“Piloting of eco-innovative fishery supply–chains to market added–value Adriatic fish products”

Priority Axis: Blue innovation
1.1 - Enhance the framework conditions for innovation in the relevant sectors of the blue economy within the cooperation area

D3.4.1. Socio-economic survey for fishing operators in Italy

WP3 - PILOTING OF SUSTAINABLE AND ECO-CERTIFIED FISHERY PRODUCTIONS
ACTIVITY NUMBER 3 - CAPITALIZING BLUE INNOVATION: ECO-CERTIFICATION OF FISHERIES AND FISHERMEN AWARENESS/TRAINING

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EXECUTIVE SUMMARY

Within the framework of the Interreg V-A project PRIZEFISH, a socio-economic study was carried out in order to analyse the situation and the possible impact of the project on fishermen and the Adriatic fish market. In the first part of the research, the initial state of the economy and the fishery sector was analysed on the basis of available official data, in order to give a snapshot of the Italian fisheries in GSA17, with some more details on the fisheries selected for the pre-assessment phase. In the second part, a survey was conducted among fishers active in the administrative regions of the most important regions in GSA17, in terms of fishing activity: Veneto, Emilia-Romagna and Marche. The survey was aimed to collect information on aspects not covered directly by publicly accessible data sources (e.g. labour contract, marketing channels) and the fishers' view/opinions on some specific aspect, e.g. market channels, labels for ecological or sustainable fishing, expectations from Prizefish and from the new labelling scheme proposed, the Adriatic Responsible Fishery Management (ARFM).

Baseline

The baseline has been defined by using secondary officially data sources, namely: a) National Accounts and Import-Export data, from ISTAT, the Italian National Statistical Institute; b) Data from the Programma Nazionale Raccolta Dati Alieutici (PNRDA) (ex Reg. CE n. 199/08), Mipaaf, Ministry for Agriculture, Food and Forestry Policies; c) Fishery Dependant Data Collection, collected under PNRDA and available on the Joint Research Center webpage; d) Data available on STECF reports (2019 and 2020).

The fishery sector on the overall macro-economic context: the national and the regional perspective. Italy's annual fish production is about 343,000 tons, of which 58% come from capture fisheries and 42% from aquaculture. Italy is the fourth European producer, accounting for 11% of the value of total captures after Spain, France, whereas it ranks tenth in terms of catch quantity. Italy is a net importer of fish and seafood; imports account for about 86% of the volume of seafood sales. The low self-sufficiency rate and the consequently high imports are due to the strong (and increasing) propensity of Italian consumers to purchase fish and seafood. According to Istat (Italian National Statistical Institute), the Gross Value Added (GVA) of the Italian fishery and aquaculture sector amounted, in 2018, to EUR 937 thousand (0.06% of the GVA of the whole Italian economy). When looking at the Adriatic region a major contribution of the fishery sector on the whole economy emerges. The same happens in terms of employment: in 2018, the number of Italian employees in the fishery and aquaculture sector was 0.11% of total employment in Italy and 3% of employed in primary sector (agriculture, forestry and fishery).In the Adriatic regions belonging to the area of GSA 17, the share of jobs in the fishery sector on the total jobs is higher than the national level, for some regions (e.g. Marche) reaching 0.30%. As far as the labour

remuneration it clearly emerges, from 2018 data (figure 6), that the fishery and aquaculture sector is a low wage sector: on average, a fisher earns half of the gross wage earnt by workers of the whole economy. Nevertheless, the average wage earnt by fishers in the Adriatic regions is higher than that registered at national level, testifying the relevance of the marine fishery sector for the area.

Commercial fishery in the waters of Italian GSA17. In 2019, approximately 2,800 vessels operated within GSA 17, the sub-geographical Adriatic area including the Italian coastal regions of the Northern and Central Adriatic, namely Friuli-Venezia Giulia, Veneto, Emilia-Romagna, Marche, Abruzzo and Molise. The fleet has stronger 'industrial' or 'semi-industrial' connotations; approximately half of the fleet operates using 'active' gear and have a LOA greater than 12 metres (30% for all the Italian fishing fleet). Considering data updated to 2019, passive gears vessels represent more than a half of the GSA17 fleet (53%) in terms of number, followed by the hydraulic dredgers (21%). Dredgers remain the second fishing fleet also in terms of tonnage (16%), the first being represented by trawlers (45%). Between 2008 and 2019, fishing capacity in GSA 17 decreased by more than 17%, both in terms of the number of boats and in terms of gross tonnage. A decrease of fishing days is detected, during the 2008-2019 period, as well. In particular, fishing effort of the demersal trawler fleet was affected by the entry into force of the national management plans for demersal fleet in 2019 (a reduction in fishing days of 5% in 2019 and 10% in 2020 was set for demersal trawlers operating in GSA 17 and 18). The Italian Adriatic fleet fishing in GSA17 landed almost 80 thousand tonnes of seafood in 2019 (46% of the overall Italian fishery production); the value of landings was about EUR 300 million. In terms of volume, pelagic trawler is the most important segments (30,291 tons, 38% of the volume of landings in GSA 17) while in terms of value, demersal trawler is the most relevant (EUR 120 million, 40% of the value of landings in GSA 17). The main commercial species in GSA 17 are Striped venus, European anchovy, European pilchard, common cuttlefish and common sole, representing 49% of total production in value. Prices have increased significantly since 2016 for the three most important fish species (anchovies, European pilchards and clams), as a consequence of lower landings with the addition, in the last years, of the valorisation strategies pursued by POs, whose role has grown significantly, especially those active in the bivalves' fisheries.

Socio-economic characteristics of the selected fisheries. As reported in the Report on Consultation Meeting with relevant fishing operators in Italy (D.3.2.1), the fisheries selected for the pre-assessment are 1)traps for common cuttlefish; 2) small pots for spottail mantis squillid; 3) small pots for changeable nassa; 4) hydraulic dredge fishery for Striped venus and razor clam; 5) hand-harvesting of Mediterranean mussel from gas platforms with scuba divers. The analysis of the fisheries has been carried out with a view to the overall GSA 17 area and, as far as the economic performance, the analysis was carried out at the level of aggregation defined by the data collection, that is *passive gears* (PGP) for the traps and pot fisheries (for common cuttlefish, spottail mantis squillid and changeable nassa);

hydraulic dredgers (DRB) for the clams' fisheries. As far as the *wild mussels' fishery on gas platforms*, considering that this fishery is not covered by the official data collection system, an ad-hoc data collection of socio-economic data was carried out.

Passive gears. Vessels using passive gears in GSA 17 are characterised by an average length of 7.05 meters (LOA), gross tonnage of 2.68 tonnes and engine power of 38.46 kW. The average crew size is 1.4 and the main fishing gears used include set gillnets, trammel nets pots, pots and traps. Passive gears used in GSA 17 predominately target high-valued species, such as cuttlefish, common sole and spottail mantis. Changeable nassa account for 9%.These four species were the most important species in 2019,accounting for about 50 % of the total landings in value. Pots and traps (the category of gears covering the selected fisheries targeting cuttlefish, spottail mantis and changeable nassa) account, in GSA 17, in 2019, for 20% of the fishing effort of passive gears. Total revenue for this fleet segment in 2019 was EUR 49 million (an average per vessel of over EUR 30 000) with other income accounting for around 15% of the total. Among the operating costs, crew costs were highest at 63 % of the operating costs. In 2019, this fleet segment generated a gross profit of EUR 21 million. With a net profit margin of around EUR 11 thousand, profitability was quite high. Net profit margin was estimated at 30% and RoFTA (the return on fixed tangible asset) at 69%, highlighting a good performance of the sector.

Hydraulic dredgers. This fleet segment consisted, in 2019, of 552 active vessels (out of a total of 594 vessels), operating mainly, in order, in Marche, Veneto and Abruzzo as reported in figure 18. The fishery is regulated by a self-management approach based on Territorial User-Rights in Fisheries (TURFs) through Molluscs Management Consortia (Co.Ge.Vo), which are distributed at compartment level. Vessels using dredges in GSA 17 are characterised by an average length of 13,55 meters (LOA), gross tonnage of 13.90 tonnes and engine power of 108.36 kW. Vessels have an average age of 32 years and a crew of 2.3person. Hydraulic dredgers in GSA 17 predominately target striped venus, representing 89% of the overall value of landings of the fleet. Smoot clams, caught exclusively in Veneto and Friuli Venezia Giulia, account for 10% of the total. Razor clams represent a very small portion of the total (0.004% in 2019). Actually, the landings of this species, usually caught in Veneto and Friuli, is facing a decreasing trend in the last 5 years for the whole GSA 17 area. Total revenue for the fleet in 2019 was to EUR 48 million, amounting to an average per vessel of EUR 87,540.Among the operating costs, crew costs were highest at 76% of the operating costs. In 2019, this fleet segment generated a gross profit of EUR 34 million. largely due to lower energy costs. Net profit margin was estimated at 26% and RoFTA at 49%. This fleet segment saw some improvement compared to previous years, registering, since 2018, an increase of net profit (from EUR 0.69 million to EUR 5.41 million), that has to be attributed to the increase in the volume of landings and, to a minor extent, to a decrease of the expenditure. Indeed, the derogation from MCRS (reduced from 25 to 22 mm) has made possible to reduce the daily fishing hours with a positive effect on operating costs and, therefore, on profitability.

Wild mussels' fishery on gas platforms. The underwater fishing of wild mussels is a special feature of Ravenna seamanship. It started in the '80s, following the ban to the fishing activity close to the off-shore platforms. The wild mussel fishery on gas platforms is carried out by around 30 fishers adhering to 2 cooperatives (La Romagnola and Conisub), accounting for eight vessels. The two cooperatives are in charge of the management of administrative aspects for the associated vessels as well as the coordination of the marketing aspects. The fishery is carried out from spring to the end of autumn by fishers contracted with full-time season contracts).The collection of mussels is conducted by scuba-divers and by specialized technical operators, since the fishing is simultaneously an unload activity to maintain the gas platforms clean and a deep specialisation is needed. The employment created by the fishery is estimated in 32 jobs (persons employed) and around 10 FTE. As far as the volume of production, the yearly total production for 2019 can be estimated at around 720 tons for a worth of around 1.3 million EUR. Total revenue for this fleet segment in 2019 can be estimated in EUR 1.3 million (an average per vessel of over EUR 162 000). The GVA generated by the fishery is estimated to be, in 2019, around EUR 1.2million (average of EUR 155,000 per vessel). As a result, the Labour productivity (GVA per FTE, EUR) can be estimated in EUR 117,000.

Survey results

This section reports the main findings of a survey conducted during May 2021 with the aim of collecting a) data and information on socio-economic aspects not covered by the official data sources and b) perceptions and expectations of the main operators with respect to the introduction of an eco-label as the ARFM. The purpose of the socio-economic research within this study has been to examine the possible impact of implementing new labels for the Adriatic fisheries, taking into account the current situations and trends in the fishing fleet as wells as experiences and opinions of local operators (fishers or their representatives). The feedback of fishers has been collected by mean of a survey based on the submission of a questionnaire containing a set of simple questions, 33 in total. The survey reached 30 respondents, largely from fishing enterprises associated with cooperatives and/or POs'. The coverage of the sample is wider of what emerges from the number of respondents when considering the coverage of the PO or the fishers' association the respondents represent as well how they have replied: indeed in 14% of the cases, respondents have replied on behalf of the cooperative to which they are associated and in 11% of the cases, they have replied on behalf of the PO, hence expanding the representativeness of the survey.

Fishing activity: income, use of resources and employment. Almost all the fishers interviewed stated that their income was made up solely of income from fishing activity (89% of the total) while in very few cases (2 respondents) they stated to use their vessel also for other activities (maintenance of mussel farming facilities and tourism).In relation to the fishing activity as main source of income, 70% of fishers

using dredges asserted to be 100% dependent on clams this resource; for the remaining 30% clams make up 75% of their income from fishing. As far as passive gears fisheries, by nature they are multi-species and only in a few cases the percentage of income from a single species is higher than 50%. On the other hand, the wild mussels' fishery on gas platform is, by nature, as mono-species activity. The type of employment contract applied is usually seasonal and provides for a salary calculated by the "share-method", a feature of the Italian fishery sector. The discourse is different for divers who fish wild mussels where fixed-wage employment contracts are applied, on a full-time basis (seasonal contracts prevail). Scarcely used the part-time contract. Many fishers, especially those who practice a more artisanal type of fishing, complain about the lack of generational renewal, because of a profession now seen as tiring (also called "exhausting") and unprofitable.

Analysis of sales channels and of market and buyers' preferences. A lack of a direct link of fishers with the processing industry emerges from the survey: 99% of the respondents do not use this channel at all while 1% declare to use this channel for a percentage of 10% and therefore residually. As far as the wholesale trade is concerned, 47% of respondents use this channel. The retail channel on the domestic market is even at a lower level, with 95% of fishers declaring that they do not sell their product directly through this sales channel. Similar is the situation for the Ho.Re.Ca. channel being an unused channel, in the first sale, by more than 97% of respondents. For most fishers surveyed (25%) the first channel remains the fish markets where the daily catch is brought. 30% of those who have stated that they use this sales channel, report to use it for 100% of their product, and another 20% for percentages close to 50%. Finally, 19% of respondents sell directly to the final consumer upon arrival at port. Clearly, these are mostly artisanal fishers using passive gears and traps. Price is the factor most influencing the buying decisions for all categories of buyers (41%) followed by the freshness of the product (35%). The freshness of the product, according to the respondents, is a factor that becomes more important as you descend downstream into the supply chain; the closer you get to the final consumer, the more decisive this factor becomes. According to some respondents, factors such as the stability of supply, in terms of timing and quantity, are at stake during the purchasing decision process, being decisive for wholesalers and processors.

Current situation about label and quality certifications. According to the result of the survey, only 44% of the respondents (represented only 60% of fishers reached by the survey) benefit of quality certification (MSC or other brands), especially those who fish for clams. However, more than 85% of them stated that holding a quality label had no effect on sales (e.g. increase) while respondents reporting an effect on sales specified that the increase was equal or lower than 40%. According to respondents, the presence of a quality label influences the purchase by Ho.Re.Ca. operators (according to 40% of respondents), of the fish markets (40%) and retailers (20%). Curiously, none of the respondents believe that final consumers are sensitive to a possible quality label when they decide to

buy their product while they think that for consumers it is important the known origin of the fish product (29% of respondents), which is also relevant for restaurants (28%) and retailers (43%), confirming what has been highlighted by the recent literature on the topic, i.e. that the final consumer pays greater attention to the origin and freshness /quality of the fish product purchased instead of sustainability certification. This aspect should be taken in due account in the implementation of the ARFM, paying due attention to consumers' awareness and training. In general, fishers interviewed think that aspect related to quality and safety of the products should be more promoted under valorisation strategies, as well as aspects related to traditional and sustainable practices diversification.

Covid-19 effect on fishing activity. The Baseline was framed around the year 2019 as, due to the Covid-19 pandemic and related effect on fishery, 2020 cannot be considered a representative year for fishing. Notwithstanding, the effect that the restrictions due to the Covid-19 emergency have had on the sector have been investigated during the survey. 80% of respondents reported an effect of Covid restriction on the fishery activities and that the greatest impact was found precisely in the stop to the sales through the Ho.Re.Ca. channel due to prolonged restaurant closures. Artisanal fishers did not complain of decreases in sales due to Covid as they sell their fish products some exclusively to fish markets, others directly to final consumers .It should also be borne in mind that in the small-scale fishing there is usually only one man on board; this condition made it possible not to interrupt the fishing activity as it could have happened to larger vessels where, due to the higher number of crewmembers and the social distancing measures imposed by the Covid-19, normal activities have not been allowed.

The expected impact from the ARFM implementation. 84% of respondents stated that the introduction of a regional certification mark such as the ARFM could give an advantage precisely in terms of reputation. For half of them (50%) the ARFM implementation could have positive effects also on the price, because of the price-premium they expect from it even if those who believe that the introduction of certification could increase costs represent 74% of respondents, thinking mainly to the increase of cost linked to administrative and bureaucratic burden. 58% of the interviewees declared that the ARFM could bring improvements in monitoring of fisheries, presumably linking to the implementation of the certification scheme the triggering of a systematic collection of data also for activities (e.g. catching mussels on platforms) or fishing aspects (e.g. safety on board) normally not covered by the official collection system. Other aspects of fishing activity that could be positively affected are those most related to economic performance, and therefore "total sales" (68%), "competitiveness with respect to those who do not have the brand" and "links with the distribution chain" (both 58%), and for aspects related to sustainability and innovation, thus considering that certification can lead to an increase in relations between operators and research institutes (58%), a conscious management of fisheries (63%) and not least the pursuit of improvements concerning fishing gear and technologies used on board (58%).

Opinions on the ARFM and on the Prizefish project. A question about the ARFM was addressed exclusively to those fishers not participating actively in the Prizefish project, hence to those who have heard of ARFM for the first time during the survey. The only 2 fishers replying consider that a label such as the ARFM could apply to all the fish landed by Adriatic vessels. However, they suggest directing the implementation of ARFM to foreign markets, in particular to markets of those countries that have a greater sensitivity on the issues of sustainability and ecology. When asked about their concerns related to the adoption of the ARFM, most of the respondents have replied that they have no fears, if compliance with the standards imposed by the certification is guaranteed. There are also those who say that they are concerned about the difficulties that will have to be faced to achieve a real adoption of the ARFM.The last question was addressed to operators directly involved in the Prizefish project with the aim of collecting their opinions about benefits detected, till now, from the participation to the project. Most of the respondents to this question think that the project gave them a lot of visibility, allowing them to inform buyers about their activity and the quality of their products.

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1. INTRODUCTION

The basic goal of the project is the introduction of innovative eco supply chains in fisheries to improve the placement of Adriatic fish products with added value on the market.

In piloting eco-innovative fishery supply–chains for the introduction of market added–value fish products, the Prizefish project is evaluating the feasibility and acceptability of an Adriatic Responsible Fisheries Management (ARFM) label. The ARFM is a new certification scheme aimed at creating an eco-label brand fully Adriatic, combining environmental protection with the social dimension and economic aspects. The proposed standards incorporate the most well known internationally agreed set of principles for responsible fisheries management and have been outlined bearing in mind other certification programs for wild-capture fisheries developed at regional and international level. Territorial eco-certification initiatives (successful example exists in Alaska, Japan, etc....) are designed to promote a regional brand identity associated with responsible fisheries practices and can create a system of regional responsible governance, asserting the value of territorial industry identities and embracing, at the same time, transnational opportunities and challenges. This is particularly true for the Adriatic Sea, which is one of the most important and productive fishing grounds in the Mediterranean.

To this aim, it is relevant to define the baseline for the Adriatic fisheries, as far as the socio-economic aspects it is concerned, as well as the perceptions and expectations of the main operators with respect to the introduction of an eco-label as the ARFM.

The present document reports the synthesis of data and information gathered under activity 3.4.1 of WP3 focusing on the fishery sector of the Italian side of GSA 17in general, but putting more emphasis on the fisheries selected under the first stage of WP3 (D 3.2.1: Report of the mapped fisheries in Italy) and to be pre-assessed according to the guidelines drafted under the deliverable 3.2.3: Sustainability guidelines for the application of the ARFM. The purpose of the socio-economic research within this study is to examine the possible impact of implementing new labels for the Adriatic fisheries, taking into account the current situations and trends in the fishing fleet as wells as experiences and opinions of local operators (fishers or their representatives). The report is based on two sections.

A first section containing the *baseline* of the fishery sector in GSA 17, for the Italian side. After a general introduction, illustrating the dimension of the fishery sector within the context of the whole economy, the section focuses on the fisheries selected, during consultations held in 2020 (D 3.2.1). The aim is to provide more inputs to understand the applicability and/or desirability of the ARFM.

The first section is mainly based on secondary data sources, namely:

- National Accounts and Import-Export data, from ISTAT, the Italian National Statistical Institute;

- Data from the *Programma Nazionale Raccolta Dati Alieutic*i (PNRDA) (ex Reg. CE n. 199/08), Mipaaf, Ministry for Agriculture, Food and Forestry Policies[1];
- Fishery Dependant Data Collection, collected under PNRDA and available on the Joint Research Center webpage[2];
- Data available on STECF reports (2019 and 2020).

Primary data or information gathered from previous Prizefish deliverables have been used to fix the baseline for the wild mussel fishery on gas platform. Being a very local one, this fishery is not covered by the official data collection.

The second section is based on the feedback received from fishers during a *survey* aimed to collect information on aspects not covered directly by publicly accessible data sources (e.g. labour contract, marketing channels) and their view/opinions on some specific aspect (e.g. expectations from the ARFM). Data were collected by mean of an ad-hoc survey submitted by mean of on-line tools. This was necessary due to the Covid restrictions limiting the possibility to held face-to-face interviews.

[1] A formal request for the use of data at regional (NUTS 2) level was presented by NISEA and officially accepted on May, 18th 2021.

[2] For the use of PNRDA data at gear level.

