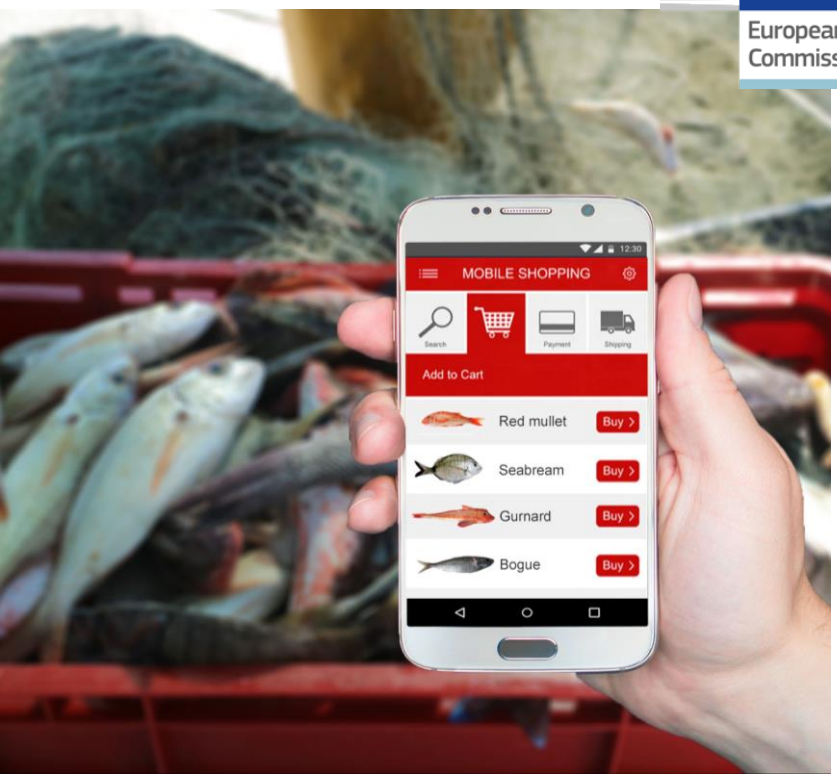
European Commission



ONLINE SALES OF FISHERY AND AQUACULTURE PRODUCTS

EUMOFA

European Market Observatory for Fisheries and Aquaculture Products

Maritimes Affairs and Fisheries

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LIST OF ACRONYMS

ACRONYM	EXPLANATION
B2B	Business to Business
B2C	Business to Customer
CSF	Community Supported Fishery
COVID-19	Coronavirus disease 2019
EU	European Union
EMFF	The European Maritime and Fisheries Fund
FAP	Fisheries and Aquaculture Products
FLAG	Fisheries Local Action Group
HORECA	Hotel/Restaurant/Café (food service and hotel industries)
IT	Information Technology
MS	Member State
PO	Producer Organisation
U.S.	The United States

1. AIMS AND METHODOLOGY

The objective of this study is to analyse the new challenges faced by stakeholders (fishermen and fish farmers), how these stakeholders utilise online sales and digital solutions, and the sales opportunities available across local, national, and global seafood markets.

The study should provide:

- Identification and analyses of online sales and technological tools used in selected EU MSs and one non-EU MS;
- Overview of platforms and initiatives for online sales of FAP established for and by producers, including examples established and exploited by fishermen and fish farmers, as well as their own innovative methods of reaching the market via online channels. Case studies relating to eight EU countries (Austria, Croatia, Denmark, Estonia, France, Germany, Portugal, and Spain) will explore the specific challenges and barriers faced by each party;
- Analyses of the role of Fisheries Local Action Groups (FLAGs)[1] and Producer Organisations in developing online sales, including specific examples of programs that help producers to attain key skills in administration, IT, language, and marketing);
- Identification of challenges (barriers to entry or other factors that delay progress); examination of barriers such as lack of IT skills, logistics, costs, and information, which are among the key obstacles that producers face in implementing digital solutions.

The study will explore and identify potential current and future opportunities (including ways of influencing the continued development of online seafood sales) and strategies for online sales success. An understanding of these issues will be formed using a methodology which includes data collection through stakeholder interviews, use of consumer, market and trade data, and qualitative comments from stakeholders. Initially, analysis of case studies from five EU Member States (Austria, Denmark, Croatia, France, Spain) and one non-EU country (U.S.) was proposed, but subsequently, together with DG MARE, it was decided to also include Estonia, Germany, and Portugal. In total, 9 countries and 11 case studies will be analysed in this report.

Countries and case studies were selected based on:

- ✓ The importance of the fisheries and aquaculture sector to the country
- ✓ Representative geographical coverage (south, west, east, and central Europe)
- ✓ Coverage of different business concepts (business to business, business to customer, internet platforms and Fisheries Local Action Group initiatives)

DATA

Data sources include literature reviews and stakeholder interviews, databases (consumption market and trade data), and qualitative insights obtained through preliminary interviews. A questionnaire template was prepared with a view to establishing a harmonised approach. Some scope was also left for interviewers to adapt sessions to the respondent and allow for the natural flow of conversation. The interviews were conducted prior to the COVID-19 crisis.

[1] Fisheries Local Action Groups (FLAGs) are partnerships between fisheries actors and other local private and public stakeholders

STRUCTURE

This study is divided into five parts: 1) objective, including a description of the study methodology; 2) introduction and literature review; 3) legal basis; 4) discussion with an emphasis on the organisation of online sales of FAP and main findings based on the interviews in selected countries; 5) lessons learnt with perspectives and future developments; and 6) conclusions.

2 INTRODUCTION

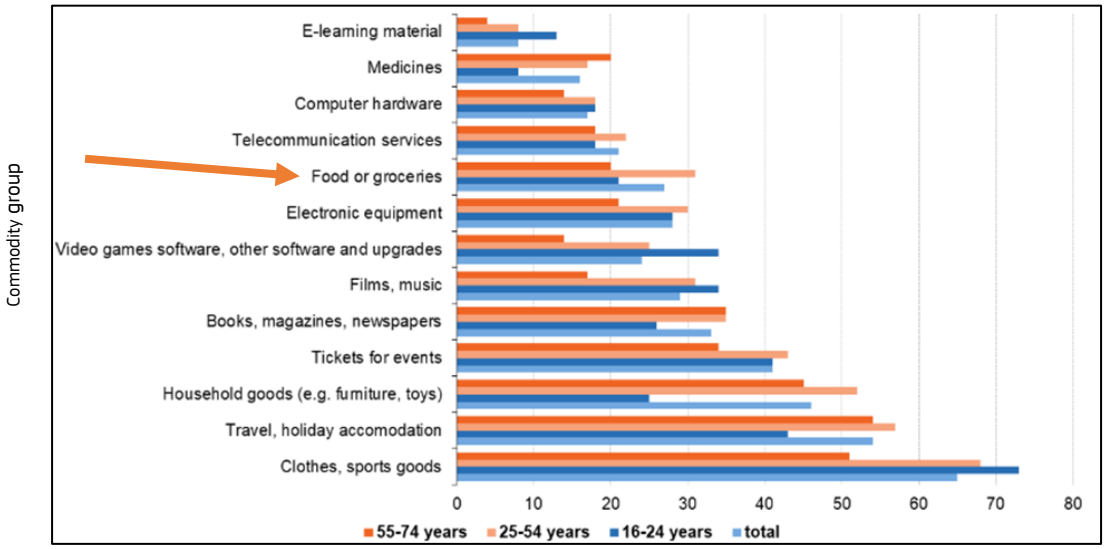
E-commerce or online shopping is becoming increasingly widespread in the EU as consumers continue to appreciate the various advantages that come with shopping from home, including freedom to shop remotely at any time, access to a broad range of products, and ease of making price comparisons. E-commerce in the European Union (EU) has grown steadily in recent years across all commodity groups. Today, the EU is one of the largest e-commerce markets in the world. The proportion of e-shoppers varies considerably across the EU, ranging from 29% of internet users in Romania to 91% in the United Kingdom[2]. The proportion of individuals aged 16-74 having shopped online in the 12 months prior to the 2019 survey stood at 63%.

Figure 1. Share of population that shopped online in 2019 (% of population aged 16 to 74)
Source: Eurostat, 2019.

[2] https://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics_for_individuals#General_overview The United Kingdom is no longer a Member State of the European Union since 1 February 2020

People between the ages of 25 and 54 make up the highest proportion (31%) of e-shoppers buying food or groceries, the commodity group within which fisheries and aquaculture products fall.

Figure 2. Percentage of online purchases by individuals who bought or ordered goods or services over the Internet for private use in EU-28, 2019.Source: Eurostat, 2020



E-commerce includes direct and indirect online sales of FAP. Direct online sales is an ultimate form of short chain distribution, as they involve a fisher or a retailer selling directly to the end consumer without intermediaries. Indirect online sales is the method whereby consumers buy a product from a wholesaler, retailer, dealership or some other intermediary. Both methods of online sales are present within the scope of this study. According to the Special Eurobarometer[3] survey conducted in 2018, a small proportion of EU consumers purchase FAP online (1%). In all but two countries (Sweden and Slovakia), online shops were the least popular place for consumers to purchase FAP, and in all but one case (Denmark: 6%), less than 5% of those surveyed buy fish from online shops

DIGITAL TOOLS

Online platforms such as search engines, social media platforms, e-commerce platforms, app stores, and price comparison websites play an increasingly important role in social and economic life. As more consumers purchase food products online, fisheries and aquaculture stakeholders are increasingly introducing initiatives to make their products available according to their customers' priorities and needs. Compared to other categories of food, FAP sales have been slow to move online. However, an increasing number of stakeholders and online sales platforms for fisheries and aquaculture products at a national level are making the transition. The seafood industry is far away from the point at which FAP online sales will represent a significant portion of total sales, but – based on examples of online sales initiatives of FAP in non-EU countries – there is clear potential for the development of online sales in Europe. The development of the online sales of FAP at the EU level differs across Member States. In some cases, online seafood sales are emerging while in others e-commerce of FAP is almost non-existent. This discrepancy may be due to variations in lifestyle, culture, consumer preferences, shopping behaviour, or lack of available online sources.

[3] Eurobarometer "EU consumer habits regarding fishery and aquaculture products", 2018, available at: https://ec.europa.eu/commfrontoffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/84923

COVID-19

COVID-19 is the name of the infectious disease caused by the most recently discovered coronavirus (SARS-CoV-2), unknown before its outbreak in Wuhan, China in December 2019. Most countries world-wide have implemented a diverse range of social restrictions and lockdown measures including travel restrictions, social distancing measures, and closure of restaurants and cafés, bars, hotels, schools, and non-essential businesses in order to reduce the spread of the virus. In many EU Member States (MS), fishmongers, fish markets, and fresh counters in retail stores were also closed, leading to reduced fishing activities and a substantial drop in demand for fisheries and aquaculture products. This situation has forced the fisheries and aquaculture sector to take advantage of online sales channels and home delivery models in order to remain solvent. Adapting to the restraints of lockdowns, Europe's online sales have boomed during the crisis. Fishers, farmers and retailers with existing online services and delivery logistics quickly experienced capacity restraints as demand increased sharply. With the loss of HoReCa, suppliers have also found new ways of selling their products, including direct sales to customers through online channels and home delivery. COVID-19 has arguably forced many traditional sales outlets to think differently and embrace new technologies, while consumers were forced to stay at home and to try new methods for shopping[4].

3 LEGAL BASIS

The EU food law and complementary national legislation, which provide the legal basis for the placing of food on the market in general, are also applicable when food including FAP are sold over the Internet[5]. Online transactions of FAP that take place directly or indirectly are subject to legal limitations and requirements. Such controls may have a variety of origins (EU, national, regional, local) and vary in scope (e.g. business law, food and safety requirements, control of fishing operations, consumer information and traceability requirements, and local planning regulations).

In the EU, food safety information[6], business law, and consumer information of FAP (article 35 on "mandatory information", article 39 on "additional voluntary information" of Regulation (EU) No 1379/2013 on the common organisation of the markets in fishery and aquaculture products)[7] are the primary legislative areas that must be adhered to both in online and retail FAP sales. Member States are often ultimately responsible for implementing more restrictive frameworks for direct sales operations within their own countries.

At the EU level, the Council Regulation (EC) No 1224/2009 states that fisheries products may only be sold to registered buyers and Producer Organisations or via registered auctions, and that a first sale note must be established[8]. However, according to article 59 of that Regulation, "a buyer acquiring fisheries products up to an amount of 30 kg which are not thereafter placed on the market but used only for private consumption shall be exempted" from these obligations, thereby allowing some flexibility in terms of direct sales.

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[4] https://eumofa.eu/covid-19

[5] https://ec.europa.eu/food/audits-analysis/overview_reports/act_getPDF.cfm?PDF_ID=1340

[6] Regulation (EC) No 178/2002 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02002R0178-20190726&from=EN

[7] Regulation (EU) No 1379/2013 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1379&from=EN

[8] Council Regulation (EC) N° 1224/2009 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02009R1224-20190814&from=EN

The Digital Single Market strategy adopted in May 2015 aims to ensure better access for consumers and businesses to online products and services across Europe, for example by removing barriers to cross-border e-commerce to create an affordable high-quality parcel delivery, the modernisation of data protection, and access to online content while increasing consumer rights and protection[9].

