrelated and must be addressed through coordinated policies across all sectors. Structural reform and external support would help to restore growth in the long run and restore consumer and investor confidence.

77. The fish farming sector was most affected by the crisis, and it requires sustainable solutions to mitigate the repercussions. In this sense, social support measures should be put in place in order to protect producers and sustain employment.

**Egypt is the largest producer in the region, and farmed fish is a major contributor to the country's food security. How has the COVID-19 crisis affected the production and marketing of aquaculture products? What measures are planned to build resilience to such situations in the future?**

**Mr Mohamed El Araby, Director, Technical Support Unit, General Authority for Fish Resources Development, Egypt.**

78. The production of fish farms in Egypt was not affected by the pandemic over the previous six months, neither in agricultural lands nor on fish farms. The feed industry was not disrupted, and there was no effect on farmers feeding their fish stocks. Egypt is currently in the feeding season due to the favourable temperatures during this time of the year.

79. The effects of the pandemic on the marketing of fish products were relatively minimal until the end of April. This stability was due to the increased demand for fish during the Sham El-Nessim season for Christians and the Ramadan Season for Muslims. The impacts of COVID-19 on fish marketing increased gradually until peaking as a result of the confinement measures taken by the government to preserve the health of its citizens. Tourism activities ceased completely, restaurants were partially closed, with only home delivery allowed. This led to the collapse of the summer season and the absence of the usual boom in fish consumption, especially in coastal areas. The government's focus was on preserving the health of its citizens, reducing the spread of the disease and limiting the transmission of infections.

80. In terms of hatcheries, the marketing of tilapia seed was affected as farmers still had stocks left from the previous year. Consequently, seed prices decreased due to the limited demand for new fish. Seabass and seabream hatcheries were affected due to the decrease in demand for fry and fish fingerlings, resulting from the decreased demand due to the halt on tourism and closure of restaurants.

81. There is a need to develop regional communication and marketing initiatives. These can include collaboration within business-to-business segments (producers, traders, retailers, organizations and media) through joint marketing or cooperative initiatives, promotional campaigns targeting the general public, especially younger generations, and the production of material promoting the region, as well as the nutritional and healthy characteristics of aquaculture products. Such campaigns would need to be preceded by a market analysis to ensure that the messages and target groups are correctly identified.

**How has the COVID-19 crisis affected tuna farming operations and sales? What is the strategy for mitigating impacts and building resilience?**

**Robert Vassalo Agius, aquaculture expert, Malta.**

82. The pandemic continues to rage around the world, a number of lockdown measures have affected the aquaculture industry, including the capture-based tuna farming industry, which provides high value Atlantic bluefin tuna *Thunnus thynnus*, mainly to Asian markets.

83. The industry depends on wild catches, which are carried out around June of each year. The harvested fish are frozen at the end of the year and sold the next. Production in 2019 was of course not

affected by COVID-19, as the harvest had already been exported before COVID-19 restrictions were put in place in early 2020.

84. However, repercussions are expected in 2020, as the fish exported in 2019 has not been fully consumed due to the restaurant lockdowns, and the remainder of the 2019 harvest is still stored in Asia. The rest of this stock will be consumed during 2020 as restaurants reopen and consumer confidence grows again. Operators in the sector could choose to catch less bluefin tuna in 2020 or to catch their full quota; by doing the latter, they risk having to sell at lower prices or failing to sell their produce at all later on in 2020. So, while no grave repercussions of the pandemic have shown up so far, they are still waiting on the horizon for the bluefin tuna industry.

85. There were also small losses in fresh bluefin tuna sales during the COVID-19 period, but these are minor in comparison to the losses in frozen harvests that are expected later on in 2020. Locally and all over the world, sales are starting to pick up again as lockdown measures are eased. In Malta, the airport reopened on July 1, and coupled with the expected increase in tourism, bluefin tuna consumption is expected to pick up again.

86. The bluefin tuna fishing season is ongoing, and all tuna farms are conducting their annual operations of catching live wild adult bluefin tuna for fattening purposes. This fishing has not been affected and preparations were carried out as usual. However, operators do expect repercussions with the onset of the 2020 harvest season, as a lower than normal demand is expected due to large amounts of bluefin tuna stock from the 2019 harvest that have still not been consumed.

87. With regards to mitigating impacts and building resilience, there is not much the industry can do on its own, as a lockdown halts all consumption. Only the operators themselves could have chosen not to fish during the 2020 season, so as to avoid incurring losses if repercussions are to emerge later in 2020, or if another COVID-19 wave hits.

