

COMMON SCHEME FOR THE MANAGEMENT OF FISHERY ACTIVITIES AT LOCAL LEVEL

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CONTENT

Regional economic and geographical context	4
<i>Geographic framework</i>	4
<i>Fleet</i>	5
Employees	11
Fish markets.....	11
Commercialized	13
Fishing cooperatives	20
Climate change and impact on the marine ecosystem.....	21
Swot analysis	26
Strengths	28
Weakness.....	28
Opportunities	29
Threats	29
SWOT analysis considerations	30
Guidelines	30
GL 1: Local market districts.....	31
GL 2: Marketing of the local fish product.....	32
GL 3: Collective enhancement and promotion interventions.....	34
Recommendations	35
Conclusions.....	36
ATTACHMENTS	39
DATA COLLECTION PROTOCOLS	39

Regional economic and geographical context

Geographic framework

The coast of Emilia-Romagna is about 130 kilometres long. The northern border is marked by the mouth of the Po di Goro River (FE), the southern border by the mouth of the Tavollo stream, which corresponds to the canal port of Cattolica (RN). The area is divided into four provinces, from north to south: Ferrara, Ravenna, Forlì-Cesena and Rimini. There are two maritime compartments: Ravenna and Rimini.

Regarding to the fishing areas, it should be noted that the smaller boats (length over all less than 10 metres) that practice gillnetting all have a "Local Fishing License". These can operate in the enrolled compartment and in the neighbouring ones, located to the north and south; while as far as the distance from the coast is concerned, the largest boats in this category can fish up to 12 nautical miles from the coast, if in possession of documents and equipment related to navigation. The trawling boats, on average longer than 10 meters, have a "Local Coast" license and must comply with the area rules summarized above or "Close Coast". In the latter case they can operate in all Italian compartments up to a maximum distance of 40 miles from the coast, then in the Adriatic Sea up to the border of Slovenian and Croatian national waters.

All the regional and neighbouring compartments are characterized by sandy-muddy bottoms and limited depths. Within 12 nautical miles from the coast, the depth does not exceed approximately 40 meters. Over the last half century, numerous works have been carried out in the area to defend the coast, protect the ports, and extract hydrocarbons. Then there are several areas with artificial barriers and, much more numerous and extensive, dedicated to mussel farming. All these areas, in addition to being characterized by hard artificial substrates that have profoundly modified the benthic biocenoses, are closed to fishing, each with buffer zones that expand the surfaces in which fishing is prohibited.

Moreover, it must be noted that the large areas in front of the mouth of the Reno River, where anchoring and fishing are "permanently forbidden due to the presence of explosive devices on the seabed", to which are added the temporary bans in which it is "fishing, navigation and any other activity connected to the public use of the sea are prohibited on the days and at the times previously mentioned, due to the carrying out of shooting exercises at the E.I. Shooting club of Foce Reno". Precise indications regarding times, methods and geographical coordinates of the aforementioned areas can be found in Ordinance No. 38/2018 of the Maritime District Office of Porto Garibaldi.

Table 1- Synoptic overview of the technical characteristics of the Emilia-Romagna fishing fleet, 2021 (source EU Fleet Register, 2022)

Port	Registration number	Quantity	LFT		GT		kW		RV Sum
			Sum	Average	Sum	Average	Sum	Average	
GORO	5RA	245	2.044,95	8,35	1.064,00	4,34	12.931,11	74,32	71
PORTO GARIBALDI	1RA	56	706,10	12,61	992,00	17,71	8.491,76	163,30	4
RAVENNA	RA	21	182,52	8,69	97,00	4,62	2.197,09	137,32	5
CERVIA	2RA	37	357,77	9,67	256,00	6,92	3.274,50	99,23	4
CESENATICO	4RM	46	576,67	12,54	841,00	18,28	7.639,86	169,77	1
BELLARIA	8RM	35	305,24	8,72	202,00	5,77	2.904,91	90,78	3
RIMINI	RM	80	1.037,16	12,96	2.341,00	29,26	13.434,81	176,77	4
RICCIONE	7RM	23	165,39	7,19	79,00	3,43	779,94	52,00	8
CATTOLICA	3RM	42	454,81	10,83	427,00	10,17	3.468,30	96,34	6
Total E-R		585	5.830,61	9,97	6.299,00	10,77	55.122,28	115,08	106
GABICCE MARE	3PS	44	506,68	11,52	472,00	10,73	4.273,78	99,39	1
Total		629	6.337,29	10,08	6.771,00	10,76	59.396,06	112,71	102

Note: LFT is the overall length expressed in metres; GT is the tonnage expressed in *gross tonnage*; kW is the power of the engines expressed in kilowatts, RV is the number of oar-sail boats, which have not been counted in the calculation of the average kilowatt per boat.

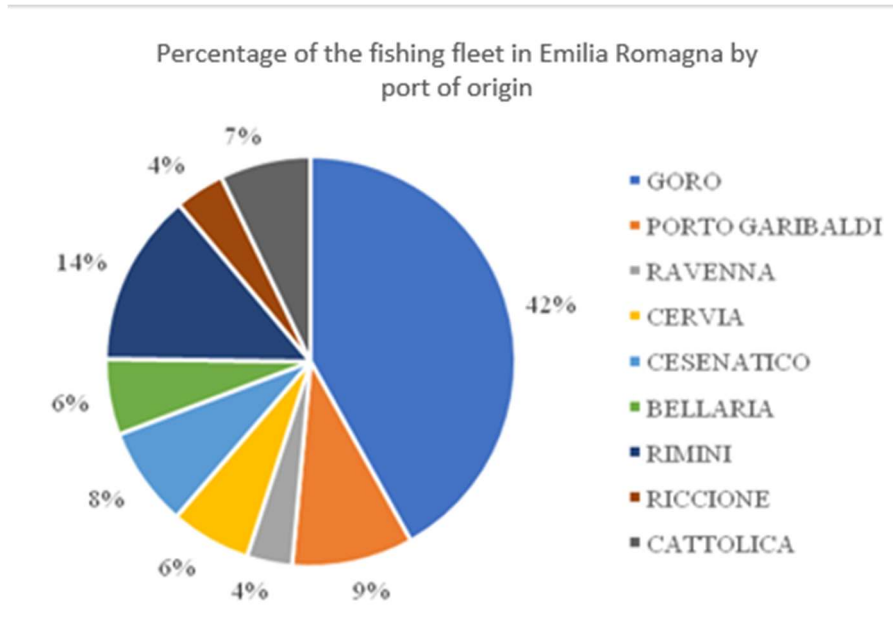


Figure 1- Breakdown of the fishing fleet in Emilia-Romagna by home port

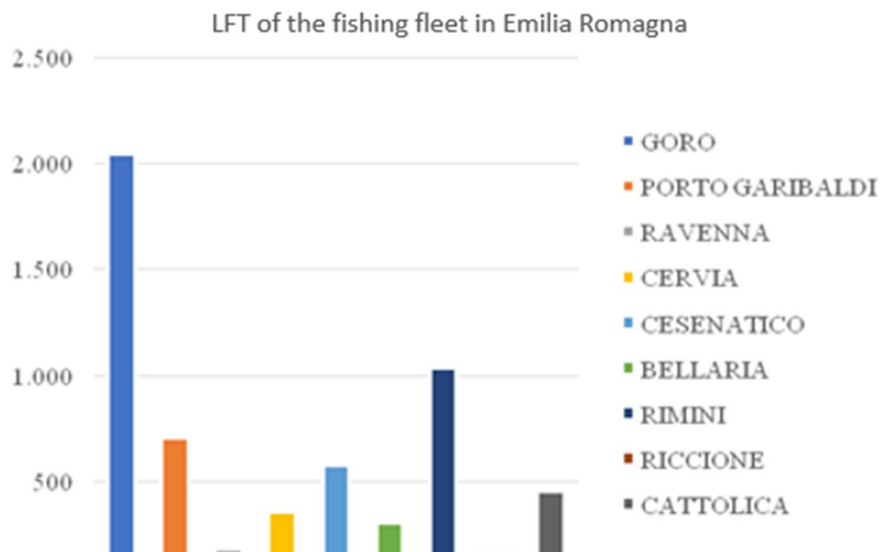


Figure 2- LFT of the fishing fleet in Emilia-Romagna

To restore the incidence of the regional fleet in the national context, Table 2 proposes a comparative analysis which shows that both in terms of numbers and technical characteristics it represents about 5% of the Italian fleet. Table 3 details the gear used or, to be more precise, the "Main fishing gear", always by place of entry. It is emphasized that in this respect the Community register presents significant inconsistencies with reality. Indeed, gear such as "longlines" or "purse seine" are certainly not the main gear and perhaps are not even used.