2. BASELINE

2.1 The fishery sector on the overall macro-economic context: the national and the regional perspective

2.1.1. Italian fishery sector: overview and main indicators

Italy's annual fish production is about 343,000 tons, of which 58% come from capture fisheries and 42% from aquaculture. Italy is the fourth European producer, accounting for 11% of the value of total captures after Spain, France, whereas it ranks tenth in terms of catch quantity (STECF, 2020).
Italy is a net importer of fish and seafood; imports account for about 86% of the volume of seafood sales (tab.1). The propensity to import, which has characterised the sector for the past two decades, is due substantially to poor domestic production (Malvarosa, 2013). At about 1,129,000 tons, imports vastly exceed exports (163,000 tons); the negative trade balance (roughly 966,000 tons) is worth nearly three times the value of domestic production. In 2018 the self-sufficiency rate, i.e. the ratio of domestic production to apparent consumption, was estimated at 26.2%, down from 27.9% in 2016. Imports are from EU Member States (Spain, The Netherlands, Greece, France, and Denmark) as well as non-EU countries, chiefly Vietnam, Thailand, India, China, Argentina, and Ecuador (Malvarosa, 2013).

Table 1 - Macro-economic framework of the Italian fishery sector

	Volume			Value		
	000 tonns			*Euro mln*		
	2016	**2017**	**2018**	**2016**	**2017**	**2018**
Landings in Mediterranean sea	*188*	*185*	*192*	*904*	*931*	*945*
Landings in other regions	*4*	*7*	*8*	*17*	*16*	*15*
Total landings (a)	***192***	**192**	**200**	**921**	**946**	**960**
Aquaculture production (a)	*157*	*153*	*143*	*387*	*526*	*443*
Total domestic production (a)	**349**	**345**	**343**	**1,308**	**1,473**	**1,403**
Import (b)	*1,032*	*1,100*	*1,129*	*5,487*	*5,850*	*6,019*
Export (b)	*129*	*159*	*163*	*665*	*738*	*769*
Trade balance	**-903**	**-947**	**-966**	**-4,822**	**-5,111**	**-5,250**
Self-sufficient rate (%)	*27,9*	*26,8*	*26,2*	*21,3*	*22,4*	*21,1*

Source: a) Mipaaf– b) Istat

The low self-sufficiency rate and the consequently high imports are due to the strong (and increasing) propensity of Italian consumers to purchase fish and seafood, Italy has always been the Member State with the highest level of total seafood expenditure; in 2019, consumption totalled 319 488 tonnes, for a total value of EUR 3.21 billion (EUMOFA, 2020).According to the latest FAO data (http://www.fao.org/fishery/statistics/global-consumption/en), per capita fish consumption in Italy in 2018 was nearly 29.76 kg, higher both than the world average (20.21 kg) and the EU average (23.09 kg).
As regards the harvesting sector, the volume of production decreased by 35% from 2004 to 2016 (Maiorano et al., 2019), as a consequence of a general reduction in fishing capacity. Employment figures have also declined. However, in the past few years signs of recovery have begun to emerge (STECF, 2020). In 2018, the fleet's economic performance improved compared to previous years (STECF, 2020). The main factors that have contributed to this change include:

- the positive trend in some important commercial species, in particular European hake, deep-water rose shrimp, Norway lobster European anchovy, giant red shrimp and swordfish.
- the increase in productivity: the landings per unit of effort (LpuE) recorded the highest level since 2008. The status of certain stocks improved in the last years, even if the achievement of a long-term sustainable utilisation of the resource is still far for the majority of the stocks exploited (STECF, 2020).
- the reduction of energy consumption that leaded to proportionally lower energy costs per landed ton.

Since 2019, a reduction of fishing effort has affected some fishing fleets as a result of the entry into force of the National management plans for demersal fisheries and the Multiannual management plan for small pelagic species in the Adriatic Sea. By the provisions of these plans, a reduction of fishing effort in terms of number of fishing days has been set for purse seiners and demersal trawlers.

2.1.2 Gross Value Added (GVA)

According to Istat (Italian National Statistical Institute), the Gross Value Added (GVA) of the Italian fishery and aquaculture sector amounted, in 2018, to EUR 937 thousand representing about 0.06% of the GVA of the whole Italian economy (fig.1). The share of the GVA on the total Italian GVA shows a decrease in the period 2011-2018 from 0.09% to 0.06%. Overall, the share is very low, and this indicates a marginal importance of the fishery activities for the overall Italian economy.

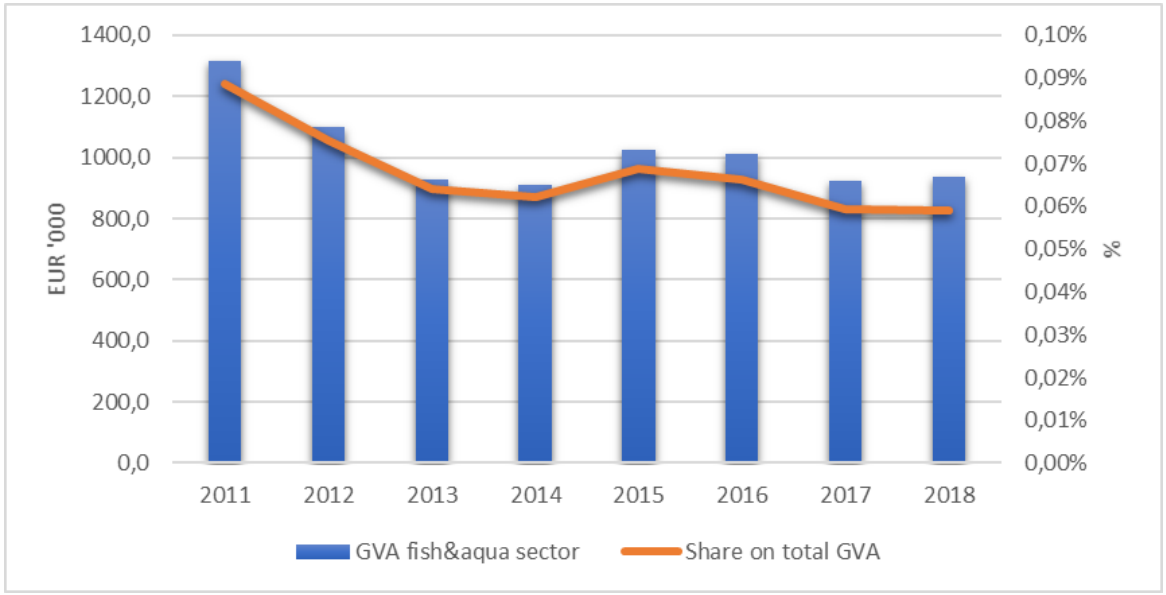

Figure 1 - Gross value added (GVA) of the fishery and aquaculture sector and its share on the total GVA in Italy, 2011-2018. Source: ISTAT, National accounts

When looking at the Adriatic region a major contribution of the fishery sector on the whole economy emerges for some regions in particular. At region level (NUTS-2 territorial level), the highest share of GVA from fishery on total economy in 2018 comes out for the Marche region (0.19%), followed by Molise (0.16%) and Friuli Venezia Giulia (0.11%). Alle the Adriatic administrative regions belonging to GSA 17 show a higher share than Italian average (0.06%) - with the only exception of Emilia Romagna region (fig.2). These higher shares, if compared to the national one, highlight the importance of the overall Adriatic region for the Italian fishery sector.

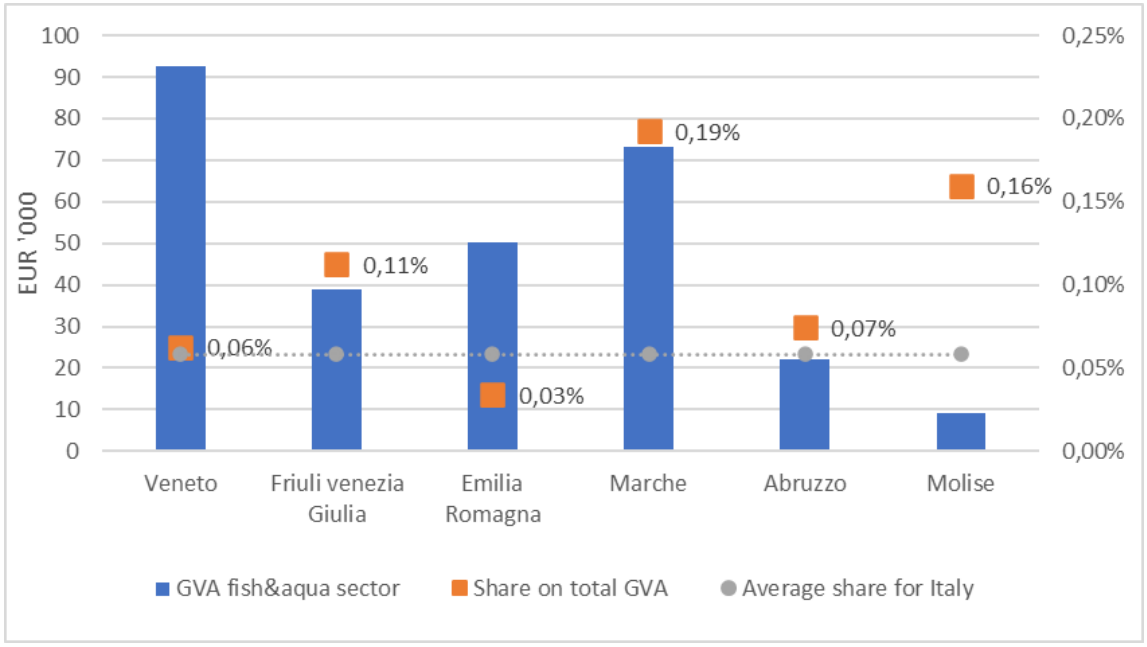

Figure 2 - Gross value added (GVA) of the fishery and aquaculture sector and its share on the GVA of the whole economy, by Adriatic regions of GSA 17, 2018. Source: ISTAT, National accounts

2.1.3 Employment

Italy has a long tradition of fishing which plays an important role in rural coastal communities.

According to ISTAT, in 2018, the number of employees in the fishery sector is 0.11% of total employed in Italy and 3% of employed in primary sector (agriculture, forestry and fishery).

In the Adriatic regions belonging to the area of GSA 17, the share of jobs in the fishery sector on the total jobs is higher than the national level with the exception of Molise (0.09%) - fig.3.

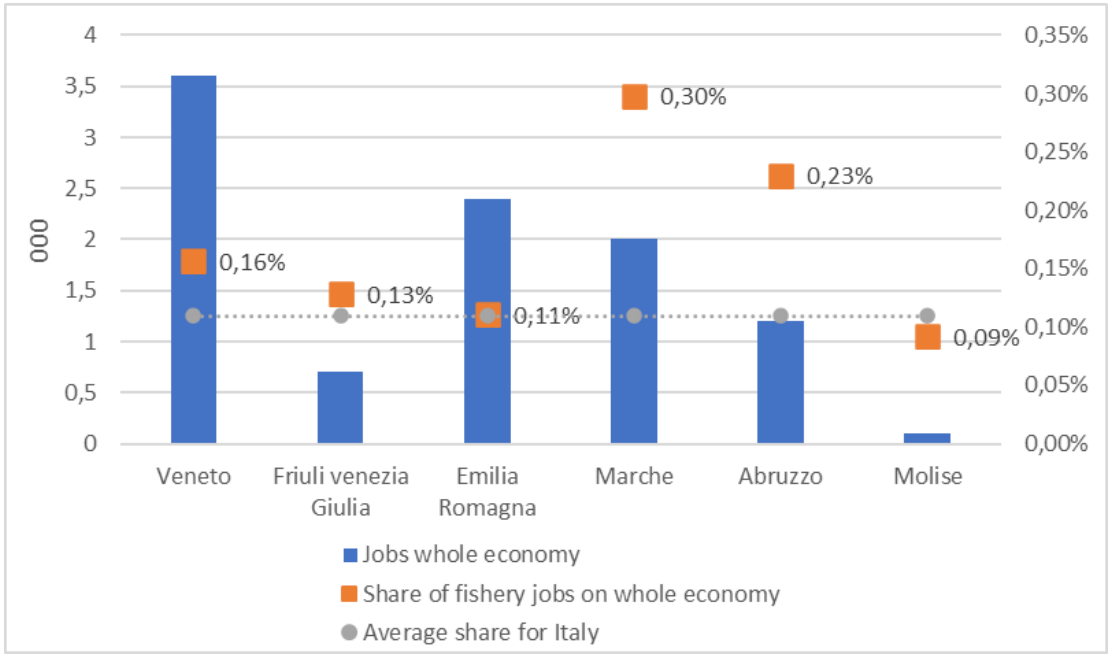

Figure 3–Number of jobs in the fishery and aquaculture sector and its share on the jobs of the whole economy, by Adriatic regions, 2018. Source: ISTAT, National accounts

If looking at the share of jobs created by the fishery sector on the overall primary sector, including agriculture, forestry and fishery, all the Adriatic regions are above the national average with the highest share of Marche where 10% of the jobs created by the primary sectors derive from fishery activities, 5% for Veneto, Friuli Venezia Giulia and Abruzzo; 4% for Emilia Romagna. Again, only for the Molise region the share is below the national average (1%) – figure 4.

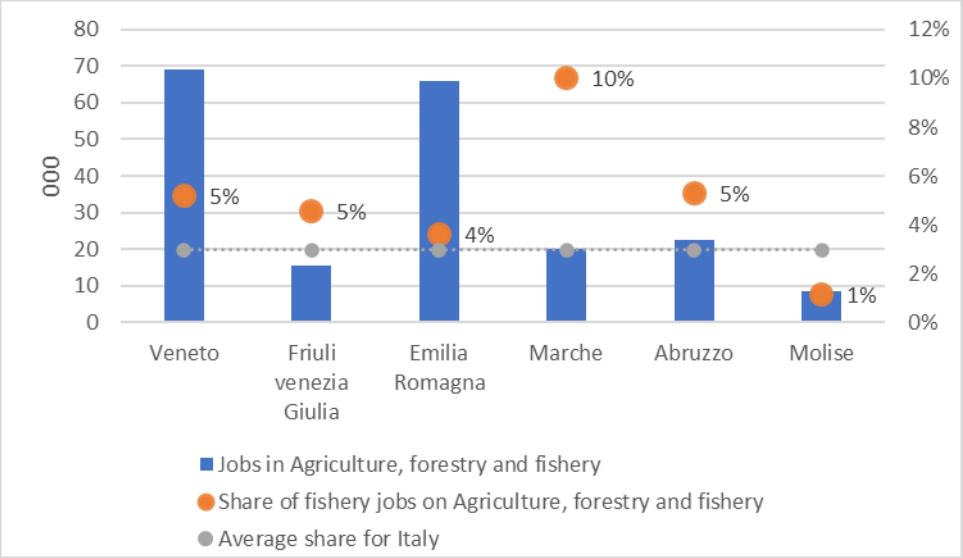

Figure 4 – Number of jobs in the fishery and aquaculture sector and its share on the jobs of the Agriculture, forestry and fishery sector (primary sector), by Adriatic regions, 2018. Source: ISTAT, National accounts

If taking onto account only the capture fisheries, the total number of crew on board of the Italian fishing vessels was estimated at 25,843 in 2018. The small-scale coastal fleet shows an average of 1.6 jobs per vessel, comparing to 3.4 for large-scale fleet. The total number of employees decreased by 13% between 2008 and 2018 (figure 6).

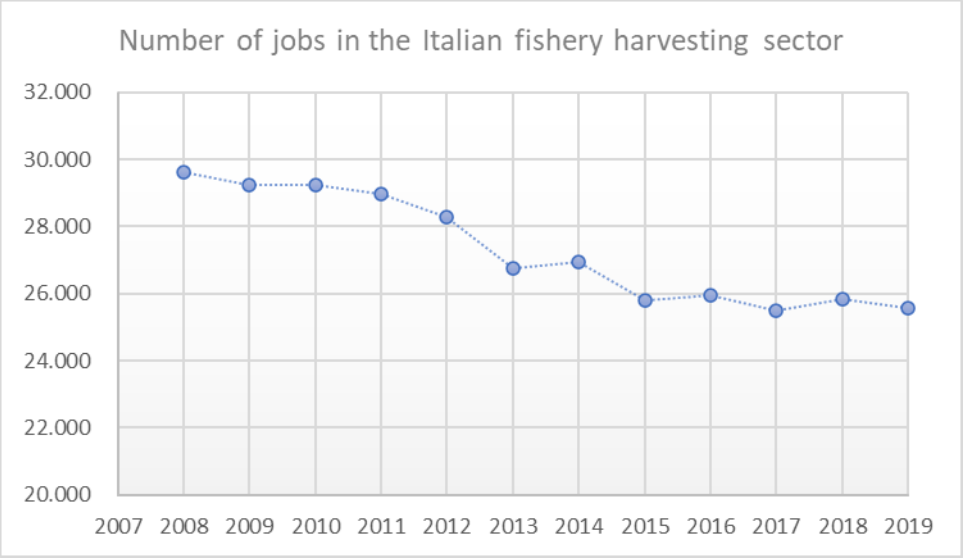

*Figure 5 - Trend in jobs in the capture fishery sector, Italy. 2007-2019 (2019 nowcast).*Source: STECF, 2020

The decline in the number of fishers has been particularly evident for the small-scale coastal fishing segment; many fishing enterprises closed because of the low generational turnover, as owner's sons are not interested to continue the fishing activity (because it is a low-income activity if compared to others – figure 6) and it is difficult to sell the small- scale vessels to other fishers. In the large-scale fleet, the employment is a problem, too; it is still difficult for many companies to recruit fishers and in some ports, the use of foreign labour (for example, African fishers) is the only way to reach the required number of workers on board (STECF, 2020).

As far as the labour remuneration it clearly emerges, from 2018 data (figure 6), that the fishery and aquaculture sector is a low wage sector: on average, a fisher earns half of the gross wage earnt by workers of the whole economy. Nevertheless, the average wage earnt by fishers in the Adriatic regions is higher than that registered at national level, testifying the relevance of the marine fishery sector for the area.

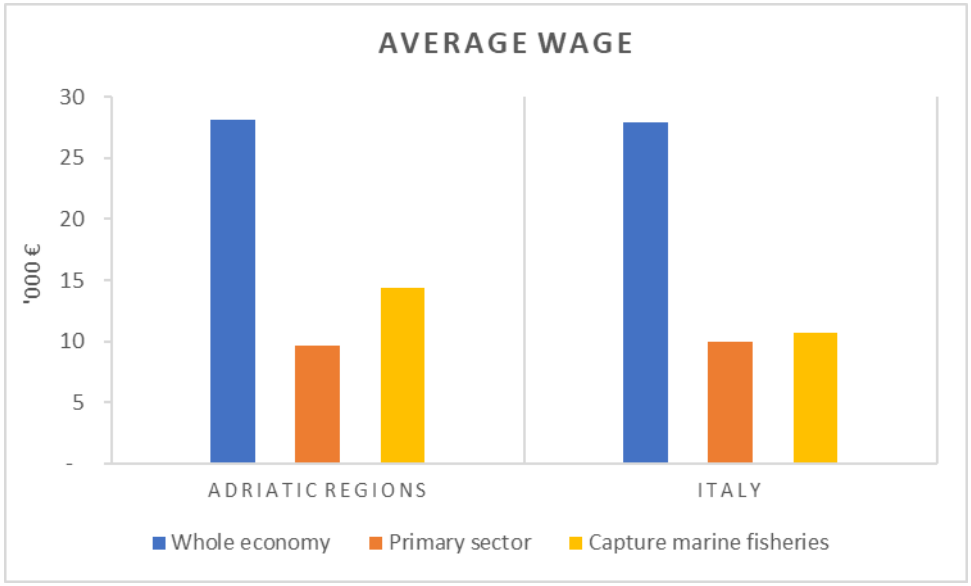

Figure 6 –Average gross wage in the whole economy, the primary sector and capture marine fisheries, by Italy and Adriatic regions, 2018. Source: ISTAT, National accounts; Mipaaf, Italian national programme for fishery data collection

2.1.4 Demographic and social aspect of employment in the capture fisheries

Of the 25,415 people engaged in 2017, 25,106 (98.7 %) of the people employed were males (fig.6). The remaining estimated 309 (1.2 %) people employed were females. Women typically fulfil onshore roles, such as accounting and other administrative roles.

The majority (91%) of people employed are within the age group, 25 and 64 years of age. Of these, 70% of the people employed were in the 40-64 years age and 21% were within the 25-39 years age band. The age bracket of 15-24 made up the smallest group of the active population with a value of 3%. The remaining 6%, equivalent to about 1,500 people, were in the >=65 age band. The Italian industry is, actually, an aged industry. The retirement time from work is, indeed, quite long, because in Italian welfare and social legislation the job of fisherman is not recognized as an "exhausting" job, but only as a "heavy job". Because of this, fishers cannot benefit from reductions in the number of years of active work recognized for the calculation of the pension, which is paid at the end of working activity, that is, to say, by 67 years old for men and 65, for women. Because of this (heavy working conditions) and because of the low wages (figure 5), attracting young fishers into the sector is becoming more and more difficult.

Employment in the Italian fishing fleet is made up mostly of nationals (23,880, equivalent to 94%). There were 306 fishers from EU countries (equivalent to 1.2% of total workers); EEA fishers (workers from European non-EU countries, e.g. from Albania) make up 0.5% with the remainder 4% (1,090) being non-EU/EEA nationals (workers from non-EU nor from EEA countries). This share mainly represents the employees of the large-scale fishery and consists almost exclusively of North African and Bengali workers.

