Raquel Poças Pereira

The socio-economic impacts of COVID-19 on the Portuguese fishing sector

UNIVERSIDADE DO ALGARVE

Faculdade de Ciências e Tecnologia

2020/2021

Raquel Poças Pereira

The socio-economic impacts of COVID-19 on the Portuguese fishing sector

Master degree in Aquaculture and Fisheries
(Field: Fisheries)

Under the supervision of:
Dra. Cristina Pita (CESAM-UA)
Dr. Karim Erzini (CCMAR-UAlg)

Universidade do Algarve

Faculdade de Ciências e Tecnologia

2020/2021

The socio-economic impacts of COVID-19
on the Portuguese fishing sector

Declaração de autoria do trabalho

Declaro ser o(a) autor(a) deste trabalho, que é original e inédito. Autores e trabalhos consultados estão devidamente citados no texto e constam da listagem de referências incluída.

(Raquel Poças Pereira)

Acknowledgments

First, I would like to thank my supervisor Dra. Cristina Pita, for giving me the opportunity to work in such an interesting field as the socioeconomic dimension of fisheries. Despite the remote work and the unusual conditions that we had to work during this last year, your knowledge and interest in these topics did influence my choices. Also to Professor Karim Erzini for accepting being the co-supervisor and always being available to give your opinion about the study.

Secondly, I really have to thank all fishers and associations representatives that I talked to by phone throughout this year. Without their help and knowledge about the Portuguese fishing sector, it would not have possible to achieve the objectives of this study.

To Tereza Fonseca, Daniela Castelo and Katina Roumbedakis, thank you for your sympathy and help since I arrived at the team to work on the project. This pandemic situation did not make me the most talkative person but believe me when I say that I’m thankful for being part of the team for a few months. Your enthusiasm was contagious.

Lastly, I would like to thank my family and friends for all these years. My life would not be the same without all of you. For always being there and believing in me even when I didn’t believe.

I always heard that finishing a master thesis was a challenging work, but in a pandemic year I felt that was even more challenging, both mentally (especially) and physically. I guess I can say: Challenge overcome!

Muito obrigada!

Resumo

Em Dezembro de 2019, na cidade chinesa de Wuhan é reportado pelas autoridades o primeiro caso de um vírus altamente contagioso, denominado de SARS-CoV-2. Nos meses que se seguiram o número de casos aumentou rapidamente por todo o mundo, levando a Organização Mundial de Saúde a classificar a situação como pandemia, a 11 de Março de 2020. De modo a desacelerar a propagação do vírus, os países implementaram medidas de segurança especificas para combater a situação, tais como confinamentos e distanciamento social. O impacto nas economias nacionais e internacionais foi grande, uma vez que muitas dessas medidas requereram o fecho de lojas, espaços de trabalho, espaços de lazer e restrições de mobilidade. Portugal não foi exceção, tendo sido diagnosticado o primeiro caso a 2 de Março e a 18 de Março decretado pelo Governo português o estado de emergência nacional. Foi implementado pelo Governo um confinamento a nível nacional, com o teletrabalho tornado obrigatório, atendimento ao público fechado, escolas e estabelecimentos comerciais fechados e evento públicos e privados cancelados. Nos serviços e lojas que foram mantidos abertos, tais como supermercados e serviços presenciais, foram limitados o número máximo de pessoas em espaços fechados e as fronteiras foram também fechadas, com o objetivo de diminuir o risco de transmissão do vírus. Todas estas medidas causaram impactos sociais e económicos aos cidadãos portugueses.

Por todo o mundo o vírus veio impactar os mais variados sectores. O fecho em Janeiro, de um dos maiores mercados de pescado da China causou um impacto no sector das pescas a nível mundial, realçando o quão vulnerável é o sector aos mercados mundiais, uma vez que em muitos países é extremamente dependente de compradores estrangeiros e não tanto de mercados locais. Os impactos no sector foram diferentes, dependendo das características dos países. As principais alterações foram nas horas de trabalho, nos preços em lota, no armazenamento e nas cadeias de distribuição. Houve uma redução do esforço de pesca e descargas, em países como Espanha e Indonésia. Com as restrições nas viagens e perdas de mercados internacionais verificou-se em países da Oceânia, como Vanuatu, a diminuição de pesca *offshore* mas um aumento da atividade de pesca em áreas mais costeiras, próximas das comunidades. O fecho dos principais mercados também contribuiu para uma perda de rendimentos, com uma baixa nos números de venda, levando a situações de desperdício alimentar por falta de capacidades de armazenamento, uma vez que houve dificuldades no escoamento dos produtos da pesca.

A perda de rendimentos das populações causou também uma alteração nos hábitos de consumo, verificando-se em alguns países uma redução no consumo de pescado fresco e um aumento no consumo de fontes de proteína mais baratas, como produtos congelados ou em conserva. Apesar dos impactos negativos que a pandemia causou no sector, também se verificaram respostas positivas para mitigar os efeitos. Uma vez que a restauração esteve maioritariamente fechada, várias empresas optaram por vender os seus produtos online ou ao retalho. No setor da pesca mais artesanal também se constatou que as organizações de produtores compraram os produtos aos seus associados de modo a garantir um preço mínimo ao longo do ano. O aumento de vendas diretas e de cabazes foi também reportado em alguns países.

O setor das pescas português é composto por uma frota maioritariamente de pequena pesca e tem como alvo um variado número de espécies usando um leque variado de artes de pesca, como redes de emalhar, redes de arrasto, palangre, salto e vara e armadilhas. No entanto, as três artes de pesca mais utilizadas são o cerco,

polivalente e o arrasto. Em termos de capturas, a média de preço em lota, em 2019, foi de 2,08€/Kg. Comparando os valores médios entre as lotas de Portugal continental e as regiões autónomas da Madeira e dos Açores, a região autónoma dos Açores regista um valor mais elevado, seguido pela região autónoma da Madeira e pelo continente. As espécies capturadas em maior quantidade são a sardinha (*Sardina pilchardus*), o carapau (*Trachurus trachurus*) e a cavala (*Scomber colias*). Nos Açores, os atuns e a lula têm o maior peso em captura e na Madeira são os atuns e o peixe espada preto os capturados em maior quantidade. Em termos de valor comercial, em 2019 o polvo foi o mais importante, seguido do carapau e da sardinha. Habitualmente era a sardinha a ter o maior valor comercial, no entanto nos últimos 6 anos tem vindo a decrescer por redução nas capturas. Em termos de mercado internacional, Portugal importa mais produtos do que exporta. O pescado importado é maioritariamente oriundo da Espanha, Suécia e Holanda. Dos produtos exportados, os principais clientes são Espanha, Itália e França.

O principal objetivo deste estudo foi identificar os impactos socioeconómicos da pandemia no setor das pescas português, as principais causas desses impactos e as medidas de mitigação e adaptação postas em prática. Dada a importância dos media para a população como fonte de informação, foi tido também como objetivo identificar os tópicos relacionados com os impactos da pandemia no setor, anunciados pelos jornais portugueses de modo a verificar se existiam diferenças entre resultados.

A metodologia consistiu em questionários realizados via telefónica, em três períodos diferentes do ano pandémico (Maio 2020, Novembro 2020 e Março 2021), a 15 representantes de associações de pescadores localizadas ao longo de Portugal continental e das regiões autónomas dos Açores e da Madeira. Os questionários foram compostos por questões de resposta aberta e fechada, organizadas por 3 seções: impacto socioeconómico do COVID-19 na atividade dos associados, impacto na saúde e bem-estar e as medidas adotadas pelo setor para combater a crise pandémica. De modo a complementar os questionários, foram também analisados os dados das descargas mensais, em quantidade (Kg), valor (€) e preço médio (€/Kg), entre Janeiro 2017 e Março 2021, das lotas com as quais as associações entrevistadas trabalham. Paralelamente, foram recolhidas noticias de 8 jornais nacionais, datadas entre Março 2020 e Maio 2021. Estas foram agrupadas por temas principais e sub-temas, assim como mês da publicação.

Os resultados obtidos nos questionários revelaram que a perceção dos representantes das associações de pescadores foi de que o primeiro confinamento, em Março/Abril 2020 impactou mais negativamente o setor do que o segundo confinamento, em Janeiro/Fevereiro 2021. O facto de o setor ser muito dependente dos mercados internacionais, do canal HORECA (hotéis, restaurantes e cafés) e o turismo foi uma das principais causas apontadas para os impactos maiores nos primeiros meses da pandemia, uma vez que estas atividades estiveram praticamente paradas. A descida do preço em lota, principalmente no primeiro confinamento, foi bastante sentida. Houve um esforço do governo por rapidamente disponibilizar apoios financeiros para mitigar os impactos causados pela pandemia e para a aquisição de equipamentos de segurança pessoal. Relativamente aos apoios financeiros, a perceção dos representantes das associações de Portugal continental foi de que o processo para a obtenção dos mesmos foi demorado e burocrático, no entanto nas regiões autónomas, os representantes consideraram que não houve problemas de maior com os apoios financeiros regionais. Relativamente ao apoio para a aquisição de equipamentos de proteção pessoal, as perceções foram de que o apoio funcionou bem. Os dados das descargas demonstraram igualmente que durante os primeiros meses de pandemia houve uma maior queda nos

preços em lota, quando comparados com o segundo confinamento em Portugal. Relativamente às notícias analisadas (n=174) nos jornais portugueses, verificou-se que houve um maior número de publicações relacionadas com esta temática, em Abril 2020 (n=48), seguido de Março (n=27) e Maio(n=20). Os três tópicos mais abordados foram as medidas de mitigação e adaptação, Pesca e lota e a tripulação, respetivamente. É de realçar que relativamente às notícias relacionadas com as medidas de mitigação e adaptação, as informações publicadas eram maioritariamente relativas aos apoios financeiros nacionais, linha de crédito e apoios financeiros regionais. Ao longo do ano de pandemia, o número de notícias acerca dos impactos da pandemia no setor foi diminuindo. Comparando todos os dados e perceções obtidas, verificaram-se algumas diferenças relativamente às respostas aos questionários e ao tipo de notícias publicadas. As diferenças maiores foram no foco dado pelos media aos apoios financeiros disponibilizados pelo governo e à perceção dos representantes, uma vez que estes nem sempre consideraram que os apoios funcionaram devidamente. Quanto aos mercados, apesar de ter sido o tópico que os representantes apresentaram como sendo dos mais impactados, poucas notícias abordaram esse tema. Relativamente a questões relacionadas com a tripulação, pesca e lota, transporte e mobilidade e sistema de vendas, não houve uma grande discrepância entre as notícias publicadas e as respostas aos questionários, ainda que tenha havido poucas notícias acercas destes temas. Apesar dos impactos negativos causados pela pandemia, o setor nunca parou a sua atividade. O facto de ser muito dependente de mercados externos e de os seus trabalhadores estarem cada vez mais envelhecidos e em menor número e a elevada dificuldade em terem poupanças, poderá ter também contribuído para os impactos sentidos. Apesar do cansaço perante toda a situação nacional e mundial, demonstrado nas várias fases de entrevistas telefónicas, os representantes demonstraram-se disponíveis em continuar a colaborar com a comunidade científica. No futuro, será necessário um estudo mais aprofundado, de modo a ser possível quantificar os impactos sentidos no setor das pescas português de modo que em situações futuras semelhantes hajam medidas de mitigação e adaptação bem apropriadas às necessidades do setor.

Palavras-chave

COVID-19; Pesca; Impacto socioeconómico; Estudo Qualitativo; Oceano Atlântico

Abstract

The COVID-19 pandemic impacted extensively on human activities worldwide, and the fishing sector was no exception. A few studies have already been published on identifying and quantifying the impact of the COVID-19 crisis on the fishing sector but a lot more research is needed. The aim of this study was to identify the socio-economic impacts of the pandemic on the Portuguese fishing sector and the measures put in place to deal with this major global crisis. A longitudinal survey gathered data from representatives of 15 fishing associations along the Portuguese coast in three different times (April 2020, November 2020 and March 2021). This information was combined with official data from Portuguese commercial landings and national news. This allowed to obtain quantitative and qualitative data on the socio-economic impact of COVID-19 on the fishing activity, impacts on health and wellbeing of fishers and identification of the measures adopted to face this crisis. The results showed that the first lockdown was more impactful mainly due to the impact on international markets, tourism and the HORECA (i.e., hotels, restaurants and cafés) channel. Regarding the fishing activity there was a clear decrease in quantities landed and average price between March and May 2020 (first lockdown period), while in January and February 2021 (second lockdown period) there were not so many variations due to the pandemic. The number of news articles focusing on the impact of the pandemic on the fishing industry decreased throughout the year and their main focus was on financial support announced by the governments, thus contrasting with the information obtained from the survey. Despite the challenges faced, the sector never stopped working, showing some resilience and adaptation capacity, but also the sector weakness to shocks. More research will be needed to quantify all the impacts and define appropriate management measures for future shocks.

Keywords

COVID-19; Fisheries; Socioeconomic impact; Qualitative study; Atlantic Ocean

Table of Contents

Table of figures

List of tables

Glossary

DGRM – *Direcção Geral de Recursos Naturais, Segurança e Serviços Marítimos (*National Fisheries Board*)*, Portugal

DGS – *Direcção Geral de Saúde* (Directorate General for Health), Portugal

EEZ – Exclusive Economic Zone

EU – European Union

FAO – Food and Agriculture Organization

HORECA – Hotel/Restaurant/Café

ICES – International Council for the Exploration of the Sea

MAL – Metropolitan Area of Lisbon (Nuts II)

NOAA – National Oceanic and Atmospheric Administration, United States of America

PPE – Personal Protective Equipment

WHO – World Health Organization

1. Introduction

1.1 The COVID-19 pandemic

In December 2019, the first human case of COVID-19, the disease caused by the coronavirus named SARS-CoV-2, was officially reported in the Chinese city Wuhan. In the following months the number of cases started to spread rapidly around the world which lead the World Health Organization (WHO) to classify it as a pandemic on March 11th , 2020 (World Health Organization, 2020).

In order to slow down the spread of the virus, most countries around the globe implemented strict safety measures such as social distancing and even national lockdowns. This led to the closure of stores, workplaces, schools, leisure places and restrictions in national and international travel, causing huge impacts on national and international economies (International Monetary Fund, 2020). Portugal was not an exception. The first diagnosed case of coronavirus happened on March 2, 2020 and on March 18 a state of emergency was declared (Governo Português, 2020a), which resulted in a full lockdown, and consequent closure of public services, schools and business, cancellation of gatherings and events, social isolation recommended, people working from home, limited number of people in public places and the closing of borders in order to reduce contact rate and try to minimize the transmission of the virus. This resulted in substantial changes in the daily life of the citizens and had major social and economic consequences.

