



**GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN
COMMISSION GÉNÉRALE DES PÊCHES POUR LA MÉDITERRANÉE**

DRAFT

**CURRENT SITUATION OF SMALL-SCALE
FISHERIES IN THE MEDITERRANEAN AND BLACK
SEA: STRATEGIES AND METHODOLOGIES FOR AN
EFFECTIVE ANALYSIS OF THE SECTOR**

Thematic session I

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AdriaMed, CopeMed, EastMed and MedSudMed

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INTRODUCTION

In the Preface of the draft “Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication” it is acknowledged that the terms ‘small-scale fisheries’ and ‘artisanal fisheries’ are considered to relate to the same segment of fisheries. Both terms can be interchangeably used to encompass different perspectives and bearing in mind that a clear definition still needs to be established. Accordingly, the FAO Glossary recognizes that artisanal fisheries are “traditional fisheries involving fishing households (as opposed to commercial companies), using relatively small amount of capital and energy, relatively small fishing vessels, making short fishing trips, close to shore, mainly for local consumption. In practice, definition varies between countries and they are often referred to as small-scale fisheries”.

Moreover, according to the FAO’s Advisory Committee on Fishery Research (ACFR) Working Group on Small-Scale Fisheries “small-scale fisheries make an important contribution to nutrition, food security, sustainable livelihoods and poverty alleviation, especially in developing countries. Despite this significant contribution, the issues constraining the sustainable development of small-scale fisheries remain poorly understood”. ACFR has therefore developed a vision for small-scale fisheries where their contribution to sustainable development can be fully realized. More precisely, this vision aims at avoiding that small-scale fishermen and fish workers are marginalized and their contribution to national economies and food security is recognized, valued and enhanced. It also recognizes that these people should be empowered to participate in decision-making with dignity and respect through integrated management of the social, economic and ecological aspects underpinning small-scale fisheries.

Against this background the FAO has recently developed the 2012 *FAO International Guidelines for securing sustainable small-scale fisheries* (“SSF Guidelines”) which are intended, among others, to support the enhancement of the role of small-scale fisheries. It is envisaged that these guidelines, which are global in scope, will inform the development of custom tailored policies for small-scale fisheries at regional level. As far as the Mediterranean and the Black Sea are concerned, this should be done through the medium of the GFCM.

1 STOCKTAKING OF EXISTING INFORMATION AND DATA ON SMALL-SCALE FISHERIES

Definition of small-scale fisheries in GFCM Members:

While small-scale and artisanal fisheries clearly differ from industrial and recreational fisheries, distinctions are hard to pin down. The FAO Glossary tends to equate “artisanal” with “small-scale”. From a technological point of view, however, the two are connected but also implies somewhat dissimilar concepts relating to, on the one hand, the size of the fishing unit (i.e. the scale) and, on the other hand, to the relative level of technology (or “artisanality”) expressed as capital investment/men-on-board.

For technologists the term “small-scale fisheries” automatically implies a relatively small vessel size and sometimes has the added connotation of low levels of technology and capital investment per fisher.

Conversely, the term “artisanal” does not directly correspond to a category of vessel size or level of specialization in a particular fishing technique. The length of the boat is not an absolute criterion and, as a matter of fact, in some GFCM Members, polyvalent vessels larger than 12 m length fishing with longlines and gillnets are considered as artisanal boats. It is therefore common to find in the Mediterranean Sea fleet composed of fishing vessels less than 12 m which are committed to a given form of trawling or purse seining.

Small-scale fisheries can also be defined as a high variable activity. The fishing intensity and the fishing strategies show very rapid fluctuations in space and time. The activity and gear employed fluctuate according to the variation of accessibility of the different main target species and seasons, the meteorological conditions, the tourist seasons and other factors.

A FAO Working Group on small-scale fisheries convened in Bangkok, Thailand, in 2003 concluded that it was not possible or useful to attempt to formulate a universal definition of small-scale fisheries. The following description of the sub sector was hence agreed upon: *“Small-scale fisheries can be broadly characterized as a dynamic and evolving sector employing labour intensive harvesting, processing and distribution technologies to exploit marine and inland water fishery resources. The activities of this sub-sector, conducted full-time or part-time, or just seasonally, are often targeted on supplying fish and fishery products to local and domestic markets, and for subsistence consumption.”*

This description seems fitting for the case of the Mediterranean Area and should be borne in mind when discussing small-scale fisheries in the Mediterranean and the Black Sea. This also applies to the case of single GFCM Members although different specificities relating to small-scale fisheries at the national levels might exist.