Table 2– Comparative analysis of the national and regional fishing fleet, 2021 (source EU Fleet Register, 2021)

Area	Quantity	LFT		GT		kW		RV
		Sum	Average	Sum	Average	Sum	Average	Quantity
ITALIA	12.132	120.159,92	9,88	146.857,90	12,07	937.966,22	95,76	2337
EMILIA - ROMAGNA (absolute value)	585	5.830,61	9,97	6.299,00	10,77	55.122,28	115,08	106
EMILIA - ROMAGNA (percentage value)	5%	5%	+1%	4%		6%		5%

Table 3- Synoptic overview of the Emilia-Romagna fishing fleet, divided by "Main fishing gear", 2021 (source EU Fleet Register, 2021)

Port	Registration number	Towed dredges	Drift gillnets	Set gillnets	Longlines	Demersal Otter trawl	Purse seine	Pelagic pair trawls	Beam trawls
GORO	5RA	7	0	131	41	62	1	0	3
PORTO GARIBALDI	1RA	0	0	14	4	35	2	1	0
RAVENNA	RA	1	1	10	8	1	0	0	0
CERVIA	2RA	11	0	14	9	3	0	0	0
CESENATICO	4RM	2	0	6	8	24	6	0	0
BELLARIA	8RM	6	0	11	13	4	1	0	0
RIMINI	RM	12	0	6	30	31	1	0	0
RICCIONE	7RM	3	0	12	6	1	1	0	0
CATTOLICA	3RM	14	0	10	12	6	0	0	0
TOTALE E-R	585	56	1	214	131	167	12	1	3

As regards the boats that carry out flying fishing (pair pelagic towing), in the Ministerial Decree of 30th March 2018, showing the list of units authorized to fish for small pelagics in GSA 17 and GSA 18, there were n. 34 authorized boats, registered in the compartments of Emilia-Romagna. Instead, it turns out that in September 2022 there are only n. 8 couples, for a total of 16 boats, of which 6 in Cesenatico, n. 6 in Porto Garibaldi and n. 4 in Goro (source informal survey among producers). They then port to Cattolica n. 2 boats registered in the Pesaro district.

Table 4- Estimated situation of the fishing fleet in Emilia-Romagna, 2021 (source EU Fleet Register, 2021)

Port	Registration number	Quantity	LFT		GT		kW		RV
			Sum	Average	Sum	Average	Sum	Average	Quantity
GORO	5RA	152	1.407,38	9,26	938,00	6,17	10.244,19	92,29	41
PORTO GARIBALDI	1RA	48	633,00	13,19	944,00	19,67	7.632,86	169,62	3
RAVENNA	RA	11	90,66	8,24	38,00	3,45	718,10	102,59	4
CERVIA	2RA	32	328,00	10,25	250,00	7,81	3.106,30	107,11	3
CESENATICO	4RM	40	522,32	13,06	809,00	20,23	7.108,22	182,26	1
BELLARIA	8RM	22	224,39	10,20	181,00	8,23	2.211,20	105,30	1
RIMINI	RM	70	979,39	13,99	2.325,00	33,21	12.978,71	188,10	1
RICCIONE	7RM	18	132,89	7,38	68,00	3,78	505,00	42,08	6
CATTOLICA	3RM	41	446,81	10,90	424,00	10,34	3.321,25	94,89	6
Total fishing fleet		434	4.764,84	10,98	5.977,00	13,77	47.825,83	129,96	66
Total non fishing fleet		151	1.065,76	7,06	322,00	2,13	7.296,45	65,73	40
Total ER		585	5.830,61	9,97	6.299,00	10,77	55.122,28	115,08	106

Employees

Still starting from the data of the EU Fleet Register, 2022 and from the field census, the workers in the sector were estimated, starting from the type of fishing carried out ("first system"). Out of the estimated 434 boats that are engaged in fishing activities, around 933 people work (Table 5).

Table 5- Estimate of fishing workers, starting from the fishing fleet of Emilia-Romagna, 2022 (source EU Fleet Register, 2022).

First System	Employees/boat	Boats	Total employees in fishing
Dredge	2	56	112
Gillnets < 7 m	1	110	110
Gillnets > 7 m	2	93	186
Trawling < 15 m	2	106	212
Trawling 15-20 m	3	16	48
Trawling > 20 m	5	18	90
Floating trawl	5	35	175
Total assets		434	933
Unit controlled by the plant	nd	79	nd
Sunk/Decommissioned/Scrapped/Sold/Other	0	71	nd
Naval traffic	nd	1	nd
Total (EU Fleet Register 2021)		585	

Fish markets

In Emilia-Romagna there are 9 main ports, all dedicated mainly to pleasure craft, fishing and aquaculture, with the exception of Ravenna (Marina di Ravenna) the only port of international commercial importance. Given the historicity of fishing in the coastal municipalities of the region, the ports are inserted and integrated into the urban fabric. In some cases, in the port area there are also structures for processing and selling the product, even if the services are undersized.

Wholesale fish markets are an important component in the marketing landscape, as they are the main forms of connection between the production and distribution phases. In Emilia-Romagna there are 5 active wholesale fish markets, which centralize fish production with distribution and information functions. From north to south, they are in: Goro (FE), Porto Garibaldi (FE), Cesenatico (FC), Rimini (RN) and Cattolica (RN).

All these structures have an average history of 40-50 years behind them, in the majority of cases managed by the same operators through cooperatives, while only some are managed by other subjects. The range of services offered to operators in the sector is remarkable: they range from the presence of refreshment points to that of boxes/warehouses, to the market cash desk. All have cold rooms and ice supply service. Other connected services, such as portage, product packaging, parking, meeting rooms, surveillance, are however quite frequent.

Overall, the sector offers quality and highly fresh products but nevertheless, from a commercial point of view, it still shows elements of weakness and fragmentation which it has to face with a strong need for coordination between the main players, starting from that between the fishermen themselves. First of all, there is the need to increase the added value of one's own productions, since the current distribution systems and the power relations between the various operators in the value chain tend to recognize fishermen only a minimal percentage of the final price of the products.

In the complex value chain of fishery products, which sees various intermediate steps (wholesalers, brokers, distributors, etc.) before reaching the retailer, the catering sector or the final consumer, it is estimated that only 10% of the final price of sale is intended for the primary producer. Therefore, shortening of the value chain appears to be of fundamental importance for improving the income of fishermen and, at the same time, offering the consumer a better product (and probably at a lower price). Fishermen often complain about structurally low prices and rigid sales conditions, by virtue of their low negotiating power compared to wholesalers and large-scale distribution.

This is also due to the weak aggregation of fishermen on the commercial side, which has made it possible to cope with the segmentation and concentration of distribution in the hands of a small number of operators.

The pressure on fish producers is not only due to low selling prices but also to higher production costs. The past energy crisis, for example, highlighted the sector's vulnerability to external conditions. Added to this is the fragility of fishing micro-enterprises, often undercapitalized and weak entrepreneurial capacity, which does not allow for adequate investments to be made to increase added value and improve business profits.

Commercialized

Table 6 summarizes the data on the quantities (kg) sold, received from the fish markets of Goro, Cesenatico, Rimini and Cattolica. As regards Porto Garibaldi, on the other hand, they were estimated starting from the percentage value calculated, with respect to the others, from data present in the bibliography, i.e. it also occurs in the case of the Cattolica market for the year 2016. It should be noted that these data do not reflect the landed different ports, for different reasons. For example, the quantities of marketed in the Rimini market also include shares of "landed in other ports", "import" and "second marketing". Indicatively, the "local landed" in the Rimini market amounts to about 70%. In Cattolica, on the other hand, the quantities of goods sold are largely contributed by boats from other ports/navies (Fano, Ancona and Civitanova Marche).

The estimated general trend of the wholesale fish markets in Emilia-Romagna is shown in aggregate and in detail for each of the markets in Figure 5 and Figure 6. As regards the composition by species in the years 2017-2020, please refer

Table 11. Table 12 instead shows the quantities (kg) for the 5 major demersal species commercialized by the markets of Goro, Cesenatico, Rimini and Cattolica in the period 2017-2020, the percentage importance of which was calculated excluding anchovies, sardines, clams, mussels and farmed product.

As regards instead the values of the marketed (€) in the wholesale fish markets of Emilia-Romagna, in the five-year period 2016-2020, as well as the 5 main demersal species and their average price are summarized in Table 8, Table 9 and Table 10.

In general, there was a general decrease in values, settling at €21,618,179.23 in 2020, with a decrease of 13% compared to 2016. The average prices of the 5 most important demersal species (both in weight and in value) kept constant. Price stability which also explains the overall drop in value, linked to the decrease in the marketed weight.

Table 6- Quantities (kg) marketed in the fish markets of Emilia-Romagna (2016-2020).

Markets	2016	2017	2018	2019	2020
Goro	977.592,50	1.102.954,40	842.562,80	974.406,91	971.273,35
Porto Garibaldi	561.876,45	539.430,28	449.349,71	545.320,26	441.611,69
Cesenatico	1.363.185,50	1.323.682,30	1.340.632,80	1.572.756,00	1.072.411,80
Rimini	1.949.773,90	1.708.813,70	1.691.314,60	1.809.512,10	1.674.807,40
Cattolica	902.359,02	800.032,22	711.861,41	1.109.156,74	704.322,89
Emilia-Romagna	5.754.787,37	5.474.912,90	5.035.721,32	6.011.152,01	4.864.427,13
Source	Fish markets	Fish markets	Fish markets	Fish markets	Fish markets

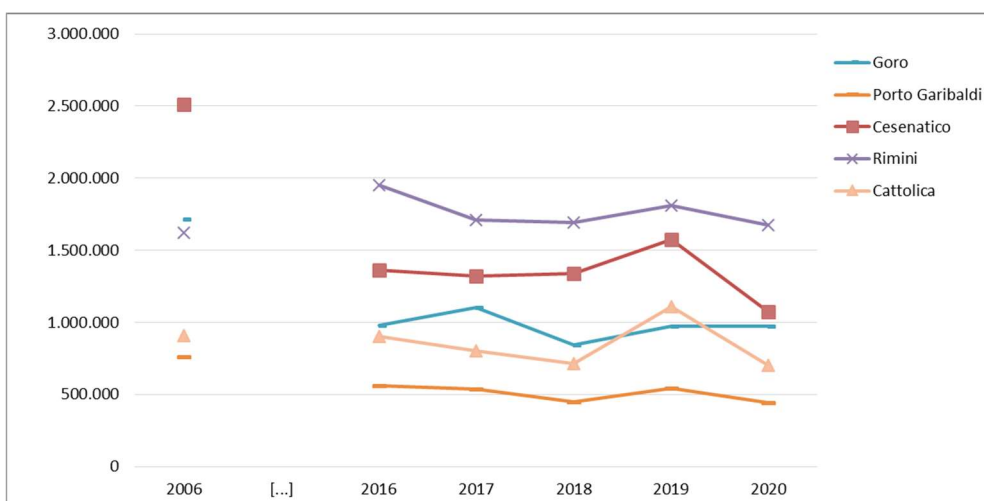


Figure 5- Trend of quantities (kg) sold in the various fish markets of Emilia Romagna, 2016-2020.