1.2 The impact of COVID-19 on fisheries

COVID-19 affected all sectors of the economy, but some are more vulnerable to the economic and social effects of the pandemic than others, and fisheries are one of those (Bennett et al., 2020). The closing of the Chinese market, and lack of demand for "luxury" seafood, due to the cancellation of the Chinese New Year celebrations, in January 2020, prompted an immediate market collapse of several value chains around the globe (e.g., Canadian and American lobster, Australian crayfish, South Africa rock lobster), highlighting the vulnerability of fisheries to global markets, since many fisheries rely on foreign buyers and not on less lucrative local markets (Knight et al., 2020; Bennett et al., 2020).

All over the world the sector was negatively impacted by the pandemic, in different degrees, depending on the profile of the country and the fishery in question. Some general trends were common around the globe, namely changes in the working-time, price at auction, storage availability, and distribution (Bennett et al., 2020). In some European countries, such as Spain, there was a reduction of fishing effort and landings (Coll et al., 2021). The same happened in Asian countries like Indonesia (Campbell et al., 2020) and in some inland fisheries in African countries like Kenya (Aura et al., 2020). While in some countries from Oceania, like Vanuatu, with the travel restrictions and loss of international markets there was a decrease in offshore fishing but an increase in fishing activity on reefs or areas close to the communities (Steenbergen et al., 2020). The closing of the major markets due to cities being under lockdown resulted in loss of income, market glut and in some cases food waste due to an overload or inadequate cold storage (Aura et al., 2020; Bassett et al., 2021; Coll et al., 2021). Even with the decrease of prices there were changes in consumer demand, with a reduction of fresh fish consumption at home and the increase in demand for cheaper and more accessible sources of protein, like chicken in South American countries such as Peru (Bassett et al., 2021). Also in Europe there was an increased demand for frozen and canned fish, which contributed to a decrease in the consumption of fresh fish that was already happening due to the closure of HORECA channels (i.e., hotels, restaurants and cafés) (OCDE, 2020; Pita, 2020).

Regardless of the negative impacts there was some response from the industry to face the effects of the pandemic. In the case of large-scale commercial fishing, there was a reduction in the size of the workforce either to protect workers health and/or to lower expenses (Love et al., 2021). The ability to rapidly adapt was also observed by the fishing business in the middle of the value chain, with a wide number of companies shifting their markets to retail and online markets, as soon as the HORECA channels were closed (Love et al., 2021). In the case of the small-scale fishing sector there were some producer organizations buying fish from their members to guarantee a minimum price throughout the year. There was also the use of food banks and other forms of food sharing to distribute the catch (Bennett et al., 2020; Love et al., 2021). For instance, an increase in fish baskets and direct producer-to-consumer sales was reported in some countries (Stoll et al., 2021), namely in Portugal (Pita et al., 2020).

1.3 The Portuguese Fishing Sector

The location of Portugal in the westernmost part of Europe, with its extensive coastline (1 214 Km,) which represents 1.8% of the 66 000 Km European coastline, resulted in Portuguese culture being closely tied to the ocean, especially with fishing, which constitutes the economic basis of many communities, that are characterized by low economic diversification (FAO, 2017b; Pita & Gaspar, 2020). Of the total Portuguese fishing fleet, 84.4% of the vessels are less than 12 meters in total length, which is considered the small-scale fleet (INE, 2020). This sector targets multiple species and uses a wide range of fishing gear, such as gillnets, trammel nets, longlines, handlines, pole and lines, pots and traps (Pita & Gaspar, 2020). Portugal is one of the countries with the largest consumption of seafood per capita in Europe (FAO,2020b), with a consumption of 56.8 kg per capita (EUMOFA, 2019). The products landed by the small-scale sector are known for having high quality, being commercialized fresh in the national market or even exported to European and North American countries (Pita & Gaspar, 2020).

In total, the Portuguese fleet has 7768 registered vessels, accounting for 9.6% of the European fleet (European Commission, 2020). However, only 3902 (around 50%) have a license and 84.4% belonging to the small-scale fleet. In terms of fishing gear, three main gears are used in Portugal: Purse seine, multi-gear and trawl. The first two account for more than 80% of landings in national ports. The north of the country has 19 % of the registered vessels while the center has 23% , the south 21.7% and 14.4% at the autonomous Region of Azores and 2.3% from autonomous region of Madeira (INE, 2020).

Regarding the characteristics of Portuguese fishers, 56.2 % are between 35 and 54 years of age. This workforce is known for having low formal education, since most of them study only until primary school or preparatory school (INE, 2020). This low educational level restricts job mobility, making fishers economically dependent on the fishing activity, working mostly exclusively in fisheries (Pita, et al., 2010; Seruca 2000; Silva et al., 2019). A total of 14 617 commercial fishers are registered in Portugal, most in the north (31.5%) and center (24.1%), with the Algarve (17.5%) and Alentejo (1.6%), archipelagos of the Azores (9.4%) and Madeira (4.7%) accounting for a lower proportion of fishers (INE, 2020).

According to Ifremer (2007) and Pita et al. (2010) the vessels are usually family owned, with each family having only one vessel, and it is common for the skipper to also be the owner of the vessel. In terms of remuneration, this is based on a share system, so the crew is paid a proportion of the revenues from the sale of the catch after deducting some costs such as social security, crew insurance, and operational costs. However this share system is not the same for all the vessels and depends on previous arrangements too (Ifremer, 2007; Pita et al., 2010). Part of the fishing costs is less than the expected because there is a considerable amount of unpaid work done by family members such as preparing the gear, mending nets and baiting which is an important support for these family enterprises (Pita & Gaspar, 2020).

Particularly in the case of small-scale fisheries, employment goes beyond the number of direct jobs in fishing. This sub-sector contributes a significant amount of indirect employment and income in coastal communities (Pita et al., 2010). It gives support to a wide range of businesses, such as fishing-related businesses (net sellers, buoys, fish boxes, etc), shipyards, fish processing industry and food and tourism industry, supplying local restaurants with fresh fish and working as a "visiting card" in coastal communities along the Portuguese coast (Ifremer, 2007; Pita et al., 2010; Pita & Gaspar, 2020).

The fishing sector is organized into cooperatives, fisher's associations, producer's organizations and unions and their purposes and roles can be really different; from managing quotas, adding-value to products, to dealing with day-to day life issues (Pita & Gaspar, 2020). There are a lot of fishing associations that are poorly organized, representing just a few small-scale fishers with a lack of cooperation between them and little political influence (European Commission, 2017; Ifremer, 2007; Pita et al., 2015). The fact that most of the legislation is implemented at the national level and does not consider specificities at the local level is one of the reasons for this lack of political influence. Over the years small-scale fisheries were mostly neglected, probably as an outcome of the low literacy and education level of their fishers, which contributed to them having little voice among decision-makers. Since their representative organisms usually represent all fishers (not only small-scale fishers), small scale fishers tend to not feel properly represented, which weakens their negotiating power even more (Pita & Gaspar, 2020).

In relation to the catches of the Portuguese fishing sector, the average price of the seafood in auction, was 2.08 €/Kg, in 2019. Comparing prices between regions, the

Azores (4.09 €) has a higher average price, followed by Madeira (2.80 €) with the mainland (1.88 €) having a lower average price. The species caught in bigger amounts were Atlantic chub mackerel, *Scomber colias* (46.3 thousand tonnes), Atlantic horse mackerel, *Trachurus trachurus* (17.2 thousand tonnes) and European pilchard,*Sardina pilchardus* (9.700 thousand tonnes). In the Azores tuna species (3.4 thousand tonnes) and squid (1.3 thousand tonnes) were the most caught and in Madeira tuna species (5.1 thousand tonnes) and the black scabbard fish, *Aphanopus carbo* (2.3 thousand tonnes) were the most caught. In terms of revenue, in 2019 on mainland fishing ports the common octopus, *Octopus vulgaris* (36.7 million €) was the most important species, followed by the Atlantic horse mackerel (20.8 million €) and the European pilchard (19 million €) (INE, 2020). Traditionally, and in previous years, the European pilchard was the most valuable species, followed by octopus. However, in the last 6 years, it's value has been decreasing due to the poor state of the stock and therefore changes of quotas for sardines leading to less catches (PORDATA, 2019).

Portuguese international trade balance had a deficit of 1,102.1 million euros. In general, the main seafood suppliers to the Portuguese market are Spain, Sweden and Netherlands with more than 50% of the products imported from these countries. Mollusks and other invertebrates are mainly imported from Spain, India and China. Fresh fish arrives mainly from Spain, Netherlands and Greece. Frozen seafood originates mainly from Spain, Russia and the Netherlands. Salted and smoked fish products originate mainly from Sweden, the Netherlands and China. Portugal exports more than 70% of its seafood to three countries, namely Spain, Italy and France. Mollusks and invertebrates are mainly exported to Spain, Italy and France, canned and transformed seafood products to France, Italy and Spain, and frozen seafood to Spain, Brazil and Italy (INE, 2020).

Small-scale fisheries can have low profitability due to the low first-sale prices of their high-quality fish in auction, the difficulty of operating during the winter season (because of the weather and sea conditions along the Portuguese coast) and the fact that they have to compete for market share with aquaculture, imported seafood products and sometimes even with illegal selling from recreational fisheries (Pita & Gaspar, 2020).

Despite the high social, economic and cultural importance of fisheries in Portugal, there is little information about human dimensions of this economic activity, mainly small-scale fisheries, which negatively conditions the sustainable management of the fleet, resources and ecosystems in a fishery sector that is highly dependent on a limited number of species. As is the case with other European countries, Portuguese small-scale fisheries face challenges like low fishing revenues, an ageing workforce, resource overexploitation, poor organization, weak representation in decision-making and neglect(Pascual-Fernández et al., 2020).

1.4 Objectives

The main goals of this work are to identify (1) the socio-economic impacts of the COVID-19 pandemic on the Portuguese fishing sector and value chain, (2) the main drivers of the socio-economic impacts, and (3) the mitigation and adaptation measures put in place to deal with the pandemic. Moreover, since the visibility the sector has in the media can influence public opinion and the public understanding of social problems, and news media are considered primary sites where discussion of legal, cultural, economic and scientific issues coexists, a second purpose of this study is to identify the topics related with the impacts of the pandemic in the sector covered by the Portuguese news media and to see if there are any differences with the results from the questionnaires.

2. Methodology

2.1. Study Area

Portugal has an Exclusive Economic Zone of 1 727 408 Km^2 that represents 11% of the European Union's EEZ. The country is constituted by mainland Portugal and two autonomous regions: Azores and Madeira. Although the fishing sector represents a small amount of the country's GDP, for many centuries fishing has been an activity considered part of the Portuguese identity and culture and it is still the main source of income for many coastal communities (Alves, 2015; FAO, 2017a).

For the purpose of this study, 6 of the 7 Nuts II (Territorial Units for Statistical Purpose) regions were investigated, due to the importance of the fishing industry in these regions, namely: North, Centre, Metropolitan Area of Lisbon (MAL), Algarve, Autonomous region of Azores and Autonomous region of Madeira. Figure 2.1 shows the location of the associations which took part in the survey.

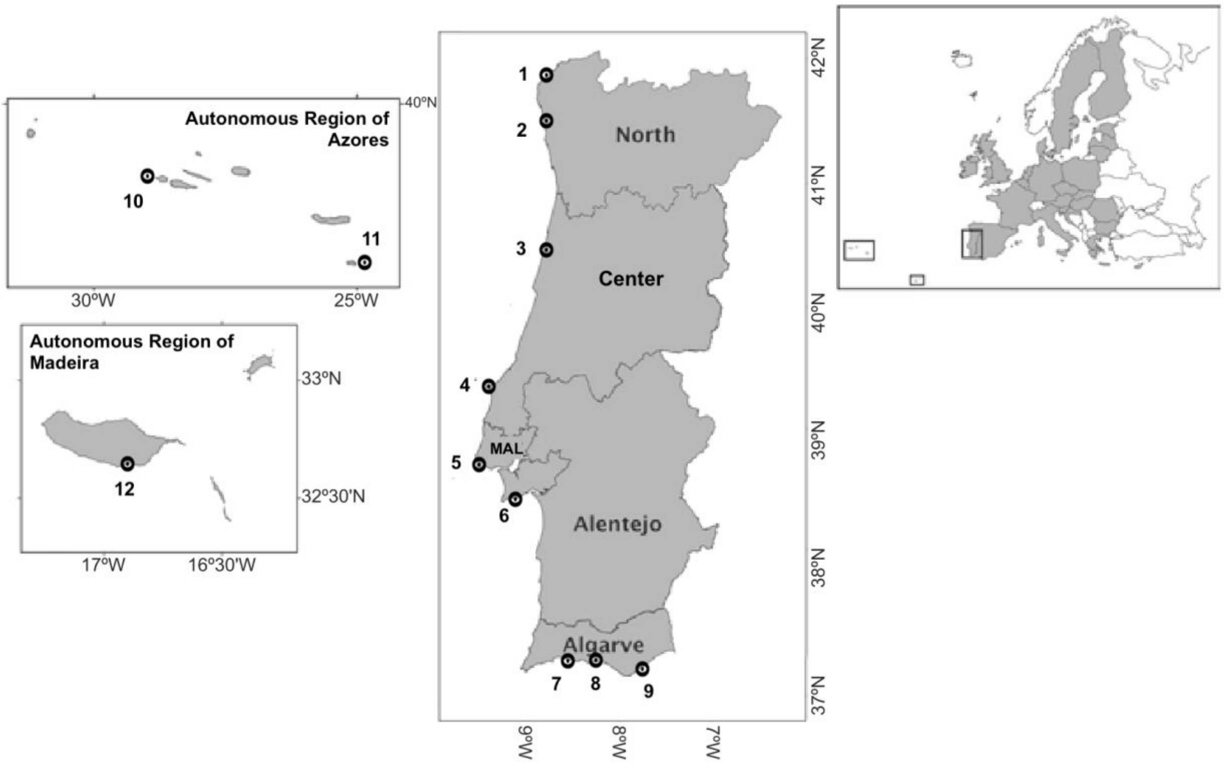

Figure 2.1. Map of Portugal with Nuts II regions and the location of the associations interviewed (1-Vila Praia de Âncora; 2-Esposende; 3-Aveiro; 4-Peniche; 5- Lisboa; 6-Sesimbra; 7- Alvor; 8-Albufeira; 9-Fuzeta; 10-Faial Island; 11- Santa Maria Island; 12 – Funchal).