In terms of consumer information, EU legislation also states that "small quantities of products sold directly from fishing vessels to consumers" may be exempted from information requirements related to the catch area, the production method, and the commercial designation of the species[10].

Similarly, regarding food safety, EU laws[11] do not apply "to the direct supply, by the producer, of small quantities of primary products to the final consumer or to local retail establishments directly supplying the final consumer". National laws do regulate such practices, including what is permitted/required regarding food safety during direct sales operations. Whole fish and shellfish are commonly allowed to be sold directly, while processing operations, such as filleting, require certain adaptations to point of sale (so that they can operate according to set standards under EU law) and are therefore typically permitted only for limited quantities.

EU legislation also requires that fisheries products be traceable at all stages of the value chain. However, traceability requirements may be waived by national authorities for small quantities sold directly from fishing vessels to consumers, provided that these do not exceed the value of EUR 50 per day per consumer. At national level, some countries (for example Spain) have an obligation to land and/or sell all fish of some specific species through an official auction. This can represent a barrier to direct sales, but fishermen are sometimes able to buy back their fish through the auction before selling directly. This means that an auction obligation does not always prevent the development of direct sales activities[12].

4 ONLINE SALES OF FAP IN THE EU

Many primary food producers try to sell some of their products online, to the next step of the supply chain or directly to consumers, and thereby circumvent other forms of trade. Online sales of FAP may take place through a range of channels, including producers' own websites, intermediate traders' or retailers' websites, and dedicated online platforms. Retailers and producers without a website may sell their products via sales platforms (detailed below) or social media networks. Products sold online can be delivered by post, parcel delivery services, the sellers' own transport or contracted transport.

In the study we cover following organisational concepts in online sales:

- **Business to consumer (B2C)** – refers to commerce between a business and an independent consumer. Most companies that sell directly to consumers are considered B2C companies.
    - **Direct sales** are the most common model, in which consumers buy goods from online retailers or fishers.
    - Other business models include **online intermediaries** such as **online platforms** connecting buyers with sellers, and **community-based models** which use social media platforms such as Facebook. These models work by establishing communities based

[9] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52015DC0192

[10] Regulation (EU) No 1379/2013. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013R1379

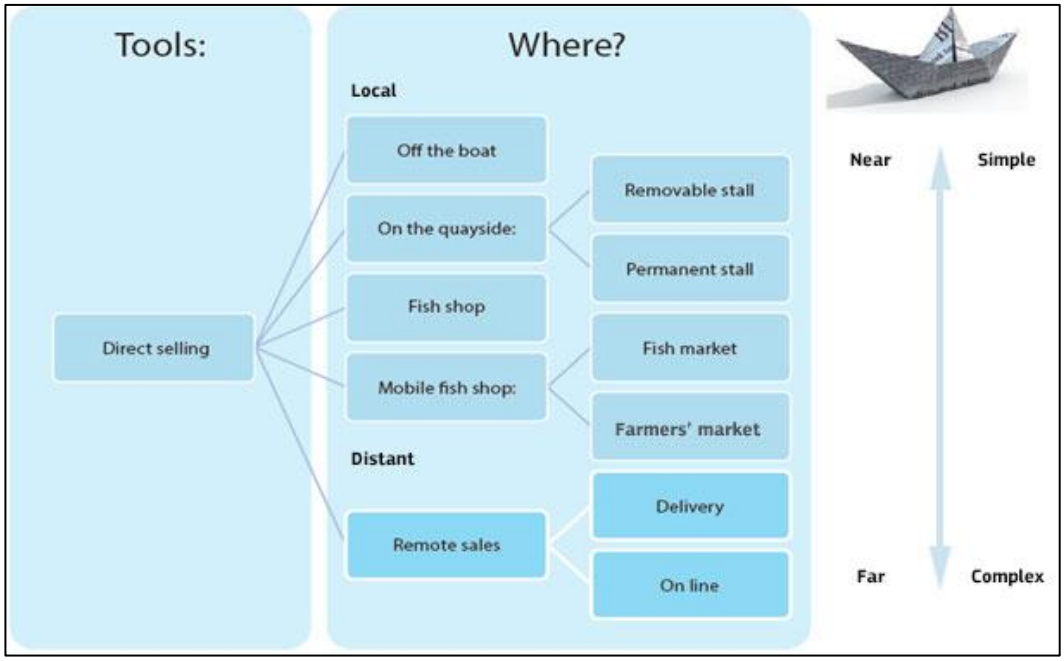
[11] Regulation (EC) No 852/2004 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004R0852&from=EN

[12] FARNET, Marketing the local catch -– European Commission.

on shared interests to help producers and advertisers promote their products directly to consumers. These two models are also regarded as direct sales, but since they require an intermediate step before the products reach the end consumer they are referred to as "direct sales in the broader sense".

- **Business to business (B2B)** – refers to commerce between two businesses. Transactions at the wholesale level are typically considered to be business-to-business

Figure 3. Methods of direct sales which include online sales.
Source: "Marketing the local catch", FARNET, European Commission, 2014.



5 MAIN FINDINGS – CASE STUDIES IN SELECTED EU MEMBER STATES

5.1 Austria

In 2017, 19% of Austrian consumers ordered food products via online channels. This was lower than the EU average of 24%[13].

In 2017, apparent consumption[14] of FAP in Austria was estimated at 13,2 kg per capita, a slight decrease compared with 2016 (-0,8%). The country is characterised by a low percentage of regular fish consumers, namely those who eat fishery and aquaculture products at least once a month (54% on average in the country, compared with 72% on average at EU level). In each age group, the proportion who consume seafood regularly is lower than the EU average. Austrians consume more frozen products than fresh and fish (51%) is less frequently consumed than at EU level (68%)[15].

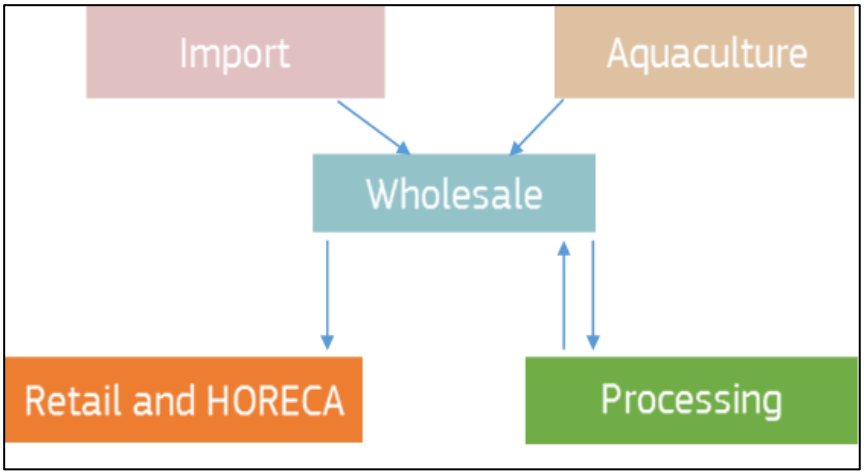
[13] Eurostat, Digital economy and society in the EU 2017 https://ec.europa.eu/eurostat/cache/infographs/ict/bloc-2a.html

[14] Apparent consumption = [total catches – industrial catches) + aquaculture + imports] – exports

[15] EUMOFA, "EU consumer habits regarding fishery and aquaculture products", 2017.

As a landlocked country, Austria's fish supply relies primarily on imports and, to a lesser extent, domestic freshwater aquaculture production (mostly trout and carp).

Figure 4. The supply chain of fisheries and aquaculture products in Austria.
Source: Global Agriculture Information Network.



CASE STUDY: Blün – Fresh Fish from Vienna

"Blün – fresh fish from Vienna" is an aquaponics[16] company located in Vienna, which combines vegetable and fish farming in large glass structures to produce aubergines, tomatoes, cucumbers and peppers, as well as catfish. The fish are sold as fillets, in line with customer preferences for filleted fish. Blün relies on the mode of production according to the principles of circular economy. Wastewater from the fish nourishes the plants or vegetables, in order to improve the sustainability and efficiency of the production and proximity with the market. The company utilises both B2C and B2B concepts (local restaurants), which each account for 50% of annual turnover. The company currently employs 4 people.

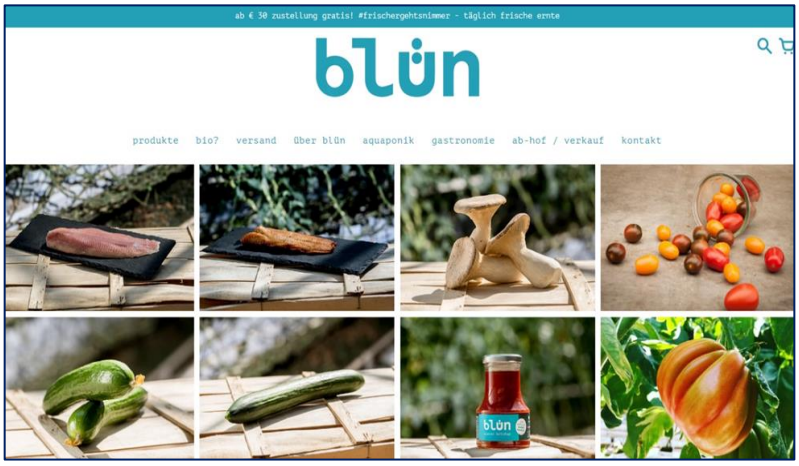


Photo 1. Blün online sales website. Source: www.bluen.at

Blün's aquaponics initially began with an annual production level of 15 tonnes of fish and vegetable production across 500 m². In 2019 the company produced 25 tonnes of fish and 8 tonnes of vegetables, with a long-term plan to reach a cumulative production level of 70-75 tonnes annually by 2021. This level of production was reached at the beginning of 2018. Juvenile fish are currently

[16] Aquaponics is the combined activity of fish production (aquaculture) with vegetable cultivation using a hydroponic technique.

purchased externally, however the company has plans to produce fish larvae on site. Fish labelled as 'Viennese fish' are sold from the farm's premises in Schafflerhofstrasse, online, and in well-known restaurants and cafés.

Online sales of fish began in 2018 and are growing significantly. Blün uses social media (Facebook, Instagram) and other marketing tools to promote their online sales, and the full range of products is advertised on the company's website. Prices and species available for sale are clearly advertised, and payment is possible by card or cash. The turnover of online sales in 2018 was approximately EUR 20.000 and is trending upwards (revenue doubled in 2019 compared to 2018). The minimum order for fish is EUR 30 with a delivery fee of EUR 6, although orders above EUR 60 are exempt from delivery charges. The efficacy of online sales is monitored through customer satisfaction. The vendor sends a short online questionnaire to buyers, then assesses their rating and feedback to improve quality and services. Blün plans to invest further in their online sales tools to maximise sales and system efficiency.

Deliveries are made twice weekly to restaurants and are delivered by post within 6 hours to private customers in Vienna and its wider area. Products are delivered in specially designed boxes which maintain freshness by keeping temperatures low. An insulated box is equipped with two high-performance cool batteries that keep the box cool below 9°C for 48 hours. The box is delivered after a maximum of 24 hours after an order is placed. If the customer is not satisfied with the product, returns may be made free of charge and with a full refund. According to Blün's customer feedback, a typical consumer is 30-50 years old, with both genders equally represented. Their typical customers are also highly educated, have a high income and an interest in healthy lifestyles.

The total operational budget for the company set-up was EUR 174.367. Budget contribution from the European Maritime and Fisheries Fund (EMFF) 2014-2020 was around EUR 30.000 (a total share for technical investment was 40% from the EMFF).

Advantages of online sales for the company include the following: elevated reach to a wider group of potential customers, easy access to buyers, and many returning customers who derive satisfaction from the freshness and quality of fish.

The main disadvantages or challenges are distribution, packing, handling orders and logistics, all of which all must be done in a short time. Additionally, attracting new customers is a significant challenge.

Future

Blün does not sell fish at traditional fish markets due to a lack of capacity and high competition perceived in the area. The company does not see any threat of online sales to the traditional fishmonger as they feel they have identified distinct groups of customers who prefer different purchasing methods. Blün's long-terms plans are to add value and increase prices by continuing to sell directly to customers, as they do not see growth to a level at which they will deal with large retailers (i.e. supermarkets) as a future possibility. In the next 5 years, Blün plans to diversify fish production by introducing local species. After expansion, they plan to apply to the next European Fisheries Fund to increase its capacities and annual production.

5.2 Croatia

In 2019, about 67% of Croatian consumers ordered products via online channels, of which less than 5% bough food products[17].In 2017, apparent consumption was estimated at 18,7 kg per capita, an 8,7% increase relative to 2016. Regular consumers (those who eat FAP at least once a month) mainly belong to the age groups 40-54 and over 55. Young people (15-24) are less inclined to consume fish than other age groups. Regular consumers within this age category stand at 63%, which is lower than the EU level (67%). Fresh products are the most consumed products in Croatia, with more loose (unpacked) fish consumed (69%) than at EU level (68%)[18].