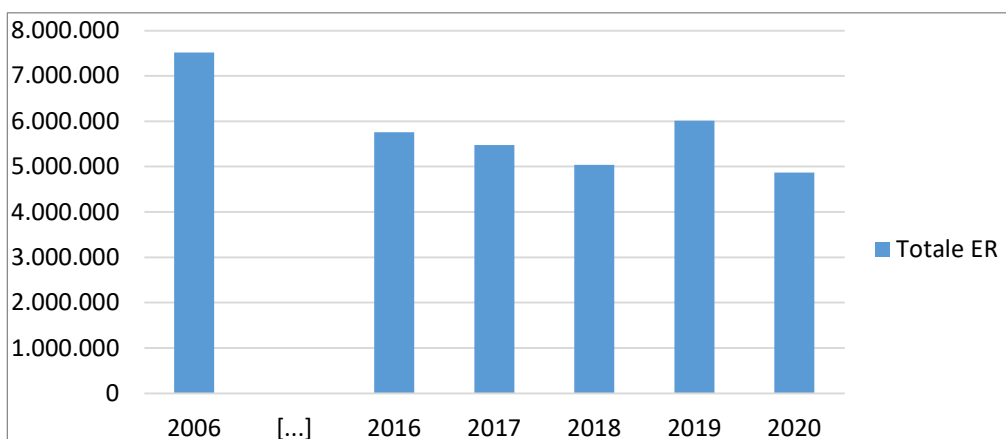


Figure 6- Trend of total quantities (kg) marketed in Emilia Romagna, 2016-2020.

Table 7- Quantities (kg) marketed by species in the ports of Goro, Cesenatico, Rimini and Cattolica, 2017-2020.

Scientific name	FAO Code	Commercial name	2017	2018	2019	2020
Mixed crustaceans	ALCROST	Mixed crustaceans	29.660,90	37.065,70	39.251,90	29.221,60
Mixed shellfish	ALMOLLUS	Mixed shellfish	59.463,40	43.077,80	23.527,20	29.821,90
Mixed fish	ALPESCI	Mixed fish	212.277,50	176.277,45	153.306,20	204.331,10
Seriola dumerili	AMB	Greater Amberjack	34,60	37,00	6,40	48,90
Engraulis encrasicolus	ANE	Anchovy	396.487,00	333.723,90	374.987,10	388.139,40
Diplodus annularis	ANN	Anular seabream	0,00	6,20	3,60	12,90

Scientific name	FAO Code	Commercial name	2017	2018	2019	2020
Atherina spp.	AVX	Big-scale sand smelt	7.361,10	9.487,40	6.502,30	5.604,00
Atherina spp. (allevato)	AVXALL	Big-scale sand smelt (Farmed)	0,00	0,00	0,00	1.701,90
Thunnus thynnus	BFT	Atlantic Bluefin Tuna	1.982,00	9.407,30	8.721,20	14.770,50
Scophthalmus rhombus	BLL	Brill	3.096,50	1.649,70	1.479,90	2.190,60
Pomatomus saltatrix	BLU	Bluefish	1.796,60	805,92	586,40	1.079,60
Boops boops	BOG	Bogue	2.058,30	2.306,80	1.839,70	1.106,30
Sarda sarda	BON	Atlantic bonito	912,20	194,70	455,50	656,00
Bolinus brandaris	BOY	Purple dye murex	2.723,40	115,58	519,10	541,70
Dicentrarchus labrax	BSS	European bass	41.634,10	37.320,44	23.773,00	26.147,20
Dicentrarchus labrax (allevato)	BSSALL	European bass (farmed)	4.926,80	2.693,60	1.635,00	2.735,60
Callinectes spp.	CAL	Blue crab	7,20	2.311,60	5.451,20	30.043,20
Cepola macrophtalma	CBC	Red bandfish	112,70	198,50	166,00	96,90
Sciaena umbra	CBM	Brown meagre	84,30	128,20	147,90	252,30
Ruditapes philippinarum	CLJ	Manila clam	262,00	35,00	20,00	0,00
Carcinus aestuarii	CMR	Mediterranean green crab	3.743,10	2.856,80	2.890,00	1.544,60
Conger conger	COE	European conger	178,30	202,30	185,10	198,10
Crangon crangon	CSH	Brown shrimp	808,80	923,00	559,70	32,20
Diplodus vulgaris	CTB	Common two-banded sea bream	70,40	42,83	122,80	40,80
Sepia officinalis	CTC	Common cuttlefish	199.995,70	214.527,36	250.018,70	164.744,80
Sepioloa rondeleti	CTR	Sepioloa rondeletii	16,10	18,50	29,60	24,80
Dentex dentex	DEC	Snapper	48,00	15,90	7,60	16,70
Dentici e pagri	DEC/RPG	Snapper and common seabream	620,50	318,80	161,90	125,60
Squalus acanthias	DGS	Spiny dogfish	1.577,00	722,90	647,60	383,40
Parapenaeus longirostris	DPS	Pink shrimp	2.236,40	2.542,30	680,20	2.155,20
Metacarcinus magister	DUN	Dungeness crab	5,50	14,80	63,70	15,60
Eriphia verrucosa	EIK	Warty crab	0,00	0,00	3,10	36,40
Sepia elegans	EJE	Elegant cuttlefish	72,10	428,70	119,60	44,50
Eel	ELE	Eel	3.317,50	2.171,60	2.224,80	1.400,70
Eel (farmed)	ELEALL	Eel (farmed)	2.237,30	2.354,90	2.229,50	1.608,00
Ensis ensis	EQE	Sword razor	61,90	3,00	0,00	0,00
Abramis brama	FBM	Common bream	0,00	108,70	100,70	145,30
Carassius	FCC	Crucian carp	188,60	568,80	747,80	451,00

Scientific name	FAO Code	Commercial name	2017	2018	2019	2020
carassius						
Cyprinus carpio	FCP	Eurasian carp	357,60	931,30	521,80	8.843,40
Platichthys flesus	FLE	European flounder	520,40	661,80	376,20	145,80
Esox lucius	FPI	Northern pike	409,10	413,90	222,60	306,70
Sander lucioperca	FPP	Zander	0,00	0,00	15,70	0,00
Prawns	GAMBGEN	Prawns	23.476,30	18.498,40	15.737,60	21.588,00
Italian farmed Prawn	GAMBGENALL	Italian farmed Prawn	11.590,40	10.221,00	10.770,30	11.514,50
Belone belone	GAR	Garfish	0,00	52,90	10,40	90,60
Gobius paganellus	GON	Rock goby	5.269,90	4.990,18	4.191,50	2.873,40
Padogobius bonelli	GPO	Padanian goby	29.771,00	28.903,30	39.533,20	32.296,00
Chelidonichthys lucerna	GUU	Tube-fish	7.137,00	24.784,17	19.037,60	5.404,00
Redfish	GUU/RSE	Redfish	56.090,30	49.501,50	40.447,70	52.109,80
Merluccius merluccius	HKE	European hake	64.804,10	106.103,00	97.269,90	79.374,10
Trachurus mediterraneus	HMM	horse mackerel	12.715,90	9.772,20	9.004,10	8.209,60
Liocarcinus depurator	IOD	Harbour crab	4.179,90	5.451,16	3.088,10	2.260,20
Ameiurus melas	ITM	Black bullhead catfish	59,00	116,10	234,20	0,00
Zeus faber	JOD	Peter's fish	760,60	209,60	657,72	787,50
Galeodea echinophora	KDE	Helmet shell	40,70	12,80	8,40	45,30
Marsupenaeus japonicus	KUP	Japanese tiger prawn	9.743,20	62.507,20	61.034,10	17.497,40
white shrimp	KUP/FAV	white shrimp	87.367,00	94.861,60	90.854,00	110.331,90
Homarus gammarus	LBE	European lobster	95,30	75,20	38,20	47,70
Lichia amia	LEE	Leerfish	457,90	7.318,20	1.242,70	1.314,40
Amberjack	LEE/AMB	Amberjack	1.390,50	0,00	0,00	2.868,10
Lepomis gibbosus	LEJ	Pumpkinseed	1,00	12,10	2,20	0,00
Squalius cephalus	LPK	Chub	0,00	3,90	1,70	3,20
Euthynnus alletteratus	LTA	Little tunny	0,00	0,00	0,80	0,00
Liza saliens	LZS	Leaping mullet	1.203,00	1.370,30	1.891,20	2.232,40
Scomber scombrus	MAC	Atlantic mackerel	68.700,90	80.769,00	63.821,90	57.032,70
Scomber japonicus	MAS	Chub mackerel	67,60	68,20	229,80	218,60
Golden grey mullet	MGA	Golden grey mullet	12.680,10	13.312,20	10.216,10	7.944,40
Golden grey	MGAALL	Golden grey mullet	0,00	0,00	0,00	689,40