2.2. Data

2.2.1. Survey

The survey was adapted to the pandemic situation from the approach used by NOAA (National Oceanic and Atmospheric Administration) to evaluate the social impact of natural disasters, like hurricanes, that commonly hit the United States of America. The NOAA approach is based on a two-survey system to the entire fisheries sector, including commercial and recreational fisheries, aquaculture and seafood processing, as well as related activities in the coastal area (bait and tackle stores, seafood dealers, marinas/boat repair/marine supply businesses). First, a rapid assessment is carried out right after the natural disaster, then a second full assessment one year later, in order to identify long-term impacts and impediments to recovery. This approach provides important information about the condition of fishing industries in the affected areas and can be used both to improve future reactions to disasters and in fishery management actions (NOAA, 2017).

We adapted this approach to investigate the impact of COVID-19 on the Portuguese fishing sector, with changes in the sample size, the questionnaire and data collection period. A rapid assessment was carried out in April-May 2020 to assess the immediate impact of the pandemic, another two assessments were done, one in October-November 2020, to evaluate the impact after the summer period, and another in March 2021, one year after the onset of the pandemic to assess the longer-term impact.

For the rapid assessment, a larger number of representatives of fishers organizations were interviewed. We aimed at interviewing as many representatives, from as many subsectors and regions as possible to get a clear idea of the impact. This rapid assessment was part of a larger global study, and the questionnaire was shorter, as the aim was to get a general global picture. The full assessment included a smaller sample size, but the questionnaires were more detailed.

2.2.1.1. Sample

In order to have a wide range of perspectives and due to the differences in the fisheries sub-sectors along the Portuguese coast, representatives of Portuguese fisheries organizations, covering the mainland and autonomous regions were interviewed over the phone (Figure 1).

For the rapid assessment, the sample size was 50 representatives of organizations. For the follow-up full assessment, and longitudinal study, 13 representatives of organizations from the rapid assessment were selected to be followed and a further two representatives were added. The selection was made taking into consideration the importance of the fishing organization, location and their interest in collaborating with the project in order to keep a proper coverage of the Portuguese situation and to minimize the possibility of losing participants over the study period. The organizations selected covered different fishing gears, boat size and target species and were from different regions such as the North, Centre, Metropolitan Area of Lisbon, Algarve and the Autonomous region of Azores and Madeira. The two new additions consist of representatives of distributing companies and were added to better understand the consequences of COVID-19 on the fisheries value chain. Some of the characteristics of the 15 organizations in the study are present in Table 2.1.

Table 2.1. Main characteristics of the organizations of the respondents (Small – 0 to 50 associates; Medium - 51 to 200 associates; Large – more than 201 associates).

Sector	**Organization size**	**Number of interviewed**	**Location (Nuts II)**
Commercial small-scale fisheries	Small size Fishers Association	1	Algarve
	Medium size Fishers Association	1	Algarve
	Large size Fishers Association	2	North; Center
Other commercial fisheries	Small size Fishing Cooperative	2	MAL; A.R. of Azores
	Medium size Fishing Cooperative	2	Center; A.R. of Madeira
	Medium size Fishers Association	2	North; A.R. of Azores
	Large size Fishers Association	3	Center; MAL; Algarve
Commercialization	Medium size Seafood Distributors	2	MAL; Algarve

Note: MAL = Metropolitan Area of Lisbon; A.R. = Autonomous Region.

Having into account some of the different characteristics in the fisheries sector along the Portuguese coast, the fishermen associations were grouped by region Nuts II in order to get an idea of the overall impact of COVID-19 on the Portuguese fishing sector across Portugal along the year.

Throughout the study there were variations in the number of interviewees as not all participants remained available to participate until the end of the survey. For the rapid assessment (in April-May 2020) we selected 13 associations from the European survey. In the survey in November 2020, an association from the Autonomous Region of Madeira and one of seafood distributors were added, which made a total of 15 associations interviewed in the second round. By March 2021, for the last round of interviews, it was not possible to interview 2 of the associations again, making a total of 13 associations interviewed. It should be noted that of the 15 associations interviewed, 14 of them had the same interviewee over the 3 rounds of interviews.

2.2.1.2. Questionnaire

The questions in both the rapid assessment and the full-assessment were organized in three different groups: (1) socio-economic impact of COVID-19 on the activity (of their associates), (2) impact on health and wellbeing, and (3) measures adopted to face this crisis. Each group of questions was then divided by topics and composed by two types of formats: a closed-ended question in the form of a rating scale from 0 (No impact) to 10 (Very high impact), followed by an open-ended question were the participant could use their own words and way of thinking without any influence on their answer (Sheatsley, 1983; Weisber et al., 1996).

The first group (socio-economic impact of COVID-19 on the activity) included questions about Markets (information regarding the impact of Tourism, HORECA Channel, national festivities and international markets), Fish and Fish Auction (information regarding the impact on catches, fishing effort, price at fish auction, buyers and fish auction logistics) and Transport and Mobility (information regarding the impact on costs, transport availability and access to other fish auctions). The second group (health and wellbeing) about the Crew (information regarding the impact on onboard crew, infections, daily routines and international mobility), and the third group (measures to face this crisis) included questions about the sales system (changes on sales system, direct sales and campaigns) and the mitigation and adaptation measures implemented (information regarding Personal Protective Equipment (PPE), financial aid, changes on the activity and concerns).

There were some changes in the wording of the questionnaire of November 2020 (Annex B) and March 2021 (Annex C) taking into account what was happening throughout the year and the time period the study was focus on.

2.2.2. Portuguese commercial landings

Data from commercial landings in Portuguese fishing ports, from January 2017 to March 2021 where the interviewed associations operated were analyzed.

A dataset of monthly landings from the mainland ports and the Autonomous Region of Madeira were obtained from *the Direcção Geral de Recursos Naturais, Segurança e Serviços Marítimos* (DGRM), the Portuguese National Fisheries Board. Data from the Autonomous Region of Azores were obtained from Lotaçor SA.

The analysis focused on the relative difference between the monthly average quantity (Kg), value (€) and average price (€/Kg) of the periods March-May 2017-2019 and March-May 2020. The same was done for the period January-February 2017-2020 and January-February 2021. The focus was on the overall data of the fish auction.

2.2.3. National News

News about fisheries and COVID-19 from the Portuguese media since the onset of the pandemic and up to March 2021 was collected from online platforms. The initial approach was done using the keywords "covid", "pesca" (fishery), "pescadores" (fisher), "Portugal", "indústria pesqueira" (fishing industry) on *Google Search*. From this first collection, 8 newspapers were chosen taking into account their dimension, location and number of news items shown on *Google Search* to have a wide range of national coverage.

All the newspapers had a website that was used to collect the online news using the keywords "covid" and "pesca" (fishery). The analysis of the news articles collected consisted in identifying and categorizing the main themes for each of it to get an overview of what was being communicated by the news media.

Each news article was labelled with the main theme, the specific theme and the publication month. The main themes of the news were selected taking into account the specific theme covered by the questionnaire as shown in table 2.2. The topic analysis was done using NVivo software.

Table 2.2. Main themes and the specific themes grouped for the news articles analysis.

Main theme	Specific theme
Markets	changes in markets
	changes in catches and revenues
	decrease in sales
	consumption campaign
	cod consumption
Fishing and Fish Auction	changes in catches and revenue
	changes in fish auction
	changes in fishing activity
	commercial fishing from land allowed
	domestic market

Transport and Mobility	Restrictions on accessing other fish auctions
	Restrictions in crew mobility
	Fuel price
Crew	Impact on the crew
	Crew infected
	Difficulty in applying safety measures
Sales System	Changes in sales system
Mitigation and Adaption Measures	Regional financial aid
	National financial aid
	Credit line – national financial aid
	Suspension of fees
	Personal Protective Equipment aid
	Special safety measures for the crew
	Insufficient aid
	Prohibited fishing on weekends
	Fishing on weekends allowed
	Fish donation
	Storage support
	Lack of regional financial aid
	Lack of European aid
	Free access to fish auction
	European financial aid

In order to verify the measures applied to face the COVID-19 pandemic, the state of affairs throughout the year and the mitigation measures applied to the sector, the official websites of the Portuguese Government (www.portugal.gov.pt and www.covid19estamoson.gov.pt), DGRM (www.dgrm.mm.gov.pt), Direção Geral de Saúde (DGS) – Directorate General for Health (www.covid19.min-saude.pt), Azores Government (www.covid19.azores.gov.pt) and Madeira Government (https://www.madeira.gov.pt) were consulted.

3. Results and Discussion

3.1. The general impact of COVID-19

Interviewees were asked about the general economic impact of COVID-19 on their fishing organization.

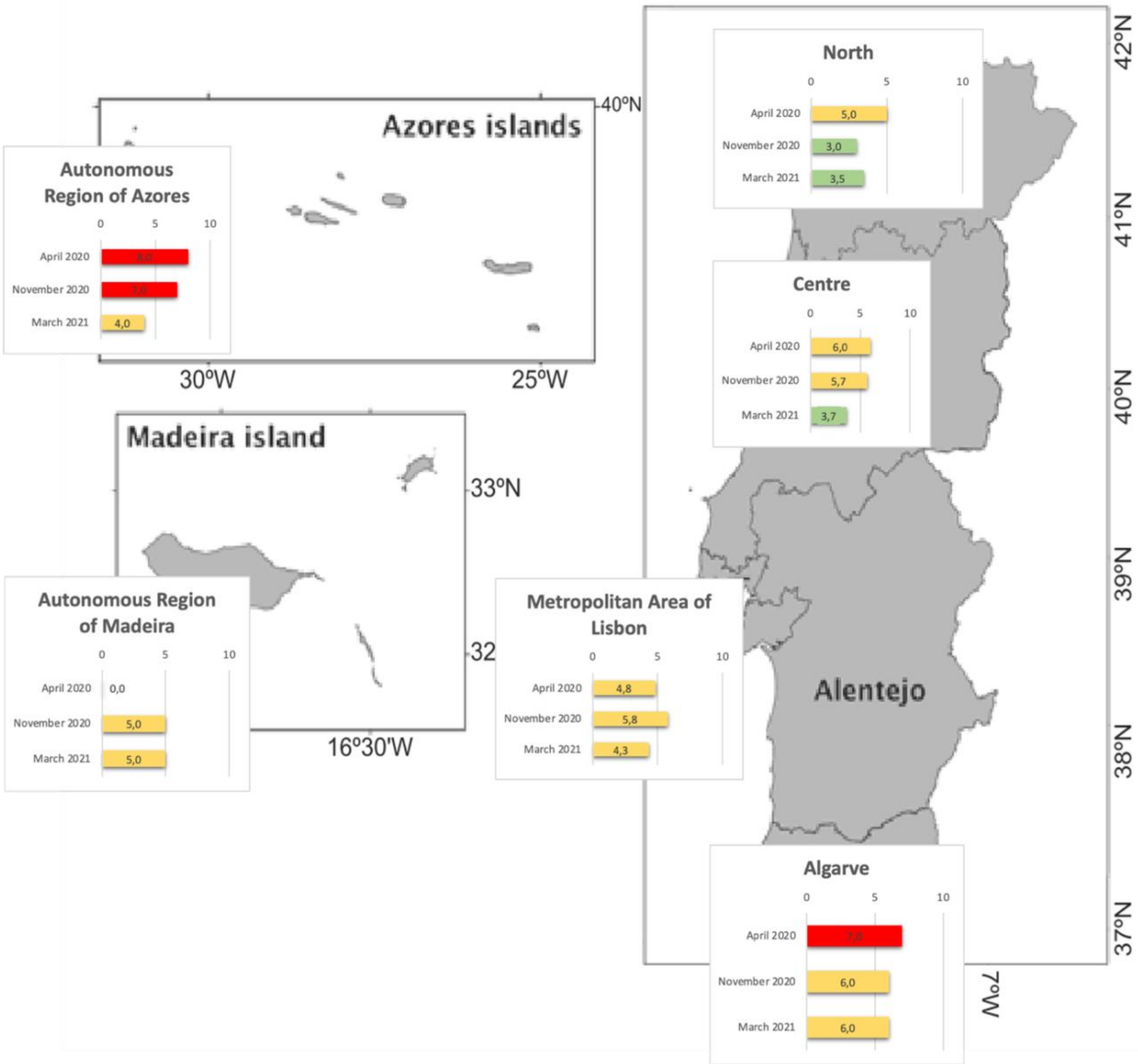

Figure 3.1. Map of Portugal with the classification by fishers interviewed about the overall impact of COVID-19 on the fishing sector over the period of the study. Scale: 0 to 3 =green (low impact); 4 to 6 = yellow (medium impact); 7 to 10 = red (high impact).

The analysis of the quantitative data, regarding the general economic impact of the pandemic on the Portuguese fishing sector, clearly shows that interviewees had a perception of more negative impacts in March and April 2020 (Figure 3.1). Along the year, even with the restrictions being applied with the second lockdown, interviewees perceived the impacts as less negative. The representatives of organizations of the Autonomous Region of the Azores reported the highest impacts. This is not surprising considering the high dependence of the Azores catch on international markets. Overall, 70–75% of all landings in the Azores are exported (mainly to mainland Portugal, Spain, Italy and Greece), making fisheries responsible for 20% of all the Azores' exports (Pita & Gaspar, 2020; Santos, 2017). The lockdowns, decrease in flights and closure of HORECA channels all over Europe had a strong impact on exports.

3.2. The reasons behind the socioeconomic impact of COVID-19

Regarding the reasons for the impact of COVID-19, all the answers from representatives of organizations were grouped by the main topics over the study period to better visualize changes (Figure 3.2).