Legal framework

Small-scale fisheries are encompassed under national legislations on fisheries which are mainly aimed at resources conservation by means of control of the fishing effort and landings. In the Mediterranean, except for some large pelagic species fisheries there are no quotas (which are recognized as not appropriate for the regulation of Mediterranean fisheries) at the moment but a great number of technical measures apply to the various gears used by the small-scale fishermen. These measures concern the mesh sizes of the nets, the characteristics of some particular gears and, in some cases, the number of gear units deployed. Regulations fixing the minimum commercial landing sizes of fishes are also in force. Furthermore, some areas where fishing is restricted exist, including small-scale activities. On the contrary, areas have been established also for the exclusive use of small scale fishermen. In most GFCM Members small-scale boats are bound to provisions regulating the national licensing system which fix the allowances to practice the different types of fishing, although it is not uncommon for vessels not included in any license system to operate.

The landing sites of small-scale vessels are widespread along the coasts and in fishing ports, thus rendering monitoring, control and surveillance (MCS) activities very difficult, even when the vessels have a license for landing at nearby port. There are everywhere numerous management rules, but in general very few fishermen respect their application and poaching and transgressions are regularly reported so it can be said that like in many other parts of the world the IUU fishing is very common in the field of artisanal fisheries. Unregulated boats are

a great gap in several countries statistics that difficult to quantify the active small scale fleet in the Mediterranean region.

Fleets and gears characteristics

The information regarding fishing fleets is sparse. Many small boats, in many small-scale fisheries, those without engine in particular, are not registered. The information on capacity (i.e. tonnage, power) is often missing or, in the case bigger vessels, incorrect. Although there is no regional database providing a complete picture of the fleet and its characteristics, a synthetic appraisal of the situation could be presented on the basis of various sources, including:

- The European Commission has published annually, since 1983, the distribution by EU countries (<http://ec.europa.eu/fisheries/fleet/>) of the capacities and the number of units per type of *métier*. It could be argued that due to the complexity of the SSF the information provided by the national fishery administrations might not entirely reflect the very complex situations in each country.
- The OCDE provides online statistics on fisheries in Members of the Organizations, (<http://www.oecd.org/statisticsdata/>) including some Mediterranean States (i.e. Spain, France, Greece, Italy, Israel and Turkey). It is possible to extract particular information on volumes of landing, the values of landings, employment and the capacities of fishing fleets. OCDE also published in 2005 general information about fisheries in all its Members.
- The FAO has been publishing annual statistics on the fishing fleet's bulletins globally from 1970 to 1995. FAO also compiles a number of information on fishing fleets and their activity, provided by country in the form of Fishery Country Profiles (<http://www.fao.org/fishery/countryprofiles/search/en>). These sheets have been the main source of information used to prepare the present document.
- Since 2007, the GFCM has established a standardization of statistics on the activities and the production of fishing fleets of GFCM Members (i.e. the GFCM Task 1). Although already operational, this database is not yet complete.
- National statistics registers published each year would be in principle the most reliable sources on the status of the fishing fleets in each country. Their level of detail depends on the importance of the fishing sector in the national economy.
- A number of relevant and detailed information can also be found in specific academic studies on fisheries. Finally the information on fleet characteristics of some countries can be found in the documents published by the Mediterranean FAO Regional Projects (AdriaMed, CopeMed (phases I and II), EastMed and MedSudMed). For instance information from most of the western and central Mediterranean countries was compiled during COPEMED phase 1 and is also available online.

A compilation of these available sources of data could be summarized in the following tables:

year 2008	TRWL	PSSP	POLY	PST	ART	TOTAL	
ALBANIA	180	22			67	269	0,33%
ALGERIA	487	1039		7	2908	4441	5,42%
CROATIA	800	400		23	2600	3823	4,66%
CYPRUS	8	1	28	1	628	666	0,81%
EGYPT	1095	238			1791	3124	3,81%
France	111	24	27	32	1079	1273	1,55%
GREECE	311	281	511	2	16250	17355	21,16%
ISRAEL	31	19			388	438	0,53%
ITALY	3520	305	292	46	9258	13421	16,37%
LEBANON		70			2590	2660	3,24%
LIBYA	140	165		29	4695	5029	6,13%
MALTA	17		114	3	1018	1152	1,40%
MOROCCO	119	150	112	3	2974	3358	4,10%
MONTENEGRO	30	18			170	218	0,27%
PALESTINE	18	67			632	717	0,87%
SLOVENIA	20	9			152	181	0,22%
SPAIN	840	277	168	6	2052	3343	4,08%
SYRIA	21	5	30		1157	1213	1,48%
TUNISIA	399	360	227	24	10316	11326	13,81%
TURKEY	300	167	33	86	7406	7992	9,75%
TOTAL	8447	3617	1542	262	68131	81999	
	10,30%	4,41%	1,88%	0,32%	83,09%		