In 2017, 2% of the people employed in the Italian fishing fleet were educated up to a high level (degree or other qualifications beyond the degree), 16% up to a medium level and 83% up to a low level.

It has to be highlighted that in both small scale and large-scale fisheries there is a good level of professionalism, e.g. naval engineers, biologists, economists, but these professionals do not have professional dependency link with the fishing enterprises, working just as human resources supporting sporadically services to the sector. The high educational level in the small-scale segment is twice that in the large-scale. This is justified by the fact that the small-scale sector is more family managed and, as such, it is more common that the sons of fishers, having a high level of education, are directly involved in the family's fishing enterprise (accountancy tasks, fishery promotion and/or income integration, e.g. fishing tourism). Many of the workers declaring the medium level of education hold the three-year upper secondary school diplomas, which allows a professional qualification to be finalized for the purpose of obtaining a professional qualification and enrolment in the "placement of seafarers", as well as the personal navigation booklet.

The majority (58%) of workers were employees and 42% were owners. These shares have a strong relationship with the predominant fishing activity in the Italian fishery, where over 65% of vessels fall under the small-scale segment.

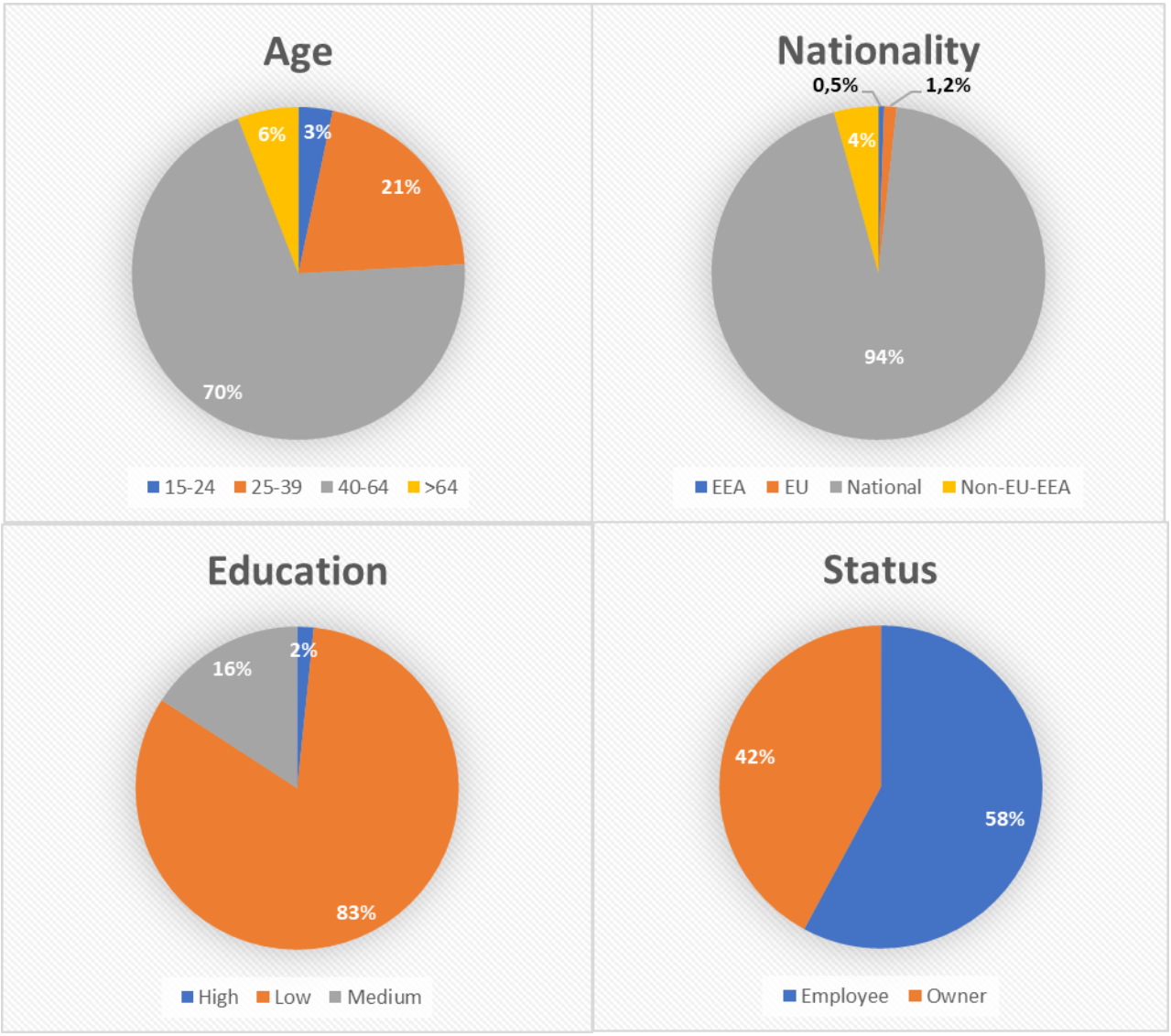

Figure 7 – Employment in the capture fishery sector by age, nationality, education and status, Italy, 2017.
Source: STECF, 2019

Social data for the fishery sector are not available at regional level hence no detailed data exist for the Adriatic fisheries. Nevertheless, STECF (2019) reports the result of a preliminary analysis carried out by mean of interviews and focus groups with fishers and stakeholders from some important Adriatic fishing

ports of the GSA 17 area (Chioggia, Ancona and Termoli). The main findings can be summarised in the following points:

- inadequate training of professional fishers;
- low level of education, which severely limits the possibility of converting into other activities to integrate the fishing income (such as fishing tourism);
- difficulty in integrating income by mean of agreements with local tourism offices, because the requirements to administer food cannot be guaranteed. Furthermore, it must be said that small vessels, usually used for fishing tourism, are structurally unable to appropriately accommodate tourists, because some boats do not have hygienic facilities within the on-board equipment.
- strong participation of women in some fisheries (mainly small-scale)

As far as the role of women, the study reported in STECF (2019) highlighted, for instance, that in fisheries practiced in the Northern part of Adriatic (the Polesine area), women actually practice on-board activity, in comparison with other area where women mainly exert on-shore activities. In other areas of the Northern Adriatic (Goro), women play an active role in managing the commercial activities of the family's fishing enterprise. Close to Ancona, the role of women is essential, but only in on-shore activities, from the repair of the networks to the marketing, up to the assistance to the administrative and fiscal activities of the family fishing companies. In Termoli, women are both involved in fishing tourism and in activities on board (seasonal) and, in some cases, they hold fishing licenses.
In general, Adriatic women involved both on board and on land have a higher level of education than their male peers. The interviewed women are recognized as having greater capacity to improve and promote the local catching activities, e.g. enhancing fish product valorisation through labelling)

2.2 Commercial fishery in the waters of Italian GSA17

2.2.1 The productive structure

In 2019, approximately 2,800 vessels operated within GSA 17, the sub-geographical Adriatic area including the Italian coastal regions of the Northern and Central Adriatic, namely Friuli-Venezia Giulia, Veneto, Emilia-Romagna, Marche, Abruzzo and Molise.

The fleet has stronger 'industrial' or 'semi-industrial' connotations; approximately half of the fleet operates using 'active' gear and have a LOA greater than 12 metres (30% for all the Italian fishing fleet).Geographically speaking, the majority of fleet is concentrated along the coasts of Marche (673 vessels), Veneto (627 units), Abruzzo (540 vessels) and Emilia Romagna (536 vessels), as reported in figure 7, extracted from the Deliverable 3.1.1, Report of the mapped fisheries in Italy, elaborated on 2017 data (Prizefish, 2019).

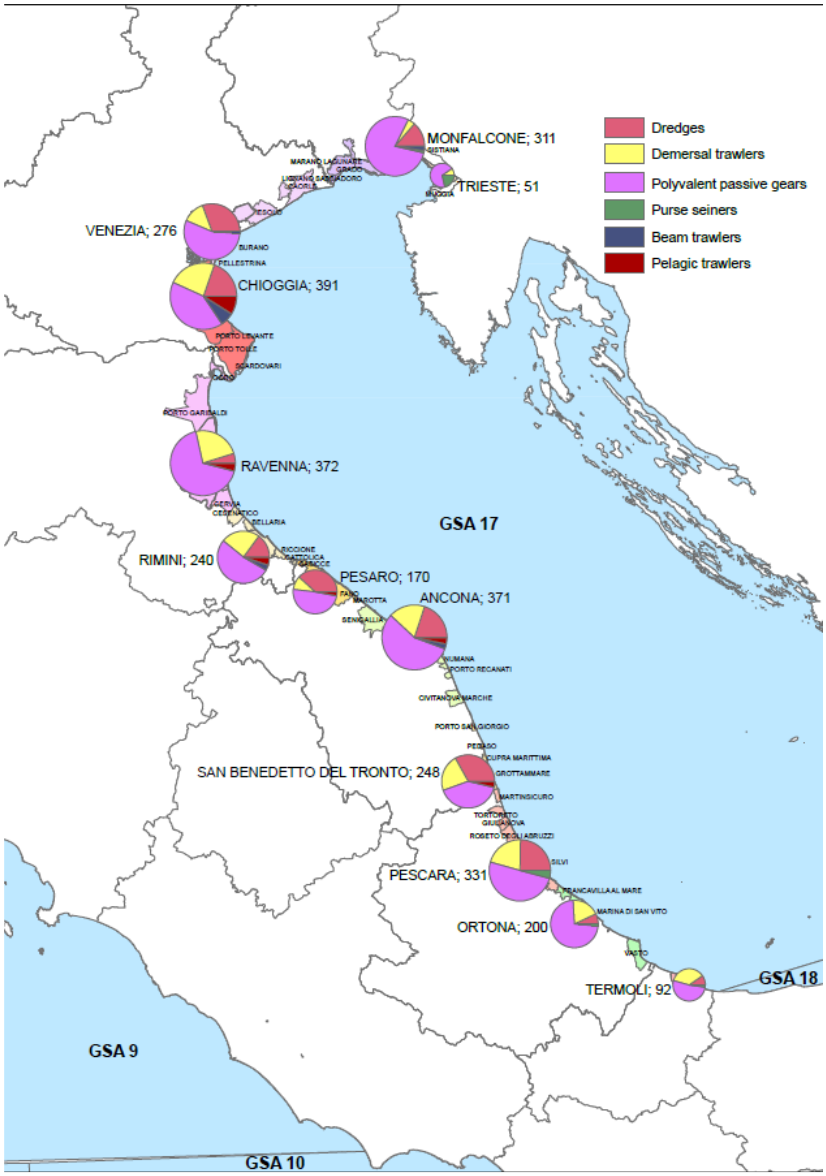

Figure 8 - GSA17: Map of registration ports and fleet characterisation by compartment, 2017. Source: Prizefish, 2020.

Considering data updated to 2019, the demersal trawler fleet consists of 533 vessels, the tonnage of which amounts to just over 23 thousand GT (tab. 2). As far as the other segments of the fleet, vessels using passive gears are 1,483, which represent 53 % in terms of numbers, but just 8 % in terms of

tonnage. Next come the dredgers (594 vessels), beam trawlers (93 vessels), and the pelagic fleet (25 seiners and 94 midwater pair trawls) – Table 2.

Table 2 - - Composition of the fleet by technique in GSA17, Italy, 2019

Fishing technique	No. of vessels	Gross tonnage
Hydraulic dredges	594	8,147
Demersal trawlers	533	22,607
Passive gears	1,483	3,769
Purse seiners	25	1,939
Beam trawlers	93	6,845
Pelagic trawlers	94	6,535
Total	2,822	49,842

Source: Mipaaf, Italian national programme for fishery data collection

2.2.2 Trend in fishing effort

Between 2008 and 2019, fishing capacity in GSA 17 decreased by more than 17%, both in terms of the number of boats and in terms of gross tonnage (Figure 9). In particular, the number of vessels fell from 3,415 units in 2008 to 2,822 in 2019, with the greatest decline occurring between 2014 and 2015. The number of vessels using polyvalent passive gears fell by more than 25%, both in terms of the number of vessels and in terms of power and tonnage.

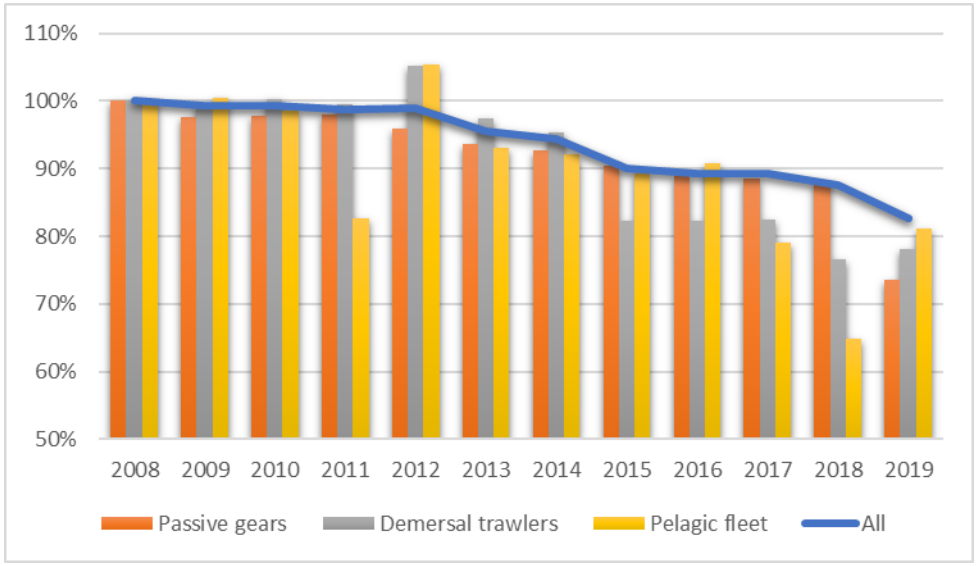

Figure 9–Trend of fishing capacity in GSA 17 for all the fleet and for the main techniques, Italy, 2008-2019 (2008=100). Source: Maiorano et al. (2019); Mipaaf, Programma nazionale raccolta dati

Fishing days for the selected fleet segments show a strong downward trend during the 2008-2019 period (figure 10).

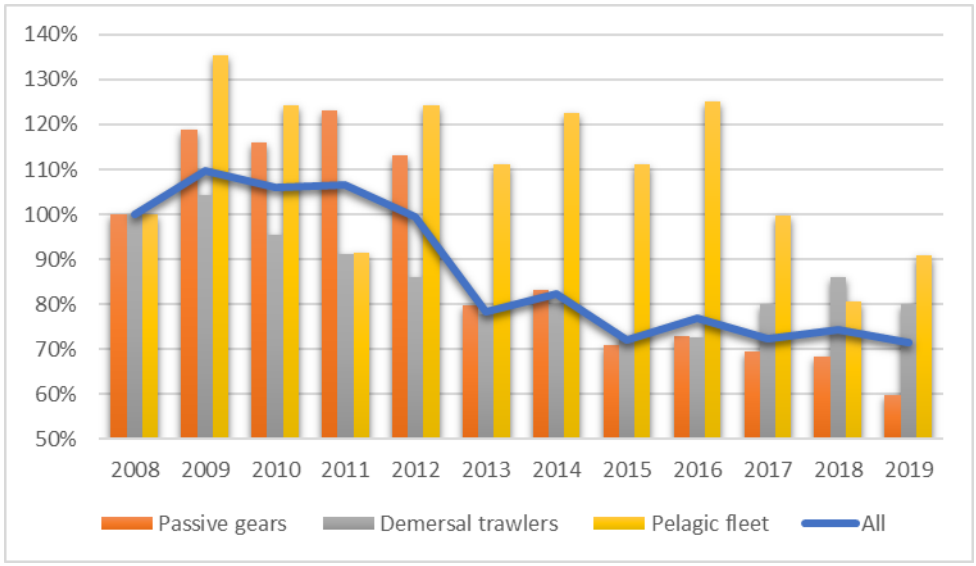

Figure 10–Trend on days at sea in GSA 17 for all the fleet and for the main techniques, Italy, 2008-2019(2008=100). *Source: Maiorano et al. (2019); Mipaaf, Programma nazionale raccolta dati*

In particular, demersal trawlers experienced a particularly sharp decrease in fishing days (a decrease of 20% in the period 2008-2019). The fishing effort of the demersal trawler fleet was affected by the entry into force of the national management plans for demersal fleet in 2019; in particular, a reduction in fishing days of 5% in 2019 and 10% in 2020 was set for demersal trawlers operating in GSA 17 and 18. In 2021, Council Regulation 2021/90 on the fishing opportunities applicable in the Mediterranean and Black Seas provide for maximum allowable fishing effort (in fishing days) by types of trawls fishing for demersal stocks in GSAs 17 and 18 (Adriatic sea).

The decline in fishing capacity was also due to:

- economic factors: increase in operating costs (i.e. energy costs) and concurrent decrease in profits;
- social factors: difficulties in finding specialised workers.

2.2.3 Landings and prices

The Italian Adriatic fleet landed almost 80 thousand tonnes of seafood in 2019; the value of landings was about EUR 300 million (table 3). In terms of volume, pelagic trawler is the most important segments (30,291 tons, 38% of the volume of landings in GSA 17); in terms of value, demersal trawlers is the most relevant (EUR 120 million, 40% of the value of landings in GSA 17).

Table 3 – Landings in volume and value by technique in GSA17, Italy, 2019

Fishing technique	Volume of landings (tons)	Value of landings (mln euro)
Hydraulic dredges	16,787	48
Demersal trawlers	18,585	120
Polyvalent passive gears	6,493	41
Purse seiners	3,868	7
Beam trawlers	4,035	24
Pelagic trawlers	30,291	57
Total	80,059	298

Source: Mipaaf, Italian national programme for fishery data collection

Landings has reduced by around 16% in volume and by 13% in value in the period 2008-2019 (figure 10).

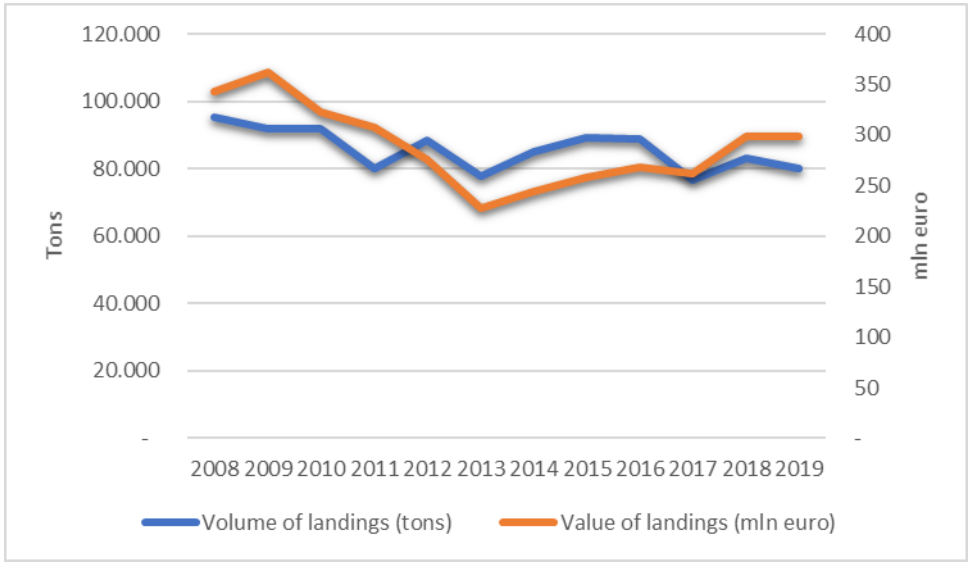

Figure 11– Trends on landings in weight and value in GSA 17 for all the fleet and for the main techniques, Italy, 2008-2019. Source: Maiorano et al. (2019); Mipaaf, Programma nazionale raccolta dati.

The main commercial species in GSA 17 are striped venus, European anchovy, European pilchard, common cuttlefish and common sole, representing 49% of total production in value (figure 11).
European pilchard, at 14,937 tonnes, continued to be the most important species (by weight) landed by the GSA 17 fleet in 2019, followed by striped venus (16 thousand tonnes) and European anchovy (15 thousand tonnes).
Striped venus, at EUR 43 million, was the top species landed in value, followed by European anchovy (EUR 37 million) and European pilchard (EUR 25 million).