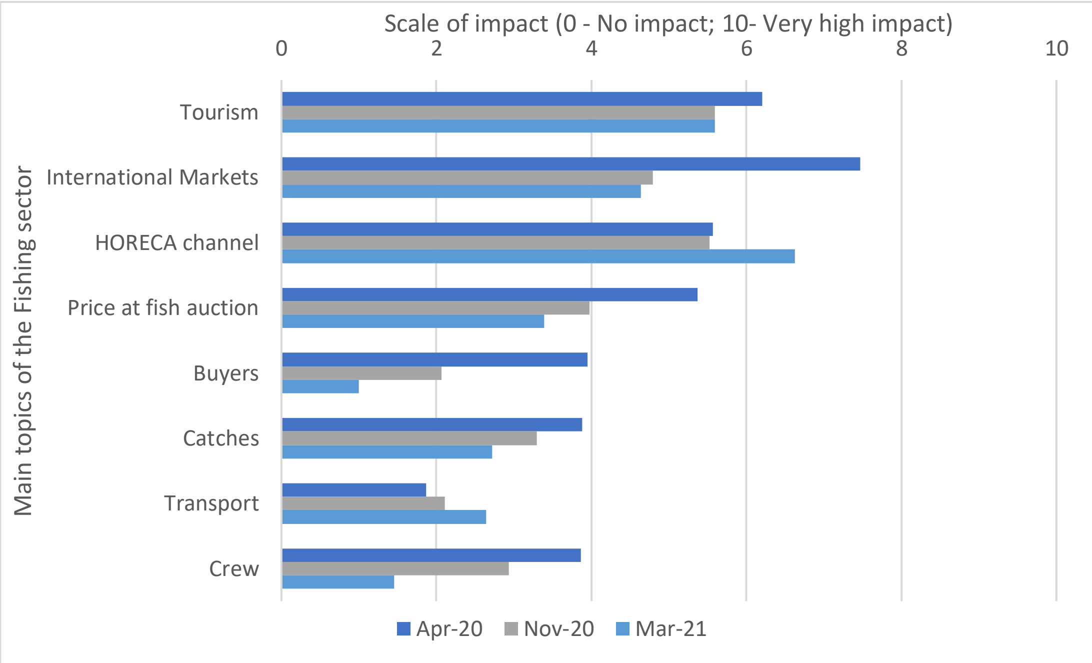

Figure 3.2. Reasons for the impacts of COVID-19 on the fishing sector attributed by all the representatives of fishing organizations interviewed.

The results from the 10-point scale, regarding the level of impact (Figure 3.2), show that the three most important reasons for the socioeconomic impact of COVID-19 on the Portuguese fishing sector were the loss of international markets, loss of tourism and closure of the HORECA channel, respectively. Apart from the impacts caused due to the closure of the HORECA channel and problems with transportation, the remaining reasons for the socioeconomic impacts were perceived to have decreased in importance throughout the first year of the pandemic.

The impacts of the loss of international markets, loss of tourism, decrease in price at auction, lack of buyers, decrease in catches and in crew, were perceived to have been higher during the first lockdown. The travel restrictions within and out of the country, and the mandatory curfew, contributed to these perceptions. Regarding international markets, all markets were closed in March/April 2020, as were the HORECA channels in these countries, leading to a decrease in demand and contributing to a fluctuation of prices at fish auction. Throughout the year and even with a second lockdown in Portugal, the impacts were not perceived as so negatively over time. The markets and the fishing industry adapted to the new reality and there were special measures to avoid price fluctuation such as prohibited fishing on weekends in the mainland decreasing fishing effort (Governo Português, 2020b) and regional financial support to the fishers who accepted to work in a rotating system (Governo Regional da Madeira, 2020).

However, the perceived negative impacts caused by the closure of the HORECA channel and problems with transport increased over time. This might be explained by the fact that the HORECA channel, even with the ease of some restrictions during summer and autumn was never able to work as completely as it used to. There were always restrictions such as reduced opening hours, reduction in the number of costumers or even total closures, with only take-away allowed, which resulted in less demand from these channels. Regarding problems with transport, the perceived increase in impact throughout the year might be due to restrictions of travel between councils. In fact, air transport saw its activity slowly return to normal but the main obstacle by the second lockdown, during the winter period, with the increase of number of cases of infection amongst the Portuguese population, was the police control between internal councils and country borders. In order to circulate a special permit was needed proving information that they were working, which led to long lines of traffic and longer travel journeys to reach the destination.

In the rapid assessment, carried out right after the first lockdown, in April-May 2020, the perceptions of representatives of the associations were that the impact on the fishing sector was very negative. Some fishing boats had stopped their activity either because they were afraid of the situation or they were forced to. There was a loss of revenue, higher in shellfish and crustacean trawling fishing, less affluence at fish auctions and specially in the Autonomous region of Azores exportation had stopped.

After the summer, when interviewed in November 2020, overall perceptions had changed a little. The perceived impact was still negative but not as bad as in the beginning. The summer season resulted in some improvements but was not as good as previous summers. The prices at auction increased when compared with the previous months, although not as much as to the levels of previous summers. The crustacean fishery was highly impacted. In the Autonomous region of Madeira, the impact was higher for the tuna fishery than for the black scabbard fishery.

After the winter period, in the interviews in March 2021, the impacts were still perceived to be mostly negative. However, not as bad as during the first lockdown. Prices at auction decreased more in April/May 2020, during the first lockdown than in January/February 2021, during the second lockdown. Most of the representatives of organizations considered the first lockdown more impactful than the second, even though there were some that considered the second lockdown worse due to the increase in fuel prices, and the closure of restaurants for a longer time. The bad weather and the fishing restrictions during the weekends contributed to the perceived negative impacts of the pandemic on the Portuguese fishing sector.

Indeed, the analysis of official landings data (table 3.1 and 3.2) showed that the first lockdown (March-May 2020) had a higher impact on the Portuguese fishing sector than the second lockdown (January-February 2021), with a decrease in the value of landing and on the average price of seafood in these period when compared to the same periods in 2017-2019, even though the second lockdown also had some negative impacts.

3.2.1. International markets and tourism

In the first assessment (rapid assessment), representatives of associations perceived that the most important reasons for the greater impact caused by the COVID-

19 pandemic was the loss of international markets. The Spanish and the Italian market, two of the main importers of Portuguese seafood (INE, 2020), were closed. There was also a big impact on the sector due to lack of tourism and closure of hotels and restaurants which lead to less fish demand. In some cases, it was pointed out that supermarkets became the largest buyers of fish, replacing restaurants. The representatives of associations showed some concern about the summer season and the possibility of cancelations of food festival and typical Portuguese celebrations as "Santos Populares", when a large amount of grilled sardines are consumed.

After the summer (interviews carried out in November 2020), the perception was that the impact was still negative and greater for those associations that have restaurants and hotels as major clients. They referred that some tourism returned during the summer, mainly from Portuguese tourists that took their holidays in their own country but that it was not enough to mitigate the impacts of the pandemic on the sector. The impact of the lack of international markets was not perceived as so large after the summer, since economies started slowly reopening at it was possible to export. Still, they were not exporting as much as in previous years. The prices at auction were also still low. The cancelation of summer food festivals had an impact on some fisheries, special purse-seining, which depends on sardine and the species decreased in value and consumption.

After the winter (interviews carried out in March 2021), interviewees perceived that international markets were not a major problem, as they were working and caused little impact. However, the prices of the exported species were lower than in previous years and when the second lockdown started some reduction in exports was observed again. Regarding the tourism the impact of the lack of tourists was considered important, and in some cases worse by this time, very related to the fact that restaurants were not working as usual. There was domestic consumption but it was not much. It was pointed that there was less demand than usual during Christmas and New Year's Eve what led to less consumption when compared to other years. Especially in the Autonomous regions, this period was perceived to have been worse due to low number of tourists, few restaurants buying seafood (mainly for local consumptions) and the prices of high-value species remained low.

The fishing sector from other countries worldwide also reported large market disruption. With the fishing sector being highly connected to international markets, the closure of countries by the time of the first lockdown, with travel restrictions and the closure of restaurants, local markets and hotels led to a reduction on import-exports, contributing to less demand and a general decrease of fish prices (Bennett et al., 2020; Love et al., 2021; OCDE, 2020). The same trend was verified in Portugal. The analysis of Portuguese commercial landings data (table 3.1 and 3.2) and also in studies with landings from the Mediterranean Sea (Coll et al., 2021) show the same trend of decreased fish prices. Regarding the Autonomous Region of the Azores, where most of the fish landings are high-valued species which are exported to the Italian and Spanish markets (INE, 2020), the impacts were much higher than in other parts of the country (table 3.1 and 3.2). In the case of the Autonomous region of Madeira, the situation was also negative but for different reasons, since most of the species are eaten locally, especially the black scabbard fish (Cardoso et al., 2013). The region is highly dependent on tourism that was strongly decreased by the time of the first lockdown due to all travel restrictions and also by the beginning of the year 2021 since normality has not yet been restored.

3.2.2. Fishing and selling at Fish Auctions

In the first round of interviews (rapid assessment in May 2020) the representatives of associations perceived the loss of catches and decrease of price at fish auction to be higher. The fact that a lot of fishing vessels stopped their activity contributed to some variation in catches and on fishing effort. The prices dropped during the first lockdown, especially those of high-value species. One of the interviewees reported to have not felt a decrease in prices since in the case of his association the fishers set the prices. Only hake and horse mackerel did not have variations in their prices. Interviewees pointed out that there was less demand at the fish auction and difficulties selling the fish, that was not worse due to the reduction of the fish auction schedule. They referred that there were changes on the type of buyers, with supermarkets and the canning industry becoming the main clients for seafood.

After the summer, by November 2020, the representatives of the associations kept approximately the same perceptions. It was pointed out that there were variations in catches and fishing effort with the prices being lower when compared with previous years, as there were also less species being landed. The high-value species such as Blackspot Seabream (*Pagellus bogaraveo*), Atlantic Wreckfish (*Polyprion americanus*), John Dory (*Zeus faber*) and European Seabass (*Dicentrarchus labrax*) usually sold to the HORECA channels did not have increases in prices, as it usually happens during the summer. In the case of crustaceans, interviewees perceived the impacts of the pandemic to be negative too as the prices decreased when compared to the usual prices. During the summer there were some improvements but it was not a summer as good as in previous summer seasons. The interviewees made reference to contingency plans and some changes in working schedules of the fish auction, however only one said that it did cause some impact on their work. All the others said that these changes did not cause any problem to their associates.

After the winter (interviews of March 2021), there were some changes in the perception of impacts. The representatives referred that variations in catches and effort by this time were due to bad weather and not so much because of the pandemic as was felt in the previous months. The prices were still lower than in previous winters, but more stable and the second lockdown did not interfere with those fluctuations. In some species such as horse mackerel, that usually are the cheapest ones, had a slight increase in the prices at auction. It was pointed out that buyers were the same, however they were buying less quantities. In the specific situation of the Autonomous region of Madeira, it was referred that the highest impact was on the black Scabbardfish fishery because it is a specie sold to local restaurants. Regarding the fish auction working schedules and contingency plans, in general the interviewees perceived that there were no negative impacts on the activity even though one of them reported there were some situations of delays on sales.

In mainland Portugal the main change referred at fish auctions was that the supermarkets started to buy more fish once the restaurants decreased their activity. It was noted at the fish auction that the number of buyers did not change but the quantity they purchased decreased. In some cases, there were changes in the type of buyers, since the canning industry and supermarkets started to buy more fish due to changes in consumer demand. During times of crisis there was always a turn to canned and frozen food and this crisis was no exception (Havice et al., 2020; Love et al., 2021; OCDE, 2020). With the decrease of prices at the fish auction and the fear of the unknown virus that was spreading around the world, there was a decrease in catches and fishing effort since a lot of fishing vessels decided to stop their activity in the beginning of the first lockdown and also a significant drop of the prices turning the activity unprofitable (Coll et al., 2021; Smith et al., 2020).

3.2.3 Transportation and Mobility of fishers

In the rapid assessment, the perceptions of representatives of the associations were that the impacts of problems related to transportation due to the pandemic were none or very few. One of the interviewees pointed out that they do their own transport of their products, so they did not feel any impact. The ones that referred some impacts were mainly related with exports, saying that there were some delays of containers and the prices to pay for transportation increased.

After the summer, when interviewed by November 2020, the representatives' opinions were still that the impacts caused by transports were scarce in Portugal. Some of them reported that the prices of transportation increased a little and there was less air transport available. It was also referred that due to the restrictions of mobility applied in Portugal, that did not allow for traveling between councils, there were some difficulties in driving in the country. This situation improved during and after the summer. The representatives' perceptions from the mainland were that there were a few obstacles on accessing other fish auction but after the end of the lockdown it went back to some normality. In the Autonomous Region of the Azores, despite the restrictions on docking in Ports that were not the one where the fishing vessels were registered, the representatives of Azorean associations did not feel that it negatively impacted their activity.

After the winter, by March 2021, the representatives' perceptions regarding the impacts of the pandemic on the transports were considered similar to the previous month. There were still less flights, especially felt from the Azorean association. It was pointed out that the restrictions on traveling between councils did cause some impact on distribution and there were some traffic lines in between borders. By this time, it was referred that there were no more problems with the access to other fish auctions.

Regarding problems with transportation and mobility, it was pointed out that there were impacts mainly with exports during the first lockdown. The closure of borders and cancellation of international passenger flights contributed to logistical problems and increased air freight costs affecting trade (Love et al., 2021; OCDE, 2020). By the time of the second lockdown the transportation of products did not face so many issues. Regarding ground transportation, the measures applied in Portugal by the time of the second lockdown did cause some constraints in the delivery of product, once travelling between councils was allowed, mostly due to labor issues. The traffic control in between municipalities resulted in difficulties in travelling between and outside of the country.

3.2.4 Crew

In the rapid assessment, perceptions were that the pandemic did not impact the crew too much. The main problem was considered to be the loss of income, that was worse for fishers engaged in shellfish fishery and those selling their catch on the international markets, but they were able to keep their job. Their perception was that the main problem with the virus was on land and not at sea, this even when they were saying that they have issues in keeping a safety distance onboard.

After the summer, when interviewed in November 2020, the representatives' perceptions were that the impacts on the crew were felt but with no bigger issues. The main changes were in the routines on land and in some situations, there was a reduction in the number of staff onboard. At the beginning of the pandemic it was referred that there were some fishing vessels that stopped fishing mainly because of the advanced age of their crew members, but that once they got confident, they went to work again. There were already some reports of infected crew. They pointed out that they tried to follow the safety measures on land, however onboard the mask is hardly used and the safety distance is difficult to keep due to the size of the boats and type of activity onboard. The representatives of associations that work with foreign crew members reported that there were issues with flights and the visas and delays on getting their crew.