Table 1. Composition of the Mediterranean national fishing fleets by *métier* for the year 2008: TRWL = trawlers and dredgers, PSSP = purse seiners for small pelagic, POLY = polyvalent vessels > 12 m, ART = artisanal (small scale) boats, PST = tuna purse seiners, MAD = traps (Source: Sacchi, 2011).

		gillnets & entangling nets	hooks & lines	traps	miscellaneous gear	seine nets	surrounding nets	other gear	gear not known	dredges	trawls	lift nets	harvesting machines	total
GSA1 Northern Alboran sea	B	74	5	28		3				32				142
929 Boats		616	3	135		33								787
GSA3 Southern Alboran sea	B													0
70 Boats	C		70											70
GSA5 Balearic islands	B	3	2	1						1				7
542 Boats	C	132	111	74	28		190							535
GSA6 Northern Spain	B													0
234 Boats	C	196		38										234
GSA7 Gulf of Lions	B	64	20	151	65	4	1	107	29	10	1	1		453
1346 Boats	C	306	83	97	170	12	9	119	72	13	9	2	1	893
GSA8 Corsica Island	B	12	6	3		1		7	5					34
270Boats	C	129	32	13		2	2	31	27					236
GSA9 Ligurian & North Thyrrenian	B	216	16	16	11	53								312
1437 Boats	C	718	100	7	19	260	21							1125
GSA10 South & central Thyrenian	B	449	249		17	79								794
2810 Boats	C	984	485			287	246			14				2016
GSA11 Sardinia	B	112	37	107										256
1244 Boats	C	459	218	298						13				988
	A	957	215											1172
GSA12 Northern Tunisia	B	150	40											190
2697 Boats	C	935	300					100						1335
	A	1078	250											1328
GSA13 gulf of Hammamet	B	150	20											170
2562 Boats	C	664	300	100										1064
	A	3885	2000	300				200						6385
GSA14 Gulf of Gabes	B	200	20	40										260
9776 Boats	C	2031	300	800										3131
GSA15 Malta island	B	323	703	332	7		1							1366
2587 Boats	C	258	605	214		7	137							1221
GSA16 South of Sicily	B	165	43			10				10				228
811 Boats	C	375	146				62							583
GSA17 Northern Adriatic	B	514		536										1050
2938 Boats	C	634		1157	93					4				1888
	A		11											11
GSA18 Southern Adriatic	B	103	41			204								348
640 Boats	C	174	39			68								281
GSA19 Western Ionian sea	B	243	108			123								474
1559 Boats	C	564	149	13	9	227	123							1085
	A	61	32			1								94
GSA20 Eastern Ionian sea	B	1001	438	8		2								1449
4051 Boats	C	1748	630	13		115				2				2508
	A	98	71	2						1				172
GSA21 Aegean sea	B	2494	1593	57	340	1				14				4499
14447 Boats	C	4022	2279	258	2950	233				34				9776
	A	2	12											14
GSA23 Crete island	B	157	152											309
892 Boats	C	311	247			11								569
GSA24 North Levant	B				71									71
904 Boats	C				833									833
Total = 52746 boats		27767	12181	4798	4613	1736	792	564	133	107	51	3	1	52746
		52,64%	23,09%	9,10%	8,75%	3,29%	1,50%	1,07%	0,25%	0,20%	0,10%	0,01%	0,00%	

Table 2. Data from GFCM Task 1- A : Polyvalent small-scale vessels without engine (<12 meters), B: Polyvalent small-scale vessels with engine (<6m), C: Polyvalent small-scale vessels with engine (6-12 meters).

year 2008	TRWL	PS	PLV	ART
ALBANIA	280	200		80
ALGERIA	280	110		30
CROATIA	400	200		70
CYPRUS	630	270	180	70
EGYPT	400	110	50	40
France	310	320	150	70
GREECE	300	190	430	40
ISRAEL	240	90	0	30
ITALY	650	280	330	200
LEBANON				50
LIBYA	270	120		30
MALTA	430	260	70	60
MOROCCO	230	180	0	30
MONTENEGRO	170	140	0	40
PALESTINE	240	80	0	30
SLOVENIA	780	150	0	40
SPAIN	190	180	80	40
SYRIA	240	80	50	20
TUNISIA	400	110	50	20
TURKEY	400	200	80	50

Table 3.- Estimated values of average power (Kw) of the vessels. (In Sacchi 2011)

Different data source for small-scale fisheries at regional level could result into different scenarios for the same country depending on the denomination or definition of each fishery. For example, in Algeria the number of active small-scale vessels in 2003 was 2210 according a PESCAMED report, although other sources mentioned the existence of 1663 “petit métiers”. Data from COPEMED in 2003 referred to 1646 small-scale vessels using 19 different gears.