Scientific name	FAO Code	Commercial name	2017	2018	2019	2020
mullet (farmed)		(farmed)				
Liza ramada	MGC	Thinlip mullet	133.774,40	124.475,40	128.589,20	113.585,60
Microchirus variegatus	MKG	Thickback sole	1.379,60	893,50	537,70	258,20
Chelon labrosus	MLR	Thicklip grey mullet	4.169,40	5.743,90	5.487,50	5.112,50
Lophius piscatorius	MON	Common monkfish	30.177,40	38.982,80	36.287,30	34.567,90
Eledone moschata	MOSC	Musky octopus	32.618,80	16.099,40	28.920,40	37.401,70
Arnoglossus laterna	MSF	Mediterranean scaldfish	2.871,40	3.010,10	3.322,60	3.202,90
Mytilus galloprovincialis	MSM	Mediterranean mussel	229.712,80	176.732,79	162.287,60	93.986,90
Squilla mantis	MTS	Mantis shrimp	684.083,60	595.694,33	654.575,94	774.286,00
Mugil cephalus	MUF	Flathead grey mullet	92.852,00	45.945,06	106.830,49	96.216,01
Mugil cephalus allev.	MUFALL	Flathead grey mullet (farmed)	4.978,30	6.211,30	5.822,10	4.972,90
Mullus surmuletus	MUR	Striped red mullet	2,70	3,40	81,40	
Mullus barbatus	MUT	Red mullet	361.231,30	246.280,30	319.912,90	236.075,70
Nephrops norvegicus	NEP	Shlobster	6.739,50	7.907,40	8.703,30	7.305,50
Nassarius mutabilis	NSQ	Mutable nassa	3.032,40	5.240,63	1.421,30	1.260,10
Octopus vulgaris	OCC	Octopus	10.504,65	6.218,60	6.513,40	5.870,50
Aporrhais pes pelecani	OHQ	pelican's foot	483,20	72,40	128,70	22,80
Alloteuthis media	OUM	little squid	752,90	643,50	1.395,61	2.063,50
Ostrea edulis	OYF	flat oyster	5,00	21,00	148,00	64,00
Pagellus erythrinus	PAC	Common pandora	882,70	492,20	229,40	91,90
Spicara spp.	PIC	Spicara spp.	2,30	0,00	0,00	2,10
Sardina pilchardus	PIL	European pilchard	1.245.478,10	1.055.782,50	1.702.507,50	1.003.698,70
Trisopterus minutus	POD	Poor cod	1.124,80	1.028,10	752,60	563,00
Procambarus clarkii	RCW	Louisiana crawfish	199,00	145,40	24,90	0,00
Sciaenops ocellatus	RDM	Red drum	1.322,20	1.130,20	1.311,40	3.329,30
Raja clavata	RJC	Thornback ray	48.711,10	37.043,30	38.517,30	37.095,60
Rapana venosa	RPW	Veined rapa whelk	10,00	310,70	46,00	39,40
Scorpaena scrofa	RSE	Red scorpionfish	718,30	561,50	538,10	561,10
Sardinella aurita	SAA	Round sardinella	0,00	450,00	8.693,80	2.729,80
Pagellus acarne	SBA	Pagellus acarne	57,10	0,00	0,00	32,00

Scientific name	FAO Code	Commercial name	2017	2018	2019	2020
Sparus aurata	SBG	Gilt-head bream	22.901,70	20.348,80	17.925,90	23.181,90
Sparus aurata (allevato)	SBGALL	Gilt-head bream (farmed)	9.840,90	6.269,20	11.475,10	9.452,00
Maja squinado	SCR	Spiny spider crab	4.384,30	9.557,30	6.628,60	6.186,90
Mustelus asterias	SDS	Dogfish	735,50	2.447,00	1.873,70	307,00
Dogfish and Nursehound	SDS/DGS	Dogfish and Nursehound	283,40	223,00	567,00	527,00
Dogfish	SDS/SYC	Dogfish	19.541,20	12.613,20	12.225,70	19.085,20
Alosa spp.	SHZ	Alosa	908,80	457,40	333,10	373,50
Pecten jacobaeus	SJA	Scallop	0,35	0,00	46,70	53,30
Sarpa salpa	SLM	Dreamfish	0,00	23,90	18,10	36,30
Palinurus elephas	SLO	Lobster	4,30	2,20	0,00	1,30
Aragoste e astici	SLO/LBE	Lobster and Crayfish	514,00	245,70	208,10	408,90
Solea solea	SOL	Common sole	271.324,00	267.216,51	333.661,50	267.739,05
Silurus glanis	SOM	Wels catfish	355,20	464,50	306,00	3.035,40
Solea lascaris	SOS	Sand sole	25,00	108,60	12,80	36,30
Sprattus sprattus	SPR	European sprat	168,70	306,20	122,60	301,00
Illex coindetii	SQM	Southern shortfin squid	24.812,20	8.659,50	16.258,40	14.674,40
Loligo vulgaris	SQR	European squid	20.753,60	28.171,40	19.983,20	28.625,60
Lithognathus mormyrus	SSB	Sand steenbras	727,80	837,80	1.642,79	1.274,98
Chamelea gallina	SVE	Chamelea gallina	46.893,82	128.302,70	23.235,30	32.213,30
Xiphias gladius	SWO	Swordfish	4.708,60	4.735,80	4.217,00	3.163,40
Scyliorhinus canicula	SYC	Small-spotted catshark	1.601,50	1.369,00	1.762,10	1.783,50
Torpedo torpedo	TTV	Torpedo	53,20	35,90	15,00	7,70
Psetta maxima	TUR	Turbot	1.636,40	4.916,70	3.640,20	984,30
Turbot and Teleost	TUR/PescPiatt	Turbot and Teleost	17.574,20	13.963,60	12.023,80	13.616,90
Uranoscopus scaber	UUC	Atlantic stargazer	37,80	21,60	0,00	115,10
Mimachlamys varia	VSC	Mimachlamys	0,60	24,80	158,80	3,30
Trachinus spp.	WEX	Trachinus	296,20	271,50	163,90	263,30
Merlangius merlangus	WHG	Merlangius	176.641,50	192.904,30	277.753,40	163.325,60
Polyprion americanus	WRF	Atlantic wreckfish	117,10	35,70	14,70	19,00
Sphyaena sphyaena	YRS	European barracuda	65,20	7,30	20,40	47,50
		Total**	4.903.728,52	4.487.246,01	5.343.512,05	4.392.736,94

Note:

*codes have been adapted in some cases to diversify mixed product, farmed product or multispecies product

** The table does not include the products for which it was not possible to obtain the category they belong to and the data from the Porto Garibaldi market; therefore, the totals do not coincide with those of the previous Table

Table 8- Quantities (kg) for the 5 major demersal species commercialized by the markets of Goro, Cesenatico, Rimini and Cattolica, 2017-2020.

Commercial Name	2017	2018	2019	2020	Total (2017-2020)(%)*
Squilla mantis	684.083,60	595.694,33	654.575,94	774.286,00	23%
Red mullet	361.231,30	246.280,30	319.912,90	236.075,70	10%
Sole	271.324,00	267.216,51	333.661,50	267.739,05	10%
Cuttlefish	199.995,70	214.527,36	250.018,70	164.744,80	7%
Whiting	176.641,50	192.904,30	277.753,40	163.325,60	7%

*This value reflects the percentage of the total weight for 2017-2020, excluding anchovies, sardines, clams, mussels and farmed products.

Table 9- Marketed values (€) for the 5 major demersal species in the markets of Goro, Cesenatico, Rimini and Cattolica, 2017-2020.

Commercial Name	2017	2018	2019	2020
Squilla mantis	4.009.320,49	3.798.157,12	4.192.828,28	4.218.990,39
Red Mullet	1.077.765,68	1.044.188,11	970.560,12	845.809,08
Sole	2.572.053,14	2.608.015,19	2.828.820,96	2.296.508,55
Cuttlefish	1.868.208,92	2.046.817,35	2.177.669,25	1.610.553,84
Whiting	480.152,58	584.286,01	582.758,58	568.424,06

Table 10- Average price (€/kg) for the 5 major demersal species in the markets of Goro, Cesenatico, Rimini and Cattolica, 2017-2020.

Commercial Name	2017	2018	2019	2020
Squilla mantis	5,86	6,38	6,41	5,45
Red Mullet	2,98	4,24	3,03	3,58
Sole	9,48	9,76	8,48	8,58
Cuttlefish	9,34	9,54	8,71	9,78
Whiting	2,72	3,03	2,10	3,48

Table 11- Marketed values (€) in the fish markets of Emilia-Romagna, 2016-2020.

Markets	Gross (€) 2016	Gross (€) 2017	Gross (€) 2018	Gross (€) 2019	Gross (€) 2020
Goro	3.373.876,24	2.956.273,83	2.843.073,51	2.573.739,69	2.471.977,53
Porto Garibaldi	2.464.487,73	2.184.041,38	2.092.545,93	2.160.967,52	1.962.582,73
Cesenatico	5.615.789,99	5.069.873,64	5.653.150,54	6.150.576,00	5.484.522,69
Rimini	11.023.393,26	9.718.681,99	10.086.762,30	10.350.575,55	9.484.958,67
Cattolica	2.452.462,79	2.237.916,54	2.774.973,94	2.584.830,10	2.214.137,61
Emilia-Romagna	24.930.010,01	22.166.787,38	23.450.506,22	23.820.688,86	21.618.179,23

Source	Fish markets	Fish markets	Fish markets	Fish markets	Fish markets
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Fishing cooperatives

Fishing cooperatives in Emilia-Romagna boast a strong and deep-rooted tradition, even in the most marginal realities in terms of production. The presence of the cooperative movement is an integral part of the history of the navy of the region and, in some ways, irreplaceable; Emilia-Romagna, in fact, thanks to the active commitment of the cooperation, is a point of reference for fishing in Italy, making proposals (technical, legislative, etc.) to the central institutions that have favoured and improved the national productive activity. The cooperatives associate most of the fishermen of the navy. Whether is been considered the role played by cooperatives, it emerges that in recent years it has been partially modified and enriched by virtue of the needs of member companies and organizational and management changes.