After the winter (interviews of March 2021) their perceptions were the same. There were some impacts on the crew but very little. Despite one of the associations that pointed that they had to reduce the number of workers, all the others were able to keep the same number. By this time all the fishing vessels were working as usual. There were some reports of crew infected and in terms of safety measures, the interviewees referred that the face mask is usually not used on board and the safety distances are difficult to keep due to the characteristics of the vessels and the activity. The issues reported about the foreign crew were referred again.

Some points referred by the representatives of associations on this topic have been already identified in previous studies, such as the lack of commercialization channels of fresh seafood contributing to low incomes in fishing communities (Giannakis et al., 2020; Love et al., 2021; Steenbergen et al., 2020). This loss of income was higher for shellfish fishers and fishers targeting high-value species for the the HORECA channel. Portuguese fishers are an ageing workforce (INE, 2020), makes them to be considered a high risk group. However despite some having stopped their activity for this reason and for fear of spreading the virus to their families (Bennett et al., 2020), there were no bigger concerns since most of them had access to and used PPE (Lopez-Ercilla et al., 2021). The increase in the cases of crew infected coincided with the increase of cases in Portugal and the starting of the high season purse seine fishing that due to the number of people on board and the implications of fishing activity contributed to the rise of cases in the sector. The travel restrictions did not affect only the circulation of products but also of people, since some fisheries, especially industrial, use foreign crew (Havice et al., 2020). As there is lack of workers in the Portuguese sector (Garrido, 2018), some representatives of associations referred that the ones that had to employ foreign crew had difficulty in obtaining flights and visas on time. The work from home system showed some fragilities and in some cases it was pointed out that were not being productive as happen with the delay in obtaining visa and other documentation more often for industrial fishing.

3.3. Mitigation and adaptation measures implemented to face the pandemic

In the rapid assessment, carried out immediately after the beginning of the first lockdown, representatives of associations reported having already implemented some adaptation measures to deal with the pandemic. One of the mitigation measures referred was the weekend fishing ban to reduce effort and contribute to product flow.

Most of the interviewees pointed to huge difficulties in acquiring PPE at the beginning of the pandemic. Some of the associations immediately requested financial support, such as credit line, and resourced to lay-off. One of them referred that they did not request financial support to acquire PPE due to the process being too bureaucratic. For the specific case of the Autonomous Region of Azores, the representatives' association referred that the regional financial support was already starting to being paid. By this time only one of the associations reported that they had a contingency plan.

After the summer, when asked about the measures adopted to face the pandemic (interviews of November 2020), most of the representatives of associations referred that they were keeping the same measures since the beginning. They were applying the safety rules given by DGS as most of them also already had a contingency plan. Some of them hired cleaning companies to disinfect their work places. In the case of the bigger fishing vessels an isolation room was set up. In terms of financial support, most of them requested support to acquire PPE not pointing any problem with it, so by this time there were no issues in accessing this type of equipment. Some of the associations reported they had requested financial support by the credit line and of temporary cessation of fishing activity and there were criticisms of the process being time-consuming and bureaucratic. The representatives of associations from the mainland Portugal pointed out that they did not have any suspension of docking fees and some referred that the insurance company helped with ease of payment. The ones from the Autonomous region reported a suspension of fees at the fish auction, but not from the insurance company. It was referred that there was a support from a hotel in the Autonomous region of Madeira that was made available to give accommodation in case of crew members becoming infected. Some representatives referred that the associations gave their own support to their associates by suspending the association fees. By this time, the main concerns of the representatives of associations were the fact that fishers do not have savings, which can be a big issue in case the second wave happens. They were worried about the lack of product flow and the low prices. They shared the opinion that more support from the governments was needed and these ones should be given on time.

After the winter, when interviewed by March 2021, there was no reference to new measures adopted. The contingency plans and the safety measures were the same. However, some representatives of associations pointed out that they were being more rigorous in applying those rules. In terms of financial supports, they did not request new support. Still, it was pointed out that support stopped being available since January 2021. The representatives of the associations from the mainland referred that the suspension of docking fees had not yet been implemented, but that the support from the insurance company were still available. The access to PPE stayed available to all of them. Some interviewees referred that the support measures were not sufficient and adapted to the reality of the sector even though they knew it will be difficult to mitigate all the impacts of the pandemic. Those from the autonomous regions were of the opinions that the financial supports were enough and there was good communication between the associations and the government knowing that the reality of the archipelagos are different from mainland. By this time, the most prevalent opinion was that the first lockdown was worse than the second. During the first one the perceptions were that the prices dropped more, and no one was expecting a global closure. The ones that reported that the second lockdown as the worst stated that it was due to restaurants and hotels being closed for a longer time than they anticipated, since they are the biggest clients and the fact that they were worried that again the supply was more than the demand. One of the representatives referred that some services were being less productive with the home-working system. Most of them think that the media was not giving enough attention to the fishing sector, with only the ones from the Autonomous regions were having the opposite opinion. They were concerned that if until the summer 2021 there are again more restrictions, the fishers might not be able to face more impacts. One of the prevalent opinions was that the decisions made for the sector should have in consideration the differences in different parts of the country.

Concerning the mitigation and adaptation measures, the application of DGS safety rules and also the hiring of cleaning companies to disinfect their working places and vessels was pointed out by some representatives of the associations. An isolation room was made available in bigger vessels. Different types of financial support like a credit line of 20 million euros, financial support for temporary cessation of fishing activity, Layoff and to acquire PPE was made available by the Portuguese government. In other European countries, more governments made available financial aid for the sector, either through national or EU funding (Giannakis et al., 2020; OCDE, 2020; Ortega et al., 2020). Concerning the credit line, there were some considering that "support in loan format is just a postponing of the problem". Another type of support was the suspension of port taxes, such as docking and storage fees. In Spain, the autonomous communities of Andalusia and Valencia exempted the fishing sector from port taxes by 100 and 50% respectively, with this measure being different across the country (Ortega et al., 2020). The Portuguese situation was similar, regarding the suspension of fees: most of the associations from the mainland reported that to their knowledge this did not happen while the ones from the Autonomous regions of Azores and Madeira did suspend port fees. However, regarding the insurance companies, there was more cooperation between these entities on the mainland with these companies to facilitate association payments. In relation with the fishing organizations themselves there were some that suspended their quotas to help their associates. Regarding the financial supports, it was a bureaucratic process which led to some organizations not applying to it while the ones that applied pointed out that they had to wait a long time for the money to arrive, as also reported in a study in Cyprus (Giannakis et al., 2020). The one that worked better, since the opinions agreed, was for the acquisition of PPE; all the organizations interviewed applied to it and reported that it worked well, allowing the materials to be distributed by all associates, even though in the first weeks of the lockdown there were some difficulties in acquiring protective equipment. Since the beginning of 2021, there was no more financial support available from the government. Only the insurance companies maintained the ease of payments in the mainland and suspension of port taxes in the Autonomous Regions.

3.3.1 Changes in the system of selling

Not many interviewees reported immediate changes on the way they sold their catch. Only one of them referred that they were about to create an online platform on *Facebook* to have a fish auction and filming it online and to do direct sales.

After the summer and winter, the majority of representatives of associations referred no changes to the selling system. Only one that changed to direct sales during the first lockdown was starting to use the same system again by the time of the second round of interviews (end of the summer). Another reported that some of their associates sell their catch through a fish basket system.

During the last round of interviews (after the winter), one representative of an association reported to have made changes. These included fishers setting the prices of their catch and that there were some fishers selling directly over the phone and improving product delivery. The ones managing a fish basket system reported good sales during the pandemic. When asked about a permanent online structure to sell their products some of them perceive this to be a good idea. Others reported that an online structure could be useful to reach more clients and to contribute to ease the product flow. However, one of the main issues associated with this system was the difficulty in product delivery.

There were some reports of difficulties selling fish as there was a lot of supply and little demand. This situation led to the application of some mitigation measures at the national level, such as reducing the working hours of the fish auction and making online fish auctions freely available (Docapesca, 2020). To overcome the low demand at fish auction, a few associations tried to sell their products through online platforms and also by direct sales as verified in other countries (Bassett et al., 2021; Lopez-Ercilla et al., 2021; Love et al., 2021; Stoll et al., 2021). To control supply, one of the measures adopted by the Portuguese government was to forbid fishing activity on weekends, that lasted from 10th of April until 2nd of May 2020 (Governo Português, 2020b). Some complained about this measure, claiming that bad weather conditions during the week and this restriction at weekends made things even more difficult for fishers.

3.4 Portuguese commercial landings during the COVID-19 pandemic

An analysis was made to the landings in the harbours of interest to the associations involved in the interviews. This consisted in comparing monthly landings from 13 portuguese harbours for the periods between March-May 2020 (the first lockdown) and January-February 2021 (the second lockdown) compared to the previous three years. The analysis consisted of comparing monthly averages of quantity (Kg), value (€) landed and average price (kg/€) as presented in tables 3.1 and 3.2.

Table 3.1. Difference in percentage between monthly average of landed quantity (Kg), landed value (€) and average price(€/kg) of the most important fish auctions of the associations interviewed of the period March-May 2017-2019/March-May 2020.

	Difference between Average March-May 2017-2019/March-May 2020		
Fish auction	% change in landing quantity (Kg)	% change in landing value (€)	% change in average price (€/Kg)
Vila Praia de Âncora	15,0%	-2,0%	-16,5%
Esposende	124,6%	95,5%	-10,0%
Matosinhos	-57,5%	-40,9%	-8,4%
Aveiro	-16,1%	4,1%	1,0%
Peniche	-26,2%	-22,3%	-13,5%
Sesimbra	9,2%	-12,1%	-14,0%
Portimão	-46,8%	-35,4%	-19,8%
Quarteira	-18,1%	1,8%	-15,3%
Fuzeta	136,2%	70,5%	-31,7%
Vila Real de Santo António	-46,0%	-54,1%	-10,8%
Vila do Porto (Santa Maria, Azores)	20,3%	-5,0%	-7,4%
Santa Cruz da Horta (Faial, Azores)	-73,4%	-73,7%	-7,6%
Funchal (Madeira)	-10,4%	-11,3%	1,8%

Table 3.2. Difference in percentage between monthly average of landed quantity (Kg), landed value (€) and average price(€/kg) of the most important fish auctions of the associations interviewed of the period January-February 2017-2020/January-February 2021.

	Difference between Average Jan-Feb 2017-2020/Jan-Feb 2021		
Fish auction	% change in landing quantity (Kg)	% change in landing value (€)	% change in average price (€/Kg)
Vila Praia de Âncora	31,2%	27,5%	-5,9%
Esposende	129,4%	92,3%	4,3%
Matosinhos	-41,8%	-25,2%	4,0%
Aveiro	-39,1%	-25,6%	2,7%
Peniche	-18,1%	-11,6%	4,0%
Sesimbra	-56,9%	-20,3%	0,6%
Portimão	-29,3%	24,7%	-0,8%
Quarteira	103,4%	60,7%	-8,4%
Fuzeta	62,5%	76,9%	43,2%
Vila Real de Santo António	2,4%	-15,1%	13,5%
Vila do Porto (Santa Maria, Azores)	-70,9%	-60,8%	1,9%
Santa Cruz da Horta (Faial, Azores)	-8,4%	-30,7%	9,0%
Funchal (Madeira)	-29,9%	-23,0%	-5,9%

During the first lockdown, there were indeed variations in both landings and prices as reported by the interviewees. High-valued and exported species showed a decrease in both landings and prices while in more commercialized species there was an increase in demand (White et al., 2021). However, there was an overall decrease in prices and landings in general (Coll et al., 2021; OCDE, 2020). Portugal was not an exception with decreases in landings and even more significantly in prices, with all the ports analyzed showing decreases in fish prices (table 3.1).

For the second lockdown, by the time of this study, there were no published studies about the variation in both landing and prices. During January and February 2021, being the winter season in Portugal, the sea state is usually stormier and with stronger winds, that can also explain some variation in landings. However, when compared with the time of the first lockdown, it was verified that there was no negative difference in prices (table 3.2), showing that by that time even with restrictive measures worldwide due to the second wave of infections, the impact on the portuguese fish auction operations were not as big as in the first lockdown.

3.3 National news

Regarding the news articles collected during the study time, the 8 newspaper used for the analysis were *Agricultura e Mar Actual* (National Online Diary), *Açoriano Oriental* (Azorean Diary), *As Beiras* (Centre Diary), *Diário de Notícias* (Madeira Diary), *Observador* (National Online Diary), *Público* (National Diary), *Visão* (National Weekly magazine) and *Sul Informação* (South Diary) resulting in a total of 175 articles from 17th of March 2020 until 26th of May 2021. The number of articles per newspaper and the main themes covered are presented in table 3.3 .

Once labelled the news articles with the main theme, the specific themes and the publication month the results showed that the month with more news about the impact of COVID-19 on the Portuguese fisheries was April of 2020 (n=48) followed by March 2020 (n=27) and May 2020 (n=20).

Table 3.3. Number of articles per newspaper and themes covered.

	Number of articles by main theme						**Total number of articles**
	Markets	**Fish and Fish Auction**	**Transport and Mobility**	**Crew**	**Mitigation and Adaptation Measures**	**Sales system**	
Açoriano Oriental	25	6	6	0	3	1	41
Diário de Notícias	26	4	3	4	2	1	40
Agricultura e Mar Actual	28	10	0	0	0	1	39
Visão	11	2	1	1	0	1	16
Sul Informação	9	3	0	1	0	0	13
Público	4	0	6	0	0	1	11
Observador	5	1	2	2	0	0	10
As Beiras	1	2	1	1	0	0	5

The main news topic found was about Mitigation and Adaption Measures (n=109) followed by Fishing and Fish Auction (n=28), Crew (n=19), Markets (n=9), Transport and Mobility (n=5) and Sales system (n=5). For each of the main topics the 3 main specific themes found were: in the main topic about Mitigation and Adaptation Measures - Regional financial aid (n=33), National financial aid (n=22) and Credit line – national financial aid (n=14); Fishing and Fish auction – changes in catches and revenue (n=17), changes in fish auction (n=6) and changes in fishing activity and commercial fishing from land allowed (both with n=2); Crew – impact on the crew(n=12), Crew infected (n=6) and difficulty in applying safety measures (n=1); Markets – decrease on sales (n=4), consumption campaign (n=2); Transport and Mobility – restrictions on accessing other fish auctions (n=3), fuel price(n=1) and restrictions in crew mobility (n=1); Sales System – changes on sales system (n=5).