To complete the Mediterranean picture, eight active traps for bluefin tuna or tuna-like species fishing one in Spain, one in Morocco and another six in Italy should be accounted (Sacchi, 2011).

In 2008, 61% of the Mediterranean fishing units (50,000 boats) were based in Greece (17,355 boats), Italy (13,421 boats), Tunisia (11,326 boats) and Turkey (7,992 boats). Among the Mediterranean countries these four countries also had the largest small-scale fishing fleet at national level, where 63% on average of the total number of fishing vessels were small-scale. The fleets of southern countries on the other hand represented in 2008 38% of the total number of Mediterranean fishing units, 42% of them being small-scale fishing vessels.

As a general comment it could be affirmed that many small-scale fishing vessels operating at regional level are more or less unsafe, due to their important average age and the low engine power of part of the fleet. The situation is different from one sub-region to another and from the one country to the other but there is in some areas a general trend in the small-scale fleet

in not adjusting fishing gears according to fishing activities or in not taking precautionary measures needed for their safety.

Small-scale fisheries encompass a great number of fishing techniques as more than 50 types of fishing gears are used and include all the *métiers* that are not typically industrial, such as the following trawl nets, large seines for large and small pelagic, large longliners and hydraulic dredges for shellfish. The most common fishing gears used in the Mediterranean small-scale fisheries remain static nets, particularly trammel nets and gillnets. At the beginning of the 80s, thanks to the introduction of cheaper synthetic material coming from Asia, their use spread out quickly in the region. Because they are easy to set, less cumbersome than traps, safer than longlines and, above all, much more efficient, gillnets and trammel nets progressively replaced various other static gears. Nearly all gillnets and trammel nets now in use are made from nylon. Monofilament nylon for making these nets proved in many cases to increase effectiveness compared to multifilament. However, it is now forbidden in some countries such as in Greece.

The gillnets and trammel nets are usually set before sunset and hauled after dawn, generally remaining for less than 10 hours at sea. Depending on the target species, these static nets may be used from very shallow waters to deeper bottoms ones. The length of net set obviously depends on the size of the vessel, the space available on board and the number of the crew.

The FAO country profiles and the annual national reports collected by the GFCM give some additional information on the SSF fleets in selected Mediterranean GFCM Members, as broken down below:

Albania

70% of Albanian active fishing fleet account for small scale fisheries, according to the data of the National Fishing Fleet Register for 2012. Of these vessels 95% belong to the polyvalent passive gears segment and the remaining to polyvalent gears. According to the socio-economic survey carried out in 2012, the total volume of landings of these segments is more than 900 tonnes which resulted in a total value of approximately 4 millions of USD.

In the Albanian Adriatic coast the most used gears are trammel nets, gillnetters, entangling nets (with different mesh size according the targeted fish/size), uncovered fishing ponds, concrete/metallic like –pots, while in the Ionian Sea coast the main fishing gears are long lines and gillnetters. About 90% of fishing boats use engine of 5-40 HP, 10 % of them without engine. Generally the fish product, is sold directly by the fishermen on the boat, especially during spring-summer time, when the prices/revenues are rather high in respect to those that can be earned if the fish is sold at the local wholesale points. In winter and autumn time, with limited fishing days at sea, the fish is mainly used for personal consumption by the fishermen families. The most important species are: *Dentex* spp. Soleidae, *Diplodus* spp., *Parapenaeus longirostris*, *Octopus vulgaris*, Mugilidae, *Platichthys flesus*, *Sepia officinalis* in the Adriatic coasts while etc. *Sciaena* spp., *Diplodus* spp., *Sarda sarda*, *Dicentrarchus labrax*, *Xiphias gladius*, *Lepidopus caudatus*, *Scomber* spp, *Pagellus* spp, etc. on the Ionian coasts.

Among the conflicts, some are reported between small scale vessels operating along the coasts and those operating in the coastal lagoons, which although managed by a different licenses system operate also on the coasts.

Algeria

The Algerian small-scale fleet is mainly composed of vessels less than 12 m long and gross tonnage from 01 to 10-ton boat. The main rang of size vary from 3 to 9 m with power ranging

from 5 to 40 HP and a crew of 2 to 8 fishermen based on the gears used. These vessels spend from 2 to 16 hours at sea and they use different gear according to the seasons. Artisanal fisheries are carrying out along the continental shelf and in the coastal areas. The total number of sites practicing the SSF identified by COPEMED (Sahim and Bouaicha, 2003) is approximately 64 with 32 ports, 23 beaches and 9 natural sites; there were identified a total of 1646 active boats providing direct employment to 4012 fishermen.