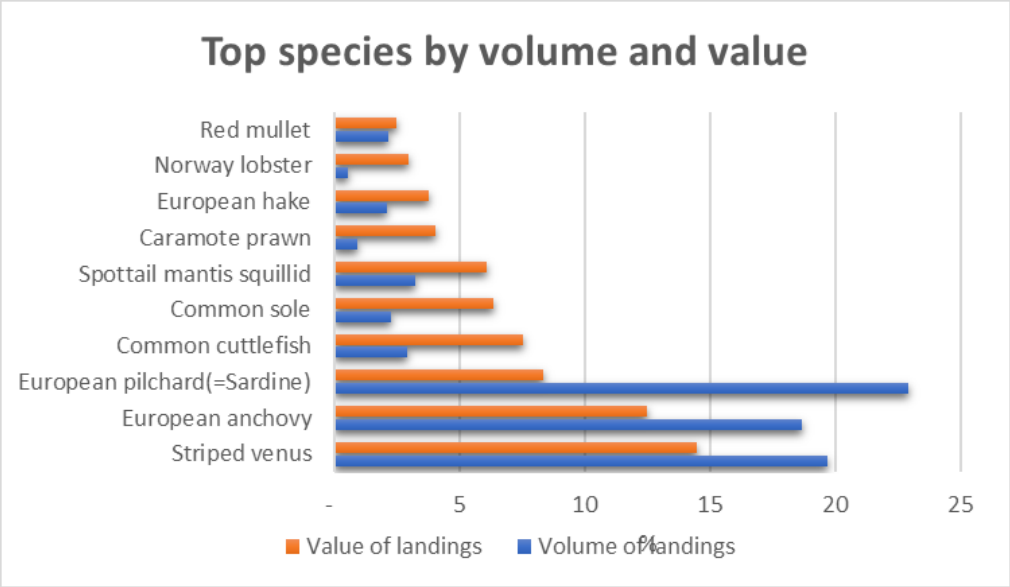

Figure 12 – Top ten species landed in weight and in value, GSA 17, Italy, 2019. Source: Maiorano et al. (2019); Mipaaf, Programma nazionale raccolta dati

Prices have increased significantly since 2016 (figure 12); for the three most important fish species (anchovies, European pilchards and clams), prices raised as a consequence of the lower landings. In the last years, in addition, the role of the Producer Organisations (POs) has grown significantly, especially those active in the bivalves' fisheries. These organisations help to bring together demand and supply and perform a fundamental role in creating direct links between producers and intermediaries.

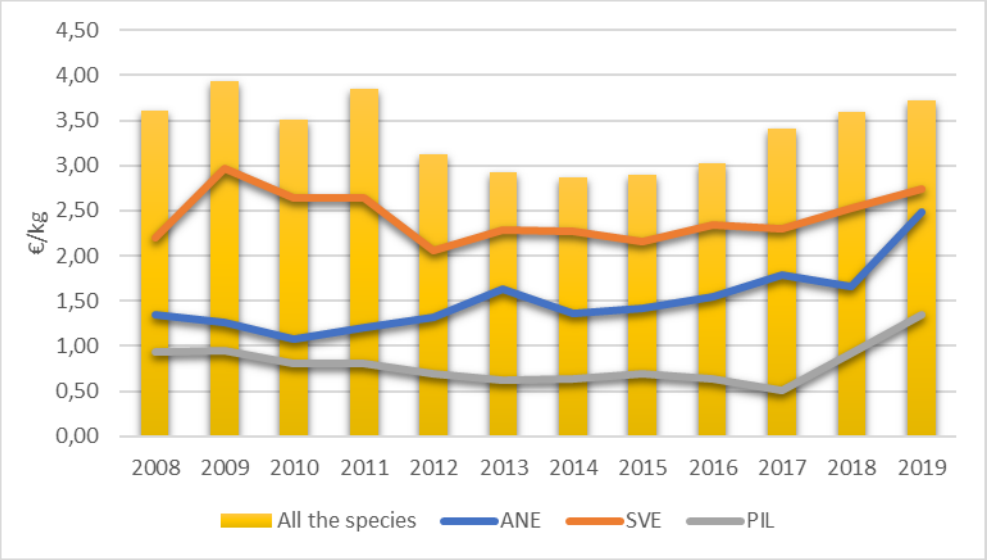

Figure 13–Average landings price of top species in value, GSA 17, Italy, 2019. Source: Maiorano et al. (2019); Mipaaf, Programma nazionale raccolta dati

2.2.4 General issues impacting the economic performance of Adriatic fisheries

Below some of the most important factors recently affecting the economic performance of Adriatic fisheries, including the Covid-19 effect:

- *Commercial competition from product imported from other Adriatic countries:* domestic landings are heavily influenced by competition on the markets from the Croatian and Slovenian fresh seafood, which reaches the Italian markets in a very short period of time but at far lower prices;
- *Restricted fishing areas for passive gear*: strong competition for fishing areas between passive gear and towed gear, and between mussel farming and small-scale fisheries.
- *High management costs for larger vessels*: larger vessels were built in periods when the price of fuel was very low and the fishing effort of foreign counties minimal, today suffer from high management costs which are disproportionate to the level of production. In addition, some of these vessels have been sold to countries on the opposite side of the Adriatic and therefore continue to be used for fishing effort in the same areas, further undermining the profitability of Italian vessels (Scarcella et al., 2017).
- *Covid-19 effect*: on 10th March 2020, the Italian government imposed a full nationwide closure of all economic activities, exception made for those that are strategic to the national economy, including fishing activities. In spite of this, fishing activities ceased almost entirely in all Italian fishing ports on Wednesday 11th March. This was due to a sharp decline in first-sale prices and a

considerable reduction in the number of wholesalers operating at larger fish markets and harbours. Demand for fresh Italian fish has plummeted due to the lockdown of food services (in particular, the Hor.Re.Ca. sector). Indeed, only in a few cases the stop of fishing activities was motivated by the need to safeguard the health of fishers and to comply with the new health standards as only larger vessels with crews of more than 6-7 members experienced issues with meeting safety regulations. Fishermen adopted several actions to mitigate the adverse economic effects of the lockdown. In many fishing ports, especially on the Adriatic coast, operators self-regulated their activities by setting restrictions such as rotation of vessels and, in some cases, by establishing quotas. Midwater pair trawls and purse seiners initially suffered due to the closure of the fish markets and the block on exports (especially in the North Adriatic area, where the sale of small pelagic species to Spain had to cease). Since April, activity has resumed in some fishing ports of the North Adriatic and end-consumer demand for anchovies and sardines has increased thanks to low prices (STECF, 2020).

- The impact of COVID-19 on small-scale fishery has generally been softer, since SSCF production (an average of 15-20 kg of landing per sea day) are usually sold directly to end consumers, local fish retailers or small supermarkets. Diversification of sales channels and changes in catch composition according to market demand were some of the initiatives adopted during the lockdown (Sabatella et al., 2021).

2.3 Socio-economic characteristics of the selected fisheries

This section provides an overview of the socio-economic characteristics of the Adriatic fisheries selected for the pre-assessment phase to be run as a final step of the ARFM testing.
After the mapping of Adriatic fisheries (Prizefish, 2019) and different consultations with local stakeholders (Prizefish, 2020) six fisheries have been selected to test the ARFM as local stakeholders reported an interest in the proposed new certification scheme for the Adriatic regions.
As reported in the Report on Consultation Meeting with relevant fishing operators in Italy (D.3.2.1), the fisheries selected for the pre-assessment are:

1. traps for common cuttlefish;
2. small pots for spottail mantis squillid;
3. small pots for changeable nassa;
4. hydraulic dredge fishery for striped venus calm and/or razor clam
5. hand-harvesting of Mediterranean mussel from gas platforms with scuba divers.

For all the fisheries under observation there is a clear interest in improving the economic performance, most of the time held back by very low prices, consequence of a very fragmented marketing system. In this system wholesalers have, most of the time, the bigger power. Where POs are really operating, fishers can benefit of price stability. A certification approach could help if producers are able to coordinate their actions: bigger is the number of producers following the certification, higher would be the result in terms of impact on the market.
From an environmental point of view, the analysed fisheries have a strong component in terms of responsible fishing practices. Clams' fisheries in Veneto are also MSC certified and this would help in following the new certification approach. The wild mussel fishery is carried out by a very mild impacting technique, the same for the cuttlefish fisheries, very selective, being made with pots and improved by responsible fishing practices, e.g. as eggs' recovery.
As far as the governance aspects, there is a strong evidence of efficacy for the clam fishery and an evidence of high participation and responsibility for the others. As far as the social dimension, at a first glance all the fisheries comply with the main security and health requirements. Furthermore, all the fisheries have a strong cultural component, being in most cases traditional fisheries or iconic for local consumers. This is the case, for instance, of the changeable nassa fishery. This gastropod mollusc is the product of coastal fishing, which is practiced all year round from five hundred meters from the shore up to several miles, provided that the seabed is shallow and sandy, just as it happens in the stretch of sea

of the Middle Adriatic. And changeable nassa in “porchetta” represent some of the most popular dishes of the Marche maritime tradition and can be considered the true traditional street food. Or, similarly, the case of the wild mussels, particularly appreciated by local consumers; indeed, the wild mussels caught on gas platforms out of the Emilia Romagna coast are the subject of local summer fairs finalised to the promotion of this product on a wider touristic and gastronomic context.

The analysis of the fisheries is carried out with a view to the overall GSA 17 area and with a focus, when possible and needed, to the different regions (Friuli-Venezia Giulia, Veneto, Emilia-Romagna, Marche, Abruzzo and Molise).

The analysis is carried out at gear level as far as the landings composition it is concerned. When turning to the economic performance, the analysis deals with the main fishing techniques. Indeed, the official data collection system is based on a two-level approach: transversal data (effort and landings data) collected by metier while economic data are collected at fleet segment level, the combination of the predominant fishing technique and the vessel length. Indeed, the main income and cost items are related to the fishing unit, i.e. the vessel, and not to the gears used (Prizefish, 2019).

As a result, the socio-economic analysis for the traps and pot fisheries (for common cuttlefish, spottail mantis squillid and changeable nassa) refers to data collected for the polyvalent passive gears fleet segment. The clam fisheries fall into the hydraulic dredgers fleet segment.

As far as the wild mussels’ fishery on gas platforms, it is worth noting that this fishery is not covered by the official data collection system. For the aim of this report and in the view of the subsequent pre-assessment phase, data collected through previous phase of WP3 (and other WPs) have been merged with data collected by mean of direct interviews with the key operators.

an ad-hoc data collection of socio-economic data has been carried out.

2.3.1 Vessels using passive gears

This section reports the main technical, productive and socio-economic indicators of vessels fishing in GSA 17 equipped with polyvalent passive gears, independently from their length.
This fleet was made up, in 2019, of 1,304 active vessels on a total of 1,483 vessels, distributed over the GSA 17 Adriatic regions as reported in figure 14.

These vessels are widely distributed along the coastline with a distribution over the GSA 17 regions illustrated in figure 14 but operate mainly out of ports of Goro, Marano Lagunare, Ancona, Ortona, Grado and Vasto. The other vessels are distributed over other 37 fishing harbours.

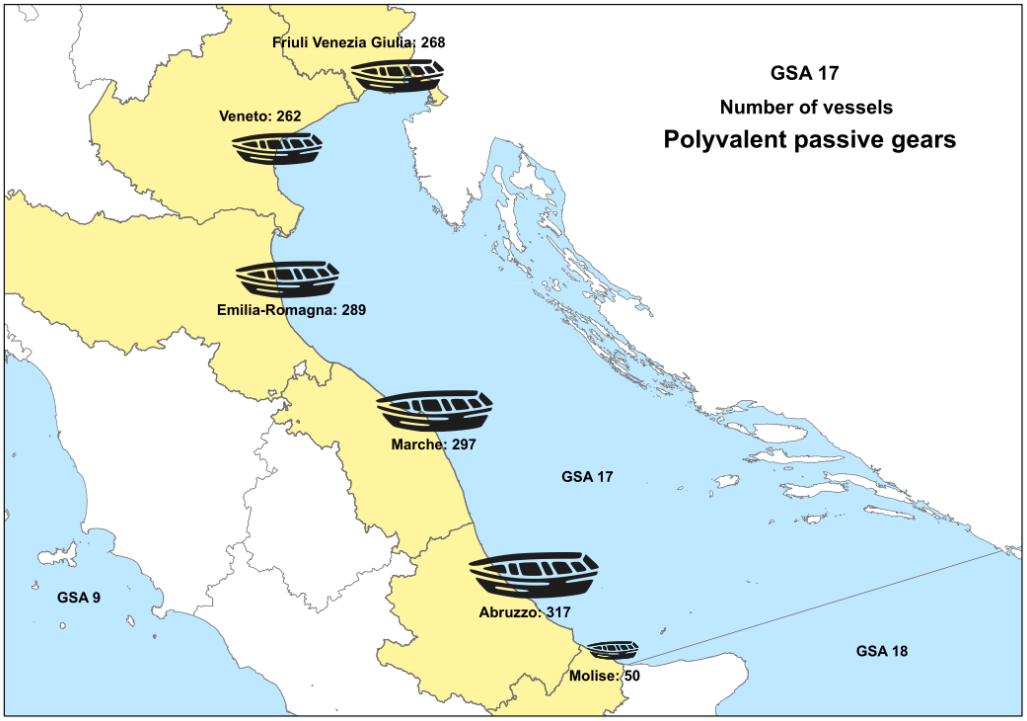

Figure 14 – Total number of vessels belonging to the polyvalent passive gear fleet segment by regions of the GSA 17, 2019. Source: Mipaaf, Italian national programme for fishery data collection

Vessels using passive gears in GSA 17 are characterised by an average length of 7.05 meters (LOA), gross tonnage of 2.68 tonnes and engine power of 38.46 kW. The average crew size is 1.4 (see Table 4) and the main fishing gears used include set gillnets, trammel nets pots, pots and traps (figure 15).

Table 4 - Basic information for passive gears vessels operating in GSA 17 (average per vessel), 2019

Passive gears's fleet	
Vessel age	31.66
Length overall (LOA)	7.05
Gross tonnage (GT)	2.68
Power of main engines (kW)	38.46
Crew size (persons)	1.4
Days atsea	93

Source: Mipaaf, Italian national programme for fishery data collection

Below the relevance of different gears within the polyvalent passive gears fleet segment for GSA 17. Figure 15 highlights the prevalence of set gillnets and trammel nets in terms of fishing effort (about 60%). Pots and traps, the category of gears covering the selected fisheries targeting cuttlefish, spottail mantis squillid and changeable nassa, account, in GSA 17, in 2019, for 20% of the fishing effort.

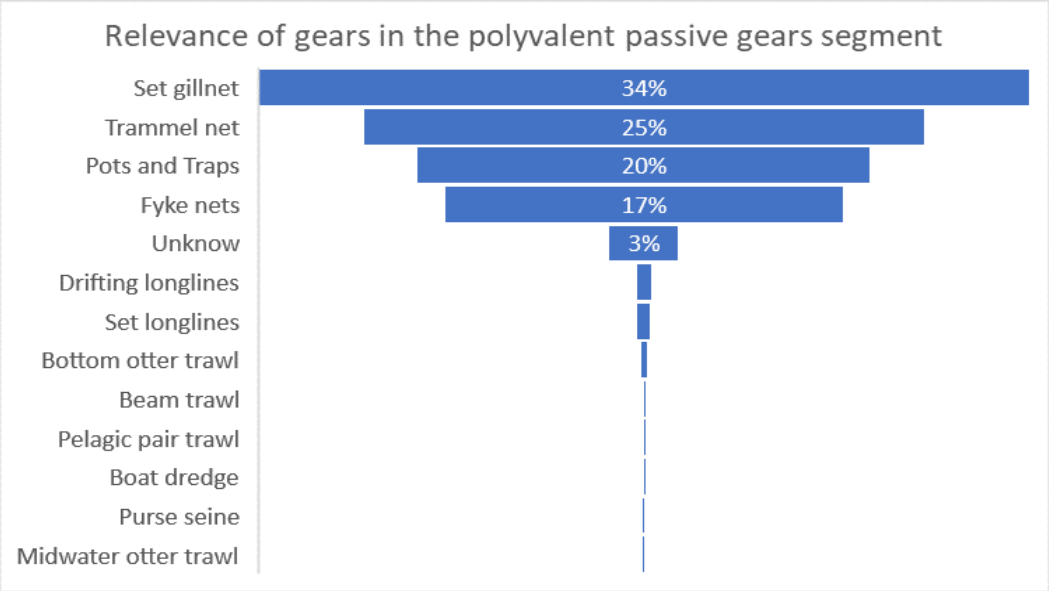

Figure 15- Fishing methods/gears used by passive gear fleet segment (as a percentage of fishing effort). Source: https://stecf.jrc.ec.europa.eu/dd/fdi

Production

Passive gears used in GSA 17 predominately target high-valued species, such as cuttlefish, common sole and spottail mantis squillid. Changeable nassa account for 9%.These four species were the most important species in 2019,accounting for about 50 % of the total landings in value (figure 16).

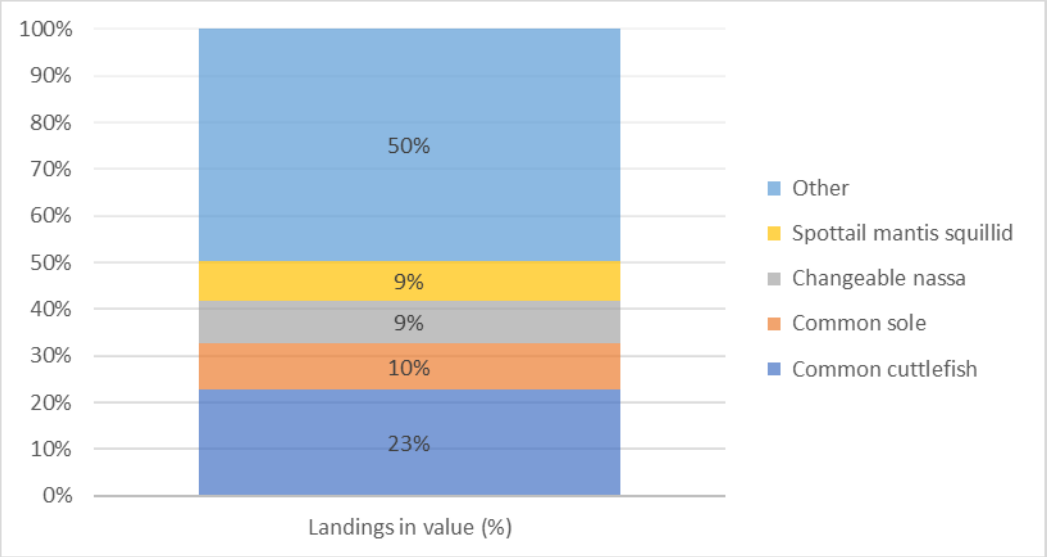

Figure 16 –Composition of the value of landing of the passive gears segment operating in GSA 17, 2019. https://stecf.jrc.ec.europa.eu/dd/fdi

Figure 17 highlights the importance of the species associated to the three selected fisheries using passive gears at GSA 17 level, based on 2019 data. Landings of cuttlefish, in terms of volume, by pots and traps represent 38% of the overall landings of passive gears. Landings of squilla mantis by pots represent 8% of the total landings of passive gears. Changeable nassa are caught exclusively by small pots (along the Adriatic coast called “cestini”).

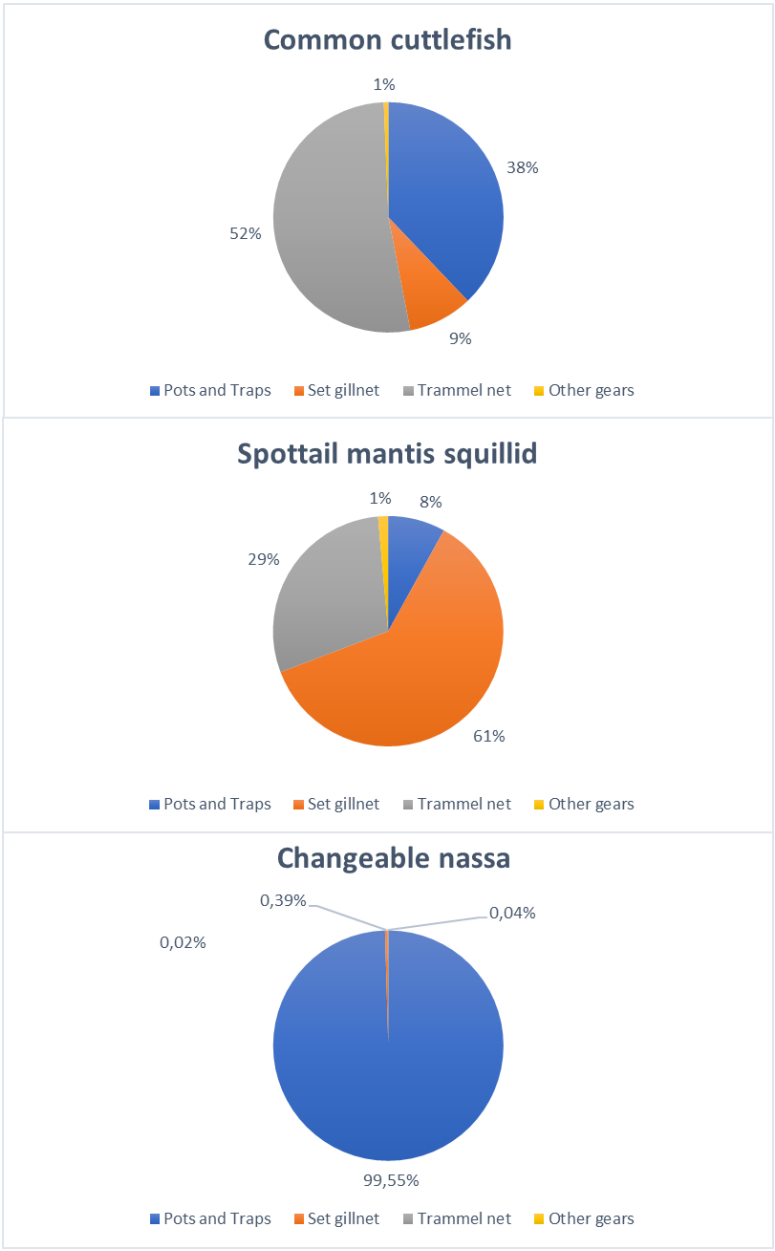

Figure 17– Value of landings of species associated to the selected fisheries by different categories of gears used for their capture, GSA17, 2019. Source: https://stecf.jrc.ec.europa.eu/dd/fdi

The landings of the 3 species of the selected fisheries have a different relevance, in volume terms, at regional level (Table 5). For instance, landings of changeable nassa by passive vessels of the Marche region represent almost 50% of the overall GSA 17productionwhile no landings are detected in Friuli-Venezia Giulia and Molise. Landings of cuttlefish by passive gears are not so relevant in Abruzzo and Molise (together accounting for 3%) while landings of squilla mantis by vessels operating with passive gears are negligible in Friuli-Venezia Giulia and Molise (1% each).