**How has the COVID-19 crisis affected plans to develop the aquaculture sector in Algeria? Is there any indication between current and potential investors toward a more adaptive and flexible strategy?**

**Mr Rachid Annane, Director of Aquaculture, Ministry of Fisheries and Marine Resources, Algeria.**

88. In Algeria, as in every other country, the COVID-19 crisis took the sector by surprise. A new Ministry for Fisheries and Aquaculture was created only two months before the COVID-19 crisis arrived. The new strategy is mainly based on the development of aquaculture between 2020 and 2024, with focusses on e-commerce and local production rather than production for the export market. The crisis prompted investors to diversify.

89. Aquaculture activities were impacted, especially in the first weeks of the lockdown. But the sector responded and adapted quickly, which was possible due to the industry being quite independent and governed by a new dedicated ministry.

90. The main measures taken by the Ministry were as follows: i) the creation of awareness units with different stakeholders, including from the private sector, to mitigate the effects of the crisis; ii) daily follow-up and monitoring of the situation, including production feed and fingerling supply; iii) assigning a working group to monitor the impacts of the COVID-19 crisis over the short- and medium-term and propose alternative plans; iv) social security for the affected professionals; v) establishing guidelines for workers along the supply chain with precautionary measures to avoid the risk of contamination and the spread of COVID-19; vi) launching electronic sales and distribution services through various media; and vii) a gradual resumption of all activities of the sector, from meetings and workshops to training sessions through remote lectures.

91. This situation has encouraged all stakeholders, including the decision-makers, to promote more resilient strategies for the development of the aquaculture sector that take into consideration the lessons learned from the COVID-19 crisis.

92. **Mr Yannis Pelekanakis, General Manager of the Federation of Greek Maricultures (FGM)**, contributed to the meeting through the chat and explained that in terms of demand, the major impact of the COVID-19 crisis in Greece was the sudden and sharp drop in sales, especially via the HORECA channel. Retail sales picked up as in-house consumption increased.

93. With regards to supply, seabass and seabream fish farming is mainly an export-oriented sector. Despite the uncertainties following the lockdown, the supply within European Union markets was not affected and fish was delivered as usual. Supplying non-European Union markets became more complex, as commercial flights were not available, and cargo flights were limited and more expensive. It seems now that demand is recovering gradually. The main challenge lies in the unsold quantities, coupled with limited cash flow after months of severely reduced profitability. This combination might lead to price drops during the second half of 2020.

94. Greek producers, like the rest of European producers, are expecting the application of the compensation measures recently approved by the European Union. So far, zero support has been received. The national government adopted several measures to improve the short-term liquidity of companies and to safeguard employment.

95. Lessons learnt include the exploration of the opportunity to improve resilience by further expanding the domestic market and developing new products, since seabass and seabream are sold mainly as whole fresh fish.

## CONCLUSIONS

96. Based on the discussions held, the following conclusions were drawn by participants:

- Five months into the COVID-19 pandemic, it is certainly too early to measure its full impact on the aquaculture and seafood supply industry and to accordingly design strategies to build resilience to such extraordinary circumstances. However, some clear conclusions can be drawn, and some preliminary suggestions can herein be made:
- It is obvious that production and supply chains must be shortened. Domestic markets need to be supplied, and under such circumstances, the best – if not the only – way is to supply through local companies. Reliance on national production rather than imports must thus become a strategic priority for governments wishing to ensure food security for their citizens. In this context, building awareness of the local industry and its products is essential. Consumers need to better realize the overall environmental and social benefits of aquaculture and the advantages of locally produced seafood.
- Regarding the actual production process and the challenges to continued operations, it is important that the supply of raw materials, such as feed and fingerlings, also physically approaches closer to the growing units (cage farms or land-based systems) – to the extent possible of course. It is vital for countries wishing to further develop their aquaculture industries to focus on strategies that also entail adequate local production of feeds and fingerlings and other necessary supplies (i.e. polystyrene boxes, liquid oxygen, etc.). Cooperating with competent international companies in the field is probably the way forward so as to minimize operational risk on the one side and commercial risk on the other.
- This crisis presents an opportunity to explore the use of alternative feed ingredients such as insect-based feeds, algae-based proteins and oils, and even bacteria-based proteins produced through a fermentation process, as these alternatives come with significant sustainability

benefits and rely less on imports of fish meal and fish oil, or of the raw materials necessary for the production of the latter.