Most frequently used gear are the various types of gillnets, trammel nets, longlines and hand lines. Some small purse seiners also exist, as well as vessels specialized in the catch of certain target species like swordfish.

Croatia

Marine fisheries have a significant small-scale character and the Croatian fleet is mainly made of small and relatively old fishing units, averaging 66 kW engine power and 11 GRT. This corroborates the large predominance of very small coastal units. A major proportion of the fleet is represented by multipurpose vessels exploiting mainly sardine, european anchovy, hake, red mullets, Norway lobster, octopus species, breams and various flatfish. The catch is landed at numerous small landing places along the coast.

Cyprus

Small-scale fisheries in Cyprus concern the inshore use of small wooden boats between 6 to 12 m, which mainly fish with bottom set nets, longlines and fish traps. A multipurpose fishery operates with boats of about 16 m in the waters of Cyprus and in international waters in the Eastern Mediterranean¹. Nets and bottom longlines are mainly used but, periodically, also fishing with surface longlines and fishing for swordfish and tuna occur. In 2003, 105 fishermen were fulltime on 38 boats licensed for multipurpose fishing. The main species caught include *Spicara smaris*, *Boops boops*, *Mullus surmuletus*, *M. barbatus*, *Octopus*, cuttlefishes and a lessepsian immigrant *Siganus sp.* Large pelagic species are targeted by the multipurpose fishery in national and international waters of the Eastern Mediterranean and include *Thunnus thynnus*, *Xiphias gladius* and *Thunnus alalunga*. Monofilament nets are banned and trammel nets must have a minimum stretched mesh size of 32 mm. The timing for setting nets is also regulated. Fishing licence limitations also control the multipurpose fishery.

Egypt

The total number of Egyptian registered fishing vessels operating at sea including the Mediterranean and Red Sea is 6,480 fishing boats; 4,089 of these vessels are equipped with inboard engines, with more than 50 up to 1,000 hp, using different fishing gears such as trawl, purse-seine, long-lines, trammel and gill nets. (PescaMed 2011). In the Mediterranean the 2008 fleet was composed of 4,509 fishing boats with 1,379 sail boats, and 3,190 motorized vessels, which use different fishing gears as above. There were 1,095 trawlers, 238 purse seines, 1,267 pelagic long-liners (Tuna and swordfish) and 529 trammel nets. While the number of trawlers and purse seiners was stable in the last five years, the number of long liners has doubled. It is highly likely that most of the 1,379 of sail boat operate mainly in the lagoons and in other costal semi-closed water bodies (EastMed 2013, in press.)

¹ <http://stecf.jrc.ec.europa.eu>, gives information on the EU countries. The 2012 report mentions that in Cyprus, 20 vessels belonging to PGP segment (polyvalent) are between 12 and 24 m. If the length is not the criterion to define SSF, but the gears, given that those 20 vessels use only nets and longlines, could be categorized as SSF vessels

The small-scale fishing vessels vary between 7 to 15 m in length and are powered by small outboard or inboard engines from 8 to 150 hp. The fishing trip usually takes from 1 to 5 days and the number of crew employed ranges from 2 to 8 fishermen per vessel. The main fishing gears include hand lines, longlines, gillnet and trammel nets. They target both demersal and pelagic species depending on the fishing season.

Egyptian fisheries has seen a drastic change in the last decades, with a considerable expansion of the trawl fishery. The landings of the Egyptian fleet in 2011 amounted to 39,307 tons with a value of 143,840 million dollars (EastMed, 2013, in press). Egyptian Mediterranean capture fisheries are important for local coastal communities, providing employment opportunities (about 32,000 fishermen and about 150,000 indirect beneficiaries were estimated in 2009). Along the Mediterranean coast the fishing grounds exploited by Egyptian vessels were mainly located in the central front part of the Nile Delta, where the continental shelf is wider compared to eastern and western coastlines. Fishing in this area is limited to 100 m depth, due to the relatively small dimensions of the majority of the fishing vessels operating and the lack of information on deep-sea resources. Official reported landing sites from west to east include: Salum and Mersa Matruh (Matruh province) Al Max, Al Anfoushy, Mena Sharki and Abu Qir (Alexandria province) Meadea and Rashid (Behera province) Borge Al Burollus and ElJezera ElKhadra (Kafr Al Sheakh province) Al Borge (Dumyat province) Port Said (Port Said province) and El Arish (North Sinai province). In addition, there are several others small landing sites.