Table 5 – Volume and value of landings and average prices of species of the selected fisheries by regions of GSA 17, 2019

	Volume of landings (kg)		Volume of landings Passive/All gears %	Value of landings (€)	Average price (€/kg)
	Allgears	*Passive gears*		*Passive gears*	
Cuttlefish					
Abruzzo	114,512	11,569	10%	139,026	12.02
Emilia-Romagna	375,613	166,138	44%	1,991,814	11.99
Friuli Venezia-Giulia	303,281	230,245	76%	2,518,020	10.94
Marche	575,074	285,636	50%	3,208,680	11.23
Molise	86,633	25,114	29%	275,139	10.96
Veneto	871,279	102,940	12%	1,162,578	11.29
Total GSA 17	**2,326,392**	**821,642**	**35%**	**9,295,258**	**11.31**
Mantis squillid					
Abruzzo	190,089	48,373	25%	460,494	9.52
Emilia-Romagna	985,627	75,706	8%	625,614	8.26
Friuli Venezia-Giulia	46,228	4,870	11%	40,197	8.25
Marche	745,440	125,033	17%	1,116,260	8.93
Molise	107,466	4,821	4%	40,685	8.44
Veneto	503,641	141,430	28%	1,197,388	8.47
Total GSA 17	**2,578,491**	**400,233**	**16%**	**3,480,638**	**8.70**
Changeable nassa					
Abruzzo	86,235	82,451	96%	238,494	2.89
Emilia-Romagna	346,861	346,861	100%	1,030,055	2.97

	Volume of landings (kg)		Volume of landings Passive/All gears %	Value of landings (€)	Average price (€/kg)
	Allgears	*Passive gears*		*Passive gears*	
Marche	597,236	593,338	99%	1,848,809	3.12
Veneto	195,528	195,528	100%	584,890	2.99
Total GSA 17	**1,225,860**	**1,218,179**	**99%**	**3,702,248**	**3.04**

Source: Mipaaf, Italian national programme for fishery data collection

Cuttlefish caught by passive gears are the most valued species with a price around 11 €/kg. Squilla mantis was sold at an ex-vessel price of around 9 €/kg, on average. Finally, changeable nassa is a less valued species, sold at a price of around 3 €/kg.

Main socio- economic indicators

Table 6 presents the total number of employed persons (paid and unpaid labour) and employment in full-time equivalents (FTE) in the passive gears fishing segment, as well as other socio-economic indicators, such as average wage, gross value added (GVA) and GVA per FTE.

Most workers on these fishing vessels are full-time employees and male. In general, the passive gears fishing segment is characterized by a low generation al handover due to poor profit margins even in traditional fishing areas, such as the Adriatic region. When a small-scale vessel has more than one crewmember, the second fisher is usually a family member (Maiorano et al, 2019).

Table 6 - Labour employed in fishing and main socio-economic indicators of the passive gear fleet of GSA 17, 2019

Passive gears' fleet	
Total employees	1,843
Full-time (FTE)	925
Average crew wage (labour costs per employee, EUR thousand)	7.5
GVA (EUR thousand)	34,853
Labour productivity (GVA per FTE, EUR)	37,681

Source: Mipaaf, Italian national programme for fishery data collection

The productivity of vessels using passive gears is different if looking at the different regions. It is higher than the average of GSA17 in Emilia Romagna (around EUR 50 000), where fishers integrate income from landings with other income, mainly that deriving from capture fishing activities for the harvest of Philippine clams in coastal lagoons, as it happens in Goro area, or from activities like "pescaturismo", in tourism-oriented coastal areas or in supporting the traditional aquaculture, in other regions like Friuli Venezia Giulia and Marche.

Total revenue for this fleet segment in 2019 was EUR 49 million (an average per vessel of over EUR 30 000) with other income accounting for around 15% of the total – table 7.

Total gross costs of this fleet segment amounted to EUR 27 million in 2019 (averageofEUR21,000 per vessel), with variable costs equating to 79%. The remaining21% consisted of repair and maintenance costs and other fixed costs. Additionally, estimated capital costs (annual depreciation and opportunity cost of capital) wereEUR6.2 million, nearly EUR5 000 per vessel. Annual depreciation amounted to95% of capital costs.

Table 7 – Main economic indicators of the passive gears fleet, GSA17, EUR thousand, 2019

Income and cost items	Total	Average per vessel
Value of landings	40,873	31.34
Other income	7,767	5.96
Total income	**48,640**	**37.30**
Labour costs	13,870	10.64
Energy costs	3,684	2.82
Repair and maintenance costs	2,879	2.21
Other variable costs	4,429	3.40
Other non- variable costs	2,795	2.14
Total gross cost	**27,657**	**21.21**
Consumption of fixed capital	5,895	4.52
Opportunity costs of capital	310	0.24
Gross profit	20,983	16.09
Net profit	**14,778**	**11.33**
Net profit margin	30%	
RoFTA	69%	

Source: Mipaaf, Italian national programme for fishery data collection

Among the operating costs, crew costs were highest at 63 % of the operating costs, followed by energy costs (17 %) and then other variable costs (20 %). The highest owner related costs were made of repair and maintenance (51 % of owner costs), followed by other fixed costs (50 %).

In 2019, an average passive gear vessel spent nearly EUR 11,000 on crew costs (meaning less than 8 thousand € per year per crew member even if, most of the time, he is also the owner of the vessel itself so the crew wage should be added to the owner's profit), almost EUR 2,800 on fuel costs and over EUR 3,400 on other variable costs. The average amount spent on repair and maintenance was EUR 2,200 and a slightly lower amount on other fixed costs.

In 2019, this fleet segment generated a gross profit of EUR 21 million. With a net profit margin of around EUR 11 thousand, profitability was quite high. Net profit margin was estimated at 30% and RoFTA (the return on fixed tangible asset) at 69%, highlighting a good performance of the sector.

2.3.2. Hydraulic dredges

This section reports the main technical, productive and socio-economic indicators of vessels fishing in GSA 17 equipped with hydraulic dredgers, independently from their length (also because dredgers are very similar in terms of technical characteristics).

This fleet segment consisted, in 2019, of 552 active vessels (out of a total of 594 vessels), operating mainly, in order, in Marche, Veneto and Abruzzo as reported in figure 18. The fishery is regulated by a self-management approach based on Territorial User-Rights in Fisheries (TURFs) through Molluscs Management Consortia (Co.Ge.Vo), which are distributed at compartment level.

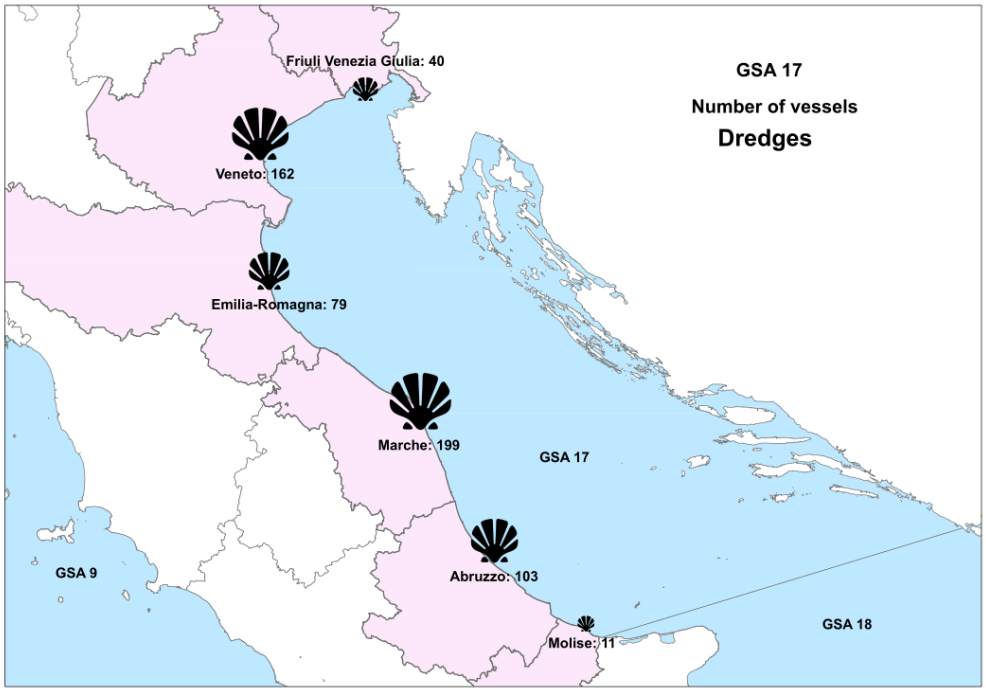

Figure 18 – Total number of vessels belonging to the hydraulic dredges fleet segment by regions of the GSA 17, 2019. Source: Mipaaf, Italian national programme for fishery data collection

Vessels using dredges in GSA 17 are characterised by an average length of 13,55 meters (LOA), gross tonnage of 13.90 tonnes and engine power of 108.36 kW. Vessels have an average age of 32 years and a crew of 2.3 person. In 2019 they operated 87 days on average (table 8).

Table 8- Basic information for hydraulic dredges operating in GSA 17 (average per vessel), 2019

Hydraulicdredges	
Vessel age	31,94
Length overall (LOA)	13,55
Gross tonnage (GT)	13,90
Power of main engines (kW)	108,36
Crew size (persons)	2,3
Days atsea	87

Source: Mipaaf, Italian national programme for fishery data collection

The hydraulic dredges segment is a monospecific fleet segment as vessels use exclusively dredgers as fishing gears.

Production

Hydraulic dredgers in GSA 17 predominately target striped venus, representing 89% of the overall value of landings of the fleet. Smoot clams, caught exclusively in Veneto and Friuli Venezia Giulia, account for 10% of the total (figure 19).

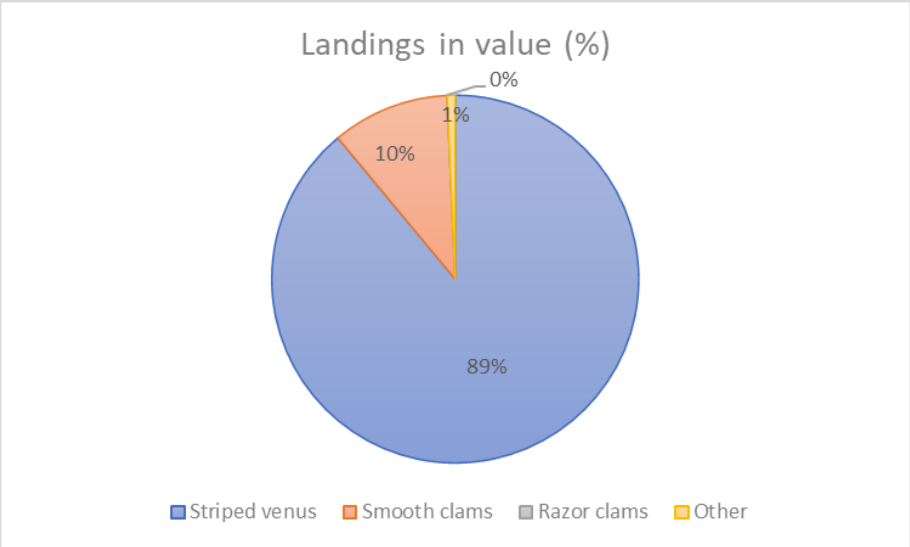

Figure 19 –Composition of the value of landing of the hydraulic dredger fleet segment operating in GSA 17, 2019.
Source: https://stecf.jrc.ec.europa.eu/dd/fdi

Razor clams represent a very small portion of the total (0.004% in 2019). Actually, the landings of this species, usually caught in Veneto and Friuli, is facing a decreasing trend in the last 5 years for the whole GSA 17 area (figure 20). This is why there are now, in place, some attempts to recover the stock also by mean of experimental restocking activities with juveniles originating from other areas, e.g. the Tyrrhenian side (Prizefish 2020a).

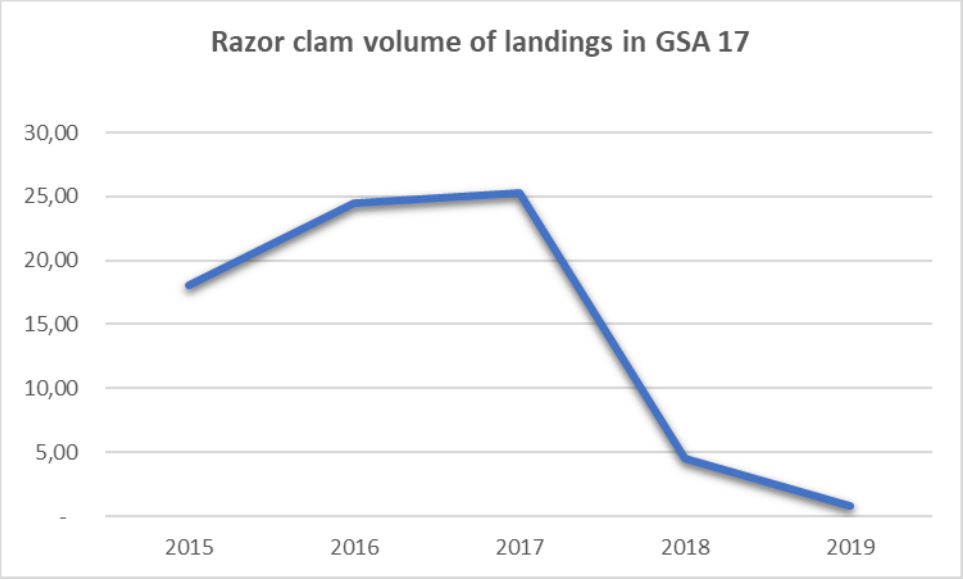

Figure 20 –Composition of the value of landing of the hydraulic dredger fleet segment operating in GSA 17, 2019.
Source: https://stecf.jrc.ec.europa.eu/dd/fdi

As far as striped Venus, the main producer is the Marche region, followed by Veneto and Abruzzo. On the other hand, Friuli Venezia-Giulia and Veneto are the two regions active in the production of smooth clams (for details, see Prizefish 2020c).

Main socio- economic indicators

Table 8 presents the total number of employed persons (paid and unpaid labour) and employment in full-time equivalents (FTE) in the hydraulic dredges fishing segment, as well as other socio-economic indicators, such as average wage, gross value added (GVA) and labour productivity.
In 2019 the total employed persons were 1,273 while full time equivalent is 459; this difference is due to low activity of vessels spending on average 80 days at sea and to the short duration of the fishing activities per day (table 8).

Table 9 - Labour Employed in fishing and main socio-economic indicators of the hydraulic dredges fleet of GSA 17, 2019.

Hydraulicdredges fleet	
Total employees	1,273
Full-time (FTE)	459
Average crew wage (labour costs per employee, thousand EUR)	14.22
GVA (EUR thousand)	36,781
Labour productivity (GVA per FTE, EUR)	80,214

Source: Mipaaf, Italian national programme for fishery data collection

Total revenue for the fleet in 2019 was to EUR 48 million, amounting to an average per vessel of EUR 87,540.

Total gross costs amounted to EUR 30 million in 2019 (average of EUR 54 000 per vessel), with operating costs equating to 80%. The remaining 20% consisted of repair and maintenance costs and other fixed costs. Additionally, estimated capital costs (annual depreciation and opportunity cost of capital) were EUR 6 million, which equals around EUR 11 000 per vessel. Annual depreciation amounted to 94 % of capital costs.

Among the operating costs, crew costs were highest at 76% of the operating costs, followed by energy costs (16%) and other variable costs (13%). The highest owner related costs were made for repair and maintenance (51% of owner costs), followed by other fixed costs (49%).

In 2019, the average vessel spent EUR 33,000 on crew costs, EUR 7,000 on fuel costs and nearly EUR 3.4thousand on other variable costs. The average amount spent on repair and maintenance was almost EUR 5,400.

Table 10 – Main economic indicators of the hydraulic dredges fleet, GSA17, EUR thousand, 2019

Income and cost items	Total	Average per vessel
Value of landings	48,321	87.54
Other income	54	0.10
Total income	**48,375**	**87.64**
Labour costs	18,112	32.81
Energy costs	3,868	7.01
Repair and maintenance costs	2,986	5.41
Othervariable costs	1,855	3.36

Income and cost items	Total	Average per vessel
Other non- variable costs	2,885	5.23
Total gross cost	**29,707**	**53.82**
Consumption of fixed capital	5,773	10.46
Opportunity costs of capital	341	0.62
Gross profit	18,668	33.82
Net profit	12,555	22.75
Net profit margin	26%	
RoFTA	49%	

Source: Mipaaf, Italian national programme for fishery data collection

In 2019, this fleet segment generated a gross profit of EUR 34 million. largely due to lower energy costs. Net profit margin was estimated at 26% and RoFTA at 49%.

This fleet segment saw some improvement compared to previous years. The introduction of a new MCRS (reduced from 25 to 22 mm) through the adoption of the Discard Plan for mollusc bivalve Venus species in the Italian waters (entered into force on 1 January 2017) positively affected the profitability of Italian dredges. In 2018, a positive net profit was estimated. The increase in net profits from EUR 0.69 million to EUR 5.41 million, was due to an increase in the volume of landings and, to a minor extent, to a decrease of the expenditure. The derogation from minimum size rules has made possible to reduce the daily fishing hours with a positive effect on operating costs and, therefore, profitability.

2.3.3. Hand harvesting of mussels on gas platform

The underwater fishing of wild mussels is a special feature of Ravenna seamanship. It started in the '80s, following the ban to the fishing activity close to the off-shore platforms. In those years, a Consortium was instituted, gathering small-scale fishers of the area, associated to the fishing cooperatives active in the Marina di Ravenna port. By virtue of a contract of maintenance signed between the Consortium and AgipSpA (today substituted by ENI, Ente Nazionale Idrocarburi) fishers started to collect (by scraping) mussels from offshore structures, which thus became the main source of income for local fishermen (since then renamed "cozzari"). In 1997 the Consortium was renamed Piccola e Media Pesca La Romagnola. Over the years la Romagnola has become the group leader of an R.T.I. or A.T.I. (AssociazioneTemporanea di Imprese) involving, today also another cooperative (Conisub).

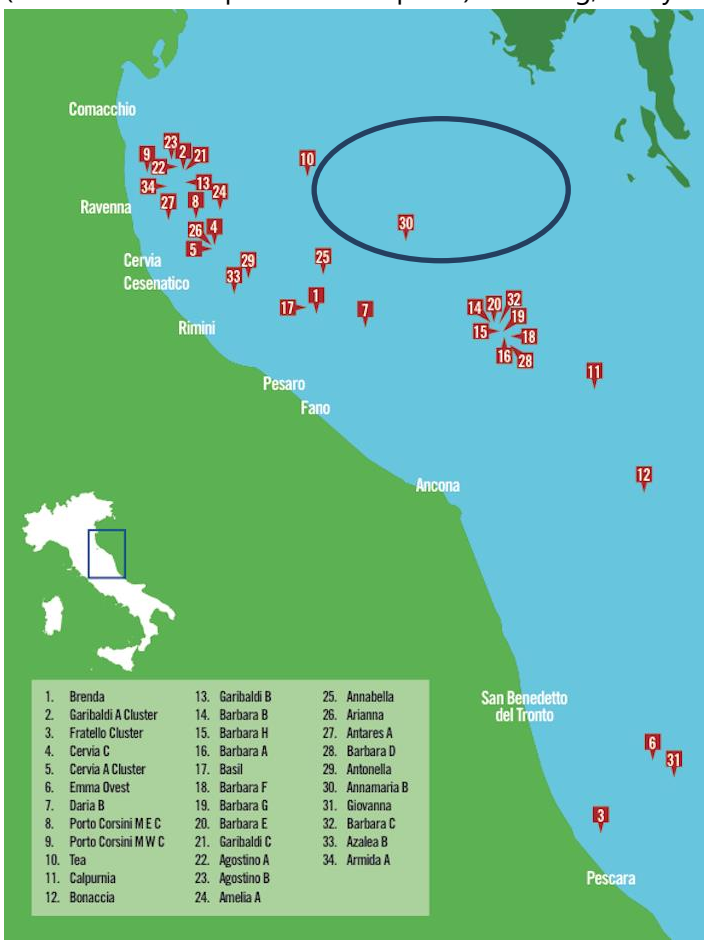

Figure 21 – Maps of gas platform in the Adriatic Sea (inside the circle the platform off the Marina di Ravenna port). Source: Il Salvagente, 2016

Activity

The wild mussel fishery on gas platforms is carried out by around 30 fishers adhering to 2 cooperatives (La Romagnola and Conisub), accounting for eight vessels. The two cooperatives are in charge of the management of administrative aspects for the associated vessels as well as the coordination of the marketing aspects.