Table a below provides an updated picture of the services provided by the cooperatives in Emilia-Romagna.

Table a- Services provided by fishermen's cooperatives in Emilia-Romagna

Seafaring	Cooperative	Accounting and administrative services	Fishing shop	Other shops (clothing, boating, food, etc.)	Fish storage (refrigerated cells)	Storage for nets and fishing gear	Fuel dispensing	Fish market management	SPC - SSC1	Processing, packaging, transformation	Marketing
GORO	Consorzio Pescatori di Goro Società Cooperativa Organizzazione di Produttori (COPEGO)							X			X
	Cooperativa servizi marittimi Soc. Coop. (CO.SE.MAR.)	X					X ²				
MARINA di RAVENNA	Cooperativa Nuovo Conisub	X			X			X			X
CERVIA	Cooperativa Pescatori Luigi Penso	X					X				
CESENATI CO	Cooperativa Casa del Pescatore Cesenatico	X	X	X		X	X				
BELLARIA	Cooperativa La Marinara	X					X				

¹ Shellfish purification center – Shellfish shipping center

² Management entrusted to a company associated with the copego

Seafaring	Cooperative	Accounting and administrative services	Fishing shop	Other shops (clothing, boating, food, etc.)	Fish storage (refrigerated cells)	Storage for nets and fishing gear	Fuel dispensing	Fish market management	SPC - SSC1	Processing, packaging, transformation	Marketing
RIMINI	Cooperativa Lavoratori del Mare	X	X		X	X	X	X	X		
CATTOLIC A	Cooperativa Casa del Pescatore Cattolica	X	X	X	X	X	X	X	X	X	X

Whether in the past the services provided were mainly concentrated on administrative services and on the supply of fuel or the management of fish markets, over the years further services have been integrated and improved and, in some cases, the commercial activity has developed to concentrate the offer as well as offering concrete answers to the need of increasing the value of production. Excluding the Goro marina, where the cooperative structures carry out well-defined and specific activities and tasks, the traditional basic services are guaranteed in the other marinas, such as accounting for fishing companies, while diversified services are provided according to the size of the structure or the number of associates and production volumes.

The need to strengthen strategies linked to the concentration of supply has become a priority in the various marines and cooperatives are increasingly oriented towards commercial development by providing concrete answers to commercial critical issues affecting local producers.

Climate change and impact on the marine ecosystem

Fishing is an activity strongly influenced by climate change. In the National Plan for Adaptation to Climate Change PNACC of 2017, it can be read: "In the Italian seas and in the entire Mediterranean, most of the fish stocks of commercial interest are overexploited, and in many cases, it is difficult to distinguish the effects of excessive fishing from those determined by climate change. As early as 2008, FAO highlighted how the impacts of climate change will have significant effects on fishing and aquaculture, with serious consequences on coastal environments and communities. Again, the PNACC points out that "Climate changes also have effects on the composition of communities, because non-indigenous and

thermophilic species, of subtropical origin, tend to settle in Italian seas, while some autochthonous species, which need lower water temperatures, become less abundant. However, since there are relatively few species appreciated by the market, these variations tend to have mostly negative effects for fishing". Recent studies state that in this context the western coast of the upper Adriatic "can be considered an extremely vulnerable area.

If this is the international and national scenario in a nutshell, the studies evaluating the effects of climate change on fishing in regional contexts and specifically in Emilia-Romagna are only at the beginning. A difficulty linked above all to the multiplicity of environmental variables, closely correlated with fishing activity.

Some preliminary fact-finding elements are collected below, useful for assessing the potential vulnerability of small-scale artisanal fishing, also in relation to the other economic activities that insist on the same area. Finally, data regarding the environmental impact in terms of emissions and the balance of climate change are compared.

Climate change in the Adriatic, Emilia-Romagna coast

Several studies highlight a significant climate change in the region under study. With reference only to marine waters, the following is a very brief excerpt from the "National Plan for Adaptation to Climate Change PNACC" of 2017. "The sea surface temperature anomalies indicate an increase of about 1.2 °C on an annual basis for the Mediterranean basin [...]. In particular, the greatest increase compared to the reference period in winter and spring temperatures occurs for the Adriatic basin, with values between 1.5 °C and 2.0 °C [...]. In the summer, the highest and most widespread anomalies occur in the Tyrrhenian Sea (about 1.5 °C), in the upper Adriatic and in the Ionian".

In the Gulf of Trieste, the OGS (National Institute of Oceanography and Experimental Geophysics) reports in recent decades "an increase in water temperatures, which has favored the accentuation of thermohaline stratification in the summer period, with consequent limitation of exchanges of oxygen with the deep layers of the water column". In the period 1985-2020 "it is possible to estimate a maximum increase of 0.4 °C/decade, in good agreement with the estimates from satellite data", reported in the bibliography for the

surface waters of the Mediterranean.

Moreover, about the oceanographic parameters, changes have also been reported regarding salinity and pH. These factors greatly influence the currents and consequently the planktonic populations both in qualitative and quantitative terms. The same PNACC highlights how climate change will have "effects also on the composition of communities, because non-indigenous and thermophilic species, of subtropical origin, tend to settle in Italian seas, while some autochthonous species, which need lower water temperatures, are becoming less and less abundant.

However, since relatively few species are appreciated by the market, these variations tend to have mostly negative effects for fishing. In addition to fish stocks, climate change will have local impacts, even highly diversified ones, with effects both on the productivity of resources and on fishing operations. Added to this is the fact that fishermen will have to adapt their fishing techniques more frequently, which will necessarily have to differ, at least in part, from those of the past and, therefore, the knowledge handed down or learned from experience will become less useful. Finally, the scarcity of economic resources dedicated to actions to mitigate the impacts of climate change or to adapt to them must be considered, also due to the now chronic low profitability of national sea fishing, linked to competition from aquaculture products or from fishing in non-Mediterranean areas”.

The fishermen highlight the impact of predatory species but also of two alien species: the blue crab and the sea nut. The swimming crab or blue crab (*Callinectes sapidus*) is a naturalized allochthonous species, introduced into the Mediterranean from the northern Atlantic through ballast water. Along the Atlantic coast it is the object of professional fishing, while in the upper Adriatic it was reported at the end of the 1940s. In recent years it has become very frequent in coastal waters and especially in lagoon waters. The situation of the Sacca di Goro is exemplary, where in the last five years there has been a real explosion. In addition to numerous newspaper articles and some scientific articles, the observations of the fishermen are evidence of this. The marketing data of the Goro Fish Market are unequivocal, where it went from 7 kg sold in 2017 to 5,451 kg in 2019 and 89,876 kg. In

2022. Another species that has recently aroused concern from fishermen, especially small-scale artisanal fishermen who operate with post gear, is the massive presence of the murex along the coast. There are two species: the spiny murex (*Bolinus brandaris*) and the truncated murex (*Hexaplex trunculus*). The latter has greatly compromised the fishing season for sea snails (*nassarius mutabilis*) creating various problems for fishermen as predators. To favor the commercial development of the aforementioned predatory species and alien species, which are poorly known and consumed, various studies and initiatives are underway aimed at spreading their consumption. An example is the start-up "mariscadoras" benefit society which, through the "Blueat"³ brand and with the support and collaboration of professional organizations and fishing cooperatives, is marketing blue crabmeat distributed through large-scale distribution.

Regarding to the issue of marine litter and plastic at sea, the fishermen of the region are involved in various initiatives and campaigns for the collection of marine litter and thanks to their participation, collaborative networks have been strengthened between the productive world, the research and waste collection and disposal companies on land.

As part of the programming of the EMFF (European Fund for Maritime Activities and Fisheries) 2014/2020, the Emilia-Romagna Coast FLAG financed five important project initiatives aimed at activating, along the entire regional coast (from Goro - FE - up to Cattolica RN) virtuous paths capable of countering the phenomenon of the presence of waste in the sea and ghost nets. A brief description of the initiatives is provided below.

Project "*PESCAMI: PESCAtori aManti dei mar!*"⁴

Beneficiary institution: Flaminia Foundation (RA)

Through close collaboration with the selected fishermen (for the three types of mussel underwater fishing, small-scale artisanal fishing, trawlers) actions have been carried out to collect sea waste, assignment and disposal at the ports of the cities of Cervia, Porto Garibaldi and Marina di Ravenna.

³ [BLUEAT - Alien is good, Alien is Food](#)

⁴ <https://www.flag-costaemiliaromagna.it/fondazione-flaminia-pescami>

Project "Raccolta e gestione innovativa dei rifiuti in mare con interventi dei pescatori del Porto"⁵

Beneficiary body: University of Ferrara

The experimental initiative has set itself a dual objective: to free vast stretches of sea and SCI from ghost nets and other waste but also to set up for the first time, in the fishing port of Goro, a differentiated collection of such waste on the quay. The waste collected and stored in special bags by the fishermen and placed in special equipped areas, was subsequently cataloged and divided by type and quantification. Material samples were also analyzed in FT-IR spectrophotometry to determine the polymer composition and identify the recoverable part.

Project "Raccolta, caratterizzazione e smaltimento dei rifiuti marini dal porto di Cattolica"⁶

Beneficiary body: Alma Mater Studiorum - University of Bologna

The project carried out waste collection actions in the sea, their characterization and their disposal at the Port of Cattolica. The fishing vessels involved provided data on the quantities and different types of waste collected during normal fishing activities, as well as providing the material collected to the operators trained for the characterization of the waste according to qualitative and quantitative criteria. Fishermen were provided with adequate tools for describing the waste and recording the areas of origin of the waste, which made it possible to carry out an initial mapping.