Throughout the year, there were monthly differences in the topic of the news specially in the specific themes (Figure 4). In every month there were news about the Mitigation and Adaptation Measures, however the specific theme kept changing. During the months of the first lockdown in Portugal (from March until May), the main theme in March 2020 was the suspension of fees (n=4), in April 2020 it was about the regional financial aid (n=17) and in May 2020 about the PPE aids (n=8). Concerning the themes about Fishing and Fish Auction already in March 2020 the main news were about changes in fish auction(n=3), in April 2020 about commercial fishing from land allowed (n=2) and in May 2020 it was about changes in fish auction (n=1) and changes in catches and revenues (n=1). Regarding the Crew, during the months of the first lockdown there were some news about the impact on the crew in March 2020 (n=3), in April(n=6) and in May there was about impact on the crew (n=1) and difficulty in applying safety measures (n=1) and in August the first news about crew infected started to appear. About the Markets only in May 2020 were there some news about the decrease in sales (n=2) and changes in markets (n=1) and then there are more news about the topic only from November 2020 onwards. Concerning Transport and Mobility there were a few news items in March 2020 about restrictions on accessing other fish auctions (n=2) and then in April 2020 again about restrictions on accessing other fish auctions (n=1), crew mobility issues(n=1) and fuel price (n=1). Relative to Sales System, in April 2020 there was one article about changes in the sales system.

During the months of the second lockdown in Portugal (from January to March 2021), although the number of news articles decreased, all the main topics were still present. In January 2021 there were some news regarding the Mitigation and Adaptation Measures writing about National financial aid (n=1) and the credit line (n=1); the Fishing and Fish Auction about changes on catches and revenue (n=1); the Crew about the impact on the crew (n=2). In February 2021, regarding the Mitigation and Adaptation Measures there were some about regional financial aid (n=3); the Crew about the crew infected (n=1); The Markets about HORECA channel issues (n=1) and the Sales System about changes on sales system (n=1). In March 2021, the news of Mitigation and Adaptation Measures were about regional financial aid (n=2) and national financial aid- credit line (n=1); the Fishing and Fish auction were about changes on catches and revenue (n=2). Over the year there was a decrease in number of news stories related with the impact of the pandemic on the Portuguese fishing sector. The increase of infection cases, the fact that the situation was no longer new and a certain habituation to the "new reality" might have contributed to this decrease in publications along the year.

In the past two decades, technological innovations had a tremendous impact on journalism and its audiences (Loosen & Schmidt, 2012; Napoli, 2011). It is becoming clear that the exposure to audience feedback, due to the use of online platforms, along with precarious wages appear to be driving journalism to produce news that people want to know, rather than keeping the traditional known journalism's role as providing news that citizens need to know (Hanusch, 2017; Tandoc, 2014). However, it should be kept in mind that media visibility can influence public opinion and discourse and the public understanding of social problems (Hilgartner & Bosk, 1988; Schoenfeld et al., 1979). Like other institutions in our society, media are shaped by external forces, such as organizational, economic, political, social, and cultural ones that influence the practices of news-gathering and the content of news. These dynamics have numerous consequences for whether and how social movements are covered (Andrews & Caren, 2010). Furthermore, the social distancing requirements and the mandatory curfews affected data collection in many research projects worldwide, leading to the need to use other sources of information.

That said, there was the need of using the news articles as a data source in order to obtain more data beside the questionnaires and commercial landings. Comparing all the data gathered there were some differences regarding the importance that the interviewed had given to some topics and the topics highlighted in the news articles. The main focus of the news along the year were about the Mitigation and Adaptation measures, especially the financial support and credit line made available by the government while in the field the association representatives had only positive comments mainly regarding the financial support for PPE acquisition and the financial aid from the regional governments. Regarding Fishing and Fish Auction was the second topic more published focused on changes on catches and revenue, either because there were some associations giving that information to the newspaper or because there were already some statistics being published. In terms of the changes and impacts in the Markets there was little focus on the topic even though this was the section where the results of the survey showed higher impact due to the pandemic. Considering the Crew there were some articles about the impacts on their routines and the infections cases, being the topic that had more matches with the results from the survey. Regarding the Transport and Mobility, the published news were focused on issues in the Autonomous Regions, where restrictions between fish auction and crossing Islands were more controlled. Lastly, regarding the Sales system, there were not many articles about the topic what coincide with the importance given by the surveys; there was indeed few changes with some associations choosing online sales to mitigate the decrease of other clients and some fish markets making home deliveries available.

Despite Portugal being one of the countries with the highest fish consumption where the fishing sector has an important role in the Portuguese culture, in general the media does not give much highlight to it with some exception in the case of regional newspapers where the amount of news about the fishing sector was higher. During this last year, the news were mainly about official announcements by the government, some published data or by some fishing associations and not so much through field research.

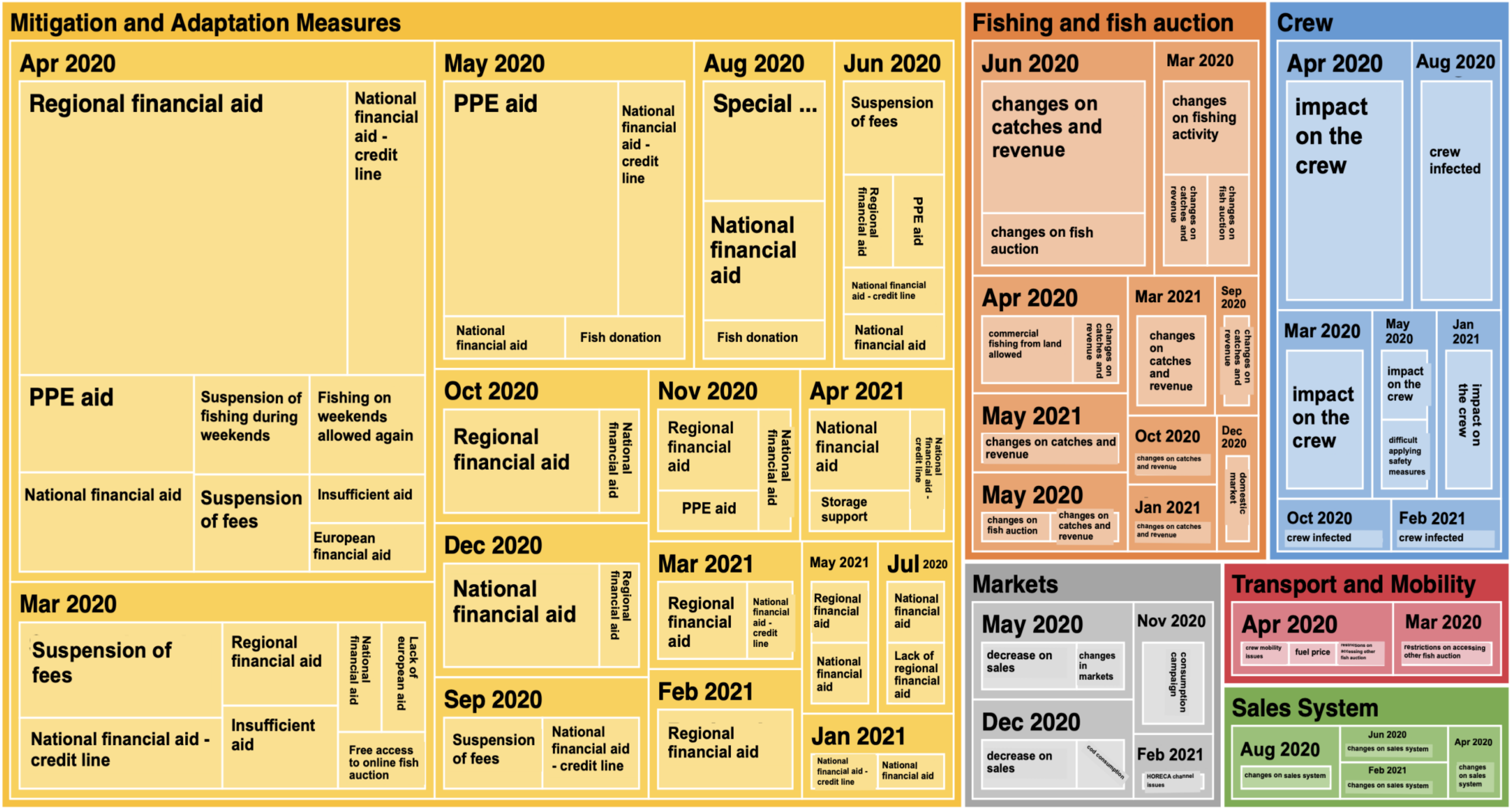

Figure 3.3. Hierarchy chart of the main themes of the news articles with the specific theme in each publication month.

4.Conclusion

This study allowed for a general overview about the impacts of the COVID-19 pandemic on the Portuguese fishing sector over its first year. The primary sector never stopped their activity completely even though it has been negatively impacted by the outbreak. The impact of the first lockdown (March to May 2020) was more negatively perceived than the second lockdown (January to February 2021), mainly because the sector is highly dependent of International Markets, HORECA channel and Tourism that practically stopped. The fact that fishers could not sell their catch to these markets led to a decrease in fish prices at auction and a decrease on effort, showing how volatile the market can be. The government acted quickly in launching mitigation measures especially in making available financial support and funding to acquire PPE. However, there was a common opinion regarding the financial support that the measure took too long to arrive to fishers with the exception of the Autonomous Regions where the communication and actions from the regional government were praised. The measure regarding the acquisition of PPE was the most successful. The high dependence of a large part of the Portuguese fisheries sector on international markets, the HORECA channels and the tourism activity, and the advanced age of most of the working force and lack of savings, contributed to it being easily impacted by the pandemic. Therefore, further research is needed to quantify all the impacts suffered by the sector and to create proper mitigation and adaptation measures appropriate to its needs. Measures like minimum sales price, direct sales, and shortening the value chain might be some measures to have in consideration for the future of the fisheries sector.

5. References

Alves, A. L. (2015). A Economia do Mar em Portugal: a estratégia e a realidade, num retrato doméstico e comunitário. *E.E.F. Mercados Financeiros*, 35–45. Retrieved from http://www.bancobpi.pt/content/conn/UCM/uuid/dDocName:PR_WCS01_UCM01011175

Andrews, K. T., & Caren, N. (2010). Making the news: Movement organizations, media attention, and the public agenda. *American Sociological Review*, *75*, 841–866. https://doi.org/10.1177/0003122410386689

Aura, C. M., Nyamweya, C. S., Odoli, C. O., Owiti, H., Njiru, J. M., Otuo, P. W., et al. (2020). Consequences of calamities and their management: The case of COVID-19 pandemic and flooding on inland capture fisheries in Kenya. *Journal of Great Lakes Research*, *46*, 1767–1775. https://doi.org/10.1016/j.jglr.2020.09.007

Bassett, H. R., Lau, J., Giordano, C., Suri, S. K., Advani, S., & Sharan, S. (2021). Preliminary lessons from COVID-19 disruptions of small-scale fishery supply chains. *World Development*, *143*, 105473. https://doi.org/10.1016/j.worlddev.2021.105473

Bennett, N. J., Finkbeiner, E. M., Ban, N. C., Belhabib, D., Jupiter, S. D., Kittinger, J. N., et al.(2020). The COVID-19 Pandemic, Small-Scale Fisheries and Coastal Fishing Communities. *Coastal Management*, *48*, 336–347. https://doi.org/10.1080/08920753.2020.1766937

Campbell, S., Jakub, R., Valdivia, A., Setiawan, H., Setiawan, A., Cox, C., et al.(2020). *Impact of COVID-19 on small-scale coastal fisheries of Southeast Sulawesi, Indonesia*. 1–22. https://doi.org/10.21203/rs.3.rs-39895/v1

Cardoso, C., Lourenço, H., Costa, S., Gonçalves, S., & Nunes, M. L. (2013). Survey into the seafood consumption preferences and patterns in the portuguese population. Gender and regional variability. *Appetite*, *64*, 20–31. https://doi.org/10.1016/j.appet.2012.12.022

Coll, M., Ortega-Cerdà, M., & Mascarell-Rocher, Y. (2021). Ecological and economic effects of COVID-19 in marine fisheries from the Northwestern Mediterranean Sea. *Biological Conservation*, *255*. https://doi.org/10.1016/j.biocon.2021.108997

Docapesca. (2020). ACESSO GRATUITO ao Leilão Online. Retrieved from http://www.docapesca.pt/pt/comunicacao/noticias/item/leilao-online-covid.html

EUMOFA. (2019). *The EU Fish Market - 2019 edition* (Publication). https://doi.org/10.2771/168390

European Commission. (2017). *SSF8- setting the scene to reinforce small-scale fishing in SWWAC area - 3/38. MARE/2014/04 – SI2.724092. BG Sea Consulting EIRL. Final technical report*. France.

European Commission. (2020). *Facts and figures on the Common Fisheries Policy - Basic statistical data* (2020th ed.). https://doi.org/10.2771/88869

FAO. (2017a). Fishery and Aquaculture Country Profiles - The Portuguese Republic. *Fisheries and Aquaculture Department*. Retrieved from http://www.fao.org/fi/oldsite/FCP/en/PRT/profile.htm

FAO. (2017b). *The state of world fisheries and aquaculture 2016. Contributing to food security and nutrition for all*. Rome.

Ferree, M. M., Gamson, W. A., Jurgen, G., & Dieter, R. (2002). *Shaping Abortion Discourse*. Cambridge, UK: Cambridge University Press.

Garrido, Á. (2018). As pescas em Portugal. In *Ensaios da Fundação*. Lisboa: Fundação Francisco Manuel dos Santos.

Giannakis, E., Hadjioannou, L., Jimenez, C., Papageorgiou, M., Karonias, A., & Petrou, A. (2020). Economic consequences of coronavirus disease (COVID-19) on fisheries in the eastern mediterranean (Cyprus). *Sustainability (Switzerland)*, *12*, 1–11. https://doi.org/10.3390/su12229406

Governo Português. (2020a). Decreto do Presidente da República n.◦ 14-A/2020, de 18 de março. *Lisbon: Presidência Da República Portuguesa (2020)*, 13-2–4.

Governo Português. (2020b). Portaria nº88-B/2020 de 6 Abril de 2020. *Diário Da República*, *1ªSérie*, *68*, 11–12.

Hanusch, F. (2017). Web analytics and the functional differentiation of journalism cultures: Individual, organizational and platform-specific influences on newswork. *Information Communication & Society*, *20*, 1571–1586.