France

The small-scale fleet is the most important component of the overall French fleet in terms of fishing units as it represents more or less 90% of the total number of the French fishing boats operating in the Mediterranean Sea. The French fleet composed of boats less than 18 m long correspond to the administrative definition of "artisanal fisheries" (Farrugio and Le Corre 1993). All the boats are engine-powered and usually performs less than 24 h fishing trips, using simultaneously several different gears according to the seasons and the regions. The gillnets and the trammel nets are the most used gear, but small trawls, dredges, driftnets, trolling lines, handlines, beach seines, set nets of several kinds, longlines, pots and traps, purse seines are also used. Their catch is composed by a great number of species which also varies from one season to another. It must be noted that in the Mediterranean the small-scale French fleet is split between the sea coastal area and a chain of lagoons representing a total of 50,000 hectares and communicating with the sea (in these lagoons an important aquaculture activity also exists). In the Gulf of Lions the small-scale fleet decreased of roughly two thirds during the last decades. However, this activity is still consistently practiced, with a 769 registered active entities and 81% of total fishing manpower in 2008. A total of 171 boats were registered in Port-Vendres, 222 in Sète, 175 in Martigues and 201 in Marseille. In 2010 the small scale fleet of the Languedoc-Rousillon region was composed of 897 boats (Table 6).

Type	N° boats	ratio	total GT	total KW
Gill& Trammelnetters	669	74,58%	2 077,10	49 510,00
Lonliners	180	20,07%	247,3	8 499,00
Dredges	45	5,02%	116,2	3 143,00
Beach seines	2	0,22%	3,9	220
Liners	1	0,11%	40	316

Total	897		2484,5	61688
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Trawlers	90	89,11%	8 914,10	27 957,00
Purse seiners	11	10,89%	374	2 603,00
Total	101		9288,1	30560

Table 6. - Composition of the fleet of the French Languedoc-Roussillon Region in 2010

Greece

Greece has a typical multi-gear and multi-species fishery and there are more than 16,000 gill-netters and bottom longliners employed in the fishery sector, mostly vessels smaller than 12 m. From a national survey between 2002 and 2006 in 147 fishing ports (www.inale.gr), a total of 1737 registrations were realised for gillnets and trammel nets, 5 registrations for veranda nets, 78 for combined nets, 57 for small surrounding nets, 616 for long lines, 36 for vertical lines, 47 registrations for trolling lines, 30 registrations for traps, 23 for fyke nets, 3 for pound net and 8 registrations for various methods of fishery. The technical characteristics that were recorded referred to the followings: (length, height, mesh size, net material and twine thickness, material and diameter of ropes, number, diameter and material of floats and weights, number and size of hooks, way of rigging, dimensions of traps and coastal trawl gears). Were recorded also data that concerned in the fishing technique (fishing season, depth and type of bottom, soaking time, number of gears used simultaneously). The recordings were used to create a data base. It is noted that the gill-netters are largely predominant in number and this underlines the importance of shore fishing even nowadays, when the activity continues to be one of the most important among those practiced in the coastal zone.

Israel

In 2005, 519 small (up to 11 m) boats were licensed. These fishermen owning the licenses could switch between gillnets and bottom or floating longlines, depending on the availability of fish and the season. Their boats landed catch along the entire Israeli coast, either on the beaches or in small protected inlets, as well as in major ports and marinas.

Italy

In the Mediterranean Sea Italian small scale fishing areas cover about 8000 km of coastline; about 800 landing points are operating and the fishing fleet is distributed all along the national shores. Out of the 800 landing sites only 198 are strictly considered harbors (PESCAMED 2011). According to a PESCAMED analysis, in 2008 the prevalence of small-scale and trawling fishing was evident. The first category of vessels accounted for 8.831 units from a total 13.683 vessels. The bulk of the fleet, (around 70% of the total) hence consisted of small-scale vessels, generally <12 m LOA and <6 GRT, deploying various fixed gear (nets, longlines, traps, etc.) on the continental shelf.

Libya

The fleet (MedSudMed country profile <http://www.faomedsudmed.org>) is mainly composed of artisanal vessels (92.5 %). Most of the catch is taken by small-scale boats working with trammel nets and gillnets or longlines and handlines and by the *lampara* fleet fishing for small pelagics. These crafts call to roughly 150 landing sites, including beaches, anchorages and harbors. Small-scale units include roughly 4695 vessels (Sacchi, 2011). Approximately

two-thirds of the smaller craft are motorized, usually with outboard engines in the 10-35 hp range. The larger units are decked vessels and are all fitted with inboard engines.

Types of small-scale fishing boats in Libya (Lamboeuf, M., 2000):

Batah: 7-8 m flat-bottomed boat *used to* fish gillnets and pots (*octopus*) in shallow lagoon waters; propelled by outboard engine for commuting then with a pole during work.