Project "Raccolta da parte dei pescatori MARINE LITTER compresa la rimozione degli attrezzi da pesca smarriti"⁷

Beneficiary body: Marine Research Center Foundation

The project focused on the methodological aspect, adopting and disseminating an integrated approach to the issue of sea waste in the Cesenatico navy, capable of combining environmental aspects with economic and social ones. Specifically, an operational protocol

⁵ <https://www.flag-costaemiliaromagna.it/unife-raccolta-e-gestione-innovativa-dei-rifiuti-a-mare-con-interventi-dei-pescatori-della-marineria-di-goro>

⁶ <https://www.flag-costaemiliaromagna.it/unibo-raccolta-caratterizzazione-e-smaltimento-di-rifiuti-marini-della-marineria-di-cattolica>

⁷ <https://www.flag-costaemiliaromagna.it/f-c-r-m-litter-a-mare>

has been prepared for the collection and management of marine waste, training of fish operators on the methods of collection, storage and disposal of marine waste and fishermen's work waste, marine waste collection actions and port in a dedicated and equipped area, subdivision, weighing and quantification of the collected material and management and transfer, waste disposal and evaluation of the recycling and/or recovery possibilities, verification and validation of the operating protocol.

Project "Sperimentazione di un modello di rete da pesca a strascico che separa originariamente i rifiuti dall'attività di pesca" – Rete Salvapesca⁸

Beneficiary: Cetacea Onlus Foundation

The project aimed to test the use of a trawl net model with the aim of effectively separating waste from caught fish, thus reducing working times at sea and obtaining cleaner and higher quality fish. The experimental activity was, therefore, aimed at verifying whether the conformation of the experimental net affected and in what way the quantities of commercial fish. Net characteristics: 4-sided trawl net, in high tenacity polyethylene reinforced with two bags (the first bag for debris mounted in the final part of the net, while the second for the fish mounted on top of the first) and complete with chains and floats.

Swot analysis

The SWOT analysis takes up the salient aspects detected during the investigation and highlights the opportunities encountered and the threats that have emerged in the production sector. In general, the attention to making more use of local fish production and the need to develop commercial aggregation and quality improvement strategies clearly emerge. It should also be considered that raising the levels of awareness, among sector operators, on aspects related to sustainability, food safety and the protection and safeguarding of the marine environment, favors and stimulates the development and implementation of aggregation processes concentration of supply, for an adequate commercial development of fish production related to small-scale artisanal fishing.

⁸ <https://www.flag-costaemiliaromagna.it/fondazione-cetacea-onlus-una-rete-salva-pesca>

Strengths	Weakness
<ul style="list-style-type: none"> • Availability of fish products of high value and quality also from a nutritional point of view; • Seasonality of fish productions; • Strong presence of local traditions linked to local marines; • Presence of direct sales at Km 0 in most of the ER marinas; • Active participation of family members in company life; • Increased consumer attention to product quality; • Growing demand for certified fish products; • Use of selective gears with reduced impact on the environment and habitat in small-scale artisanal fishing; • Growing availability of technologies in the sector; • Greater awareness and attention of fishermen to sustainability; • Presence of seafaring places rich in historical-cultural traditions of high tourist attraction. 	<ul style="list-style-type: none"> • Weak and fragmented forms of association for commercial development and product aggregation; • Little interest of fishermen in pursuing collective strategies; • Strong commercial competition; • Fragile and fragmented market positions; • Difficulty in guaranteeing continuous supplies to large-scale retail trade; • Skepticism on the part of fishermen towards certification schemes or collective marks aimed at increasing value; • Conflict between fishermen and between fishing systems; • Strong and pressing competition on sales prices; • Undercapitalized micro-enterprises with low profitability; • Difficulties of fishermen in complying with obligations (regulatory, technical, ..).
Opportunities	Threats
<ul style="list-style-type: none"> • Sensitivity of consumers to information on fishery products; • Attention of consumers towards guarantee of freshness and quality; • Attention of consumers towards the short supply chain; • Greater media attention to seafood (cooking shows, cooking shows, lessons); • Greater attention of the catering sector to the valorisation of local products and peculiarities; • Presence and support of the ERC FLAG in the field of information and dissemination activities; • Strong presence on the coast of activities that favor integration and enhancement projects (tourism, catering, commerce); • Support measures for the development 	<ul style="list-style-type: none"> • Reduction of fish stocks; • Excessive market presence of cheap imported products; • Loss of traceability within the HORECA structures (Hotels, Restaurants and Catering); • Difficulty entering new markets or promoting new logos in a sophisticated market; • Changes in consumption and eating habits; • Conflict between fishermen and other sectors (maritime space management).

of the sector (European Funds).	
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Strengths

The consumer tends to pay more attention to quality and freshness, especially where there is a strong seafaring culture in which local fish products are traditionally known. Since fishing in Emilia-Romagna is an activity carried out mainly "in the day", it can guarantee and ensure the freshness, quality and authenticity of the product. Consumers, as well as the world of local restaurants, who buy directly from fishermen (direct sales), have a greater knowledge of local fish, also recognizing the value of freshness and quality and therefore accepting a slightly higher price than the products consumer fish.

The world of local catering, especially in those areas with a high tourist connotation, should be more involved and encouraged in the use of local fish products, also providing for "off-menu" gastronomic proposals based on what the producer gives daily. It is notoriously known that tourists who frequent coastal towns are looking for restaurants or trattorias characterized by the offer of fresh local fish. The zero-kilometres theme is also taken into consideration by consumers and represents an important strength of local fishermen. The search for certified or traced products or territorial collective brands connected to a direct fiduciary relationship with the fishermen, by the more attentive and demanding consumer, represents another strong point of the sector and should be further expanded and developed, as the fisherman is able to offer and satisfy those qualitative guarantees and certainties sought by consumers. Similarly regarding to the several local fish species linked to seasonality, each of which lends itself to various and different gastronomic elaborations, represents a favorable element that should be better supported with stable and permanent actions (informative, promotional, etc.).

Weakness

Despite the experiences gained in the area, which highlight the successes of commercial aggregation forms, especially where organizations concentrate many producers, in some local realities the ability to concentrate the product is still rather weak and limited. In some cases, the lack of success of the initiatives pursued has led the fishermen to greater individualism, reinforcing a sceptical and critical conviction towards the processes of commercial aggregation. Even towards the certification systems, in some cases, a certain distrust has spread on the part of the fishermen, due to the failure to achieve short-term economic benefits. Large-scale retail trade tends to seek standardized productions (in terms

of quality, size, etc.) to which, for example, aquaculture can respond but, for example, for some fishing trades this represents a strong element of weakness.

Opportunities

The attention of consumers towards a healthy and quality diet represents an opportunity; it is in fact known and scientifically proven that fish is good for health. Therefore, supporting and promoting the benefits of fish consumption in general is an important action to be pursued on a constant and permanent basis. Even the creation of promotional campaigns related to fishery products and their seasonality, together with the development of collective brands can contribute significantly to strengthening the sector, improving the image of the fisherman and guiding the consumer towards responsible and sustainable purchasing. In terms of communication, in recent years television schedules have introduced various programs and lessons dedicated to cooking; in this context, the promotion of fishery products could be strengthened by creating strong connections with TV programs and involving renowned testimonials capable of spreading a new image of the sector. Other relevant opportunities emerge from the role that the FLAG could further play in contributing to the qualification of fish production. The FLAG can concretely help the entire supply chain (from production to marketing) in the adjustment process (technical, organizational, qualitative) by making fishing companies more innovative, farsighted, resilient, and sustainable over time.

Threats

The main threat is dictated by the CFP and the reduction of fish stocks, even if their management appears to be effective and the hope is that production can become sustainable from the point of view of the use of resources. Competition from imported and cheaply traded products also poses a significant threat to the economic viability of the sector. The information provided to consumers is often reduced, limited and unverifiable, such as for example in restaurants in which checking the authenticity and freshness of a fishery product once cooked becomes extremely difficult (bearing in mind that, in catering, traceability ends up in the kitchen and not on the consumer customer's table) and this represents a real threat both economically and in terms of image. A further, not negligible, critical issue is represented by changes in consumption and eating habits. The younger generations, in fact, usually eat ready-to-eat products; a habit that cannot be reconciled with the marketing of fresh fish. Added to this is the myriad of brands, logos or advertisements

present on the food market and the consumer tends to lose interest, disoriented by the numerous advice and suggestions for purchases.

SWOT analysis considerations

The analysis made it possible to frame the prospects of the sector, bringing out fragility, weaknesses but also the strengths of the sector and opportunities deriving from the various local contexts. The various experiences highlight an extremely important potential, to be supported and promoted through a development strategy that considers the peculiarities, specificities and characteristics of regional fishing. The sector is the bearer of a strong and deeply rooted local tradition, on which it is necessary to base a strategy based on various important aspects such as seasonality, the use of selective tools with low environmental impact as regards small-scale fishing, knowledge of territory, the quality and freshness of the products landed daily. Although the sectoral policies of recent years have favoured the development of bottom-up strategies, producers appear marginally, bringing out all the fragility of a weakly organized sector. Today, private companies, websites or food bloggers, information services rather than institutions (at local or central level) are at the forefront of promoting well-being and the related benefits deriving from fish consumption. For this reason, a correct commercial and valorisation strategy must duly consider the involvement of a wide network of subjects, transversal and participatory, who can guide product marketing policies (differentiated according to the different target groups) convincingly influencing the consumer and the various distribution channels.

Guidelines

As issued from the SWOT analysis, the sector has an extremely important unexpressed potential since, in addition to being the bearer of an undeniable heritage (historical, cultural, social) it offers a production of high value, linked to the territory and with peculiarities that strongly highlight the characteristics of typicality, seasonality and sustainability. The elaboration of a development strategy, which puts the figure of the fisherman at the centre, and which sees the involvement of a large network of subjects, will necessarily have to consider the elements listed above and will have to provide for transversal actions and interventions, which go beyond the borders localized, and are divided into segments (development areas) and clearly defined target targets.