Croatian fish and seafood supply chains rely on both marine fisheries and aquaculture. Aquaculture includes the production of European seabass, gilthead seabream and fattened Atlantic bluefin tuna, and production of trout and common carp through freshwater aquaculture. National supply is supplemented by imports, and feeds both domestic markets and the processing industry (canning and freezing). The mariculture (especially bluefin tuna) and canning sectors (especially sardine) are strongly export-oriented.

CASE STUDY: **BuyFish.eu**

BuyFish Shop was the first electronic fish market in Croatia. It was opened in 2018 by the "Mare Croaticum" fishermen's association located in Umag, Croatia. The purpose of the initiative was to connect fishermen with customers while selling fish at the best price available, and to make the delivery process of FAP more efficient. The initiative was primarily intended as an efficient sales tool to aid producers and customers in areas where there are no traditional auction markets. Coverage extends across the northern Adriatic, with potential to expand into neighbouring countries (Italy and Slovenia). The online shop was closed in early 2019 due to a lack of interest from fishermen and relevant national and local institutions, shortage of administrative human capacity and financial resources, as well as lower-than-expected online sales. The market facilitated a B2B concept that aimed to assist fishermen who sold their products, and all relevant stakeholders to purchase FAP. Stakeholders included all first buyers, including intermediaries such as fishmongers, restaurants, and supermarkets.

Photo 2. Small-scale fisherman in Croatia could benefit using online sales.

[17] https://ecommercedb.com/en/markets/hr/all

[18] EUMOFA, "EU consumer habits regarding fishery and aquaculture products", 2017.

Online sales through the electronic market were organised by the individual fishermen, while the association ensured that the platform worked efficiently. The electronic fish market functioned as an internet auction: a registered fisherman inserted the catch quantity, uploaded a photo of fish species available with a price and auction time (hours, days), and then a potential customer would submit an offer. Prices were determined by the fishermen themselves, who accepted the best price by wholesalers during a given bid period. Once the fisherman had accepted a bid, they contacted the wholesaler who was then able to see the full profile and location of the fisherman. Fishermen and purchasers were free to agree on their preferred pick-up point and payment method, although all parties had to be registered on BuyFish. The platform did not act as an intermediary at any stage in the process. Products offered included fresh whole fish, mainly from trawl and shellfish fisheries, which usually require one working day spent at sea (this is common for most of the Croatian fishing fleet). Around 100 users were registered, and two people were involved in administration of the platform. Users were able to complete a purchase either by card or cash. There were no specific promotional campaigns due to lack of financial support, and only a couple of sporadic promotions on local and regional websites, radio stations, and through fishermen promoting it via their own channels, with limited success. For development of their electronic shop, Mare Croaticum received financial support amounting to EUR 3.000 from Istria County. Other funds were not granted due to various difficulties, including lack of information and skills, as well as a lack of administrative capacity.

Advantages of digitalisation include the possibility to retain a greater share of value by shortening the supply chain. In areas without fish auctions, B2B online sales would be very beneficial for wholesalers and dealers who can regularly supply fish markets.

Challenges include the absence of wholesalers who can regularly supply fish markets across the whole country. Furthermore, the lack of auctions to organise first sales of fish in Croatia generates high volatility in the availability of fish supply which is a challenge for online sales. In addition, fishermen are not keen to use online tools in their working conditions, which include a wet environment and need to handle such tools in rough weather at sea. A lack of IT skills is considered among the key challenges, including a lack of confidence in the functionality of online sales platforms.

Future

The founder of BuyFish.eu suggests that online sales systems should be initiated by relevant national institutions. Fishermen and other stakeholders need to have high confidence in such systems to be sure that trade will work efficiently and efficiently. Typically, fishermen prefer to sell fish to regular customers, with immediate payment, and the risk of losing long-standing customers not used to online sales is an important consideration. Online sales could be beneficial for Croatian FAP, since fish markets cannot accommodate high volumes of fish. Italy is a major destination for FAP exports from Croatia and could therefore be a potential global market to be maintained. Currently, fish is sold to Italian wholesaler, who then fisher-sell the products at auction in Italy. In this case, Croatian fishermen earn a lower rate for their fish due to the longer supply chain. BuyFish.eu perceives that the fish supply chains in Croatia currently function as fisherman-wholesaler-auction-customer, rather than fishermen-auction-wholesaler-customer, and that online sales could help to reverse this model. The benefit of the reverse model would be the better first-sales price for fishermen as selling directly through auction system (instead directly to wholesalers), provides better transparency on offer/demand balance and therefore, better market conditions for the fishermen.

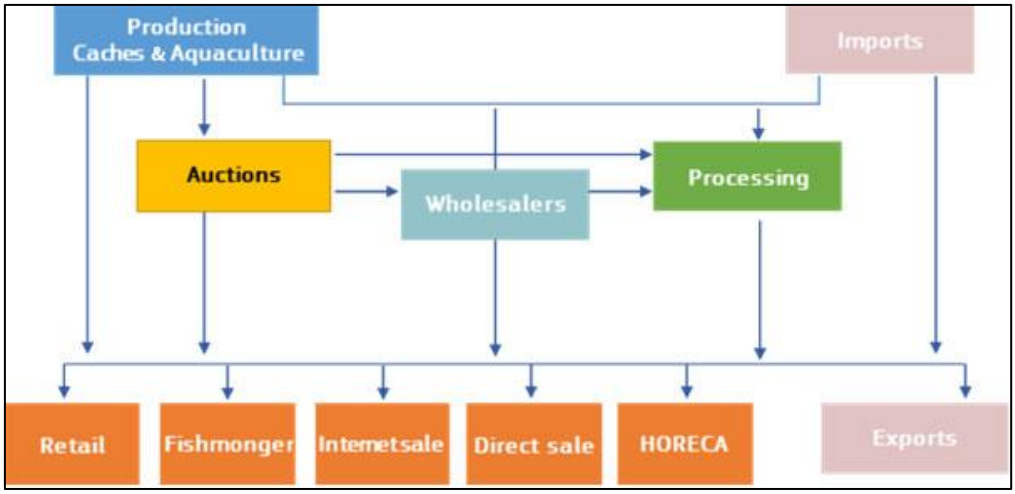
5.3 Denmark

In 2017, 22% of Danes ordered food products through online channels, 2% lower than the EU average (24%)[19].

In 2017, apparent consumption was estimated at 27 kg per capita, a 5,9% increase relative to 2016. Regular consumers (those who eat fishery and aquaculture products at least once per month) mainly belong to age groups 40-54 and over 55. Danish young people (15-24), like other young EU citizens, are less inclined to consume fish than other age groups. However, 82% of consumers within the 15-24 age bracket consume seafood regularly (once per month), which is much higher than at EU level (67%). Danes primarily consume tinned and smoked products; loose fish (64%) is less frequently consumed than at EU level (68%)[20].

Denmark is one of the most important players in the EU for both fisheries (small pelagics, mussel, flatfish, Norway lobster) and aquaculture (trout, mussel, eel) products. The Danish supply chain is mainly focused on exporting seafood products (more than 95% of the total supply). The domestic supply chain consists of wholesalers, traditional fishmongers, retailers selling seafood packages, and "shop in shop" concepts (such as a fishmonger operating within a supermarket). Several companies offer online sales of seafood to consumers. Most Danish catch is sold through seven auctions, of which Hanstholm, Skagen and Hirtshals account for approximately 70% of first-sales volume, while aquaculture production is mainly sold directly to the processing sector.

Figure 5. The supply chain of fisheries and aquaculture products in Denmark.
Source: Eurofish.



[19] Eurostat, Digital economy and society in the EU 2017.

[20] EUMOFA, "EU consumer habits regarding fishery and aquaculture products", 2017.

CASE STUDY: **HavFriskFisk** (platform)

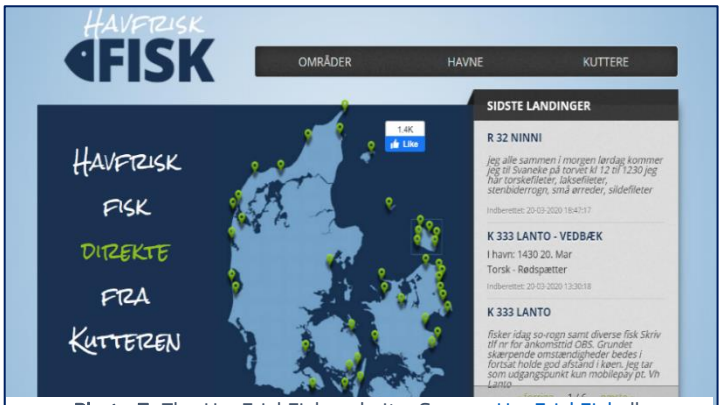


Photo 3. The HavFriskFisk website. Source: HavFriskFisk.dk

HavFriskFisk is an online platform intended primarily for small-scale fishermen and buyers. It functions as a B2C concept, offering only wild fresh catch within local areas. It aims to provide real-time information to customers about local vessel catches and expected times of arrival. The consumer receives a text message from the fishing vessel with details of the day's catch and expected time of arrival to a specified port as the vessel returning from the day's fishing. The consumer may then decide if they want to go to the port to buy fish directly from that vessel. Havfriskfisk.dk is a private initiative founded in 2010 by the media company fiskerforum.dk, which publishes news for the fisheries sector. The online sales service is a subsite of www.fiskerforum.dk, which affords it higher potential to attract readers from the news site, and gives fishermen a free online sales service. Fiskerfourm.dk has approximately 120.000 visitors per month. The site operates in both Danish and English.

The online sales platform is available for all fishermen who wish to sign up, but is mainly used by small-scale fishermen who have trips of one or two fishing days at a time. In 2019, approximately 50 fishermen and 3.500 customers were registered. To be able to use this service, fishermen need to satisfy legal conditions (food safety, hygiene as established by the relevant authorities). Those who receive official approval have a "smiley" certificate displayed on the site. HavFriskFisk does not control these restrictions after the initial registration stage, but make fishermen aware of ongoing requirements, and encourage customers to deal only with approved vessels. Alongside whole fresh fish products, some fishermen also cut and sell filleted fish, although an additional authority approval is required to accommodate "processing activity on vessel". To access the online platform, users must register, provide a mobile phone number, and select their desired "region". After the initial text message is received with details of the species caught and point of sale (port), the price is set by the fishermen in the harbour. Fishermen are also required to inform the website of their estimated time of arrival at the given port. Customers can pay for products either by cash or electronically using an app called "mobile pay".

The online sales platform is not involved in logistics since all fish is sold harbourside. It only functions as an intermediary that connects fishermen and potential customers free of charge. It also sells advertising material, including bags, to the fishermen on request, which can be used when selling products to customers. There are no formal promotional campaigns introducing the service, which has been shared amongst consumers via word of mouth. Customers can also sign up for a newsletter where they get information about fisheries and fish recipes. The platform did not receive any funds for development but was initiated and financed by Fiskerforum. An estimation of total expenditure for the whole platform set-up is EUR 130.000 over the last 10 years. The activity on the website has, however, led to more traffic on www.fiskerforum.dk.

Online sales platforms are recognised as a very popular tool for the locals and tourists, and it helps to bring them in rural areas in Denmark. Fishermen benefit from the service by limiting time spent on fishing activity and investing more time in selling their catch, while increasing their income - up to 10 times more than public auctions.

Disadvantages of online sales platforms include a lack of public awareness of such services. Another potential issue could also be the difficulty in guaranteeing that fish will be available when a customer arrives, as the catch can be "sold out" beforehand. Namely, fishermen only provide information on available supply on the platform, the sales occur at the harbour.

Future

There are no similar initiatives in Denmark. Private Facebook initiatives by individual fishermen do exist, as well as various websites where customers can buy fish directly. *HavFriskFisk* expects its service to continue to grow. All fishermen involved should continue to maintain higher sales and more attractive profits than could be expected using traditional distribution methods. Customers can expect continuation of a convenient shopping experience, better prices, and optimal freshness while supporting the local community by buying directly.

Development of local tourism is an area that also benefits from this activity and has the potential to profit further. The tourism industry informs visitors of the service, allowing them to experience authenticity and local produce in the area, while providing a convenient way to purchase fresh fish. Additionally, the economic value of the fisheries activity will be retained in the local area when sold locally.

According to the founder of platform, direct sales through online channels are not considered as a threat or competitor to traditional fishmongers. This is because online customers are distinct from traditional consumers by virtue of the fact that they need to visit a fishing vessel in a harbour to purchase fish. The potential for further development of this tool is significant.