- This situation also calls for new strategies on inventory management and control. For all types of raw material and supplies that can be stored, companies must make sure that they maintain strategic reserves able to ensure uninterrupted operations over longer periods.
- Companies that invest in good working conditions for their employees, reducing potential health hazards and keeping high hygiene and safety standards for their personnel at their work-stations and their accommodation units, are those with an advantage over the others. These are the companies that will end up with fewer cases of infection and will manage to continue operations instead of closing down completely.
- While shortening the production chain, localizing suppliers and investing in better working conditions may provide better access to the market during similar pandemics, under normal conditions, such an approach may increase the costs of production to non-competitive levels in relation to imports from third countries that do not follow the same environmental, social and operational standards, let alone the responsible investment practices described above. Thus, ensuring a continued level-playing field is essential. This is probably an area of intervention that might have some effect towards mitigating the negative effects of crises such as the present one, especially once transport bans are gradually lifted and international trade restored.
- Measures to help with the liquidity of companies in the short term are important. Measures such as soft loans, deferrals of tax payments and government loan guarantees are just a few examples of such potentially useful tools. But these need to be designed proactively so as to avoid bureaucratic obstacles that may arise when the measures urgently need to be put in place. Also, in order to use such crises as opportunities to improve the sector, it is suggested that companies complying with a predetermined set of criteria should be eligible for such assistance and support. The criteria should ensure responsible practices, adequate consideration of the welfare of employees and support lent to local suppliers and local markets. In other words, these criteria should determine that a company has undertaken the risk of higher production costs, and thus lower profit margins, in return for a higher positive societal impact.

## Agenda

### **Introduction and opening of the webinar**

### **Thematic discussion 1: Impacts of COVID-19 on the aquaculture sector and sharing best practices by producers (production and market)**

- Ongoing monitoring and initial assessment of the impacts of COVID-19 on aquaculture
- Impacts of COVID-19 on aquaculture production
- Impacts of COVID-19 on the aquaculture market and supply chain
- Responses and best practices adopted by producers

### **Thematic discussion 2: Building resilience through mitigation measures**

- National measures supporting the aquaculture sector
- National strategies to improve resilience of the aquaculture sector

### **Q&A and conclusions**



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### List of panelists

#### **Javier Ojeda, General Secretary, Federation of European Aquaculture Producers (FEAP)**

Javier Ojeda is the Chairperson of the Aquaculture Advisory Council (AAC) and presently serves as interim General Secretary of the Federation of European Aquaculture Producers (FEAP). He is also the General Secretary of the Spanish Aquaculture Farmers Association (APROMAR), the Vice-President of the Spanish Technology Platform for Fisheries and Aquaculture (PTEPA), Counsellor at the Spanish Economic and Social Council and Chairperson of the Spanish Standardization Bureau on Aquaculture. Serving in these different functions, he contributes at the national level to promoting responsible aquaculture with public authorities, policy makers, trade unions, media, non-governmental organizations and researchers. Mr Ojeda is also deeply involved at the international level, working in relationship with the European Commission, the European Parliament, the European Economic and Social Committee, FAO, IUCN and other relevant international organizations. Mr Ojeda is a biologist, having graduated from the University of Madrid, Spain, and he holds an MSc degree in Oceanography from the University of South Carolina, United States of America.

#### **Ali Alshaikhi, CEO, National Fisheries Development Programme and Director General for Fisheries, Ministry of Environment, Water and Agriculture, Saudi Arabia**

Ali Alshaikhi is currently the Director General of the General Directorate of Fisheries, as well as the Chief Executive Officer of the National Fisheries Development Programme of the Ministry of Environment, Water and Agriculture of Saudi Arabia. He is also Director of Administration and Human Resources for the bakery sector (western region) of the AlMarai Company, as well as Director of Human Resource Management and Business Development at the National Aquaculture Company. Mr Alshaikhi graduated with a PhD in Human Resources Management from Hillford University and holds an MBA from the American University of London as well as a BSc in Biology from Umm Al Qura University. He is currently the Chairperson of the Regional Commission for Fisheries (RECOFI) and also a member of the Committee for Aquaculture Demands as well as a member of the Standing Committee for the Protection of the Coastal Environment.

#### **Buket Yazicioglu Altintas, General Secretary, Central Union of Turkish Aquaculture Producers, Turkey**

Buket Yazicioglu Altintas is the Secretary General of the Central Union of Aquaculture Producers in Turkey, a position she has held since 2017. She holds a PhD in Reproductive Biology from the University of South Bohemia in the Czech Republic, as well as a Bachelor's degree and a Master's degree in Aquaculture from the Süleyman Demirel University in Turkey.