Gaïk: double-ended boats of 4-6 m, derived from traditional craft that were propelled by oars, often now *adapted* for outboard engine propulsion; more common in the western part of the country.

Flouka: small fishing craft of *varied* sizes ranging from 2 to 7 m; shapes are diverse but generally with a flat transom and no deck; powered by outboard engines.

Mator: generally greater than 5-6 m in length running up to 18 m or more, with deck and roof for the *smallest units*, wheel house, fish hold, and net hauler for the largest; shape and design similar to units found in Tunisia, Greece and Egypt.

Lampara: usually 12-13 m with deck, inboard engine, a small roof and a purse seine winch; associated with one to three *Dghaissas* carrying kerosene or butane gas lights to catch small pelagic fish using light attraction at night; some units may convert to net and/or line fishing during the off-season; only present in the western part of Libya.

Dghaissa: 7-8 m, without *deck* and engine; serves as light boat in association with the *Lampara*.

Lebanon

Fishing activities in Lebanon have always been considered at small-scale level, traditionally based on bottom stationary gears (trammel nets and longlines), purse seine nets and beach seines (PESCAMED 2011; Sacchi & Dimech 2011). In 2004 the Lebanese fishing fleet was made up of 2,662 operational fishing vessels calling to 44 fishing ports along the 220 km of coast. These fishing vessels are typical small-scale vessels of less than 12 m, with 60% of the fleet less than 6 m. The average gross tonnage of the boats and the average power are 2.52 t and 22.68 hp respectively, with 71% of the vessels having an engine power less than 30 hp. Most of the vessels (92%) are motorized, usually with inboard diesel engines of 20 to 50 hp (often a truck engine). Only few vessels have a Global Positioning System (GPS), while the rest have very limited navigational or safety equipment, with 20% of the vessels having small electronic fish finders. Although the construction of the vessels is quite good, they are not built to face rough seas, fish in offshore waters and are not equipped to keep the catch in good conditions, for example they lack facilities for ice packaging. The crew on board of each vessel is made up of 2 to 4 fishers usually, with most of the boats being individually owned (80%). Equipment for the preservation of fish is very basic, with some of the vessels having insulated fish holds and use ice for longer trips. Main fishing techniques used are mostly based on passive gears such as gillnets, trammel nets, longlines, purse seine nets and *lampara* nets. Fishing operations, with the exception of longlines, are mostly carried out at depths of up to 50 m. The national fleet is built almost exclusively for small scale and inshore activities, with some vessels equipped with old low quality echo sounders to detect fish. Their net winches are not fitted to haul gillnets deeper than 50 m, without the risk of damage or loss of the gear.

Malta

Maltese fisheries are of a typically Mediterranean artisanal type, mostly small-scale, employing full and part time fishermen switching from one gear to another several times throughout the year. The number of active vessels, including small-scale vessels, varies

according to fishing season, with minor ports having practically no active vessels during the winter period and major ports having only a quarter of the registered vessels landing fish in the same period. With the exception of trawlers, the average Maltese fishing vessel is under 10 m. Most vessels are traditionally crafted (i.e. the wooden luzzu and kajjik), although more than 35% of the fleet is composed of multi-purpose fiberglass units. The main engine power of small-scale fishing vessels is generally very low. They use mainly various forms of hook-and-line, different types of gillnets and entangling nets and traps (i.e. bogue and octopus traps). The most common method of fishing is set bottom longlining, which is seasonally carried out by over half of the active fishing vessels, especially those belonging to the fleet segment less than 6 m and those belonging to the 6 to 12 m fleet segment. Other frequent methods of fishing are drifting longlines, trammel netting and hand trolling with lines, which are locally known as “rixa” and target mainly dolphin fish, frigate mackerel and amberjack. Apart from these activities, an important share of small-scale vessels (i.e. less than 6 m) also participate in the traditional dolphin fish, or “lampuki” fishery, which relies on Fish Aggregating Devices (i.e. FADs, locally known as “kannizzati”).

Montenegro

Legal framework in Montenegro recognizes small-scale (commercial) fisheries, which differ from large-scale fisheries in vessel size, type and number of fishing gears permitted. There is only limited data available on the size and catch of the current small-scale fishing fleet. The number of licensed vessels (70 in 2012) as recorded by the Ministry of Agriculture, represents only part of the total small scale fleet, as no national monitoring system on these fisheries is in place and, apart from some estimations, poor data on catch are available.