Below a table with the average characteristic of the vessel used.

Table 11 - Basic information for vessels used for the wild mussels' fishery on the gas platform in GSA17 (total vessel and average indicator per vessel), 2019

Vessels used for the wild mussels' fishery on gas platform	
Total number of vessels	8
Gross tonnage (GT)	17
Power of main engines (kW)	286
Length overall (LOA)	15
Crew size (persons)	4
FTE (full time equivalent position)	1.24
Days at sea	124

Source: ad-hoc data collection done with the support of Cestha, partner of the Prizefish project

The fishery is carried out from spring to the end of autumn (figure 22) indeed most of fishers are contracted by the cooperative with full-time season contract (see section 3.2.3). The estimated days at sea for 2019 were 124 (18 per month, on average). The collection of mussels is conducted by scuba-divers and by specialized technical operators, since the fishing is simultaneously an unload activity to maintain the gas platforms clean and a deep specialisation is needed. The catch of mussels is done manually on a working time of 4 hour (on average) scraping the underwater "legs" of structures, with the collection that concerns only those individuals of more than 25 mm. The work is physically demanding but does not fall within the list of heavy and arduous professions under national law and does not entail a specific risk of accidents.

The employment created by the fishery is estimated in 32 jobs (persons employed) and around 10 FTE, calculated on the basis of the threshold used under the data collection framework for Italy.[3]

[3]Based on a threshold for a full-time position of 1,600 working hours per year.

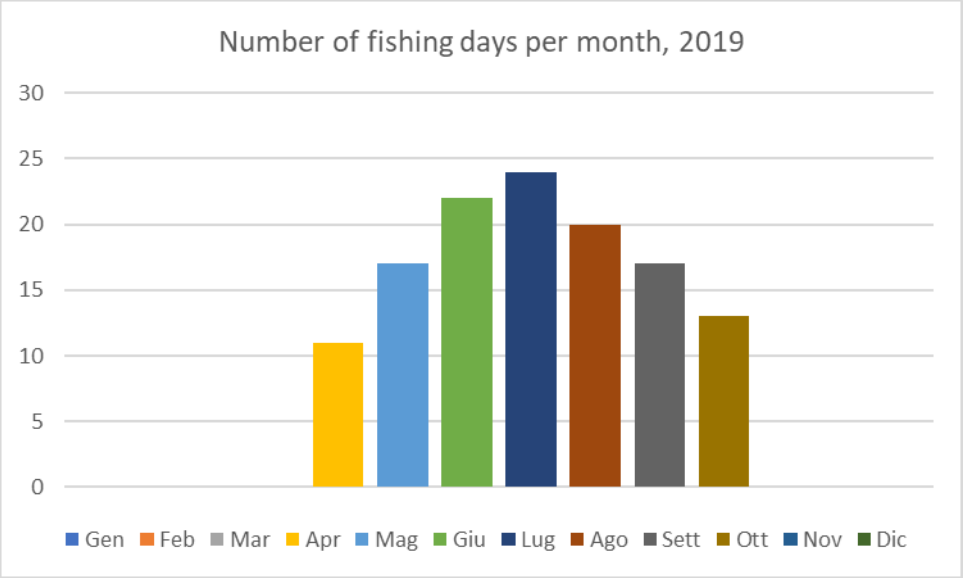

Figure 22 –Average days at sea per month for vessels used for the wild mussels' fishery on gas platforms in GSA17, 2019. Source: ad-hoc data collection done with the support of Cestha, partner of the Prizefish project

Production

The product ends up directly on the market when it has been caught on inactive gas platforms while it is destined to some relaying treatments when mussels are caught on active gas platforms. The fishing cooperative applies a random rotation on the platforms assigned to fishers (because relaying treatments produce some costs).

As far as the volume of production, in 2019 scuba divers adhering to the 2 cooperatives active in Marina di Ravenna caught on average, 90 tons per vessel, with an average *ex-vessel* price of 1.80 €/kg. The price shows an increasing trend with the approaching of the summer seasons, when mussels are more requested from the market. The price tends to remain stable level with the decrease of supply in line with the approach of autumn – figure 23.

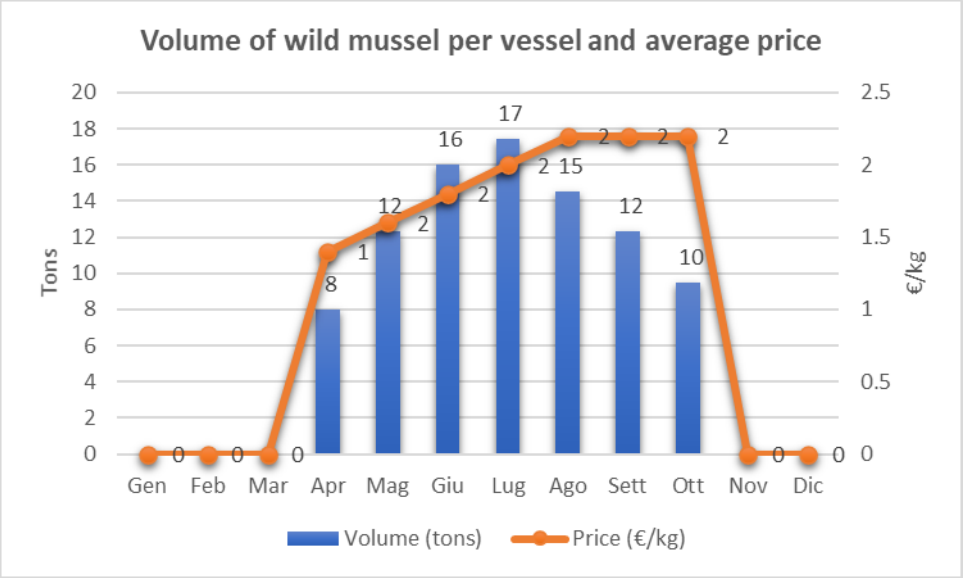

Figure 23 – Average monthly production (per vessel) and ex-vessel price of wild mussels' fishery on gas platforms in GSA17, 2019. Source: ad-hoc data collection done with the support of Cestha, partner of the Prizefish project

The yearly total production for 2019 can be estimated at around 720 tons for a worth of around 1.3 million EUR.

Indeed, even if in the past some criticism has been raised against the quality of mussels' meat because of their origin (they grow on the metallic legs of the gas platforms), the health analysis carried out systematically by the sanitary presidia (ASLs) confirm that the product is completely safe and that the quality of the meat is largely superior to the farmed ones. This can be explained, in particular, by the fact that the platforms are located off-shore, distant from coastal sewage systems and exposed to high currents. As a consequence, wild mussels from Ravenna are highly appreciated and requested from the market (mainly local consumers and restaurants) and, as a consequence, the *retail price* is generally higher (around € 4.5/kg, even more than 2 times the farmed mussels).

Revenues and costs

Total revenue for this fleet segment in 2019 can be estimated in EUR 1.3 million (an average per vessel of over EUR 162 000) – table 12.

Repair and maintenance costs have been assumed similar to those sustained by vessels using passive gears in GSA 17, with and additional amount due to the maintenance of the technical diving equipment.

European Regional Development Fund

They amount, on average, to 32 thousand EUR, equal to an average of 4 thousand EUR per vessel per year.

As far as other variable costs, they represent cost linked to the commercialization of mussels, in charge of ATI and related, mainly, to the packaging and distribution of mussels, including the marketing coordination activities. They amount, on average, to 24 thousand EUR per year, on a whole basis, a bit more than 3 thousand EUR per vessel.

As far as other non-variable costs (e.g. accountancy, sanitary services, licenses renewal, etc…) they are estimated at 2.14 thousand EUR per year per unit, for an overall amount of around 17 thousand year[4].

The total gross costs of this "fleet" amounted to EUR 849thousand in 2019 (an average of EUR 106,000 per vessel), equating to 65 % of revenues.

Table 12 – Main economic indicators of the wild mussels' fishery in GSA17, EUR thousand, 2019

Income and cost items	Total	Average per vessel
Value of landings	1,296	162.00
Total income	1,296	**162.00**
Labour costs	720	90.00
Energy costs	56	7.00
Repair and maintenance costs	32	4.00
Other variable costs	24	3.12
Other non- variable costs	17	2.14
Total gross costs	**849**	**106.26**
GVA	1,167	145.74
Gross profit	447	55.74

Source: ad-hoc data collection done with the support of Cestha, partner of the Prizefish project

The GVA generated by the fishery is estimated to be, in 2019, around EUR 1.2million (average of EUR 155,000 per vessel). As a result, the Labour productivity (GVA per FTE, EUR) can be estimated in EUR 117,000.

On average, each vessel has gained a gross profit (before taxation) equal to EUR 55,740, amounting to EUR 447 thousand for the whole sector.

[4]Being the first data collection for this fishery it has to be noted that it has been possible to collect only the major revenues and costs items. Some costs, e.g. repair and maintenance and other non-variable costs have been estimated on the basis of average data for passive gears for GSA 17, with some adjustments deriving from consultations with local operators.

3. SURVEY RESULTS

This section reports the main findings of a survey conducted during May 2021 with the aim of collecting a) data and information on socio-economic aspects not covered by the official data sources and b) perceptions and expectations of the main operators with respect to the introduction of an eco-label as the ARFM. The project focus on some Adriatic fisheries selected as case-studies for a first test of the ARFM. But other Adriatic fisheries could be eligible for the ARFM. This is why the survey has been addressed to fishers representing the selected fisheries, but it was open also to others.

The socio-economic data requested relate to 2019 as it has been assumed that 2020 cannot be considered a representative year for fisheries, due to the Covid-19 pandemic. Nevertheless, some questions addressed the Covid-19 effect on fisheries and the related supply-chain. Questions could be answered by vessels' owners or by cooperatives and POs'(Producer Organisations) representatives. Indeed, it has been assumed that some questions could be better addressed by persons more properly informed, because of their role, e.g. those related to marketing aspect, in some cases in charge of POs or cooperatives.

The feedback of fishers has been collected by mean of a survey based on the submission of a questionnaire containing a set of simple questions, 33 in total. The questionnaire used for the Italian survey is partially based on that developed and submitted during the survey for the Croatian fisheries.

The questionnaire is made up of the following 5 sections:

A. General information (about the respondent, its role and landing port);
B. Basic information about the business (focusing on the income generation, main species/gears and questions on employment);
C. Markets' and buyers' preferences (focusing on the main marketing channels, purchasing criteria, the role of labels and the Covid 19 effect);
D. Expectations from the ARFM application.

Because of the Covid-19 health restrictions, it has not been possible to carry out the survey face-to-face and so, in order to ease the process, a digital tool for an on-line survey has been *ad-hoc* developed and implemented. The link to the survey has been sent to the selected interviewees, previously informed about the survey and ensured about confidentiality. The respondents could compile the questionnaire in a user-friendly manner as the questionnaire was also accessible by smartphone.

3.1 Sample composition

The questionnaire was completed by 30 respondents, largely from fishing enterprises associated with cooperatives and/or POs'. The analysis reported in the following sections is based on 27 compiled questionnaires because 3 questionnaires contained only information on the landing ports or the PO of affiliation.

The questionnaire was administered to fishers operating in the key ports of the selected fisheries (clams' fisheries in Veneto and Marche; passive fisheries for cuttlefish, mantis squillid and changeable nassa in Emilia Romagna and Marche; wild mussel on gas platform in Emilia Romagna). The survey was eased by local facilitators (representative of partners of the Prizefish project as OP Bivalvia, Cestha and ASSAM), helping in reaching as more fishers was possible.

The geographical areas of the respondents are Emilia Romagna, Marche and Veneto. Emilia Romagna is the most represented, with 41% of the respondents, followed by Veneto (30%) and Marche (29%), represented with similar percentages, respectively 37%, 36% and 27% of the total responses – figure 21.

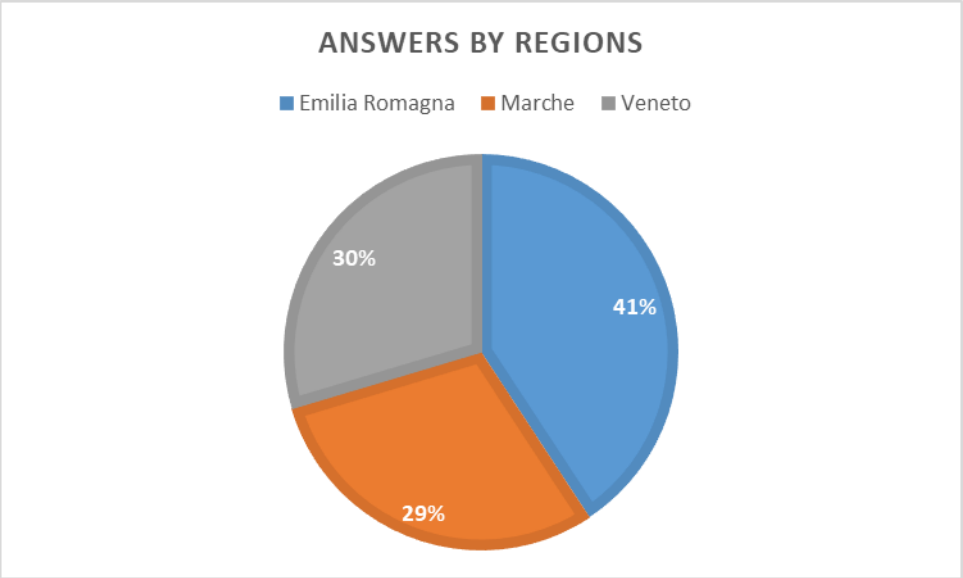

Figure 24 –Composition of the sample by GSA 17 regions

Below the composition of the sample by region and PO's and/or cooperatives of affiliation of respondents (table 11).

Table 13 – Sample composition by regions and POs of affiliation

Name of PO or producers' association	Region	No. respondents
O.P. BIVALVIA VENETO S.C.	Veneto	8
ATI wild mussel	Emilia Romagna	9
COGEPA	Marche	4
O.P.PE.F.S.	Marche	1
Associazione Produttori Pesca Soc. Coop. P. A.	Marche	1
PO Civitanova Marche	Marche	1
Individual enterprises	Emilia Romagna	2
	Marche	1
Total		**27**

The coverage of the sample is wider of what emerges from the above table if we consider the PO or the fishers' association the respondents represent as well how they have replied, i.e. on behalf of what. Indeed, only 75% of the answers have been provided on behalf of the own fishing enterprises. In 14% of the cases, respondents have replied on behalf of the cooperative to which they are associated. On 11% of the cases, they have replied on behalf of the PO, hence expanding a lot the representativeness of the survey.

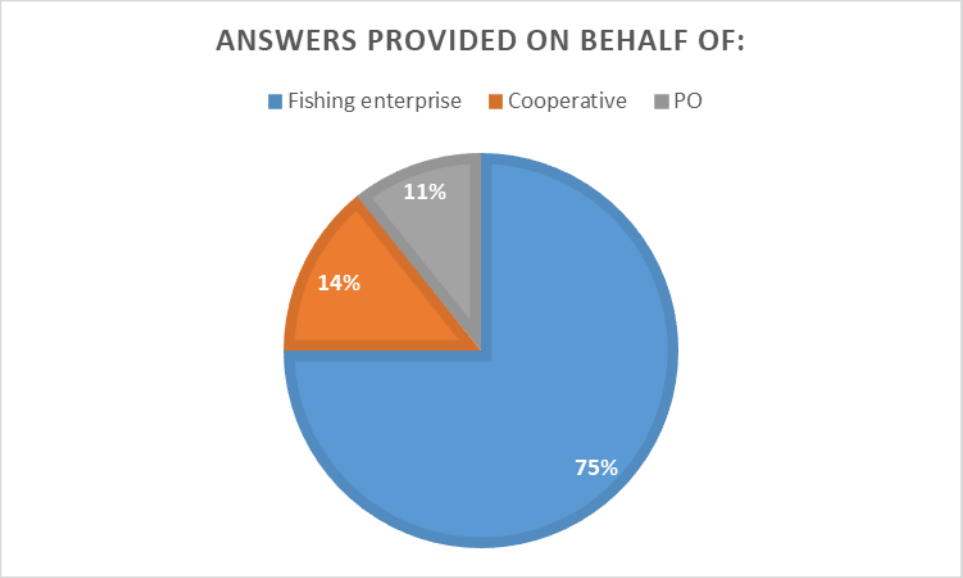

Figure 25 –Composition of the sample based on what behalf answers have been provided

This is the case, for instance, ofO.P. BIVALVIA VENETO S.C., based in Veneto, collaborating with Co.Ge.Vo. of Venezia and Chioggia for a sustainable management of the Venus clams (*Chameleagallina*) and its marketing. 75% of vessels managed by the 2 Co.Ge.Vo. (around 100 fishing enterprise) are associated to PO Bivalvia. In the last years OP Bivalvia adopted several initiatives for a sustainable exploitation of the clams, such as: i) seeding in nursery areas, ii) restocking, iii) catch control, iv) rotation of exploitation areas, v) temporary closure of specific areas for reproduction, nursery or recovery purposes. On the other hand, by mean of production and marketing plans tries to harmonize supply with demand (for more details see Prizefish 2020a; Prizefish 2020b; Prizefish 2020c). Because of this, in 2018, the "Venetian Wild Harvested Striped Clam fishery" became the first Italian and Mediterranean fishery to achieve an MSC certification, highlighting the strong role exerted by the PO active in the bivalve fishery in the Veneto region (one of the fisheries to be addressed in the pre-assessment phase of the Prizefish project according to the ARFM).

The ATI (Associazione Temporanea di Imprese) in charge of the wild mussels' fisheries on gas platforms, based in Marina di Ravenna (Emilia Romagna) represents 100% of fishers active in this fishery. Fishing operators are very well organised and demonstrate a good willingness to test the ARFM. The main reason is the chance to differentiate the wild products from the farmed ones. It is, indeed, not so uncommon that some fishmongers sell farmed products with a "wild" etiquette, creating in this way a distortion on the market and negative economic effects on fishing operators. Actuallly, a process aimed

to the creation of a label for the wild mussel focusing on the wilderness of the mollusc in comparison with the farmed one is in place, coordinated by the FLAG "Costa dell'Emilia Romagna" and financed by FEAMP.[5]

As far as other respondents, 4 of them are members of the COGEPA (COnsorzio GEstione Pesca Artigianale) for the management of small-scale fisheries in the Marche region.

1 respondent is member of O.P.PE.F.S., a PO based in the Marche region and associating around 61 fishing enterprises (65 vessels) active in many types of fisheries among which clams' fishery by mean of hydraulic dredgers is predominantly represented (51 vessels, around 26% of the total number of dredgers operating in the region). The answer from O.P.PE.F.S can be considered representative, even if only 1, considering that the respondent has replied on behalf of the PO.

The same can be asserted for the answers provided by the 2 respondents declaring to be affiliated to PO Civitanova Marche and to the Associazione Produttori Pesca Soc. Coop. P. A. The latest is the entity in charge of the management of the wholesale fish market of Ancona also involved in activities related to quality certifications and productions with regard to the enhancement of the local fish product, promotion of safe traceability systems and development of new marketing channels. As for the previous case, the respondent replied on behalf of the producer association. The interesting thing is that this questionnaire has been compiled in representation of fisheries different from those selected. Indeed, the respondent declares that the producer association represents vessels operating mainly with trawlers, beam trawlers and gillnets.

Indeed, the sample is composed for 41% of respondents representing clams' fishery by dredges, 30% by diving fishers catching wild mussels on the gas platforms, 11% by fishers catching changeable nassa by small pots/basket (called cestini), 7% by cuttlefish fishers with cogolli and another 7% from spottail mantis shrimp fishers with cages.