#### **Abdulaziz Al-Marzouqi, Director General, Fisheries Resources Development, Ministry of Agriculture and Fisheries, Oman**

Abdulaziz Al-Marzouqi is a specialist in fisheries management and development, with more than 20 years of experience. He holds a BSc in Fisheries Science from Sultan Qaboos University in Oman and an MSc in Fisheries Science from Hull University in the UK, as well as a PhD in natural resources – fisheries management from Bremen University in Germany. He has been involved since 1996 in the work of the Ministry of Fisheries of Oman, where he currently serves as Director General of Fisheries Resources Development. He is experienced in formulating fisheries development activities and programmes, such as strategic planning and outlining regulations, in cooperation with regional and international organizations. Mr Al-Mazourqi has excellent knowledge of the national marine ecosystem and its resources and knows how to interact effectively with stakeholders.

**Rumaitha Abdulaziz Alshehhi, Aquaculture research assistant, Ministry of Climate Change and Environment, United Arab Emirates**

Abdulaziz Alshehhi joined the Ministry of Climate Change and Environment of the United Arab Emirates in 2016 and has been working as an aquaculture research assistant ever since. She holds a BSc in management and organizational studies from Brescia University College in Ontario, Canada, as well as an MSc in international studies from Wollongong University in Dubai, United Arab Emirates.

**Mustapha Bendag, Aquaculture expert (supply chain for feed and fingerlings), Tunisia**

Mustapha Ben Dag is an aquaculture expert and sales manager working for an international fish feed company in North Africa. He is also the formal Director General of the Technical Centre of Aquaculture in Tunisia and he has worked as a technical advisor on several fish farms.

**Majida Marouf, Director General, National Agency for the Development of Aquaculture (ANDA), Morocco**

Majida Marouf is currently the Director of the National Aquaculture Development Agency (ANDA). After graduating from the Hassan II Institute of Agronomy and Veterinary Sciences in 1991, she began her professional career in the fish farming sector, first as an executive and then as a production manager. Before holding her current position, Ms Maarouf worked at the National Halieutic Research Institute (INRH) within the INCO project on cephalopod fisheries in Northwest Africa. In 1999, she joined the Marine Fisheries Department at the Directorate for Maritime Fisheries and Aquaculture and served as Head of the Department for Planning and Management of Fishery Resources and Chief of the Division for the Protection of Fishery Resources. In 2011, she was appointed Director of the National Agency for the Development of Aquaculture (ANDA) of Morocco. ANDA aims to support marine aquaculture investors and promote the attractiveness of the sector in Morocco. This group's work is well summarized in its motto: "One vision, many opportunities."

**Ilaria Ferraro, Expert, Directorate General for Maritime Fisheries and Aquaculture, Ministry of Agricultural, Food and Forestry Policies, Italy**

Ilaria Ferraro is an expert at the Italian Directorate General for maritime fisheries and aquaculture (MIPAAF). She graduated in marine biology resources from the University of Genoa and, in 2014, she won a scholarship at the Council of the European Union, more specifically at DGB 2 A – Fisheries Internal and External Relations, where she was in charge of different dossiers mainly related to the GFCM and ICCAT. During the Italian Presidency of the Council of the European Union, she also worked at the General Secretariat of the Council on the allocation of fishing quotas for 2015. After this experience, she started collaborating with the Directorate General for Maritime Fisheries and Aquaculture at the Italian Ministry for Agriculture, Food, and Forestry Policies, where she has been in charge of following matters related to fisheries and international relations. In particular she works on GFCM issues (fisheries and aquaculture). She participates as an expert at major meetings related to aquaculture at the national, European and international levels.

**İlhan Aydın, Deputy Director General, General Directorate for Agricultural Research and Policies, Ministry of Agriculture and Forestry, Turkey**

İlhan Aydın is currently the Deputy General Director of the General Directorate of Agricultural Research and Policies of the Ministry of Agriculture and Forestry in Turkey. He is also the formal Director of the Central Fisheries Research Institute (SUMAE). He also serves as editor-in-chief of TrJFAS, GenAqua and Aquaculture Studies. Mr Aydın researches aquaculture and fisheries and contributes to the work conducted by the GFCM in the Black Sea.