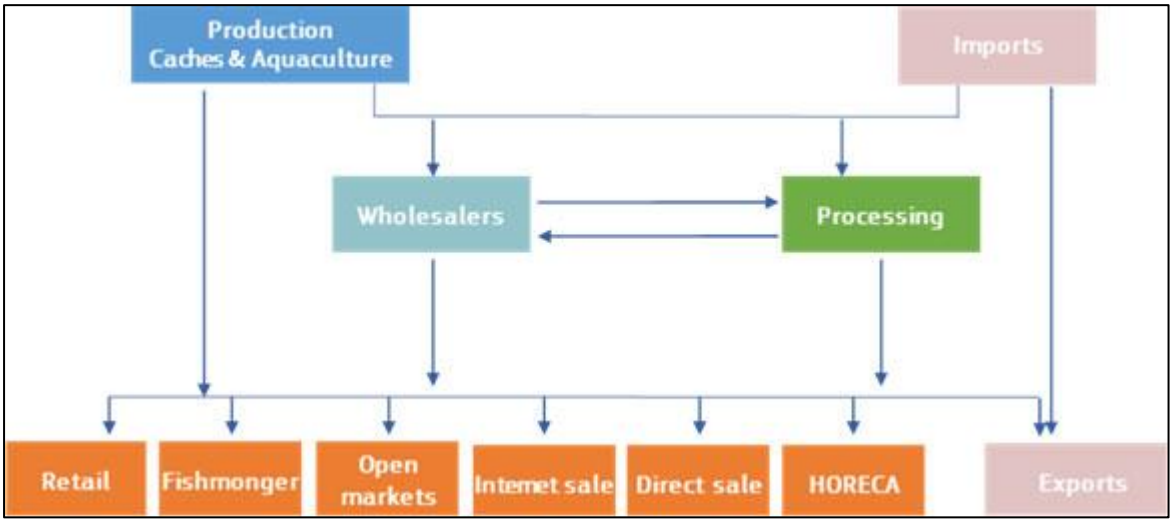
5.4 Estonia

In 2017, 35% of Estonians ordered food products through online channels. This was 11% higher than the EU average (24%)[21].

In 2017, apparent consumption was estimated at 16,3 kg per capita, a slight decrease relative to 2016 (-1,8%). Regular consumers (those who eat fishery and aquaculture products at least once a month) predominantly belong to age groups 25-39 and over 55. Young people (15-24) are less inclined to consume fish than other Estonian consumers, as is the case in the EU as a whole. 72% of Estonians consume seafood regularly, which is higher than at the EU level (67%). Estonians consume fresh and smoked products in particular, while loose fish (67%) is less frequently consumed than the EU average (68%)[22].

The Estonian fish and seafood supply chain relies on both marine (mostly herring and sprat) and inland fisheries. Aquaculture is rather limited. There are no auction markets in Estonia, with wholesalers and processors buying directly from fishermen.

Figure 6. The supply chain of fisheries and aquaculture products in Estonia.
Source: Eurofish.



[21] Eurostat, Digital economy and society in the EU 2017.

[22] EUMOFA, "EU consumer habits regarding fishery and aquaculture products", 2017.

CASE STUDY: **Stonefish OÜ** (FLAG support)

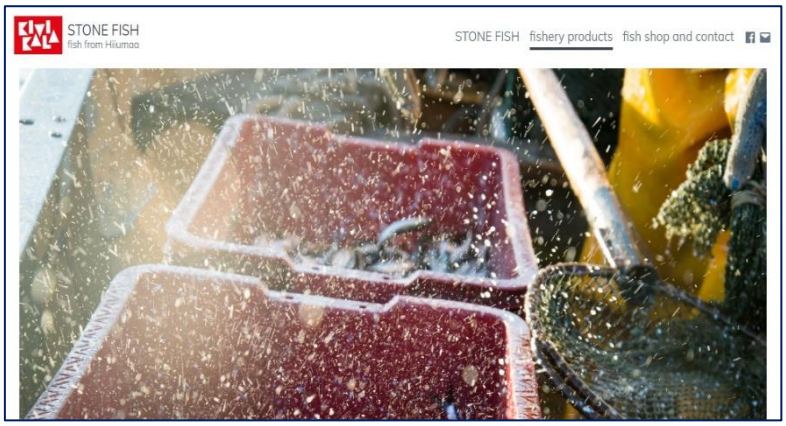


Photo 4. Stonefish OÜ Fish online sales website. Source: Stonefish.ee

Stonefish OÜ Fish[23] is an online and physical fish and gear shop opened with support from Hiiukala Fiseries Local Action Group (FLAG) and financed through the European Maritime and Fisheries Fund 2014-2020 (EMFF). In 2012, a coastal fisherman from Western Estonia developed the fish shop, allowing fresh fish to be processed locally and sold online, while also creating local jobs. The company's main business area is Hiiumaa, the second largest island in Estonia. The primary activities of the company are marine fishing and manufacturing, as well as sales of fish and fishery products – both in-person and online. The shop sells its own fresh fish and fishery products; fish from other local fishermen, and products from other producers (fishing equipment, outboard motors, etc). In order to meet demand, the company purchases fish and fishery products that are not readily available in the quantities required (e.g. trout, eel) from other producers. The concept for the business came from steady decline in consumption of fresh fish which subsequently reduced sales of fresh fish in local markets. As a result, it was deemed necessary to find ways to expand activities and offer a more diverse range of products.

The company operates mainly as a B2C. Sales channels include the on-site shop, website and Facebook account. Most sales are made through the local fish shop "Fish and Net" (in Estonian "Kala ja võrk") in Kärdla, the capital of Hiiu County. The website is the primary form of digital marketing, with Facebook operating as a secondary channel of communication with customers. Highest turnover occurs in summer, when more people reside on the island and tourist levels are at their highest. During winter months, sales tend to drop. For this reason, the company created a website to sell goods and products outside Hiiumaa during low-season, with online sales having been available since 2019. The company is relatively new player in the supply chain, offering fresh fish and fisheries products from Hiiumaa to other parts of Estonia. In Hiiumaa, there are no similar companies with online sales. However, many sell their products in smaller quantities using social media as a marketing platform. The company has listed all fisheries products and fishing gear for sale with prices on their website, where customers can see what's available and choose the products they would like to buy. Orders are usually placed via email, and it is not possible to place an order directly from a website. For the company, online sales are not a primary source of revenue, but rather an additional marketing opportunity. In addition to the website, the company also has a Facebook account, which is mainly directed towards local customers. The company informs local customers of the fresh fish and fisheries products available and take orders through Facebook. There is no variation in prices between online sales and the on-site fish store.

[23] http://stonefish.ee/

The company sells fresh local fish, fish fillets (manually filleted), smoked fish, salted and spicy fish, dried fish, canned products, and other fish products. However, the availability of fish products depends on fishing seasons. The volume of goods offered in the online store also depends on local consumption, i.e. if the products are sold-out from the on-site fish shop, it will not be available for purchase online. Products can be paid for both electronically and in cash. The company does not closely monitor the profile of the typical customer, nor does it analyse online sales turnover (online sales are currently very small compared to on-site sales). The company has seven employees, of whom there is no individual person whose sole job is to deal with online orders; this task is divided between various team members. The transport of goods is currently in the development phase. At present, the company transports orders once a week to Tallinn, while orders to other regions are sent using parcel delivery servicers.

Photo 5. Fish offer available through Stonefish OÜ Fish online shop. Source: stonefish.ee

Advertising campaigns are conducted via Facebook (primarily targeted to local consumers); e-mail campaigns prompting wholesalers to place orders; content marketing; local newspaper advertisements and articles about the fish shop; and food fair visits (mainly targeting those who may sell their products on).

Stonefish OÜ received support from the European Maritime and Fisheries Fund in 2016 to design and construct small processing and fishing gear shops (two projects) and in 2017 to purchase equipment and conduct inventories for processing and selling the products (two projects). The total amount of support from the European Maritime and Fisheries Fund is approximately EUR 227.000. The company has also received support for various skills training sessions from the Fisheries Local Action Group (FLAG) Hiiukala, which is responsible for the allocation of the European Maritime and Fisheries Fund's support in the Hiiumaa Fisheries Area[24].

Advantages of online sales include the opportunity for fishermen to diversify their sales channels and also to increase their income shortening number of stakeholders in the supply chain.

Among challenges in online sales are the logistics chain and lack of infrastructure. There is also the risk of further decreasing fish consumption as young people consume less fish in Estonia what could pose an indirect business challenge in online sales of FAP and sales of FAP in general.

[24] https://webgate.ec.europa.eu/fpfis/cms/farnet2/on-the-ground/good-practice/short-stories/revamped-shop-brings-fish-processing-estonian-island-0_fr?2nd-language=lv

Future

The operators of online sales initiatives envisage that e-shopping of FAP will become an increasing market in the future. They plan to develop a web portal where customers and consumers will be able to access fishing information (species of fish, time of fishing, etc.) and place online orders directly to fishermen. Currently, the company expends relatively large amount of labour in processing orders manually, although there are no major barriers to hinder further development of online sales. In the future, a possible challenge could be continued decline in fish consumption and a lack of confidence amongst consumers in preparing fish, which may indicate that customer would prefer to purchase processed products as opposed to whole fish.

According to Stonefish OÜ Fish management, online fish sales do not pose any threat to traditional fish traders locally, as current online sales are relatively underdeveloped. Therefore, the online sale segment requires a significant development of infrastructure, particularly the purchasing of refrigerators for storing fish at destination. Although products can be transported by a refrigerated van, there is also a need for an appropriate storage space while packages are awaiting collection by customers. Therefore, fishery products that do not require special storage conditions (e.g. dried fish, etc.) can be sold in shipped to very long distances.

5.5 France

In 2017, 22% of French consumers ordered food products through online channels. This was 2% lower compared to the EU average of 24%[25].

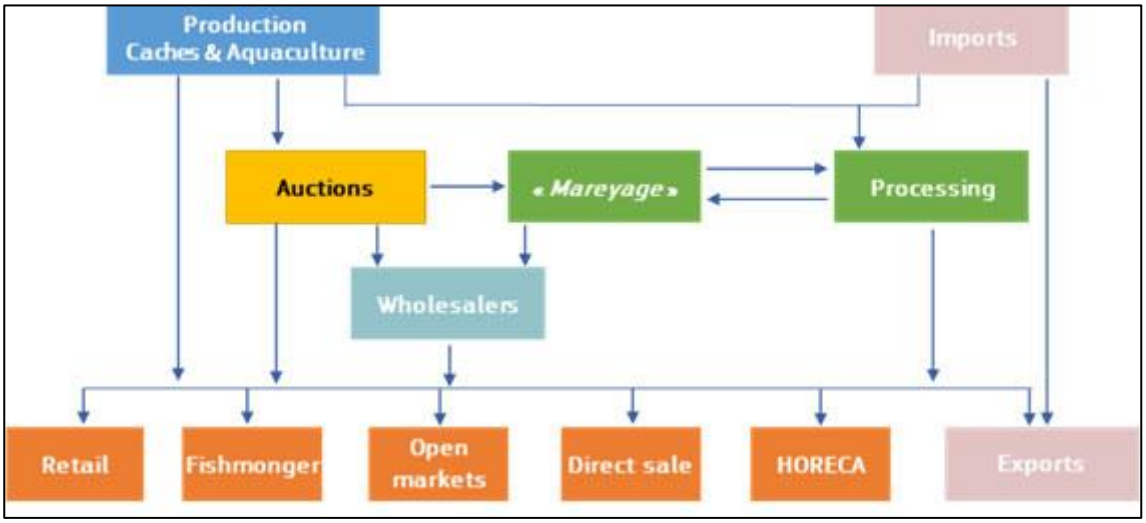
In 2017, apparent consumption of FAP was estimated at 33,7 kg per capita, a slight increase compared with 2016 (+1,5%). Regular consumers (those who eat fisheries and aquaculture products at least once a month) mainly belong to age groups 40-54 and over 55. French young people (15-24) are less inclined to consume fish than other consumers, as is the case at EU level. However, 79% of young people in France consume FAP at least once a month, which is much higher than at EU level (67%). French customers primarily consume fresh, frozen, and tinned products, although loose fish is more frequently consumed (71%) than at EU level (68%)[26].

France is one of the EU's major players for marine fisheries and aquaculture. Fisheries rely heavily on the auction network all along the coast and provide a large variety of species: finfish, crustaceans, molluscs, and cephalopods. In auctions, first wholesalers ("*mareyage*") account for a significant share of first sales, before then selling the products through different channels: fishmongers, retailers, and HORECA. Marine aquaculture concerns mostly shellfish farming (oyster and mussel) whereas freshwater aquaculture is dominated by trout production. The processing industry mostly relies on imported species (tuna, salmon, cod, tropical shrimp, small pelagics).

[25] Eurostat, Digital economy and society in the EU 2017.

[26] EUMOFA, "EU consumer habits regarding fishery and aquaculture products", 2017.

Figure 7. The supply chain of fisheries and aquaculture products in France.
Source: FranceAgriMer.



CASE STUDY: **Monpêcheur** (platform)

Monpecheur.com is an online platform, developed by a private company to connect fishermen and local consumers in accordance with a B2C model based on geolocation. The company has plans to expand to a B2B platform for wholesalers, fishmongers, and restaurants, allowing them to buy fish in direct sale.

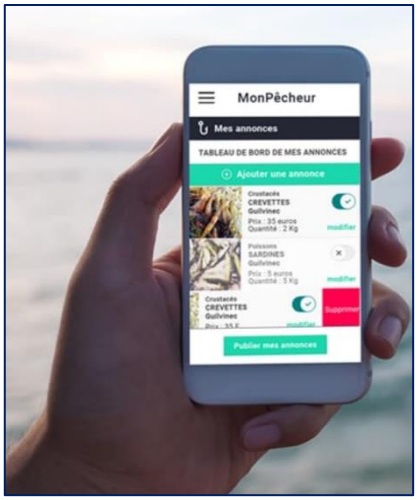


Photo 6. Preview of MonPêcheur app.
Source: monpecheur.com

The project has been granted public funds from the EU and regional authorities (Bretagne), although funds have not yet been received as the project is still in its preliminary testing phase. Currently, the project involves the founder, retired fishermen interested in the project, and a small number of active fishermen (mostly those new to fishing itself, but having worked in other industry sectors preciously), who have volunteered to trial the app. An online direct sale platform already exists in the region (Bretagne Sud-Ouest), developed by a fishmonger. This platform offers ready-to-cook products and is already used by some coastal fishermen to advertise and promote their daily catch on Facebook.