[5] http://www.flag-costaemiliaromagna.it/la-romagnola-soc-coop-la-cozza-selvatica-di-marina-di-ravenna/

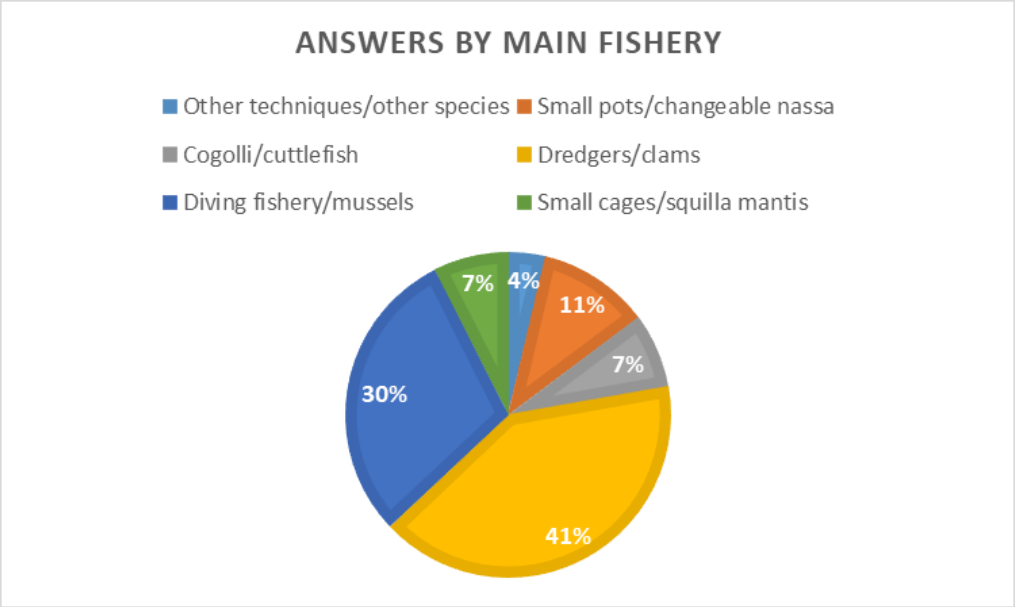

Figure 26 –Composition of the sample by main fisheries

3.2 Fishing activity: income, use of resources and employment

3.2.1 Source of income

As far as the source of income, almost all the fishers interviewed stated that their income was made up solely of income from fishing activity (24 respondents, 89% of the total) while in very few cases (2 respondents) they stated to use their vessel also for other activities, namely the maintenance of mussel farming facilities and tourism. This is the case of 2 fishers: one diver catching wild mussel and providing his skill also in local mussels' farming plants (cleaning and repairing mussels' rows); the second is the owner of a dredge in the Marche region. In any case, the income from fishing represents more than 75% of the total income.

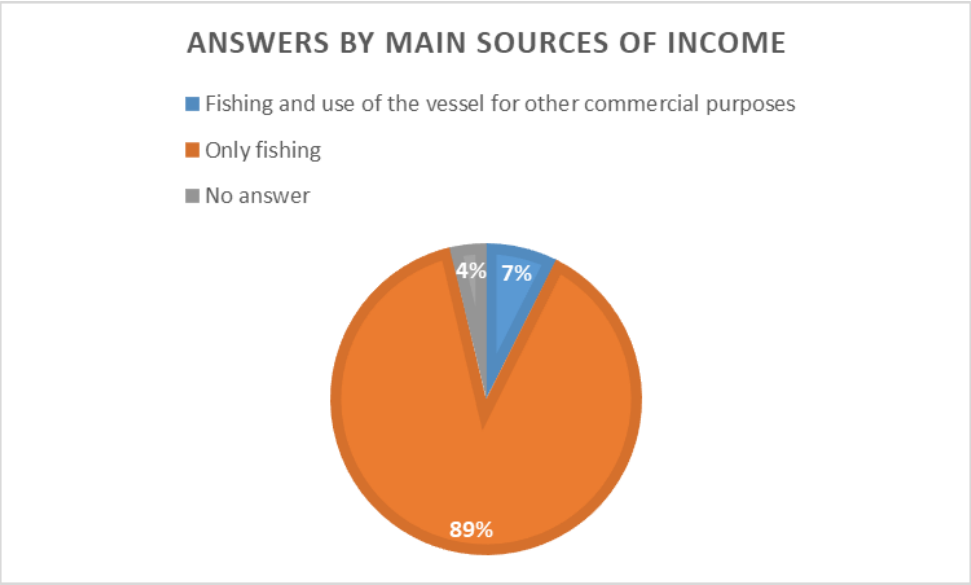

Figure 27 – Answers on the source of income

It is clear from the answers to these questions that the sample of respondents, although small, is largely representative of a category of operators, and their families, living mainly of fishing. This observation guarantees on the real knowledge of the topics covered and on the reliability of the answers to the next questions of the survey as well as on the relevance, for respondents, of the covered topics.

3.2.2 Use of resources

In relation to the fishing activity as main source of income, it was asked how much the target species, identified in the previous questions in association with the gears (representing the fisheries selected for the pre-assessment) affect the composition of income from fishing,

70% of those using dredges for catching clams asserted to be 100% dependent on this resource. The remaining 30% stated that this resource makes up their income at or more than 75%, the remaining 25% of fishing income depending, on a very marginal basis, from the capture of other species: this is the case of very few declaring species accidentally caught with dredgers or using dredgers for fishing tourism or for capturing peanut worms (*Sipunculusnudus*) to be used as fishing bait – figure 25.

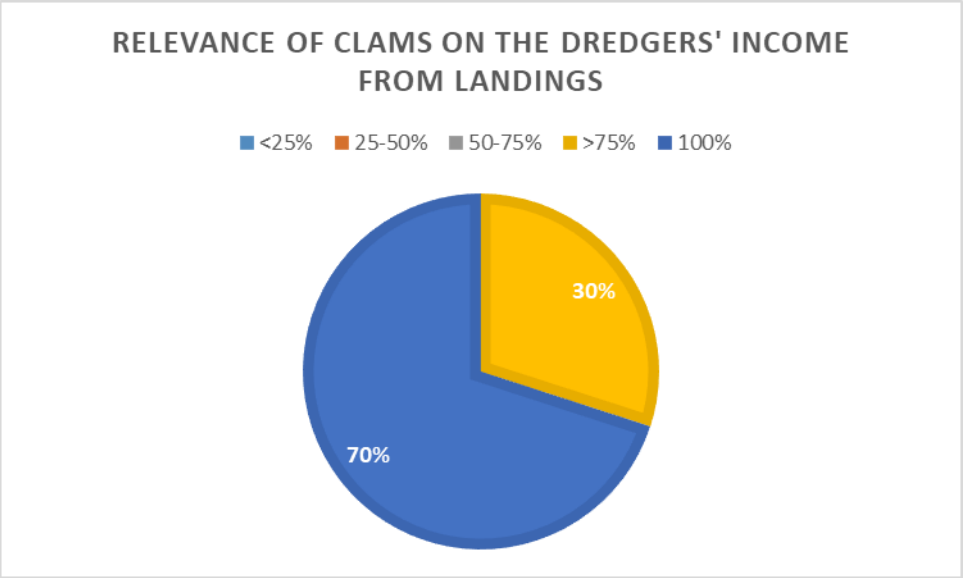

Figure 28 – Answers on the relevance of clams on dredgers' income from landings

Another type of highly specialized fishing, as well as that of clams, is certainly the wild mussels' fishery on gas platform.

In fact, fishermen belonging to the cooperatives that fish underwater for these molluscs have stated in 88% of cases that they are dependent exclusively on this type of fishing and the remaining 13% for a percentage ranging between 50 and 75% (the remaining 25%-50% deriving from species caught with artisanal gears (small-scale) – figure 26.

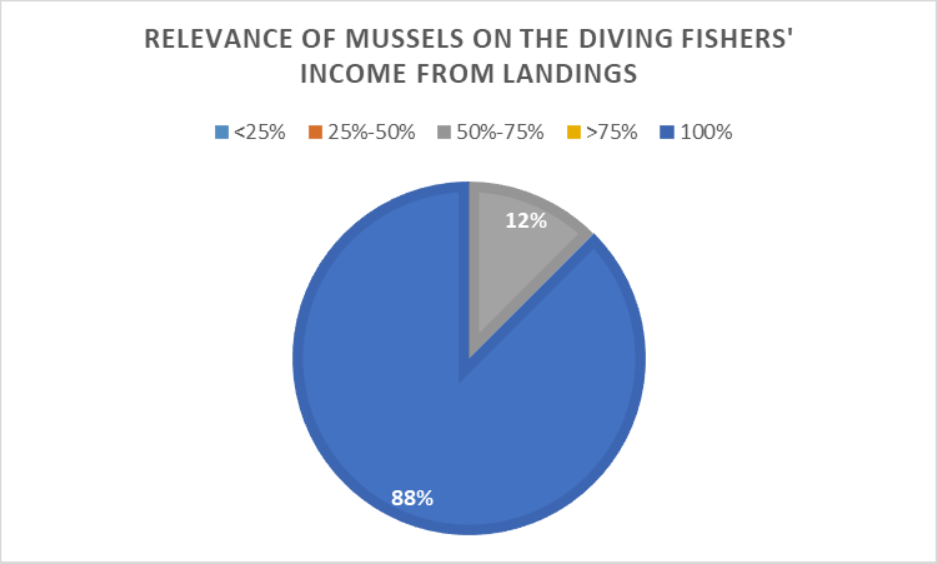

Figure 29 – Answers on the relevance of mussels on diving fishers' income from landings

By reviewing answers provided by fishers using passive gears, such as baskets, cages and cogolli, we can see how these fishing systems, by their nature transversal to the different species (see section 2.3.1 in detail), arrive only in a few cases at percentages higher than 50% for a single species– figure 27.

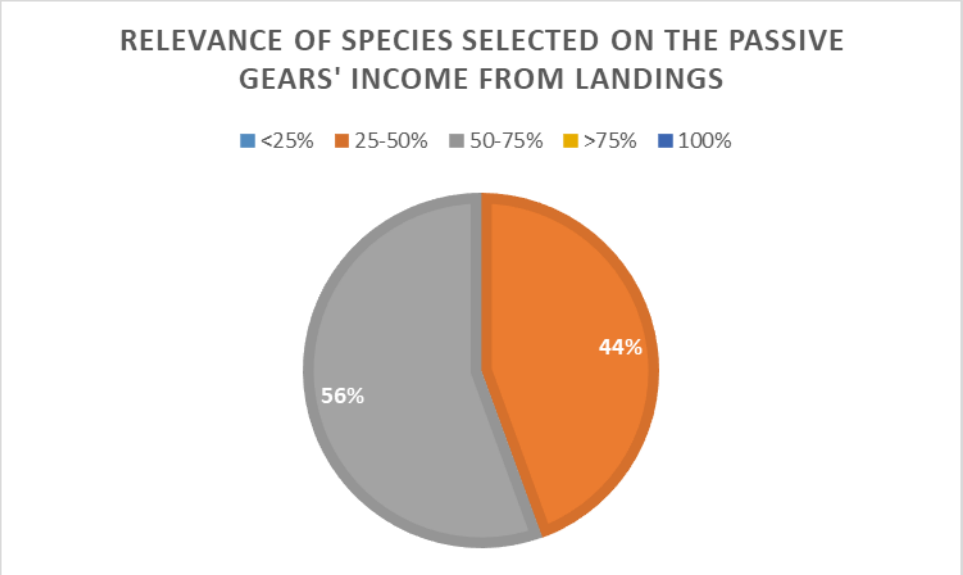

Figure 30 – Answers on the relevance of cuttlefish, mantis squillid and changeable nassa on passive gears vessels' income from landings

3.2.3 Employment and labour costs

The type of employment contract applied is usually seasonal and provides for a salary calculated by the "share-method", a feature of the Italian fishery sector.

The remuneration of the crew members is calculated on the basis of the revenues of the vessel to which certain cost items are subtracted (cassettes, panatics, baits if necessary, etc.). The remaining sum is divided equally, but arrangements may be made where more than one share goes to the owner of the boat; there is no single method of calculating the part as it differs from area to area and from fishery to fishery.

The discourse is different for divers who fish wild mussels. Respondents of the cooperatives interviewed declare to apply fixed-wage employment contracts to their employees. Even if on a full-time basis, seasonal contracts prevail (5 respondents out of 8).

For dredgers, the number of employees varies between 1 and 3 per fishing company, with an average of 2.3 employees, in line with national data for these types of boats, as also reported in the official surveys of the fishing data collection program (for details see section 2.3.2). Scarcely used the part-time contract: only interviewee, actually answering on behalf of the Producer Organization of the Marche, reports that this type of contract is applied to crewmembers working on some of the associated vessels (5% of 185 represented employees).

As far as labour on board it is concerned, it was therefore asked what is the share of labour costs on total revenues produced by the vessel.

52% of respondents said that the incidence was over 50%, while 26% reported that it is well below 30%, in the middle 22% stating that the share of labour costs on revenues from landings falls in the range 30-40% - figure 28.

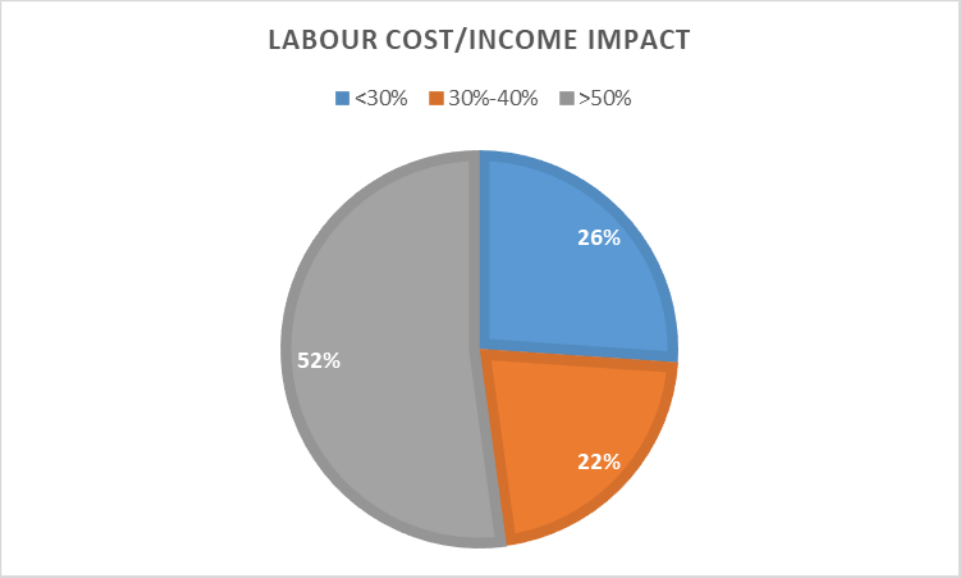

Figure 31 – Answers on the share of labour costs on revenues from landings

By crossing the data with the type of fishing carried out and the type of contract applied, it can be assumed that there is probably a positive correlation between fishing specialization and labour costs, or, regardless of the type of contract applied (fixed wage or part method) dependent fishers who practice a higher specialization type of fishing are able to obtain better economic treatment (e.g. a fixed salary vs. a variable one, as the one based on the share system). The phenomenon could also be explained simply because for certain types of fishing more employees are required on board; while for vessels using passive gear, small-scale fishing, sometimes the only one on board is the owner himself.

3.2.4 Medium-term expectations on the fishing activity

Within section B, after the questions on the composition of landings, on the composition of income and crew, some questions were asked with the aim of detecting the opinion of the interviewees regarding their medium-term expectations on the fishing activity.

According to the respondents, expectations for the near future of Adriatic fishing are not the best: in fact, 100% of the sample surveyed do not foresee an increase in the number of vessels in their marinas over the next 5 years and consequently the number of employees in the sector – figure 29. This has to be explained, of course, in the light of the limitation on the size of the fleet set by EU and national plans. However, worrying is the percentage of fishers expecting a further decrease (46%).

There is no relationship between the type of the fishing system and declared expectations, let alone a relationship with the port to which it belongs; this can be considered as a sign that the sensations, as personal, are transversal to the whole sample.
However, those who have a negative mood towards the situation of the fleet express the same pessimism about the number of people employed, declaring a deterioration for these over the next 5 years, too, a rather expected answer considering that the level employment is strictly linked to the fleet capacity. This is the case for those who expect some stability for the future, even if among them, in some cases, the employment situation is still perceived to be deteriorating. As far as employment it is concerned, the response rates are reversed compared to the previous question, with 46% of respondents expecting a stable situation and 54% of those considering the labour factor to be decreasing.

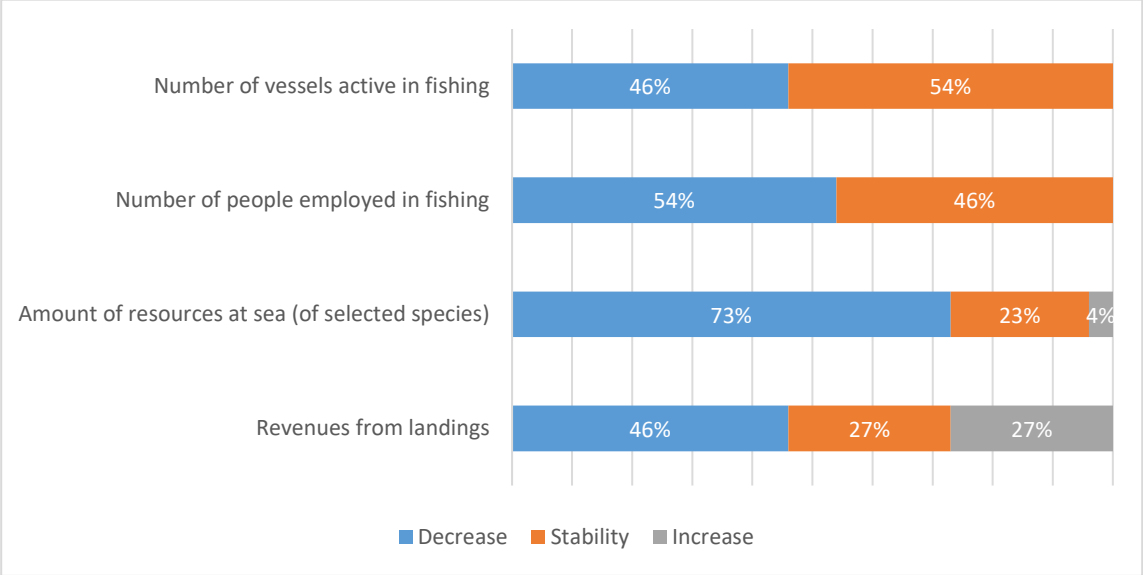

Figure 32 – Answers on the medium-term expectation on the fishing activity

The situation of underwater fishermen of wild mussels who see the employment situation as stable is unique, even though, at the next question concerning the quantities of stocks of the target species declared, they still see a decrease in resources from now and the next five years because of the uncertainty given by the decommissioning of the gas platforms.
Only a few respondents representing the dredgers' category, expect that in the coming years natural resource stocks can remain at least as such. Alarming the fact that all other categories are more

pessimistic and expect a decreasing trend on the amount of target species in the near future, reaching 73% of the total responses received for this question. One respondent, representing other fisheries (bottom and beam trawlers) expect an increase, mainly due to the trust in the upcoming effort measures to be implemented in the demersal trawlers' fisheries.

Turning to the most markedly economic factors, the question related to the expectations on revenue from landings, it is interesting to note that for a percentage just over 46% the sample is pessimistic and therefore believes that their earnings will decrease in the near future; for 27% the situation will remain almost unchanged, while another 27% expect that revenues can increase.

Fishermen were then asked to motivate their feelings about the future. Many of them, especially among those who practice a more artisanal type of fishing, complain about the lack of generational renewal, because of a profession now seen as tiring (also called "exhausting") and unprofitable. Along this, problems related to pollution have added, over the years.

Others complain of the lack of adequate marketing strategies especially in the last period impacted by the Covid-19 pandemic that made it impossible to use normal sales channels, first of all the Ho.Re.Ca. sector (hotel, restaurants and catering).

There are also those who complain about the scarcity of resources due to large fishing vessels fishing offshore and with which small-scale fishing vessels are unable to compete.

Among optimists stands out those who, despite seeing difficulties related to their sector, with the consequent decrease in the resources caught, believe and hope that adequate enhancement strategies will allow an increase in revenues (mainly diving fishers).

3.2.5 Impact of key factors on fishing activity

In subsequent questions, it was asked to respondents to specify the level of impact that is recognized for certain key factors.

Marine pollution, a factor already identified by some of the respondents in the previous question as decisive, turns out to have a high impact for about 89% of respondents – figure 30.

The presence of algae and/or invasive species also appears to have a high negative impact for the majority of respondents, although with a lower percentage (61%) compared with pollution; 35% say that this factor has a low impact on fishing activity, while only 4% don't see relation between the presence of algae and/or invasive species and the fishing carried out.

The change in water temperature is not perceived by everyone as a determining factor in fishing performance: the sample is more unbalanced on responses that attribute, to the increase in the water temperature, a low impact (50% of respondents) or zero impact (8%). On the other hand, 42% recognize a high capacity to have an impact on fishing activity.

Turning to more relational aspects and therefore belonging to the social sphere, the questions were asked whether any conflicts, and then the lack of cooperation with other fishers, could affect fishing or not. On this question, the sample is divided almost equally between those who think that this factor is decisive (27%), those who think otherwise (38%, mainly diving fishers of wild mussels, an understandable answer considering it is an activity circumscribed to a restricted area) and those who believe that it has a neutral impact (35%).