Havice, E., Marschke, M., & Vandergeest, P. (2020). Industrial seafood systems in the immobilizing COVID-19 moment. *Agriculture and Human Values*, *37*, 655–656. https://doi.org/10.1007/s10460-020-10117-6

Hilgartner, S., & Bosk, C. L. (1988). The Rise and Fall of Social Problems: A Public Arenas Model. *American Journal of Sociology*, *94*, 53–76.

Ifremer. (2007). *Small-Scale Coastal Fisheries in Europe*.

INE. (2020). *Estatísticas da Pesca 2019*. Lisboa.

International Monetary Fund. (2020). *World Economic Outlook: The Great Lockdown*. Retrieved from Publication Services website: https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020

Knight, C. J., Burnham, T. L. U., Mansfield, E. J., Crowder, L. B., & Micheli, F. (2020). COVID-19 reveals vulnerability of small-scale fisheries to global market systems. *The Lancet Planetary Health*, *4*, e219. https://doi.org/10.1016/S2542-5196(20)30128-5

Loosen, W., & Schmidt, J. H. (2012). (Re-) discovering the audience: The relationship between journalism and audience in networked digital media. *Information Communication & Society*, *15*, 867–887.

Lopez-Ercilla, I., Espinosa-Romero, M. J., Fernandez Rivera-Melo, F. J., Fulton, S., Fernández, R., Torre, J., et al. (2021). The voice of Mexican small-scale fishers in times of COVID-19: Impacts, responses, and digital divide. *Marine Policy*, *131*. https://doi.org/10.1016/j.marpol.2021.104606

Love, D. C., Allison, E. H., Asche, F., Belton, B., Cottrell, R. S., Froehlich, H. E., et al. (2021). Emerging COVID-19 impacts, responses, and lessons for building resilience in the seafood system. *Global Food Security*, *28*, 100494. https://doi.org/10.1016/j.gfs.2021.100494

Napoli, P. (2011). *Audience Evolution: New Technologies and the Transformation of Media Audiences*. https://doi.org/10.7312/napo15034

NOAA. (2017). *Assessment of the social and economic impact of hurricanes and other climare-related natural disasters on commercial and recreational fishing industries in the Eastern, Gulf Coast, and Caribbean territories of the United States*.

Organization for Economic Co-operation and Development (OCDE). (2020). *Fisheries, aquaculture and COVID-19: Issues and Policy Responses*. (June), 1–10. Retrieved from https://www.oecd.org/coronavirus/policy-responses/fisheries-aquaculture-and-covid-19-issues-and-policy-responses-a2aa15de/

Ortega, M., Mascarell, Y., & Coll, M. (2020). *Monitoring of the COVID crisis in the Spanish Mediterranean Fisheries - Weathering the storm of COVID-19 crisis*.

Pascual-Fernández, J., Pita, C., & Bavinck, M. (2020). *Small-Scale Fisheries in Europe: Status, Resilience and Governance* (J. J. Pascual-Fernández, C. Pita, & M. Bavinck, Eds.). https://doi.org/10.1007/978-3-030-37371-9

Pita, C. (2020). The impacts of COVID-19 on small-scale fisheries in Europe Small-scale fisheries in Europe. In *ICES Reflections*.

Pita, C., Dickey, H., Pierce, G. J., Mente, E., & Theodossiou, I. (2010). Willingness for mobility amongst European fishermen. *Journal of Rural Studies*, *26*, 308–319. https://doi.org/10.1016/j.jrurstud.2010.02.004

Pita, C., & Gaspar, M. (2020). Small-Scale Fisheries in Portugal: Current Situation, Challenges and Opportunities for the Future. In *Small-Scale Fisheries in Europe: Status, Resilience and Governance* (pp. 283–305). https://doi.org/10.1007/978-3-030-37371-9_14

Pita, C., Pereira, J., Lourenço, S., Sonderblohm, C., & Pierce, G. J. (2015). *The Traditional Small-Scale Octopus Fishery in Portugal: Framing Its Governability*. https://doi.org/10.1007/978-3-319-17034-3_7

Pita, C., Roumbedakis, K., Fonseca, T., & Castelo, D. (2020). *Impacto da pandemia de*

Covid-19 nos sectores da pesca e aquicultura em Portugal (No. 1). https://doi.org/10.2760/45076

PORDATA. (2019). Agricultura e Pescas - Pescas. Retrieved December 16, 2020, from https://www.pordata.pt/Subtema/Portugal/Pescas-426

Santos, R. (2017). *Análise da evolução recente do setor das pescas nos Açores*. Universidade dos Açores.

Schoenfeld, A. C., Meier, R. F., & Griffin, R. J. (1979). Constructing a Social Problem: The Press and the Environment. *Social Problems*, *27*, 38–61.

Sheatsley, P. B. (1983). Questionnaire construction and item writing. In Rossi, J. D. Wright, & A. B. Anderson (Eds.), *Handbook of survey research* (pp. 195–230). San Diego: Academic.

Silva, P., Cabral, H., Rangel, M., Pereira, J., & Pita, C. (2019). Ready for co-management? Portuguese artisanal octopus fishers' preferences for management and knowledge about the resource. *Marine Policy*, *101*, 268–275. https://doi.org/10.1016/j.marpol.2018.03.027

Smith, S. L., Golden, A. S., Ramenzoni, V., Zemeckis, D. R., & Jensen, O. P. (2020). Adaptation and resilience of commercial fishers in the Northeast United States during the early stages of the COVID-19 pandemic. In *PLoS ONE* (Vol. 15). https://doi.org/10.1371/journal.pone.0243886

Steenbergen, D. J., Neihapi, P. T., Koran, D., Sami, A., Malverus, V., Ephraim, R., & Andrew, N. (2020). COVID-19 restrictions amidst cyclones and volcanoes: A rapid assessment of early impacts on livelihoods and food security in coastal communities in Vanuatu. *Marine Policy*, (August), 104199. https://doi.org/10.1016/j.marpol.2020.104199

Stoll, J. S., Harrison, H. L., De Sousa, E., Callaway, D., Collier, M., Harrell, K., et al. (2021). Alternative Seafood Networks During COVID-19: Implications for Resilience and Sustainability. *Frontiers in Sustainable Food Systems*, *5*(March). https://doi.org/10.3389/fsufs.2021.614368

Tandoc, E. C. (2014). Journalism is twerking? How web analytics is changing the process of gatekeeping. *New Media and Society*, *16*, 559–575. https://doi.org/10.1177/1461444814530541

Weisber, H. F., Krosnick, J. A., & Bowen, B. D. (1996). *An introduction to survey research, polling, and data analysis*. Thousand Oaks, CA: SAGE Publications.

White, E. R., Froehlich, H. E., Gephart, J. A., Cottrell, R. S., Branch, T. A., Agrawal Bejarano, R., & Baum, J. K. (2021). Early effects of COVID-19 on US fisheries and seafood consumption. *Fish and Fisheries*, *22*(1), 232–239. https://doi.org/10.1111/faf.12525

World Health Organization. (2020). Coronavirus Disease 2019 (COVID-19). In *Situation Report* (Vol. 94). Retrieved from https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200423-sitrep-94-covid-19.pdf

Annexes

Annex A – Questionnaire from April 2020

Questionário: Impacto do COVID-19 na atividade pesqueira

O surto do coronavírus (COVID-19) está a causar um impacto crescente na economia global, com consequências imprevisíveis, e o setor pesqueiro/aquacultura não são exceção. Gostaríamos de recolher informação de representantes de organizações de produtores (OPs, associações) relativamente ao impacto da pandemia do COVID-19 no setor. Como tal, vimos por este meio convidá-lo a preencher o seguinte questionário. A sua resposta contribuirá para a identificar os impactos do COVID-19 nesta indústria.

A informação recolhida será tratada em conformidade com o Regulamento Geral de Proteção de Dados (Regulamento da UE 2016/679) relativo à proteção e privacidade de dados. Todos os dados publicados serão anónimos. Os entrevistados têm o direito (a qualquer momento) de consultar e/ou retificar os seus dados pessoais, assim como de os eliminar. Se surgir alguma dúvida ou comentário sobre este estudo, por favor contacte Cristina Pita (c.pita@ua.pt). Estamos ao seu dispor para fornecer qualquer informação adicional. No final deste estudo, os resultados serão partilhados consigo.

Gratos pela sua participação.

Eu concordo com a participação (marcar com um *x*) ☐

Informação sobre si:

Nome:

Organização que representa:

Localização/localidade:

País:

Cargo que ocupada na organização:

Contacto (Email/telefone):

Impacto do covid19

1. Número de pescadores e/ou mariscadores membros da sua organização?

2. Quais as principais espécies capturadas pelos membros da sua organização? Enumere pelo menos as 5 espécies mais importantes.

3. Quais as principais artes de pesca utilizadas pelos membros da sua organização? Enumere pelo menos as 5 artes mais importantes.

4.1 Qual o tamanho médio das embarcações dos membros da sua organização?

4.2 Indique também o comprimento da menor e maior embarcação?

5. Indique qual o número médio de pescadores a bordo das embarcações associadas à sua organização (incluindo mestre e tripulação).

6. Qual a idade média dos pescadores e/ou mariscadores?

Impactos do COVID-19 na atividade pesqueira:

9. Indique se ocorreram **impactos económicos** (direto e indireto) entre os membros da sua organização devido à crise causada pelo COVID-19? 1 (= nenhuma perda económica) a 10 (elevados impactos económicos) (marcar com um *x*).

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

9.1. Se reportou impactos económicos, por favor estime a percentagem da perda de receitas entre os membros da sua organização (%)?

10. Indique se ocorreu alguma perda de **postos de trabalho** (perda de trabalho por parte dos pescadores, outras pessoas a trabalhar na sua organização) devido à crise causada pelo COVID-19. 1 (= não se registaram perdes de postos de trabalho) a 10 (= elevada perda de postos de trabalho) (marcar com um *x*)

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

10. 1. Quantos postos de trabalho foram extintos? (por favor estime o número)

11. Por favor indique a importância de cada uma das seguintes razões no **impacto socioeconómico** sofrido pela atividade pesqueira devido à crise causada pelo COVID-19. 1 (= sem qualquer importância) a 10 (= extremamente importante) (marcar com um *x*):

	1	2	3	4	5	6	7	8	9	10
1. a) Diminuição das capturas										
2. b) Decréscimo nos preços										
3. c) Impossibilidade/dificuldade na venda em lota										
4. d) Restrições logísticas de transporte										
5. e) Aumento dos custos de transporte										
6. f) Dificuldades/insolvência/abandono por parte das seguradoras										
7. g) Dificuldade por parte dos fornecedores na recolha de produtos da pesca										
8. h) Perda da procura devido à ausência de turismo										
9. i) Perda de mercados internacionais										
10. j) Perda de clientes habituais (escolas, restaurantes, etc.)										
11. k) Perda de compradores (intermediários)										
12. l) Dificuldade para encontrar tripulação										
13. Outra (Por favor especifique):										

12.1. Por favor indique que **medidas de adaptação** foram implementadas (ou estão no processo c ser implementadas) pela sua organização para fazer face à crise do COVID-19?

12.2. Que relevância têm as seguintes medidas para a sua organização?

	implementada		Relevância para a sua atividade									
	Sim	Não	1	2	3	4	5	6	7	8	9	10
1. a) Alteração das espécies alvo												
2. b) Alteração do esforço de pesca (tempo da faina, arte)												
3. c) Alteração das áreas de pesca												
4. d) Venda direta ao consumidor final												
5. e) Contratação de novos tripulantes												
6. f) Alterações nos compradores (e.g. indústria conserveira) ou mercado												
7. g) Alteração no armazenamento (e.g. congelação)												
8. h) Solicitou ajuda financeira (EU)												
9. i) Solicitou ajuda financeira (nacional)												
10. j) Solicitou ajuda financeira (local)												
11. k) Outra (por favor especifique):												

13. Por favor indique qual a importância dos seguintes impactos originados pela pandemia de COVID-19 **na saúde e bem-estar** dos pescadores?
1 (= sem importância) a 10 (= extremamente importante) (marcar com um *x*):

	1	2	3	4	5	6	7	8	9	10
1. a) Os pescadores estão assustados como o vírus										
2. b) Os pescadores estão mais vulneráveis ao vírus quando estão no mar										
3. c) Os pescadores precisam de cuidar das suas famílias										
4. d) Falta/escassez de equipamento de proteção individual (luvas, máscaras, desinfetante para as mãos)										
5. e) Condições de trabalho inadequadas (por exemplo, sobrelotação)										
6. f) Melhoria do relacionamento com outros atores da cadeia de valor										
7. g) Aumento da eficiência no trabalho										
8. h) Outra (por favor especifique):										

14. Tem alguma sugestão para investigação que deva ser implementada focada nos desafios que a sua organização/pescadores estão a enfrentar devido à pandemia?

15. Tem algum contacto ou associação que sugerisse contactarmos?

Comentários:

Annex B – Questionnaire from November 2020

Questionário: Impacto do COVID-19 na atividade pesqueira

No seguimento do questionário realizado em Março/Abril, gostaríamos de recolher nova informação de representantes de organizações de pescadores relativamente ao **impacto da pandemia do COVID-19 no setor**. Como tal, vimos por este meio convidá-lo a responder ao seguinte questionário. A sua resposta contribuirá para **continuarmos a identificar os impactos do COVID-19 na indústria pesqueira** e percebermos as suas alterações ao longo do tempo.

A informação recolhida será tratada em conformidade com o **Regulamento Geral de Proteção de Dados** (Regulamento da UE 2016/679) relativo **à proteção e privacidade de dados.** Todos os dados publicados serão anónimos. **Os entrevistados têm o direito (a qualquer momento) de consultar e/ou retificar os seus dados pessoais, assim como de os eliminar**. Vamos enviar o consentimento por email, que solicitamos que nos envie assinado.

Se surgir alguma dúvida ou comentário sobre este estudo, por favor contacte Cristina Pita (c.pita@ua.pt). Estamos ao seu dispor para fornecer qualquer informação adicional. No final deste estudo, tal como já aconteceu com a primeira recolha de dados, os resultados continuarão a ser partilhados consigo.

Agradecemos desde já a sua atenção!

Eu concordo com a participação (marcar com um *x*) ☐

Data da entrevista:

Informação sobre si:

a) Nome:
b) Organização que representa:
c) Cargo que ocupada na organização:

IMPACTOS DA COVID-19 NA ATIVIDADE PESQUEIRA

1. Indique se ocorreram **impactos económicos** (diretos e indiretos) devido à crise da COVID-19 imediatamente aquando do seu aparecimento? Numa escala de 0 (nenhuma perda económica) a 10 (perda económica muito elevada).