The guidelines (LG) presented below provide some operational guidelines to support the sector and the development of the socio-economic fabric in the local context. 3 guidelines

are proposed in the field of aggregative organization, local product marketing and the promotion and enhancement of coastal fishing.

GL 1: Local market districts

Starting from the main players, i.e. the fishermen, the scarce presence in the fishing communities of organizations capable of concentrating and coordinating the offer, such as Producers' Organizations (POs) or other forms of aggregation, is a major criticality on which it is necessary to intervene. The product aggregation centres manage to create that collective strength of concentration of the product necessary for the management of the fishing activity and the definition of management and marketing strategies.

POs, for example, are officially recognized bodies and deal with the day-to-day management of fisheries, playing an essential role in governing production. They guide fishermen towards sustainable fishing by implementing collective management of their members' fishing activities, reconciling demand with supply and implementing commercial policies and strategies that generate support in the creation of added value. Through the production and marketing plans, the POs are supported under the CFP through financing measures that allow them to pursue medium/long-term commercial positioning strategies with an aid intensity of 100%.

Operators' awareness of the need to "give value" to their product can be the lever on which to trigger aggregation mechanisms, favouring the development of new and diversified commercial channels. Precisely because the current distribution channels appear to be inefficient and rather limited and because the fishermen often give directly to local wholesalers and traders who often operate under a monopoly regime determining the purchase price, the development of the various forms of commercial aggregation should encourage their participation by the fishermen. In Italy, the Producers' Organizations have found implementation mainly through the form of cooperative enterprise or consortia, which has a historical tradition as an aggregating centre of producers, and due to its characteristics manages to combine the aspects of organization and facilitation of the private economic activities of members, with the intergenerational aspect and the commitment to the community as a whole (7° cooperative principle) which are the basis of the commitment to sustainable production.

As is well known, the established producer organizations (recognised under the European Regulation n.1379/2013) direct production and ensure that their members comply with the legislation on fishing and the environment, manage unwanted catches of commercial species and implement measures to optimize the marketing of fishery and aquaculture products through their own "production and marketing plans". The objective of organizing and

stabilizing the market is pursued through POs; the added value proposed by the POs is to favor the adaptation of production to market demands. The main requirements for the establishment of POs are:

- represent a sufficient proportion of the economic activity in the area they intend to cover, especially as regards the number of members or the volume of marketable production;
- not to discriminate on the basis of the nationality or geographical location of potential members;
- meet the legal conditions required by the Member State concerned.

The aggregation experiences matured and consolidated in Emilia-Romagna, but also outside the regional territory, have shown that the concentration of supply can significantly improve the conditions for strengthening the value chain, price stabilization but also develop territorial marketing aimed at enhancing the productions and directing the consumer towards aware and responsible purchases. In addition to the aggregation of fishermen within fisheries management bodies, Local Fishing Districts could be evaluated, including a plurality of local subjects from various economic sectors (from the world of fish producers to restaurants and *hotellerie*, from fishmongers to technology producers, service providers, local associations) which could generate positive actions with a strong impact on the territory, rich in traditions and peculiarities. An aggregation of micro-enterprises organized collectively that promotes and supports the local productive world in the economic and social development of the territory. The reality that comes closest to the Local Fishing Districts is that of the FLAGs which, however, have different characteristics (including the participation of public institutions) and with broad and transversal objectives (which also impact on all types of fishing and aquaculture present in the area). The District should be thought of as a local economic network of actors capable of triggering mechanisms which, placing fishing at the centre, elaborate and develop broad diversified strategies in the various fields (food, social, artistic, cultural, environmental) addressed to different target groups (consumers, younger generations, tourists, citizens, professionals, etc.).

GL 2: Marketing of the local fish product

Fishing encompasses various specificities and particularities that distinguish it: it is strongly influenced by weather and sea conditions, the quantities and species vary from day to day, prices vary in ways that are sometimes incomprehensible. These are just a few elements which, when associated with production costs and sustainability, make it even more uncertain and highly fickle. At the same time, fish consumption is on the increase and consumers, increasingly attentive and demanding, consider the origin of the product as a

determining factor of their quality. This attention coincides with the increase in certified or organic products or products recognizable through collective territorial or identification brands (such as, for example, PGI, DOP brands).

As highlighted, the consumer tends to pay more attention to quality and freshness, above all where there is a strong seafaring culture in which local fish products are traditionally known and this can be considered a countertrend to the globalization of the trade in fish products which allows highlight real opportunities for local producers, to the extent that fishermen are able to develop and strengthen a close link with the consumer. Developing this link can be problematic for local producers, who are more attentive to the volumes caught and possibly to quality improvement techniques and processes but not to those for establishing new relationships with consumers. Although the consumer may be increasingly attentive and demanding, today a quality production may not be sufficient. In addition to sustainable and quality fishing, it is necessary to know how to interpret, tell and illustrate it to strengthen this bond with the consumer. And in the process of creating added value, social and environmental aspects have become as important as the quality of the product itself. Therefore, a correct product marketing policy that goes in this direction can concretely help the economic development of fishing micro-enterprises.

In this area, the development of knowledge and the acquisition of new skills can contribute significantly. Traditionally, the role of the fishermen's wives or families is very important in company life, providing a significant contribution in the management of various activities such as, for example, the sale of the product. Therefore, training interventions aimed at fishermen's families but also at the fish producers themselves, for the acquisition of skills and knowledge, would make it possible to broaden one's strategic vision in the commercial sales activity. A marketing approach, which can allow you to acquire tools for analyzing the potential market for your product and develop modest sales strategies and strengthen ties with local buyers, could favour the creation of decisive value for fishing. The training interventions could also be directed towards the acquisition of other project management skills, activity planning, feasibility studies, development of new products, communication. Knowing how to communicate also through the internet or social networks can provide, especially to small-scale fishing, an important aid to the development of the short supply chain. Numerous experiences at international and European level have shown, for example, that direct selling by artisanal fishermen can be organized in an efficient way, far better than traditional fish trading systems. The further advantage of using modern technologies is the reduction of post-capture losses since production can be organized according to consumer demand.

There are examples of consumers who pay for the supply of fresh fish, scheduled for one day a week, so that the fishing activity is better organized and safer. The consumer is

informed, through the network, of any problems relating to the catches, or adverse weather conditions or other critical issues that prevent the weekly supply. By technologies, the consumer can buy fish directly, but also receive recipes and suggestions for the preparation of the products purchased. A web page that presents the family business, with its traditions, its history, the specifics of its business and its production, informing the consumer about the beneficial properties that fish offers for health and suggesting practical advice on cleaning and preparation of fish, directing communication towards seasonal or little-known fish products.

Therefore, it is suggested to make the renewal of the marketing strategies of the fish product - also using technologies - an integral part of the initiatives aimed at supporting fishing rather than relegating them to a "phase 2" left to the individual producer.

At a systemic level, it is instead suggested to capitalize on the experiences of existing commercial platforms by trying to aggregate them at a regional if not national or European level, as these platforms are effective and sustainable mainly in cases in which a large visibility is obtained and significant savings are made of scale.

Finally, it should be highlighted how the form of cooperative enterprise for the governance of these platforms can be fundamental to ensure that the benefits of their use - and the ownership of the tool - fall on the producers themselves, in addition to the benefits brought to consumers.

GL 3: Collective enhancement and promotion interventions

Over the years there have been numerous promotional and dissemination campaigns carried out at national and territorial level as well as information initiatives on fishery products and educational activities in order to make the world of fishing and its peculiarities known. Added to this are interventions aimed at promoting production innovation and the application of protection systems for fish products as part of the procedures for the recognition of quality brands and the enhancement of fish products along the entire supply chain.

Beyond the initiatives carried out towards the public, whose attention normally ceases as soon as the financial resources available to the project or campaign carried out run out, efforts must be concentrated on those actions and interventions which can maintain attention for periods longer or long-term initiatives, even at reduced expense, which may affect consumer loyalty.

There is no doubt that the economic operators of the supply chain, in order to successfully meet the competitive challenges, must rethink their development strategies: professionalism, organizational skills, integrated working methods, innovation in processes

and products are the essential elements for building an offer system of fish products, suitable to meet the needs of a growing market, not only in terms of numbers but also from the point of view of quality and diversity of references.

Fishing should first move towards the construction of product aggregation centers to create the strength necessary for an incisive and balanced market positioning, as it possesses those characteristics and peculiarities that can contribute to success. Secondly, it should develop a product marketing strategy, as reported in the previous paragraph, which focuses on the local market to strengthen a direct link with its consumers. Thirdly, carry out promotional and information actions aimed at the various targets (restaurants, fishmongers, direct consumers, schools, senior centres, social structures, etc.) to involve the entire local community.

The actions could be aimed at enhancing those fewer known species, through the conveyance of information on the characteristics of the product (nutritional values, freshness, seasonality) and on the techniques of processing and preparation of the product, encouraging the relationship in the context of a short supply chain, with products that tend to low price. Other initiatives could focus on health trends, through the dissemination of information to enhance the health characteristics of fresh fish specialties from fishing and aquaculture.

Furthermore, the portion of fishermen who carry out direct sales, on the quay or in dedicated places, somehow organized, which represent an important component along the coastal strip, and which sees the active participation of their family members shouldn't be underestimated. The lock down period highlighted all the weaknesses and critical issues of this niche of fishery producers who found themselves in the position to suspend their activity due to lack of buyers. For this category, it would be worthwhile to develop a transitive process of modernization of direct sales, coordinated by cooperative structures, towards more qualifying diversification activities, such as for example online sales or home delivery.