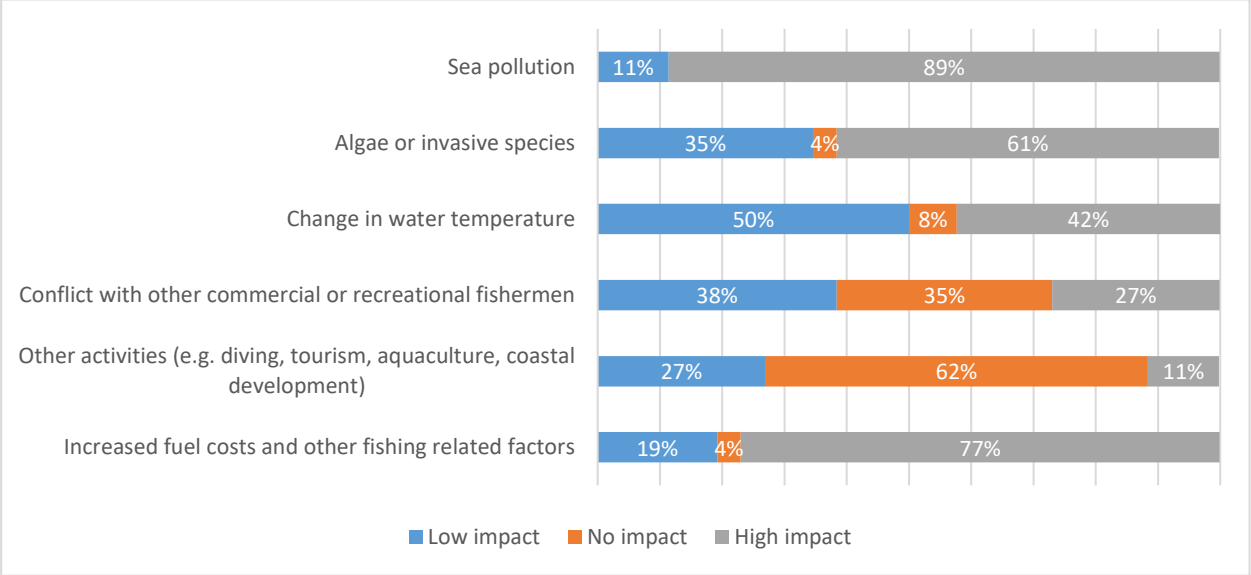

Figure 33 – Answers on the impact on fishing activity of key factors

Other activities carried out on the sea, such as aquaculture, fishing tourism, diving, etc. are also considered to have no impact on fishing by 62% of respondents, while 27% recognize a low impact; only 11% recognize a high impact on this factor.

On the other hand, 77% of interviewees recognized the increase in the cost of fuel and other factors directly related to fishing as highly decisive for their fishing activities; the remaining 23% considered that this factor has a neutral impact (4%) or a low impact (19%) on the activity and is therefore not highly decisive. In the latter group, in fact, we find respondents who carry out small-scale fishing with passive gears which are normally left at sea and recovered even after days; this fishing activity is therefore characterized by low fuel consumption.

3.3 Analysis of sales channels and of market and buyers' preferences

3.3.1 Sales channels

Looking at the sales channels usually used for the sale of fish we find: fish markets, wholesale, retail, processing industry, Ho.Re.Ca. and final consumers (direct selling).
Fishers have been asked which of these channels they prefer and use most frequently.
The fact that immediately comes to the fore is the lack of interaction with the processing industry; in fact, 99% of the respondents do not use this channel at all, both national and foreign, while 1% declare to use this channel for a percentage of 10% and therefore residually -figure 31 and table 12.
As far as the wholesale trade is concerned, 47% of respondents use this channel; only 39% of the sample surveyed use the national channel with percentages, however, which in some cases even reach well above 80%.Little used, however, the wholesale channel for exports, declared by just 8% of the interviewed and in any case with percentages of product placed, through this channel, even below 30%.

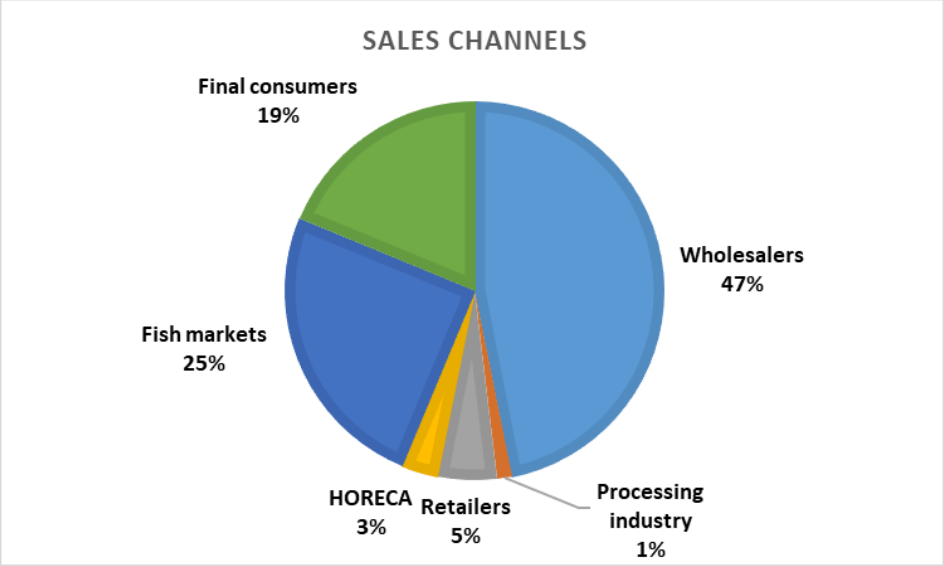

Figure 34 – Answers on the use of sales channels

The retail channel on the domestic market is even at a lower level, with 95% of fishers declaring that they do not sell their product directly through this sales channel. The situation does not change with the question on foreign retail trade although there are exceptions; in one case, in fact, the sale of 50% of the product through this channel is declared (mainly for clams).

Similar is the situation for the Ho.Re.Ca. channel being an unused channel, in the first sale, by more than 97% of respondents.

For most fishers surveyed (25%) the first channel remains the fish markets where the daily catch is brought. 30% of those who have stated that they use this sales channel, report to use it for 100% of their product, and another 20% for percentages close to 50%.

Finally, 19% of respondents sell directly to the final consumer upon arrival at port. Clearly, these are mostly artisanal fishers using passive gears and traps. Among these, in fact, there are those who manage to sell in this way also 70% of the landings.

Table 14 – Sales channel use

Sales channels	% sales channel use					
	10%	***20%-30%***	***40%-50%***	***60%-70%***	***80%-90%***	***100%***
Wholesalers, local or national market	27%	9%	9%	0%	18%	36%
Wholesalers, export market	43%	43%	0%	14%	0%	0%
National processing industry	100%	0%	0%	0%	0%	0%
Foreign processing industry	100%	0%	0%	0%	0%	0%
Retailers, local and national market	50%	50%	0%	0%	0%	0%
Retailers, foreign market	50%	0%	50%	0%	0%	0%
HORECA (hotels, restaurants ...)	75%	0%	25%	0%	0%	0%
Fish markets	20%	30%	20%	0%	0%	30%
Final consumers	44%	0%	22%	33%	0%	0%

3.3.2 Factors influencing the purchase of fish products

Once the preferred sales channels have been identified, it has been asked what is the key factor influencing the different categories of buyers in the purchase of fish products; answers are reported in figure 32, where the size of each box highlights the importance of the relative purchasing factors. Among those who replied it is evident that the "price" component is the one considered most decisive for all categories (41%) followed by the freshness of the product (35%).

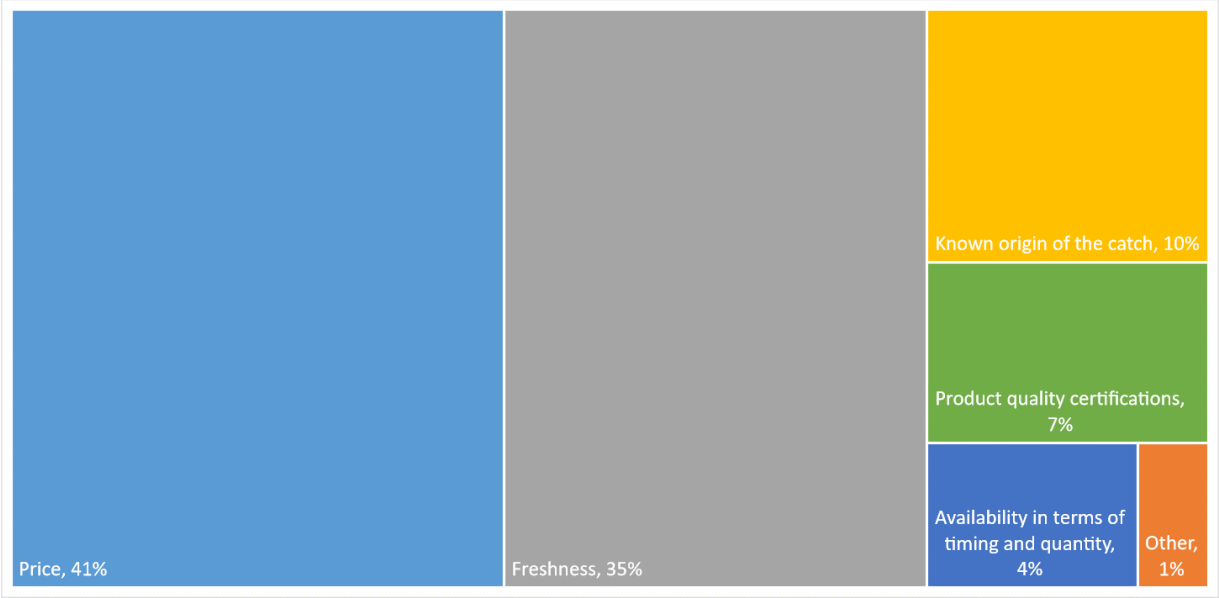

Figure 35 – Relevance of purchasing factors

The price is important for all categories of buyers. 18% of respondents consider it the most important for the purchasing decisions of operators in the fish market, while 14% consider it decisive for final consumers. Many more are those who consider price fundamental for the processing industry (25%) and even more so for wholesalers (29%) – Figure 33

The freshness of the product, according to the respondents, is a factor that becomes more important as you descend downstream into the supply chain; the closer you get to the final consumer, the more decisive this factor becomes.

In fact, while only 8% of respondents believe that this factor is important for wholesalers, a higher percentage (13%) declares that retailers and the Ho.Re.Ca. sector take into account the freshness in the purchase of the fish products while the percentage raises to 33% for the fish market and final consumers.

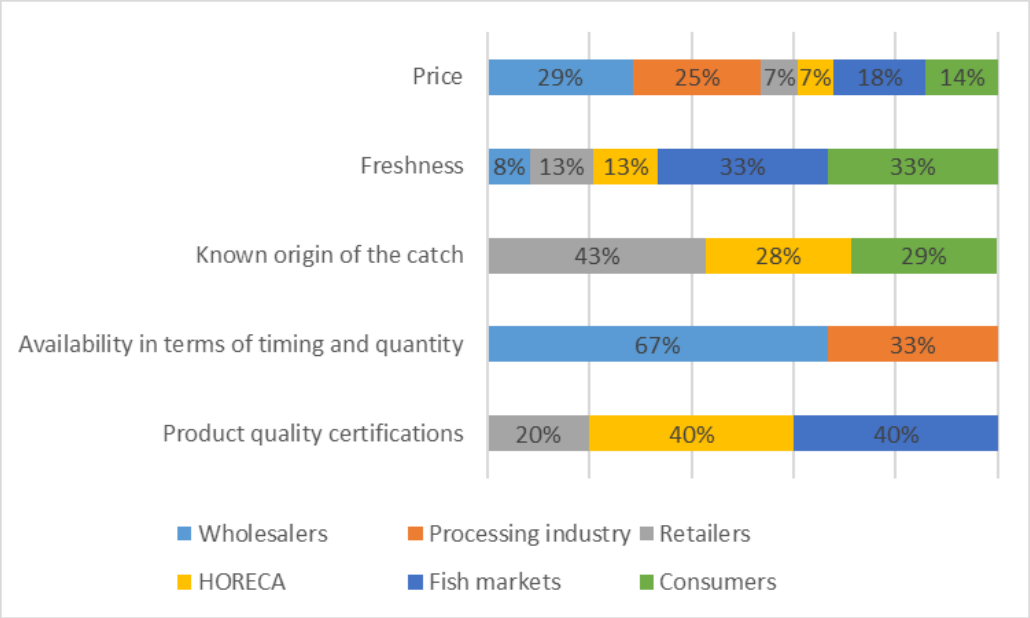

Figure 36 – Relevance of purchasing factors by sales channels

According to some respondents, factors such as the stability of supply, in terms of timing and quantity, are at stake during the purchasing decision process, which is decisive for wholesalers and processors, while this factor seems not to be considered by other categories of buyers.

Opposite result, instead, for product quality certifications. This factor, in fact, influences the purchase by Ho.Re.Ca. operators (according to 40% of those who responded), of the fish markets (40%) and retailers (20%). Curiously, none of the respondents believe that final consumers are sensitive to a possible quality label when they decide to buy their product while they think that for consumers it is important the known origin of the fish product (29% of respondents), which is also relevant for restaurants (28%) and retailers (43%). The responses on the factors influencing the purchase of final consumers confirm what has already been noted in recent studies (Pirrone*etal*. 2017; Mr Zander *et al.* 2021) in which, in fact, a greater attention of the final consumer emerges at the origin and freshness /quality of the fish product purchased if compared to the presence of environmental sustainability certifications.

When asked if their product has a quality certification (MSC or other brands) only 60% replied and among them 44% said they use a quality certificate, especially among those who fish for clams. However, more than 85% of those who said they held a certification also stated that this had no effect on sales (e.g. increase) while respondents reporting an effect on sales specified that the increase was equal or lower than 40%.

3.3.3 Aspects to be promoted

It was therefore asked to write freely which aspects of their own fishing activity should be promoted. Clearly depending on the type of activity and experience, different aspects have emerged, but as highlighted by the tag cloud built on the most recurring words – figure 34, quality and safety of the products emerge, transversally to the different categories of fishers, as well as aspects related to traditional and sustainable practices (such as the recovery of eggs in the fishing of cuttlefish with cogolli).

Figure 37 – Tag cloud about opinion of respondents on aspects of fishing activity that should be promoted

The next question asked how economic performance could be improved. Here too, using a tag cloud you can see at a glance that the most used words, among others, in the respondents' answers, were: diversification, product, but also quality and certification – figure 35.

Figure 38 – Tag cloud about opinion of respondents on how to improve the economic performance of the fishing activity

3.3.4 Covid-19 effect on fishing activity

As specified in the introduction to the questionnaire, the socio-economic data requested refer to 2019 as, due to the Covid-19 pandemic and related effect on fishery, 2020 cannot be considered a representative year for fishing.

However, the effect that the restrictions due to the Covid-19 emergency have had on the sector has not been overlooked. To the question "Did the covid-19-induced health emergency have impacted the fish sales chain?", 80% of respondents replied "yes", motivating that the greatest impact was found precisely in the stop to the sales through the Ho.Re.Ca. channel due to prolonged restaurant closures. In addition, direct sales to consumers also fell, due to lower turnout at landing port, or direct sales points, due to contagion control measures.

Artisanal fishers do not complain of decreases in sales due to Covid, answering "no" to the above question. These are the same who declared to sell their fish products some exclusively to fish markets, others also directly to final consumers. This phenomenon could have an explanation in the quantities of fish landed which, since probably not very high, could be entirely sold to few buyers. Or it could also depend on the relationship of trust that is established between fishers and consumers, with the latter feeling protected on the quality and health of the product, independently from the risk related to the contagion. It should also be borne in mind that in the small-scale fishing there is usually only one man on board; this condition made it possible not to interrupt the fishing activity as it could have happened to larger vessels where, due to the higher number of crewmembers and the social distancing measures imposed by the Covid-19, normal activities have not been allowed.

3.4 The expected impact of the introduction of the ARFM

3.4.1 Expectation from the ARFM implementation

An analysis of the answers to questions in section D of the survey shows that the introduction of a regional quality mark such as the ARFM could help to strengthen the relationship of trust between fishers and consumers.

In fact, when asked for an opinion on the impact of the introduction of regional ARFM certification, 84% of respondents (19 in total) stated that the introduction of a regional certification mark such as the ARFM could give an advantage precisely in terms of reputation; the remaining 16% consider this impact to be nil, but no one thinks it will have a negative effect on the image of fishers– figure 36.

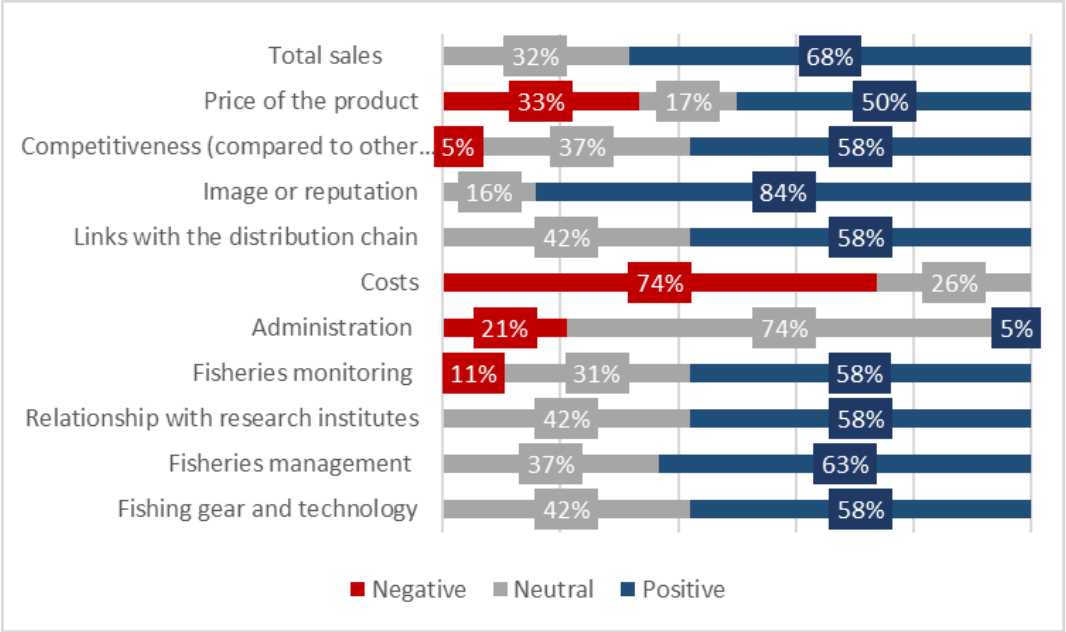

Figure 39 – Expectations from the implementation of the ARFM

The potential negative impacts are related to the more strictly economic aspects, such as the costs that should be incurred to comply with the rules imposed by the brand. Those who believe that the introduction of certification increases costs represent 74% of respondents and there is also a 33% of respondents thinking that the ARFM could have a negative impact on prices, referring to the fact that for them, an increase of the price, usually resulting from the use of a quality label (premium-price) could also result in the decrease of competitive power with other producers (mainly fishers using pots and

traps). On the other hand, for most of them (50%) the ARFM implementation could have positive effects on the price, because of the price-premium they expect from it.
Hypothetical negative effects are expected also on the administration and therefore on the completion of bureaucratic practices (21%).
Fisheries monitoring, in 10% of responses is considered as one of those aspects that could be negatively affected by the ARFM adoption, but 58% of the interviewees think differently and declare that indeed the ARFM could bring improvements in monitoring, presumably linking to the implementation of the certification scheme the triggering of a systematic collection of data also for activities (e.g. catching mussels on platforms) or fishing aspects (e.g. safety on board) normally not covered by the official collection system.
Other aspects of fishing activity that could be positively affected are those most related to economic performance, and therefore "total sales" (68%), " competitiveness with respect to those who do not have the brand" and "links with the distribution chain" (both 58%), and for aspects related to sustainability and innovation, thus considering that certification can lead to an increase in relations between operators and research institutes (58%), a conscious management of fisheries (63%) and not least the pursuit of improvements concerning fishing gear and technologies used on board (58%).

3.4.2 Opinions on the ARFM

Finally, the latest questions are addressed to operators to understand their opinions on ARFM quality certification.
The first of these questions is addressed exclusively to those involved in the sector who are not participating in the Prizefish project and therefore, to those who have heard of ARFM for the first time.
They were asked to indicate (a) which fishery products could be promoted and (b) which markets could be reached by a future application of the ARFM. The few respondents to this question (only 2) stated that they did not have a particular preference over the products, considering that a label such as the ARFM could apply to all the fish landed by Adriatic vessels.However, they suggest focusing abroad, on the markets of those countries that have a greater sensitivity to the issues of sustainability and ecology.
It was therefore asked to express any concerns related to the adoption of the ARFM. Most of the respondents to this question (6 in total) have replied that they have no fears, if compliance with the standards imposed by the certification is guaranteed. There are also those who say that they are concerned about the difficulties that will have to be faced to achieve a real adoption of the ARFM.
The last question of Section D was addressed to operators belonging to entities (POs or cooperatives) being active subjects of the Prizefish project (partners and/or fishers selected for the pre-assessment). The question asked for a list of any benefits detected, till now, from the participation to the project. Their perception is synthesised in the tag cloud reported below – figure 37

Figure 40 – Tag cloud about benefits detected by fishers from the participation to the Prizefish project

Most of the respondents to this question (10 in total) replied that the project gave them a lot of visibility, allowing them to inform buyers about their business and the quality of their products and this has resulted in an increase of sales.

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