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

1.1. Qual foi o impacto? O impacto foi muito negativo/negativo/positivo?

1.2. Entretanto conseguiram recuperar (durante o verão)? Porquê? Como?

FATORES CAUSADORES DE IMPACTO SOCIOECONÓMICO

2. Impactos relacionados com mercados (interno e externo)

2.1. Qual foi o impacto associado ao **Turismo**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

2.1.1. Como? Porquê?

3.2. Qual foi o impacto da pandemia no **esforço de pesca**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

3.2.1. Conseguiram recuperar no verão? Conseguiram voltar ao mesmo esforço de pesca? E como foi o esforço comparável com o verão do ano passado? Se mudaram de espécies alvo, voltaram às anteriores?

3.3. Qual foi o impacto da pandemia no **preço em lota**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

3.3.1. Conseguiram recuperar no verão? Conseguiram voltar aos preços anteriores? Melhores/ Piores? E como foi o preço em lota em comparação com o verão do ano passado? Explicar.

3.4. Qual foi o impacto da pandemia no **número de compradores em lota** (nacionais e estrangeiros)? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

3.4.1. Aumentaram/diminuíram? Houve alguma alteração no tipo compradores (ex. mais conserveiras/congelação)? Voltaram a recuperar os compradores no verão? Explicar.

3.5. Qual foi o impacto da pandemia na **logística/funcionamento da lota**? (venda em lota, turnos, venda noutras lotas). Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

3.5.1. A logística ficou mais fácil durante o verão? Continua complicada? (venda em lota, turnos, venda noutras lotas, distanciamento social). Explicar.

4. Em relação ao transporte e mobilidade

4.1. Qual foi o impacto da pandemia nos **custos e disponibilidade de transporte**? (barco, avião, camião)? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

4.1.1. Conseguiram recuperar no verão? Os custos e disponibilidade voltaram aos valores anteriores?

4.2. Qual foi o impacto de não ter **acesso a outras lotas** (outras lotas e ilhas no caso da R. A. Açores)? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

4.2.1. Voltou ao normal? Ou não?

5. Em relação à tripulação

5.1. Qual foi o impacto da pandemia **na tripulação a bordo**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

5.1.1. Ocorreu alguma alteração no número de postos de trabalho? Mais/menos postos? Detalhar.

5.1.2. Tem conhecimento de **casos de infeção covid-19** em alguns dos seus associados?

5.1.3. Qual foi o **segmento de frota mais impactado** (cerco, arrasto, artesanal)?

5.1.4. Foram necessárias **novas contratações**? Se sim, teve dificuldade? Detalhar.

5.1.5. A falta de **mobilidade internacional** (filipinos, tailandeses e espanhóis) impactou na tripulação? Como?

5.1.6. Houve alguma **alteração na rotina dos pescadores** com mais idade/grupos de risco? pararam de trabalhar? voltaram ao mar no verão? Pararam para sempre?

6. Medidas de mitigação e adaptação

6.1. Que **atividades específicas/medidas de adaptação** foram implementadas (ou estão no processo de ser implementadas) pela sua organização para fazer face à crise do COVID-19? Quem as liderou/implementou (vocês/indústria? Ou estado?)

6.2. Medidas de proteção social.
6.2.1. Solicitaram/receberam **apoio/ajuda financeira**? Se sim, quais (ex. paragem atividade, etc.)? O quão burocrático considerou o processo (nada burocrático/demasiado, burocrático)? Estes apoios ainda continuam?

6.2.2. Tiveram acesso a alguma **isenção de taxas** (acostagem, lota, etc.)? Se sim, qual/quais? Foi uma medida benéfica? Continuam ainda?

6.2.3. Usufruíram de algum apoio por parte das **seguradoras**? Qual? Como? Continua ainda?

6.2.4 No caso de pescadores infetados, que tipo de **medidas de apoio** que tem disponíveis?

6.2.5. Outras medidas de proteção social? Quais? Continuam ainda?

6.3. Material proteção/Distanciamento social
6.3.1. Existe atualmente acesso a **material de proteção** (ex. máscara, álcool gel)? Usam a **máscara a bordo**? Existe **distanciamento de segurança**? Se não, porquê? Se sim, como?

6.4. Sistema de venda
6.4.1. Fizeram alguma **mudança no sistema de venda**? Se sim, qual? Acredita que essa mudança continuará a ser utilizada mesmo depois da pandemia COVID-19? Se não, estão interessados em fazer alguma mudança? Qual?

6.4.2. Implementaram algum **sistema de venda direta** (cabazes, venda nas redes socias, venda direta ao consumidor)? Se sim, qual? Mantêm o sistema? Se não, estão interessados em algum?

6.4.3. Que impacto teve/tem este sistema? (toma notas de explicação)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

6.5. Sabe de alguma campanha de sensibilização? Qual foi o impacto destas campanhas?

7. Planos de contingência para o futuro

7.1. Implementaram **planos de contingência** para o inverno/nova vaga/novas medidas?

7.2. Considera que a indústria está preparada para enfrentar esta 2ª vaga? Que medidas serão tomadas? Detalhar.

7.3. Os pescadores têm algum fundo de maneio disponível para esta 2ª vaga?

8. Principais preocupações neste momento (em que estamos a implementar medidas mais restritivas outra vez)?

9. Sugestões. Tem alguma sugestão de um assunto que deva ser avaliado relacionado com os desafios que a sua organização/pescadores estão a enfrentar devido à pandemia?

Annex C – Questionnaire from March 2021

Questionário: Impacto do COVID-19 na atividade pesqueira

No seguimento do questionário realizado em Novembro, gostaríamos de recolher nova informação de representantes de organizações de pescadores relativamente ao **impacto da pandemia do COVID-19 no setor**. Como tal, vimos por este meio convidá-lo a responder ao seguinte questionário. A sua resposta contribuirá para **continuarmos a identificar os impactos do COVID-19 na indústria pesqueira** e percebermos as suas alterações ao longo do tempo.

A informação recolhida será tratada em conformidade com o **Regulamento Geral de Proteção de Dados** (Regulamento da UE 2016/679) relativo **à proteção e privacidade de dados**. Todos os dados publicados serão anónimos. **Os entrevistados têm o direito (a qualquer momento) de consultar e/ou retificar os seus dados pessoais, assim como de os eliminar**. Vamos enviar o consentimento por email, que solicitamos que nos envie assinado.

Se surgir alguma dúvida ou comentário sobre este estudo, por favor contacte Cristina Pita (c.pita@ua.pt). Estamos ao seu dispor para fornecer qualquer informação adicional. No final deste estudo, tal como já aconteceu com a primeira recolha de dados, os resultados continuarão a ser partilhados consigo.

Agradecemos desde já a sua atenção!

Eu concordo com a participação (marcar com um *x*) ☐

Data da entrevista:

Informação sobre si:

a) Nome:
b) Organização que representa:
c) Cargo que ocupada na organização:

IMPACTOS DA COVID-19 NA ATIVIDADE PESQUEIRA

1. Indique se ocorreram **impactos económicos** (diretos e indiretos) devido à crise da COVID-19 imediatamente aquando do seu aparecimento? Numa escala de 0 (nenhuma perda económica) a 10 (perda económica muito elevada).

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

1.1. Qual foi o impacto? O impacto foi muito negativo/negativo/positivo?

1.2. Os últimos 3 meses como correram? Porquê? Como?
Qual dos confinamentos foi mais impactante? Porquê? Como?

FATORES CAUSADORES DE IMPACTO SOCIOECONÓMICO

2. Nos últimos 3 meses, Impactos relacionados com mercados (interno e externo)

2.1. Qual foi o impacto associado ao **Turismo**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

2.1.1. Como? Porquê?

2.1.2. Qual foi o impacto das novas restrições de inverno? Explicar.

2.2. Qual foi o impacto sentido devido ao fecho/redução do funcionamento dos **hotéis e restauração**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

2.2.1. Como? Porquê?

2.2.2. Qual foi o impacto das restrições no inverno e do 2º confinamento? Explicar.

2.3. Qual o impacto do confinamento durante o **Natal/Passagem de Ano**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

2.3.1. Como? Porquê?

2.4. Qual o impacto devido ao fecho/redução dos **mercados internacionais**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

2.4.1. Como? Porquê?

2.4.2. Foram sentidas alterações nos mercados com as novas restrições, foi equiparável ao 1º confinamento? E Verão? Explicar.

<u>3. Em relação à pesca e lotas</u>

3.1. Qual foi o impacto da pandemia no **volume de capturas**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

3.1.1. Houve alterações no volume de capturas? E como foi o volume de capturas em comparação com o inverno do ano passado?

3.2. Qual foi o impacto da pandemia no **esforço de pesca**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

3.2.1. Foi alterado o esforço de pesca? E como foi o esforço comparável com o inverno do ano passado? Houve alterações das espécies alvo, se sim, quais?

3.3. Qual foi o impacto da pandemia no **preço em lota**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

3.3.1. Houve alterações nos preços com as novas restrições? E como foi o preço em lota em comparação com o mesmo período do ano passado? Alguma semelhança com o 1º confinamento? Explicar.

3.4. Qual foi o impacto da pandemia no **número de compradores em lota** (nacionais e estrangeiros)? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

3.4.1. Aumentaram/diminuíram? Houve alguma alteração no tipo compradores (ex. mais conserveiras/congelação)? Explicar.

3.5. Qual foi o impacto da pandemia na **logística/funcionamento da lota**? (venda em lota, turnos, venda noutras lotas). Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

3.5.1. A logística sofreu alterações com as restrições de inverno? Alguma comparação ao 1º confinamento? (venda em lota, turnos, venda noutras lotas, distanciamento social). Explicar.

<u>4. Em relação ao transporte e mobilidade</u>

4.1. Qual foi o impacto da pandemia nos **custos e disponibilidade de transporte**? (barco, avião, camião)? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

4.1.1. Restrições de inverno e 2º confinamento causaram algum constrangimento? Os custos e disponibilidade viram os seus valores alterados? Foi equiparável ao 1ºconfinamento?

4.2. Qual foi o impacto de não ter **acesso a outras lotas** (outras lotas e ilhas no caso da R. A. Açores)? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

4.2.1. Tornou a haver restrições entre lotas? Ou não?

5. Em relação à tripulação

5.1. Qual foi o impacto da pandemia **na tripulação a bordo**? Numa escada de 0 (nenhum impacto) a 10 (impacto muito elevado)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

5.1.1. Ocorreu alguma alteração no número de postos de trabalho? Mais/menos postos? Detalhar.

5.1.2. Tem conhecimento de **casos de infeção covid-19** em alguns dos seus associados?

5.1.3. Qual foi o **segmento de frota mais impactado** (cerco, arrasto, artesanal)?

5.1.4. Foram necessárias **novas contratações**? Se sim, teve dificuldade? Detalhar.

5.1.5. A falta de **mobilidade internacional** (filipinos, tailandeses e espanhóis) impactou na tripulação? Como?

5.1.6. Houve alguma **alteração na rotina dos pescadores** com mais idade/grupos de risco? pararam de trabalhar? Continuaram a trabalhar?

6. Medidas de mitigação e adaptação

6.1. Que **atividades específicas/medidas de adaptação** foram implementadas (ou estão no processo de ser implementadas) pela sua organização para fazer face à crise do COVID-19 nestes últimos 3 meses/segunda vaga? Quem as liderou/implementou (vocês/indústria? Ou estado?)

6.2. Medidas de proteção social.
6.2.1. Solicitaram/receberam **apoio/ajuda financeira**? Se sim, quais (ex. paragem atividade, etc.)? O quão burocrático considerou o processo (nada burocrático/demasiado, burocrático)? Estes apoios ainda continuam? Pediu apoios para o 2ºconfinamento?

6.2.2. Tiveram acesso a alguma **isenção de taxas** (acostagem, lota, etc.)? Se sim, qual/quais? Foi uma medida benéfica? Continuam ainda?

6.2.3. Usufruíram de algum apoio por parte das **seguradoras**? Qual? Como? Continua ainda?

6.2.4 No caso de pescadores infetados, que tipo de **medidas de apoio** que tem disponíveis?

6.2.5. Considera que os apoios existentes para o sector têm sido suficientes?

6.3. Material proteção/Distanciamento social
6.3.1. Mantem-se o acesso a **material de proteção** (ex. máscara, álcool gel)? Usam a **máscara a bordo**? Existe **distanciamento de segurança**? Se não, porquê? Se sim, como?

6.4. Sistema de venda
6.4.1. Fizeram alguma **mudança no sistema de venda**? Se sim, qual? Acredita que essa mudança continuará a ser utilizada mesmo depois da pandemia COVID-19? Se não, estão interessados em fazer alguma mudança? Qual?

6.4.2. Implementaram algum **sistema de venda direta** (cabazes, venda nas redes socias, venda direta ao consumidor)? Se sim, qual? Mantêm o sistema? Se não, estão interessados em algum?

6.4.3. Que impacto teve/tem este sistema? (toma notas de explicação)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

6.5. Sabe de alguma campanha de sensibilização? Qual foi o impacto destas campanhas? (lota em casa, Docapesca)

6.6. Considera que a falta de infraestrutura de comércio online para a venda de pescado poderá ter contribuído para colocar o sector em desvantagem durante a pandemia? E o novo sistema "lota em casa"?

6.7. Seria útil criar uma estrutura permanente de comércio online para a venda online de pescado?

6.8. Que uso foi dado às redes sociais para a comercialização dos produtos durante a pandemia?

6.9. Que outra alternativa para a comercialização considera que podiam ser úteis para a sua organização?

7. Planos de contingência para o futuro

7.1. Implementaram **planos de contingência** para o novo confinamento ou foram mantidos os mesmos?

7.2. Considera que a indústria estava preparada para enfrentar um novo confinamento? Que medidas deviam ter sido tomadas? Detalhar.

7.3. Na globalidade, qual dos confinamentos considera mais impactante? Porquê?

8. Principais preocupações neste momento (em que foram implementadas medidas mais restritivas outra vez)?

8.1. O que considera que os pescadores poderiam mudar para enfrentarem melhor as consequências desta pandemia ou para estarem prontos para enfrentar uma próxima?

9. Sugestões. Tem alguma sugestão de um assunto que deva ser avaliado relacionado com os desafios que a sua organização/pescadores estão a enfrentar devido à pandemia?

10. Considera que a comunicação social está a dar atenção suficiente ao sector?