Recommendations

The guidelines illustrated above provide some indications and suggestions to support fishery producers in finding solutions to improve the economic conditions of their businesses, enhance their productions and increase the added value of the product. The main recommendation is aimed at encouraging the aggregation of fishermen. Only through the concentration of the offer, linked to the qualification of the productions and supported by adequate commercial strategies, can it be possible to guarantee greater strength in commercial negotiations. Furthermore, product aggregation broadens the range of products

and guarantees the reliability and continuity of supplies. And furthermore, it favours the increase in the value of productions when the world of production presents itself with a single voice.

Another recommendation focuses on the figure of the fisherman. Apart from the need to strengthen the image of the artisanal fisherman, distinguishing him from other professional figures precisely due to the specificity of his profession and the characteristics of the activity he carries out (peculiarity, seasonality, sustainability), it would be advisable to concentrate efforts by intervening on the motivation and on active involvement, making the fishermen themselves active protagonists of the change process in which they are involved. Intervening on the motivation to contribute to a participatory and collective development can help trigger solidarity mechanisms among fishing operators by strengthening the development of collective activities. A final recommendation is aimed at avoiding the implementation of projects or promotional campaigns that show a decline in interest as soon as funding ceases.

Conclusions

The work carried out demonstrates that an integrated approach to the fishing and aquaculture supply chain is appropriate and very useful for understanding the structural characteristics, threats and opportunities, the evolutionary dynamics of the market, with the peculiarities and characteristics that distinguish it internally. On the one hand, the observation of experiences gained in the various local contexts makes it possible to focus and bring out excellences that are consolidating, demonstrating that the aggregation of fishermen and the concentration of the fish supply can give concrete answers to the structural weaknesses of the sector. On the other hand, it clearly and unequivocally highlights the importance of intervening on the entire value chain, making it more efficient and functional for the sector, improving synergies and collaborative strategies.

An "along" look of the supply chain is not only an essential prerequisite for setting up a serious policy in favour of the quality and traceability of fishery products, but more generally it must become a substantial reference for fisheries policies at a regional and national. Moreover, at the Community level, the reforms of the Common Fisheries Policy and of the Common Organization of the Markets include among their priorities that of "encouraging the organization and aggregation of fishermen", an imperative which must not run the risk of remaining only on paper. The importance of the supply chain concept also derives from the fact that it allows the relationship between production and territories to be addressed in the right direction.

As noted in this report, in recent years the weight of the short supply chain has grown significantly (in terms of the number of fishermen involved but also in terms of the

originality and quality of local initiatives carried out in the context of the quality and enhancement of local fish production) based on direct sales, at zero-kilometres, from the producer to the consumer, whether they are residents or tourists or restaurateurs. This phenomenon should be given the utmost attention and consideration because it can represent a concrete response to the needs of local fishing. However, it must be avoided to think that those who are not involved in short supply chains get lost in the circuits (and value chains) of the global economy, where the only recognizable identities are those of the large fishing companies, the fish and their brands.

The activity carried out was mainly directed towards small maritime realities, in a logical space between the zero-kilometres and the *global value chains* presided over by the fishing industry, bringing out that this space hosts various opportunities that can better enhance fishing.

It includes in particular: the short supply chains linked to the territory, activated by micro-enterprises whose value network is for a significant part immersed in a specific local territory; the fishing "districts", which could include a plurality of local subjects from different economic sectors (fish producers, restaurateurs, fishmongers, technology producers, service providers, local institutions, etc.) form a territorial context capable of generating positive externalities for the subjects who operate within it, with productions with high added value and linked to the territory.

In summary, the sector should strengthen its entrepreneurial capacity to research, identify and exploit new business opportunities. High-value entrepreneurial experiences are still rather limited and should be supported to further guarantee the quality of processes and products in a more marked and stable way (chain quality), to improve relations between companies and phases of the chain in terms of efficiency and effectiveness and disseminate knowledge along the entire supply chain.

Reflecting on the cultural and resource limitations of many of the fishing micro-enterprises, it is easy to deduce that the promotion of entrepreneurship must constitute the *mainstreaming* of a policy aimed at strengthening the competitive sustainability of the sector. From this point of view, the aggregation of micro-enterprises, if aimed at collectively developing the processes of entrepreneurial growth, becomes a very important objective.

In support of what has been described, the fishing districts (which could be defined as "*local districts*") must not be imagined as the simple sum of several sectors but should represent a system within which subsystems of considerable importance are present and operate. The first is made up of a series of subjects that are different from each other but share the ability to create contexts of experience for consumers of local fish products, thus enriching the value of traditional fishing as an umbrella brand for these products. Among the

most emblematic cases is reported for example "Slow Fish", whose success is evidenced by the large number of subjects involved as producers or consumers.

A similar role, on a smaller scale, is played by demonstrations or promotional campaigns, in which the local fish product and gastronomic fish traditions are the most salient aspects, which are transformed into experiential contexts for consumers, tourists and citizens. The second subsystem consists of the cognitive infrastructure of the supply chain: research institutions, education, and training structures (professional, higher technical and university), suppliers of business services with a high knowledge content, private or institutional in nature. Since in global competition companies and supply chains must express a high development of innovation, it becomes crucial that the subsystem of actors specialized in the production and dissemination of knowledge and that of its users are able to interact with each other because it is in this context that generate innovations.

It would be appropriate for the Institutions to open a working table that identifies some supply chains (e.g. large pelagic, blue fish, demersal species, molluscs) on which to encourage the construction of entrepreneurial projects capable of enhancing these productions also through transformation and promotion of new distribution and marketing dynamics. Added to this is the need to strengthen and modernize the system of wholesale fish markets which must necessarily renew and innovate also through investment projects that include the processing, transformation, and enhancement of local products.

ATTACHMENTS

DATA COLLECTION PROTOCOLS

Below are the specific protocols for data collection at the local level defined in collaboration with the entrepreneurial associations and cooperatives of fishing, aquaculture and the trade of fish products and in close collaboration with the Adriatic Advisory Council - AAC;

Section 1 – vessel and fishing data

Please complete the items relating to the vessel used for fishing.

Section 1.1 – Vessel

Vessel Name	_____	Serial Number	_____
Year of construction	_____	Tonnage (GT)	_____
Motor power (kW)	_____	LFT (m)	_____
No. of people embarked	_____	No. of employees	_____
Main tool	_____	Secondary tool	_____
Mooring port	_____	Working days	_____

Section 1.2 – gear and catch

As far as fishing is concerned, the following should be completed by gear

	Tool type _____		
Month _____	N. _____	Fishing _____	_____
days/month			
List of species caught and quantity (kg) caught			
Species	Quantity (kg)	Species	Quantity (kg)

Section 2 – data relating to economic aspects

Please report below the official economic data relating to your fishing activity

Gross annual income in Euros* _____

* gross salable production (GSP), direct subsidies (fishing stops, covid19 contributions, de-minimis contributions), other revenues (fishing tourism, ittitourism)

Expenses for on-board personnel in Euros _____

Fuel costs in Euros _____

Maintenance costs in Euros _____

Section 3 – social data

Please complete the following items for the different types of fishing

Section 3.1 – Type of business:

<input type="checkbox"/>	Hydraulic dredger	<input type="checkbox"/>	Longlines	<input type="checkbox"/>	Fish Wheel
<input type="checkbox"/>	Trawling	<input type="checkbox"/>	Hooks and lines	<input type="checkbox"/>	Aquaculture
<input type="checkbox"/>	Gillnetting	<input type="checkbox"/>	Purse Seine	<input type="checkbox"/>	Other: _____

Total number of employees: _____

Number of males: _____ average age of males: _____

Number of females: _____ average age of females: _____

Section 3.2 – Level of education and origin of fishing operators

- Elementary School ____%
- Middle School diploma ____%
- Higher Diploma ____%
- Degree ____%

Nationality of operators

- Italian ____%
- European Union ____%
- Extra EU ____%

Section 4 – Changes in the world of fishing

In this section, operators are asked for opinions, information, observations, etc. in relation to climate change, the presence of invasive or alien species and the presence of plastic in the marine environment.



Rules for form compilation

Section 1 – vessel and fishing data

This section must be presented to operators and/or fishing cooperatives and completed as follows:

Section 1.1 - Vessel

Enter the data of the vessel used for fishing. If the owner has several boats, repeat the section for each of them.

For this section you can start from the Fleet Register and update it and/or from the lists held by the local Port Authorities and validate them in the field or at the local fishing cooperatives.

Section 1.2 – gear and catch

For each tool used, indicate on a monthly basis:

- fishing days completed
- the type of catch (species)
- the quantities expressed in kg

Section 2 – data relating to economic aspects

This section must be presented to operators and/or fishing cooperatives and completed by completing the items relating to:

- gross annual income derived from fishing activity, possibly indicating other income always linked to the fishing profession (fishing closure, covid19 contributions, de-minimis contributions, fishing tourism, ittitourism, etc.).
- expenses incurred for the crew (on an annual basis)
- expenses incurred for fuel (on an annual basis)
- expenses incurred for the maintenance of the boat and tools (on an annual basis)

Section 3 – social data

The data in this section must be requested from trade associations and chambers of commerce and refer to the various sectors of marine fishing.

Section 3.1 – Type of business

Select the activity one at a time and for each of them indicate:

- the number of total employees
- the number of male operators

- the average age of male operators
- the number of female operators
- the average age of female operators

Section 3.2 – Level of education and origin of fishing operators

Indicate at regional level the percentages of education level of fishing operators and the percentage of Italian operators, coming from EU and non-EU countries.

Section 4 – Changes in the world of fishing

This section can be completed by bringing together a significant sample of sea fishing operators, best employed in different trades, and directly requesting opinions, information, observations, and opinions on the following topics:

- climate change
- presence of invasive or alien species