**Ibrahim Haoui, Advisor to the Minister of Agriculture in charge of Fisheries and Aquaculture, Lebanon**

Ibrahim Haoui currently holds the position of Advisor to the Minister of Agriculture in charge of Fisheries, Aquaculture, Natural Resources and Forest Management. He holds a diploma in Agricultural Engineering (equivalent to an MSc) with a focus on animal production and poultry sciences from the Lebanese University. Mr Haoui has 22 years of professional experience and is qualified in public-private partnership building, community development, project planning and management, and forestry, fisheries and aquaculture.

**Mohamed El Araby, Director, Technical Support Unit, General Authority for Fish Resources Development, Egypt**

Mohamed Elaraby is currently the Director of the Technical Support Unit for the GAFRD Chairperson (GAFRD). He graduated from Ain Shams University, Faculty of Agriculture in 1993 and started his professional career in the integrated agri-aquaculture sector as an executive at the Al-Keram international company, before taking the position of Production Manager. Before 2009, he spent most of his working life in the aquaculture private sector, after which he joined the Marine Aquaculture Development in Egypt (MADE I) project. In 2011, he was appointed Technical Coordinator of the MADE I project, and then Technical Field Coordinator of MADE II. Since 2019, he has worked as a National Project Manager of the MADE II project; under his responsibility, an aquaculture district is being built in the port Said governorate, which consists of a marine hatchery for meagre and sole, an extension service centre for fish disease treatments and water quality, as well as a multi-trophic fish farm and a marine fish hatchery for seabass in Alexandria. Mr Mohamed Elaraby was also elected First Vice-Chairperson of the Scientific Advisory Committee on Aquaculture (CAQ) of the GFCM in September 2019.

**Robert Vassallo Agius, Aquaculture expert, Malta**

Robert Vassallo Agius is an international aquaculture expert specialized in marine broodstock development of new species. Following his BSc degree from the University of Malta, Dr Vassallo-Agius pursued his studies in Japan, where he graduated with an MSc and a PhD from the Tokyo University of Fisheries, specializing in marine finfish broodstock nutrition. With more than 30 years of experience in marine aquaculture, he has contributed to the development of species of commercial interest, such as yellowtail and striped jack in Japan, Atlantic bluefin tuna and Mediterranean amberjack in Europe. He has a long of experience in marine hatcheries and has spent the last 15 years contributing to strategic and development aquaculture in both in Malta and across the Mediterranean region. He principally works on developing sustainable aquaculture and diversifying aquaculture development through privately and European Union-funded research projects. He is the former Head of aquaculture research at the Malta Aquaculture Research Centre, where he successfully spearheaded innovative research and development on amberjack and bluefin tuna propagation.

**Rachid Annane, Director of Aquaculture, Ministry of Fisheries and Marine Resources, Algeria**

Rachid Annane is the Director of Aquaculture Development at the Ministry of Fishing and Marine Resources of Algeria. Previously, he was appointed as Director of the National Centre for Research and Development of Fisheries and Aquaculture in 2015. After obtaining his Master's degree in aquaculture project management and chemical engineering, he started his career in 2001 as a laboratory engineer in the fishing and aquaculture sector. He then worked as a project manager for the development of a shrimp farm in cooperation with South Korea and became operations manager in 2011. He has been working as a researcher in public policy management since 2017.



**This report presents the outcomes of the webinar on “the experience of the aquaculture sector through best practices and mitigation measures facing the COVID-19 crisis” which took place online on 1 July 2020. It was organized by the General Fisheries Commission for the Mediterranean (GFCM) of the Food and Agriculture Organization of the United Nations (FAO) in cooperation with the Regional Commission for Fisheries (RECOFI). The webinar aimed to address the pandemic’s effects on the aquaculture sector and to identify best practices and mitigation measures adopted by aquaculture farmers and by countries. The first thematic session highlighted the difficulties faced by the sector due to the effects of the COVID-19 pandemic as well as several mitigation approaches: i) specific financial support programmes designed through the European Maritime and Fisheries Fund (EMFF); ii) Saudi Arabia’s national aquaculture strategy guaranteeing self-sufficiency along the supply chain of shrimp farming; iii) subsidies and credit loans to help producers in Turkey; iv) the development of an online platform for fish auctioning in Oman; v) opening of direct communication channels between the government and the farms in the United Arab Emirates; and vi) solidarity between the sector and the consumers in Tunisia. Other topics addressed during the second thematic session included specific measures, such as the focus on different aquaculture final products (e.g. frozen fish) and the establishment of local hatcheries and fish feed factories. The question and answer session that followed concluded the webinar.**

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