Monpecheur.com allows fishermen to create an account on the website where they can upload details of their catch on the boat as they return to port from their day's fishing (they may sell up to 100 kg of fish per day). Consumers can then order their products (limited to a maximum order size of 30 kg per day) via the app, if they have also created an account. Transactions will take place directly on the quayside or in grocery stores that have volunteered to facilitate the scheme and comply with require food hygiene standards.

There is almost no storage expected in transaction points. All costs are incumbent on the fishermen (commission fees to transaction point owners, packaging, transport to the focal point). Online sales are organised and the price of fish is set independently by fishermen. Payments can be made in cash

directly to the fisherman, with plans to move towards electronic payments once the necessary e-commerce features are developed. *Monpecheur.com* will receive a commission on each sale.

Offerings will include all species caught by the local small-scale fleet from fishing trips lasting less than 24h to ensure freshness of produce. As a result, the website will only offer fresh fish (which will be gutted for most species). The profile of consumers is currently unknown, but *Monpecheur.com* anticipates that its main customer demographic will be people living along the coast as well as visitors to the area. A lack of local public transport means that customers from further inland are unlikely to utilise the app. The website aims to target younger generations to encourage increased knowledge of the fishing sector and consumption of fresh fisheries products. The overall aim is to promote the benefits of local production for local consumption.

In the target region (Bretagne Sud-Ouest), the fishery sector is strongly structured with a high concentration of auctions, wholesalers, and fishmongers. Thus, the project manager has experienced significant opposition, in particular from wholesalers, despite assertions that the project will not be a competitor to the existing first-sale system.

The website and app are intended to work as a complementary system to benefit small-scale fishermen, although it may also be of benefit on a larger scale in regions with less infrastructure behind its fishing sector. In addition, fishermen selling their products via this app are limited to a quantity of 100 kg per day, limiting its to competition to auctions. It may therefore become a positive complementary tool for targeting new consumers and promoting unknown or underrated species.

Direct sales can allow fish to be sold at higher prices than in the traditional auctions. Most of the fishermen interested in the project are interested in the app for information on their activity and promotion of their products, saving time (for sale and logistics), as well as reaching consumers from the younger generations.

There are few technical barriers, as the app is available on smartphones that are well-suited to such software. However, complying with the regulation of direct selling can be a barrier for some fisherman who are accustomed used to do some direct sales but in a to more informal methods.

Future

The *MonPêcheur* project has raised the interest of many stakeholders in the supply chain and the testing phase should allow for potential technical issues to be resolves in order to optimize the usability of the app. If fishermen involved in the testing phase are convinced by the experience, it is likely that others will want to try it.

Thus, so far, promotion of the app has mainly consisted of presentations to the fishery sector (to introduce the project and test early reception) and local administrations, and at conferences of FLAG projects. However, a promotional campaign is planned to reach to consumers (press and social networks). Depending on the success of the project at a local level, the development may be extended to other regions or expanded to B2B with payment features included in the app.

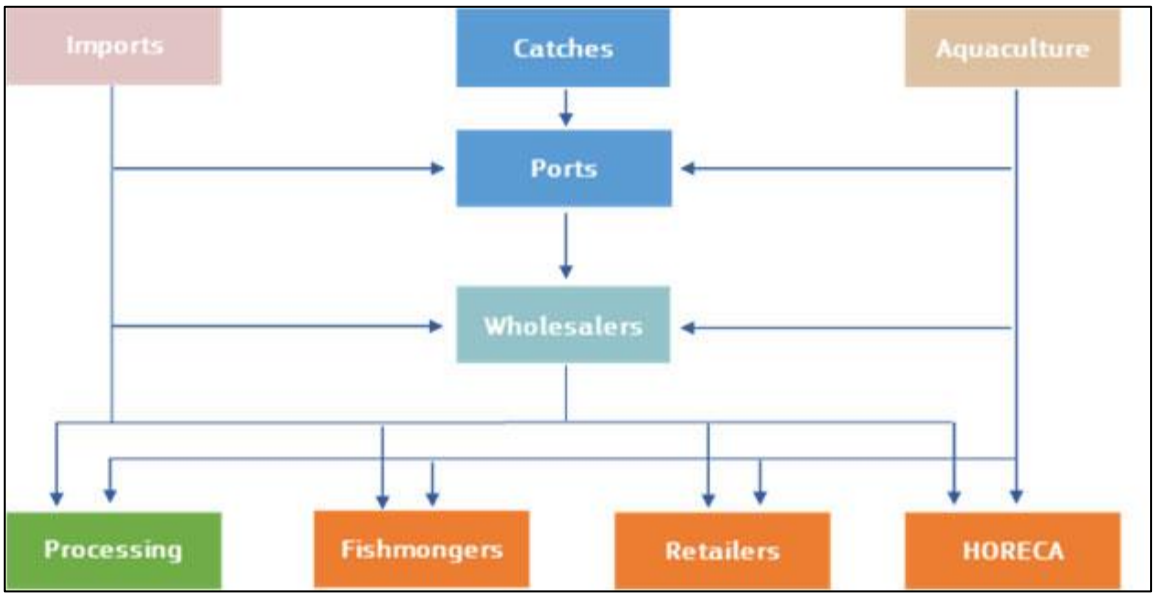
5.6 Germany

In 2017, 28% of Germans ordered food products through online channels, 6% greater than the EU average of 24%[27].

68% of the German population are regular consumers of seafood, slightly higher than the EU as a whole (67%). Germans prefer frozen products; loose fish is more rarely consumed (54%) than at EU level (68%)[28]. In 2017, apparent consumption of FAP was estimated at 13,4 kg per capita, a 5% decrease compared with 2016. Germany is one of the few countries where regular consumers (those who eat fishery and aquaculture products at least once a month) are primarily young people belonging to the age groups 15-24 and 25-39.

The German supply chain relies on a variety of species provided by marine fisheries landings (herring, cod, brown shrimp, groundfish etc.) and aquaculture production (mostly trout, carp and eel in freshwater aquaculture, and mussel in mariculture). In Germany, auctions have lost their importance and most fish is sold directly to the wholesale trade, filleting wholesalers (in fishing harbours) and processors, or processed and sold by fishermen cooperative trade and filleting units, which then sell products to different distribution channels.

Figure 8. The supply chain of fisheries and aquaculture products in Germany.
Source: Germany Overseas Market Introduction Service, British Embassy Berlin 2012



[27] Eurostat, "Digital economy and society in the EU" 2017.

[28] EUMOFA, "EU consumer habits regarding fishery and aquaculture products", 2017.

CASE STUDY: **Fisch vom Kutter** (FLAG AktivRegion Ostseeküste)

Fisch vom Kutter is the online platform initiated by AktivRegion Ostseeküste (Baltic Sea Coast Active Region) FLAG. It has support from the EMFF and also from local sources (municipalities, Chamber of Agriculture, tourist offices). It has successfully linked increasing demand for fresh and local fish with the use of cheap and widespread information technology. The initiative developed a direct sales system for fish coming from the Baltic by using the interactive website www.fischvomkutter.de.

Photo 7. Fisch vom Kutter direct sales. Source: fischvomkutter.de

The plans for the project were laid out in 2009 and it was implemented between Spring 2010 and Spring 2011. The website launched in January 2011 and the project was presented to the press and media in March 2011. It is a B2C project.

The principle is as follows: fishermen send details of their catch and their estimated landing time via SMS (on their mobile phones) to the website while at sea. Customers can then see where, when and what fish will be available for sale directly from the boat when it comes to port. The portal is a pure information portal. There are no online sales. No costs are involved for the fisherman or customer (except access to the relevant technologies).

Before the creation of Fisch vom Kutter, fishermen were selling in auctions in the Netherlands and in Denmark (no auctions took place locally). They now predominantly sell directly to the consumer and the website is visited by 400 to 700 users daily. The project even also attracted the interest of Danish fishermen, who participated in the project before going on to build their own web portal (HavFriskFisk).

The project, which functions without employees, involves 24 fishing companies (one <12m vessel per company) selling predominantly cod, flounder, plaice, turbot, dab and brown shrimp. In the beginning the fishermen were selling only whole fish, but over time they started to fillet and process catches (into smoked fish, fish patties, etc.). Fishermen are small-scale, so fishing trips are at maximum 10 nautical miles from shore and only a few hours in duration, so products are guaranteed to be fresh. The project has raised a lot of interest and attracted extensive media coverage. The project was not considered a threat for the few traditional fishmongers or fresh fish counters in the relevant part of Schleswig-Holstein (only one supermarket in the region has a fresh fish counter).

During the COVID-19 crisis, an increase in activity on the portal has highlighted its importance to the area. Fishers, who would previously only market a small percentage of their fish directly, are now turning to the portal to sell their entire catch to meet increased demand. Alongside the project's usual

delivery sites, the platform also introduced a mobile truck which will deliver fish directly while open-air markets are closed[29].

Direct sales through the online tool can allowed to achieve significantly higher prices through direct sales and self-marketing compared to wholesale. Networking between fishermen, tourism specialists and the gastronomic sector has increased as has customer information which has helped to foster stronger integration of the fishing industry into the region.

The main barrier for local fishermen is the strong reduction of the Baltic quotas especially for cod, potentially weakening their activity in the short-term. But it may also be considered that the reduced volumes of catches are likely to force fishermen to seek a better unit value and thus to turn increasingly towards direct sales.

Future

The project is set to continue long-term (note that EU funding provided was intended only as start-up financing from the outset). The website will be operated by the "Fisch vom Kutter" interest group on an ongoing basis, a group which relies upon motivated volunteers to keep costs manageable. The project also aims to expand into new areas in the Baltic Sea basin.

Locally, at Fisch vom Kutter, no development of online sales is envisaged in the short-term. Current direct sales, with no investment, are sufficient in ensuring fishermen can sell their produce at better prices. Consumers are informed of the fish species available and of the time and place of the sale in advance, but they are not informed of the prices. The fishermen involved in the initiative have considered selling online but concluded it would be too complicated (due to a need for specialist skills, a lack of available refrigeration, etc.).

5.7 Portugal

In 2017, 23% of Portuguese people ordered food products through online channels. This was slightly lower than the EU average of 24%[30]. Consumers who eat fishery and aquaculture products at least once a month (i.e. regular consumers) mainly belong to the following age groups: 15-24 and over 55. Of particular interest, 74% of young people (ages 15-24) are regular consumers of FAP, considerably higher than the EU as a whole (67%). Fresh products and tinned products are the most consumed products in Portugal. Loose (unpacked) fish is also more frequently consumed in Portugal (89%) than at the EU level (68%)[31].

In 2017, apparent consumption of FAP was estimated at 56,8 kg per capita, the highest level in EU, a slight decrease compared with 2016 (-0,2%). Portugal's supply chain relies on both marine fisheries landings (mainly small pelagics and cephalopods) and aquaculture production (clam, mussel and oyster for shellfish farming; turbot and gilthead seabream for finfish farming). Fish auctions are still the major place of sale for Portuguese landings, but some direct sales exist, especially for vessels owned by the processing industry (canning of small pelagics). The retail channel relies on both large-scale retailers and a strong network on independent fishmongers. However, Portuguese consumption

[29] https://webgate.ec.europa.eu/fpfis/cms/farnet2/news-events/news/covid-19-flag-response-message-board_en

[30] Eurostat, Digital economy and society in the EU 2017.

[31] EUMOFA, "EU consumer habits regarding fishery and aquaculture products", 2017.

and processing relies highly on imports (of cod, shrimp, salmon, etc.) to complement national production.

CASE STUDY: **Cabaz do mar** (platform)

The "*Cabaz do mar*" or "basket of the sea" is a direct-sales marketing scheme functioning as an **online platform** set up by a partnership between TAIPA, Cooperative Organization for the Integrated Development of the Municipality of Odemira , and an association of inhabitants and fishermen in Azenha do Mar. The project was supported by the **Além Tejo FLAG** and aims to generate additional income for local fishermen, as well as to promote their proactive involvement in local economic development. The first step was the design of a short-chain distribution scheme that would bring fishermen closer to local consumers by giving them the opportunity to sign up for regular deliveries of local fish. This was followed by the investment in the necessary equipment, logistics and communications.

The project consisted in selling "baskets of fish": consumers pay a fixed price, 22 EUR for 3 kg of fish, but the contents of the basket depends on weekly catches, including various coastal species. Approximatively one third of the "basket" is of species considered to be lower-value. The project was entirely managed by fishermen. Payment was not online but directly to the association.

The sales of the baskets were organised by the association. Initially, fish was obtained from only one auction and delivered to a few locations in the same district. After a few months they started to buy from 3 other auctions (within a radius of about 45 km) in order to meet consumer demand, involving up to 66 fishermen. Promotion was via their website and Facebook page. Promotion of the project was mainly through word of mouth and social media.

Direct sales through the online tool had allowed to find alternative outlets at interesting prices for their catch and especially less know species.

The main barrier has been profitability, as they managed to cover costs, but did not make profit.

FUTURE

The project stopped after a few years due to several issues related with profitability as they managed to cover the costs but did not make profit. Namely, this is closely linked with insufficient number of registered fishermen who were supplying fish, and insufficient number of regular customers.

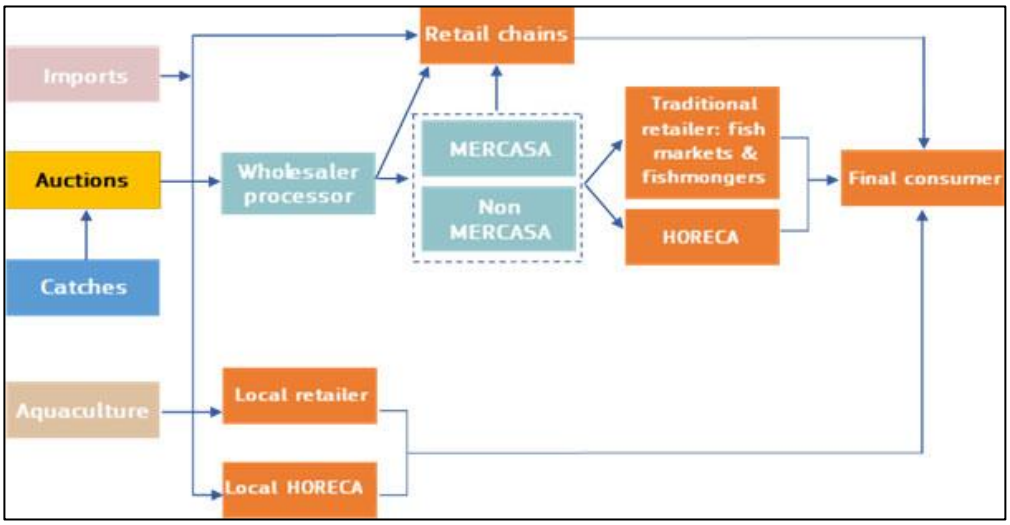
5.8 Spain

In 2017, 16% of Spaniards ordered food products through online channels. This was 8% lower than the EU average of 24%[32].

In 2017, apparent consumption was estimated at 45,6 kg per capita, a slight increase compared with 2016 (+0,4%). Regular consumers, namely those who eat fishery and aquaculture products at least once a month, mainly belong to age groups 40-54 and over 55. Spanish young people (ages 15-24) are less inclined to consume fish than other age groups, as is the case at EU level. However, 86% of Spanish people consume seafood regularly, which is much higher than at EU level (67%). Spaniards show a preference for fresh and tinned products; loose fish is much more frequently consumed in Spain (92%) than at EU level (68%)[33].

Spain is one of the EU's major players for both marine fisheries and aquaculture, providing a large variety of species, namely finfish, tuna, crustaceans, molluscs and cephalopods. The supply chain is organised through auction sales, which is the only legal way to sell landed fresh fish in Spain. The high volumes guarantee regular supply and availability of various fisheries products for market purposes. Along the supply chain, the Mercasa network (wholesale markets) plays an important role for providing fish products to fishmongers, retailers, and caterers. Mariculture concerns both shellfish farming (mussel) and finfish farming (seabass and seabream), whereas freshwater aquaculture is dominated by trout production. The processing industry uses products landed in Spain but also relies highly upon imported raw material (tuna, salmon, tropical shrimp, small pelagics).

Figure 9. The supply chain of fisheries and aquaculture products in Spain. Source: IDES, Uni. of Cantabria.



[32] Eurostat, "Digital economy and society in the EU", 2017.

[33] EUMOFA, "EU consumer habits regarding fishery and aquaculture products", 2017.

CASE STUDY: **Pescadoartesanal.com** (platform)

"Pescado artesanal" is an online platform initiated by FLAG (Pontevedra) and entirely funded by the European Fisheries Fund (EFF)and European Maritime and Fisheries Fund (EMFF). Its communication campaign aims to increase the consumption of seafood from small-scale local fleets. The online platform pools the products of four auctions (Bueu, Campelo, Portonovo, Marí), aiming to make local seafood more accessible to buyers. It is a B2B project.

The demand came from the association of cofradías[34] (6 cofradías) in response to a decrease in the number of buyers in small auctions. There was a tendency for buyers to concentrate more and more on large auctions where they were more likely to find everything in one place. Buyers were complaining about the uncertainty of supplies in smaller auctions and the fact that they sometimes made the trip and did not find what they wanted.

The online platform aimed to provide information to buyers before the auctions took place so they could decide whether to make the trip knowingly. The project consisted in the development of two tools with no costs involved for fishermen or buyers):

The website:

- Areas exclusively accessed by buyers to see catches of the day and prices from previous days;
- Maps for the public to reference final points of sale for fish sold through the four auctions participating in the platform (points of sales and restaurants);
- Blogs with information on the products and auctions.

The **mobile app** for fishermen and buyers:

- Allows fishermen to share information on and photos of their catch;
- Allows buyers to see the catches and bid remotely (although remote bids are barely used).

At this stage, buyers mainly use the information available on the platform to anticipate their purchases, but still go to the auctions or send an intermediary. Buyers still want to see the fish before buying (or have someone they trust to see it). Buyers can come from small local wholesalers, fishmongers or restaurants, wholesalers selling their products in Madrid or Barcelona, the canning industry, the frozen products industry and so on. Buyers can see the fish available on sale (species and quantities) as well as the prices of previous days, a good indication of the likely price. At this stage the platform does not manage logistics. The possibility to deliver the products has been tested occasionally (only for high value products) but as a complementary project.

The products presented on the platform are still sold through traditional auctions and include a large variety of species: octopus, rock fish (sea bass, turbot, mullet, maragota, etc.), barnacles, clams, sea urchin, seaweed, spider crab, small pelagics (horse mackerel, mackerel, sardine, etc.), hake, striped seabream, shrimp, and suchlike. The platform changes the information available to buyers (in terms of the species and when they will be available), but does not, at this stage, create new channels.

There was no formal promotional campaign for buyers, but auction staff communicated extensively with fishermen and buyers to improve their awareness and their perceptions of digital tools. There were some technical challenges, in particular regarding the integration (streamlined, accurate, and in auction information in real-time) of both a tool in the pre-existing tool used by Spanish auction to

[34] Fishing vessels owners' associations in Spain.

report sales and a website with the auctions' information systems (all auctions use a centralised information system that sends sales information to the authorities). Beyond technical issues, the main problem was to convince users about the benefits of digitalisation as many were reluctant to rely on digital tools.

The main challenge associated with developing the platform further relates to logistics. Currently, fish are sold by the auctions directly to the buyers who come and take care of the transport of the fish. There are no transport providers working on a regular basis with the auctions (which can be in remote places on the coast).

Digitalisation helps the local fisheries to retain their buyers in smaller auctions, and therefore to keep higher prices (more competition between buyers).

The main barriers concern technical issues (integration of the website with the existing auctions information systems) and acceptability of users about the benefits of digitalisation, as many are reluctant to rely on those tools, which necessitates a lot of soft communication from the auction staff.

Future

The project does not include online sales at this stage, but it is a possibility for the future. The success of the platform and the greater digital awareness of younger operators (both fishermen and buyers) should allow this type of development. For now, buyers still lack sufficient trust to buy remotely, as they prefer to visually assess the fish. But this is changing progressively. The project is looking into the possibility of setting up a distribution system, but it is difficult to find local transport providers who could provide that service for a reasonable price.

CASE STUDY: La Pescadería de mi Barrio

"La Pescadería de mi Barrio" ("Fish Shop in my Neighbourhood") is an **online fish shop** located in Vigo, founded as a family business in 2012. It functions as both a B2B and B2C concept. Fish shop owners (the registered first-sale buyer) buy fish from the auction market in Vigo, and sell it either at their physical shop or online (mainly through social media platform Facebook and cross-platform messaging service WhatsApp). The physical shop is still more preferred option among customers and holds a 60% share of the company's total fish market trade relative to 40% via the online shop. The online fish shop covers all of Spain (mainly cities such as Madrid and Barcelona), but about 90% of all trade is done locally, in Vigo. Online sales are facilitated by a Facebook page, where owners post daily fish offers to over 1.600 followers. Fish is offered in the section "shop" where customers can see the price per kg for various species and order it directly, paying via the online payments system PayPal. After receiving an order, the fish is packed carefully in a reusable, recyclable cooler

Photo 8. Fish shop La Pescadería de mi Barrio.
Source: www.facebook.com/lapescaderiademibarrio

containing dry ice. The individual portions or packs within the cooler are vacuum-packed. Fish items are transported via a shipping company in temperature-controlled environment.

Another way that fish is sold is through the application "WhatsApp Business". This application offers business profiles by category to list important information, such as a company's address, email and website, statistics to see how many messages were successfully sent, delivered and read, and messaging tools to quickly respond to customers. The fish available and a link to video clips (on YouTube) with "today's offer" are sent to the list of contacts, which include restaurants as well as individual customers, and once the fish is ordered, it is delivered to the customer's address. A customer pays the transportation costs only if their location is outside Vigo, and the total delivery price depends on quantity and distance. About 50 to 200 kg of fish is sold daily through online sales channels, while the highest level of activity on Fridays and Saturdays, in line with the traditional habits of Spaniards. Sales growth is measured through online analytics.

Typically, consumers comprise 60% women and 40% men, with greater representation from those of an intermediate or high level of education, in the age group 35-50, employed on a high income, and from urban areas. Fish offered include the species available at the Port of Vigo auction. Fish is supplied from Spanish fishermen but also from abroad, as a considerable volume of fish is imported to satisfy demands. The products in greatest demand are Atlantic and Mediterranean species: grouper, turbot, cod, hake, lobster, sardine, mackerel, octopus, horse mackerel, mussel, clams, oyster, spider-crab, bluefin, and albacore and bluefin tuna. Fish is offered whole, gutted, or filleted with skin.

Online sales are promoted via paid advertising on social media (targeting specific groups of customers on Facebook) and production of short video clips with an educational character to present daily fish offered. For example, a fishmonger may record an entertaining and interactive video on "fish of the day" – usually trophy fish available in the shop.

The shop owners received regional support for starting the business from the Regional Government of Galicia, "Xunta De Galicia", although due to lack of information they did not receive any support from EU funds.

La Pescadería de mi Barrio's positive experience with higher annual turnover in online sales, encouraged other fishermen and fishmongers to start with online sales and follow similar concepts.

Shop owners are concerned about the lack of interest from young people, who are not buying fish due to several reasons such as low income, lack of skills and knowledge about fish preparation, and low consumption habits. Lack of IT and administration skills were the main problems for the founders and forced them to invest in further training (including marketing skills).

Future

Since 2012, online orders have regularly increased year on year, and soon the small online sales shop plans to employ three more people to satisfy increasing market demand. Currently, the owners are the only two employees.

The online shop owners believe that local fisheries can benefit from online sales if they adjust to market trends and new or emerging technologies. In the future, there will be higher trade via online shops, but this will not replace the physical fish market as there remain many consumers who prefer to see fish products in person, as part of the unique experience. Fish markets must adjust to appeal to younger generations of consumers, while recognising their needs and lifestyles. Online sales should be engaging and should present information such as the health benefits of seafood

consumption, sustainability of products, and organic production. Consumer preferences can be affected by prices, species, the consumer group in question, and certifying bodies. All these must be taken into account when planning the future of online sales.

CASE STUDY: **Delmaralplato** (platform)

"Delmaralplato" is an online sales platform for FAP located in Vigo, which is involved in both B2B and B2C business concepts. The founder initiated and developed the platform in 2014 after recognising the vast potential for online sales. The platform buys fish from the auctions in Vigo, the biggest and busiest fishing port in the world, and sells to registered first-sales buyers such as restaurants and intermediaries, as well as directly to consumers. The company sells FAP both online and in a physical shop in Vigo. The platform uses Enterprise Resource Planning software (ERPs), customer relationship management software (CRMs), cloud computing, online tools, social media tools (Facebook, WhatsApp), and its own online shop.

Photo 9. Delmaralplato, the platform for online sales of fisheries and aquaculture products
Source: www.delmaralplato.es

FAP are bought in Vigo and then sold to customers both locally and throughout Spain, by the means of 24-hour transport companies. The goods are a similar price to traditional fish markets, and all prices are visible on the website. Delmaralplato offers wild and farmed fish from off the Galician coast. Wild fisheries products available include: pollock, bluefin tuna cut, fresh and salted cod, white seabream, Atlantic bonito, mackerel, scorpionfish, turbot, gilthead seabream, lemon sole, horse mackerel, common sole, European seabass, grouper, john dory, monkfish, red mullet, and sardine. Aquaculture products available include gilthead seabream, European seabass, turbot, and Atlantic salmon). Fisheries and aquaculture products offered are mostly fresh but also include frozen products in fillets, slices, or in loins based on the customer's preference and special requests. Innovative customer experiences are also offered in order to attract new consumers. One example is a gift card that can be spent at the online shop. Furthermore, a customer can purchase packs that include selected FAP including additional products, such as recommended wine that can be paired with fish.

The company delivers within Spain's mainland and to the Balearic Islands. Customers can receive orders in less than 24 hours. To ensure optimum freshness, deliveries are made before 2pm during the week and before 1pm on Saturdays. The boxes are made of expanded polystyrene, which maintains the products at an adequate temperature for 24 hours after packaging. For customers outside of Vigo, the minimum order is EUR 60, the shipping cost is EUR 6,95 whatever the weight of the package and free shipping starts from EUR 120. Deliveries within the local area (Vigo and the Nigrán municipality) are free for orders over EUR 50. There is also a possibility to collect fish directly from the company.

When produce is shipped, a customer can track an order at any time on the website of the selected transport agency. Payment is carried out electronically via card payment or online payment systems such as PayPal and Leo Pay[35].

Currently there are about 500 customers, and two management and administration employees. A typical consumer is 40-65 years old, with a mid to high education level, from mainly urban areas. Males and females are about equally represented. Sales through online tools are recording double-digit growth, which is tracked using Google Analytics data.

Promotional activities for online sales are a nonstop activity. Tools to attract new consumers include a blog section on the website where seafood recipes ("the Galician octopus", "rice with lobster", and so on) and fish-related educational articles for customers are regularly posted ("Can you recognise the difference between the quality of hake you buy?", "Five reasons to buy fish," etc). The platform received support from the European Maritime and Fisheries Fund between 2014 and 2020, as well as the Regional Government of Galicia (Xunta de Galicia, Consellería del Mar) and from the Fisheries Local Action Group (FLAG) Vigo-A Guarda[36].

The advantages of online sales are significant as long as sales and marketing activities are managed effectively. Time-saving purchasing process, convenient delivery options, easy access to market, potential for rapid growth and customer intelligence are among the advantages in online sales.

Delmaralplato faces challenges relating to market knowledge, marketing and sales skills, and extra costs incurred. These costs can include logistics, online development, maintenance costs and publicity efforts. Planning, designing, creating, hosting, securing, and maintaining a professional online sales platform require constant significant investments, especially in situation when growing sales volumes are experienced.

Future

Delmaralplato sees scope for further development of online sales through the integration of information technologies within sales, which allow companies to improve ways of working and to adapt the demands of the market in an agile way. Further computerised solutions may also help to enhance communications challenges, particularly through consolidating information for customers and integrating this into core business activity. This my enable the company to make responsive market decisions in real time. Future avenues for development also include improving productivity, enhanced business management and improving visibility online.

[35] E-wallet payment and financial platform that enables money transfers and offers clients multi-currency IBAN accounts.

[36] https://webgate.ec.europa.eu/fpfis/cms/farnet2/on-the-ground/flag-factsheets/r%C3%ADa-de-vigo-%E2%80%93-guarda_lv

6 THE UNITED STATES OF AMERICA (U.S.)

In 2019, online sales of food and beverages was the fastest-growing commodity group among e-commerce products at 18.2%[37]. In the U.S. in 2017, apparent consumption of FAP was estimated at 7,2 kg per capita, which was 0,5 kg more than in 2016[38].

U.S. consumers spend about two-thirds of their annual FAP expenditure on seafood in restaurants, cafeterias, or other types of foodservice businesses. In the U.S., there are a few hundred different fish and shellfish products available in the marketplace. However, only ten types of fish and shellfish product represent over 80% of the seafood consumed. The majority of FAP consumed in the U.S. is imported, but a significant portion of this imported seafood is caught by U.S. fishermen, exported overseas for processing, and then imported back to the U.S. The leading species landed by commercial fishermen include Alaska pollock, menhaden, tuna, cod, and salmon.

In the U.S., the amount of fish and shellfish harvested from the wild annually is over 10 times greater than the amount produced by domestic aquaculture farms. Catfish represents a little over half of the total farm-raised seafood products produced annually, while crawfish, trout, oysters, salmon, tilapia, and striped bass represent other important domestic aquaculture products, in order of quantity produced[39].

Once seafood products are harvested, they are generally processed or packaged for distribution to retail stores and restaurants. Wild and farmed products are transported and packed for distribution to processing plants or wholesalers. There is a large network of commercial wholesale and distribution businesses in the U.S. that purchase seafood products from a variety of different sources, store them, assemble the items into orders for customers, and deliver them. This network is responsible for sourcing, purchasing, transporting, storing, and delivering seafood products[40].

CASE STUDY: **The Local Catch** (platform)

The Local Catch is a fisherman-run seafood processing and distribution B2C company that specialises in marketing Rhode Island-caught seafood to consumers in Rhode Island and eastern Connecticut. They sell catch through direct sales either online or directly to restaurants, farm markets, and a community-supported fishery (CSF) program. CSF is an analogue to local direct marketing efforts in fish market systems. The Local Catch CSF program works as a debit system. A set amount of money is preloaded at the beginning of the contract, and the participant may spend that preloaded money at any place they desire. Consumers who subscribe to the CSF pay an up-front fee to join; throughout the year, they receive a basket of fresh seafood every week, which they collect from centralised pick-up locations. A CSF helps fishermen to finance their operations.

The origins of the concept trace back to over 15 years ago when a group of fishermen, cooperative extension agents, professors, and community leaders from North Carolina investigated methods to boost demand for seafood from local fishermen, and in turn help them get a better price for their harvest. Those customers who select other sales options can purchase FAP after pre-order (only for the actual week) through a form on the website. After an email confirmation they can pay for their

[37] https://www.emarketer.com/content/grocery-ecommerce-2019

[38] https://www.ers.usda.gov/data-products/food-availability-per-capita-data-system/

[39] https://www.fisheries.noaa.gov/national/fisheries-united-states-2017

[40] https://www.fisheries.noaa.gov/resource/document/fisheries-united-states-2017-report

products. Before forming The Local Catch, fishermen's catch was sold to centralised wholesalers, who marketed it through out-of-state seafood auctions in locations such as New Bedford, Boston, and New York. From there it was shipped all over the U.S. and the world. Some of it found its way back to Rhode Island, but only after passing through many hands, deteriorating in quality, and accumulating a high carbon footprint.

Among challenges that are facing future development of The Local Catch company, such as successful marketing and reaching larger number of customers, are constraints to involving other Rhode Island fishermen in the project, who still sell their catch through out-of-state seafood auctions. In this way fishermen get lower prices for their catch, because several sets of intermediaries (dealer, wholesaler and retailer) are sharing marketing margins[41].

CASE STUDY: **Louisiana Direct Seafood** (platform)

Louisiana Direct Seafood is a marketing initiative which functions as a B2B and B2C online platform administered by Louisiana State University Agriculture Center and Louisiana Sea Grant, with funding from the Louisiana Office of Community Development and the Gulf States Marine Fisheries Council.

The initiative's mission is to help coastal fishermen to connect with consumers, and to help local dealers to buy fresh fish directly from fishermen and thereby build community support for locally wild-caught seafood products. There are more than 150 fishers involved. This initiative is also focused on quality business practices, working with fishermen to deliver a superior, sustainable product that meets rigorous standards and preserves fisheries for generations to come. A website, social media, and e-commerce help fishers to better market their products along the entire Louisiana coastline and the state. The website allows for fishers to announce their catch directly to buyers. As soon as they dock, fishers place messages on the website's Fresh Catch message board via their smartphones or tablets. The messages, which appear on the website's homepage, typically include the type of product available, size, location, and contact information. The messages are also automatically sent to the Facebook pages of the four programme areas on the coast: Cameron Direct Seafood, Delcambre Direct Seafood, Lafourche-Terrebonne Direct Seafood and Southshore Direct Seafood. The variety in FAP offered through online channels is wide, from fresh products to ready-to-cook local seafood. To overcome seasonal challenges and meet consumer demand, the team facilitated the introduction of value-added packaged products and updated branding.

Over the past few years, the team has helped fishers and processors across the coast introduce frozen packs of fish, shrimp, and more. The frozen seafood products listed on the online shop provide contact details for the fishermen who caught and/or processed the seafood. Many of the products also carry the Certified Authentic Louisiana Wild Seafood label, which guarantees the seafood was caught in the Gulf of Mexico or Louisiana coastal waters by licensed Louisiana fishermen, landed at a Louisiana dock, and processed and packaged by a Louisiana-based company. Higher visibility of online platforms is assured by regular posts in the news section of the website, as well as with plentiful options and up-to-date information on the website. A highlight of the interactive website is the "Seafood Academy" section, which contains educational videos for fishermen and consumers to understand the changing seafood industry. For example, there are videos on "How to use social media", "How to market successfully", and various videos on regulations required by federal law and for seafood health and safety compliance, among others[42].

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[41] http://thelocalcatch.com/

[42] https://louisianadirectseafood.com/la-seafood/seafood-academy/

7 LESSONS LEARNT FROM THE CASE STUDIES AND TYPOLOGY

These projects are either B2B or B2C, sometimes both. Most of them have been granted EU funds, mostly through EMFF, including under the form of FLAGs. These projects are either private business initiatives or public-private initiatives. They all include an online platform in order to facilitate sales by small-scale fishermen/fish farmers, but also sales by wholesalers, and sales of imported FAP. However, the level of digitalisation varies significantly across projects, from a simple web page where fishermen provide information about their daily catch, to a comprehensive online platform where registered producers and buyers can buy, sell and deliver products.

In most cases, these projects reported **advantages** of online sales systems which have broadened the outlets available for direct selling, leading to increased sales and sometimes higher prices, and improved promotion of species and products. Online sales allowed buyers to be informed in advance of the supply and thus anticipate their purchases, which allowed buyers to better manage the high volatility of the FAPs' supplies and prices. In Spain, online sales have allowed buyers to gather the supply from several small auctions (reaching better diversity and regularity of the supply) and prevent buyers from concentrating solely on bigger auctions. Several projects highlighted that consumers reported the convenience of such delivery options, easier access to products and a timesaving purchasing process.

In some areas, online channels are not considered to be a threat or competitor to traditional fishmongers or wholesalers but are seen rather as a positive complementary tool for targeting new consumers (especially the younger generation) and promoting unknown or underrated species. In addition to building the information available and the promotion of fishing activities and products, most of these projects created or increased networking between fishers, tourism specialists and the gastronomic sector.

Online sales allow better monitoring of sales volume and unit value, useful information that can help producers to better know their market. Moreover, this can also provide a better level of information, supplemented by additional services (blogs, recipes, videos), to consumers than traditional direct sales (species, fishing technique, sustainability, health benefits, etc.).

However, one of the main **constraints** faced by people involved in surveyed projects has been the lack of IT and administration skills, including marketing skills, among producers and typical customers.

Moreover, the lack of trust is a key factor that can be a barrier to the development of online sales in a sector where seeing the product before purchase has been important to guarantee origin, freshness, etc. Trust issues mostly arise from buyers when buying remotely and from producers used to being paid immediately. A minority of projects reported acceptability issues from “traditional” stakeholders such as wholesalers, who saw online sales as a threat to their own activity.

In addition, depending on the activity, online sales systems could lead to specific investment in areas such as IT, packaging, refrigeration, ice machines, storage facilities, delivery trucks, and so on. Apart from investment challenges, there is a logistical burden involved, including the challenge of adaptability to new infrastructures that could hinder the involvement of producers afraid of profitability issues.

Table 1. Summary of the main characteristics of all the case studies studied

Case study	Initiator/ Users / Type of Project	Online tools	Consumers / Buyers	Main achievements	Main challenges
Austria (Blün Farm)	Fish farm (B2B, B2C)	Website www.bluen.at, social media (Facebook, Instagram, Twitter)	Local – inhabitants of wider Vienna (B2C), restaurants (B2B).	High level of customer satisfaction, two-fold growth in online sales.	Distribution, handling orders, logistics, attracting new customers.
Croatia (BuyFish)	Fishermen's association / fishermen (B2B)	Website BuyFish.eu (online platform)	Local (Umag), regional (Istria County) - registered first buyers: fishermen, fishmongers, restaurants and supermarkets.	The first initiative of its kind in Croatia (closed in 2019).	Lack of interest from fishermen, shortage of human capacity, financial resources.
Denmark (HavFriskFisk)	Small-scale fishermen (B2C)	Website www.havfriskfisk.dk (online platform)	National – inhabitants of Denmark and tourists.	Growth of the service, higher sales for fishermen, better prices for customers, self-funded initiative.	Lack of greater public awareness of existence of such service, no guarantee for fish availability.
Estonia (Stonefish OÜ Fish)	Small-scale fishermen, (B2C)	Email orders based on offers on www.stonefish.ee, social media (Facebook).	Local (island of Hiiumaa), regional, national – inhabitants of Estonia and tourists.	Additional marketing opportunity for fishermen.	Logistics chain and lack of IT and infrastructure for distribution.
France (MonPêcheur)	Small-scale fishermen (B2B)	Mobile app, social media (Facebook, Instagram)	Local, regional – inhabitants of Bretagne Sud-Ouest	Project still in testing phase but the app is already operational.	Stakeholders' acceptability, compliance with regulations on direct selling.
Germany (Fisch vom Kutter)	Small-scale fishermen (B2C)	Website www.fischvomkutter.de (online platform).	Local, regional – inhabitants of Schleswig-Holstein region in the Baltic Sea,	Increasing demand for fresh and local fish with the use of cheap and widespread IT technologies.	Strong reduction of Baltic quotas hindering diversity and regularity of supply for main commercial species (e.g. cod) in short and medium term.
Portugal (Cabaz do mar)	Fishermen (B2C)	Website, Facebook. The project closed.	Local – inhabitants of Azenha do Mar and municipality of Odemira	Alternative outlets found by fishermen at interesting prices for their catch and especially for lesser known species.	Profitability issues. Costs covered but no profit.
Spain (Pescadoartesanal)	FLAG Pontevedra / fishermen (B2B)	Website www.pescadoartesanal.com (online platform), social media (Facebook, Twitter)	Local / 4 fish auctions – registered first-sales buyers: wholesalers, fishmongers, restaurants, processors…	Allowed buyers to take advantage of smaller auctions by providing a wider range of products at greater and more stable volumes, allowing higher prices.	Technical issues and reservations of users about the benefits of digitalisation.
Spain (La Pescadería de mi Barrio)	Wholesalers (B2B, B2C)	Social media (Facebook, Instagram, WhatsApp Business), YouTube.	Local – inhabitants of Vigo region.	Higher annual turnover, good results encouraged other to start with online sales and to follow similar concepts.	Lack of IT and administration skills, not enough information available on funding sources for further investments.

Case study	Initiator/ Users / Type of Project	Online tools	Consumers / Buyers	Main achievements	Main challenges
Spain (Delmaralplato)	Wholesalers (B2B, B2C)	Website www.delmaralplato.es (online shop), social media (Facebook, WhatsApp).	National – registered first sales buyers: restaurants and intermediaries (B2B) and private consumers (B2C)	Double-digit growth in sales, popularisation of online sales of FAP among customers, wide range of products on offer.	Lack of market knowledge, marketing and sales skills, plus extra costs including logistics, online development, and maintenance.
U.S. (The Local Catch)	Small-scale fishermen B2C)	Website www.thelocalcatch.com (pre-orders or through Community-Supported Fishery program), social media (Facebook, Twitter, Instagram)	Local (Rhode Island and eastern Connecticut) - restaurants, farm markets, and a consumer who subscribe to the community-supported fishery (CSF) program	Keeping seafood-related profits and jobs in the U.S., and reduction of carbon footprint of products.	Fishermen still sell most of their catch to centralised wholesalers.
U.S. (Louisiana Direct Seafood)	Fishermen, vendors - (B2B, B2C)	Website www.louisianadirectseafood.com, (online market) social media (Facebook)	Local, regional – inhabitants of Louisiana (B2C), restaurants, wholesalers, processors (B2C)	Fishermen adopted a new set of skills: business management, marketing, technology, packaging and processing, increased competitiveness. Wide offer of products: from fresh to ready-to-cook products. Advanced and interactive website and e-commerce tool.	Involvement of higher number of fishermen, seasonal variation in product availability.

8 CONCLUSIONS

Engagement at every step of the supply chain is needed to deliver fisheries and aquaculture products to the final consumer. Online sales provide a solution that brings many advantages to the producer, but also some challenges. Choosing an online sales option demands consideration of numerous factors as well as operational and individual requirements. These include the location and size of the business, the population density and purchasing power in the area, the local supply levels and inherent competition, the time required for necessary transport routes, the investment required, and personnel costs. Fishermen's commitments and personal abilities may also play an important role. An entrepreneurial approach and a willingness to assume significant risks are necessary attributes for those aiming to transition from traditional sales to direct sales online. The producer must manage their business well and be able to offer an attractive assortment of products. Particularly helpful in the start-up phase is a network of reliable customers who buy the company's products regularly.

ADVANTAGES OF ONLINE SALES OF FAP

The internet is reputed to be a modern, convenient, and time-saving supply channel for sales of many products, including FAP. Online marketing and sales herald advantages for both producers and consumers. Producers increase their revenue thanks to more flexible pricing models (more competitive prices than in supermarkets, promotion of traditionally less attractive FAPs) while consumers usually benefit from high product quality and competitive prices. In addition, digital tools offer new possibilities for local producers to effectively market their catch and find a balance between demand and supply.

Online sales are used by fishermen to sell a portion of their fresh products and diversify their sources of income. With the current trend towards the development of short supply chains, online sales are increasingly popular and can be an efficient way to meet consumer demand for authenticity, quality and traceability. One of the biggest advantages of sales through online channels is the fact that the supplier has control over the marketing process at every phase, and therefore has a greater level of autonomy. With the appropriate customer frequency, high sales can be achieved in a relatively short period of time, which signifies benefits to the business over a short time scale.

Direct sales, which are an important segment of online sales, are more lucrative than supplying to wholesalers and retailers. Buying fish direct from producers also benefits consumers. According to the report "Fish Consumption in Croatia"[43], by buying directly from local suppliers, consumers are able to ensure that they are supporting local and seasonal products, and usually have a higher guarantee of both freshness and quality. In addition, fish purchased directly from producers is usually less expensive than that sold in supermarkets[44].

CHALLENGES OF ONLINE SALES OF FAP

For suppliers, online selling entails a number of obligations and risks. Usually, these include the additional costs of packaging and shipping. In addition, establishing and maintaining online tools can be challenging and time-consuming. Internet buyers are often price-sensitive and compare the offers of different suppliers meticulously before placing an order. Lack of skills in using social media and

[43] https://ribarstvo.mps.hr/UserDocsImages/Final_hrvatski_Eurofish_Izvje%C5%A1taj_Konzumacija%20ribe%20u%20Hrvatskoj_2017.pdf

[44] Eurofish Magazine 3/2019, 50-53 pp. https://issuu.com/eurofish/docs/eurofish_magazine_3_2019/50

IT, and limited marketing experience and online trade knowledge all present significant challenges for producers.

Suppliers must also be compliant with existing legislation on fisheries and aquaculture products. It is especially challenging to comply with legislation during delivery to the final consumer, because a producer needs to deal with perishables, timely transit, proper handling, and paperwork at all points of shipment. Produces needs to be able to ensure proper harvest, temperature control during handling, sanitation, and documentation throughout the whole supply chain.

Other identified challenges include logistics and costs, which include the need for greater staff and fisheries capacity (in terms of volume of production), costs of packaging, storage, and transport. Seasonal limitations can influence fishers' daily catch, and adverse weather conditions may prevent boats from fishing at short notice. Also, there is pressure on the supplier to sell the fish as quickly as possible due to consumer preference for fresh fish. This demands a level of flexibility from customers in order to obtain the desired products. However, this pressure is offset by producers' autonomy in establishing their own pricing models.

Challenges for customers include a general preference for shopping in-person, which allows them to verify the quality of a product before purchase as well as supporting their preferred local businesses. In some fishing locations it is possible to attain information about the day's catch via web portals, which enables consumers to adjust their expectations accordingly. Other issues faced by potential customers include a lack of IT skills and appropriate means to make online payments.

Online purchasing and social media are leading to changes in how people find and purchase goods. People want to feel more of a connection with their food and know its source. An emerging opportunity for online sales are mobile market purchases, which allow fishermen to utilise the internet to sell directly to consumers through various applications and social media tools on mobile phones or other mobile devices. Such sales methods require greater time commitments and the uptake of new skills among other things, but also bring benefits such as faster selling, higher product price and development of loyalty among customers. While fishermen only offer fish from their own catches when selling through online channels, aquaculture businesses can also offer additional complementary products, such as vegetables grown using aquaponic models. This has the added benefit of increasing efficiency and production capacities by utilising existing resources to maximum advantage. There are also business initiatives where products offered are supplemented by imported products.

COVID-19 OUTBREAK

The effects of the Covid-19 outbreak, in particular the closure of fresh counters in large retail shops, city markets, the HoReCa sector, and the drop in demand for fresh fish products in retail, have led to significant impacts for the fisheries and aquaculture sector. Many small-scale fishermen and aquaculture farmers have been forced to find alternative outlets for their daily production to stay economically viable. This has led to a strong development of direct selling in coastal areas and the development of online tools and delivery services to support this new market opportunity. Some of the online sales projects covered in this study reported an increase of sales (e.g. Fisch vom Kutter, Germany).

There were many other initiatives from most EU Member States where various market restrictions pushed stakeholders to develop new services. Some of these were developed through efforts and

actions carried out by FLAGs, National Networks and Managing Authorities[45] (e.g. take-away services in Finland[46]; 24/7 vending machine system in Slovenia developed by FLAG Posavje[47]), or by private businesses (Gran Canaria fishermen switched to online sales on social media[48]; Spanish fishmongers developed online sales via WhatsApp[49]), and public service initiatives (The Croatian Ministry of Agriculture has launched an online web platform Tržnica.hr[50] that enables the purchase and sale of domestic agriculture, fisheries and aquaculture products from all over the country; Bretagne region in France launched the online sales platform, "Breton producers and consumers together"[51]).

In addition, according to Rabobank analysts[52], social distancing measures introduced to contain the coronavirus outbreak have been accelerating the rise of online shopping across Europe and the U.S. They report that e-commerce sales of fresh produce have risen by about 20% since March 2020, when coronavirus became more serious in Europe and North America, and online takeaway deliveries have doubled. This may change purchasing behaviours in the long term. Although many first-time users of e-commerce channels will go back to physical shopping because many online delivery platforms are not able to cope with the current demand levels, some consumers will alter their purchasing behaviour in the long term. Consumers may also demand locally produced foods and there will be a lower tolerance for products that come from complex international supply chains[53]. In this context, the outlook for online selling tools in the seafood sector in the future can be considered very positive for a range of stakeholders, from major global distributors to local fishery companies.

[45] https://webgate.ec.europa.eu/fpfis/cms/farnet2/news-events/news/covid-19-flag-response-message-board_en

[46] https://webgate.ec.europa.eu/fpfis/cms/farnet2/news-events/news/covid-19-flag-response-message-board_en

[47] https://www.eposavje.com/ostale-novice/na-trznici-videm-v-krskem-prvi-ribomat-v-sloveniji

[48] https://www.eldia.es/economia/2020/04/06/sector-echa-redes-traves-perfiles/1067974.html

[49] https://www.lavozdegalicia.es/noticia/maritima/2020/04/06/alta-cocina-sale-rescate-flota-animando-comer-pescados-frescos/0003_202004G6P32991.htm

[50] https://trznica.mps.hr/

[51] https://lemarin.ouest-france.fr/secteurs-activites/peche/36366-peche-lancement-dune-plateforme-bretonne-de-vente-directe

[52] https://research.rabobank.com/far/en/sectors/fresh-produce/corona-concerns-in-the-global-fresh-produce-sector.html

[53] https://www.undercurrentnews.com/2020/04/13/rabobank-covid-19-crisis-to-squeeze-salmon-producers-margins-2/

ANNEX I. (QUESTIONNAIRE TEMPLATE)

Questionnaire – Online Sales of Fisheries and Aquaculture Products

1. Please introduce your organisation (who initiated it, when, why, and the area of operation)?
    - Is it a B2B (business to business) or B2C (business to customer) company?
    - Are you a new actor in the supply chain?
    - Do online sales models other than yours already exist in the supply chain?
2. Please describe the way it functions. What tools do you use (Facebook, Twitter, email, website…)? How do you manage logistics (storage, transport, packaging)? What are the costs for fishermen?
3. Are you selling the same products via different channels? What is the share of various share channels and online sales markets in term of value/volume?
4. Are online sales organised by each individual fisherman or are they organised by the association for all the members?
5. Was there any promotional campaign to introduce to potential consumers the new concept of online sales/shopping?
6. What activities do you conduct to promote this sales channel?
7. How many fishermen/customers are involved in online sales? How many administration/management employees does your organisation have?
    - What is a typical consumer profile (age group, gender, education, area)?
    - Can consumers pay for the fish electronically (card, phone etc.) or is it only by cash?
    - What are the species being sold? Is the product whole round fish or is there any kind of value addition – gutting, filleting?
    - How long are the trips made by the fishermen, a few hours, a day, or several days?
8. How can local fisheries benefit from online sales? Do online sales pose a threat to traditional fishmongers?
9. What are the opportunities on local, national or global markets? Do you sell your products to other MSs? How do you see the development of online sales in the near future?
10. How do you measure the effectiveness of online sales (profit, number of customers)? What is the growth trend?
11. Are consumers informed in advance of the prices and fish species that are available for sale?
12. How can digitalisation support local communities in retaining a greater share of the value of what is produced?
13. How are prices determined in online sales? Are the prices different comparing to other sales channels (If yes, what justify the difference)?
14. What are the challenges (e.g. skills, logistics, costs) for stakeholders (fish farmers, small-scale fishermen) when implementing digital solutions?
15. Are there barriers (e.g. national regulations, control) that slow down the evolution of this market in terms of value, growth, and jobs?
16. Did you receive EU, national, regional, or local support (funds) for the initiative?
17. Did you receive support from Producers Organizations (POs) or Fisheries Local Action Groups (help in building capacity including digital, language, and marketing skills)?
18. What is the approximate annual turnover of online sales of registered fishermen?

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