Gillnets are the most common type of fishing gear, followed closely by trammel nets and beach seines targeting pilchard (*Sardina pilchardus*) and anchovy (*Engraulis encrasicolus*). Out of the 70 vessels registered, 71% operate in Boka Kotorska Bay (ports of Herceg Novi, Zelenika, Kotor and Tivat), the area where small-scale fisheries, particularly those involving beach seines, have been present for centuries, and are part of the cultural identity of the people from the region. Around 61%, are vessels with length overall below 6 m, and the rest (39%) are in the 6–12 m segment.

Morocco

The fishing production in Morocco significantly increased since 1990, mainly owing to Atlantic landings of small pelagic and demersal fishes. In the Mediterranean region the most important species landed are small pelagics. The number of Mediterranean ports (PESCAMED, 2011) is 6, plus 3 additional landing sites (i.e. Sidi Hussaine, Cala Iris and Finideq). In addition, a high number of landing sites are known to exist for small-scale fisheries and they are distributed across the Mediterranean shores of Morocco. In 2003, an inventory of small-scale fishing communities done by COPEMED reported the existence of more than 90 landing sites, used by roughly 2,600 active boats. Small-scale fisheries in Morocco encompass small vessels, usually under 6 m length, with or without engine and using a great variety of gears (i.e. from 2 to 5 per vessel). The number of different artisanal gears used accounts for some 20 *métiers*. The small-scale fleet usually operates in proximity of the coasts during the whole year in the case of trammel nets, longlines and beach seines, or seasonally, in the case of trolling lines targeting bluefin tuna and bottom longlines targeting Blackspot seabream in the Gibraltar Strait region.

Spain

80% of the Spanish fleet is small-scale (Camiñas; Baro & Abad, 2004) and more than half of them have no inboard engines and interchangeably use gillnets, bait or traps, according to

their target species and the different ecological environments accessible to them. Management of this fleet falls under the competences of autonomous governments that regulate fishing activities and landing and are responsible for the collection of statistics. A study of the Spanish small-scale fleet in each autonomous region was carried out during the 80s, with the support of the European Commission (Camiñas, Baro & Reina, 1990). Additional information was collected during the phase 1 of COPEMED (available online). The Spanish small-scale fleet fish mainly with static nets, namely gillnets and trammel nets. A more specialized segment of this fleet relies on dredges targeting bivalves and there is also a high number of octopus pots deployed.. Other gears used include bottom loglines, trolling lines, handlines and other lines. In some fishing grounds and during some fishing seasons small-scale driftnets targeting medium pelagic species (i.e. bullet tuna, bonito, etc.) are also used. The total number of different gears used in is around 50. The diversity in small-scale vessels construction is witnessed by the traditional Phoenician jábega (between 7 to 9 m of length), small boats (between 5 to 7 m length) without deck, boats without keel, with and without inboard engine (i.e. chalana, patera), boats between 6 to 8 m length with inboard protected engines and a TRB of 90 hp. Small-scale vessels built in fiberglass are also used, mainly those of larger length and higher engine power.

Syria

The fishery sector plays a minor role in the Syrian economy (<http://www.fao.org/fishery/facp/SYR/en>), due not only to the scarcity of resources and the low natural productivity of fishing grounds, but also to technical, administrative and legislative constraints. Small-scale fishery dominates in the marine. It comprises some 1200 coastal fishing vessels licensed to fish within the territorial waters (12 n.m.) along a coastline of 183 km. Real industrial marine fishery barely exists, except for 21 comparatively small offshore vessels operating beyond the 12 n.m. zone.

Artisanal fishery is the only capture fishery in inland waters with 1 283 small fishing boats, of which 436 are motored. Main inland water resources are located in the south and southeast of the country. Other resources in the western, central and coastal areas are considered marginal. Fishing communities are distributed accordingly.

Capture fishery has been traditionally a source of living for poor and more-or-less illiterate people in coastal and lacustrine areas. The low output of capture fishery, particularly in inland waters, does not secure more than a minimum living for artisanal fishers.

Tunisia

Since antiquity, the history of Tunisia is closely linked to the sea and the coastline that has been the site of intense human activity and that is a major component of its territory. Small scale fisheries in Tunisia (FAO-ArtFiMed 2011), is the most important sector in terms of employment, value of production and contribution to the exportation.

This sector employs about 33,500 fishermen and 5,000 seasonal workers wich represent around 75% of direct employees in the fisheries sector. Small scale fisheries produce about 28,000 Tons of high value products (27% of the quantities fished in Tunisia) and contribute to 40% of the value of total production at the national level.

There are around 10.500 Small Scale boats (93% of the total fleet in Tunisia) with size ranging from 5 to15 m. Most part of the fleet (57 %) is not motorized (rowing boats and sailboats).

There are many fishing techniques and gears used, but most part of them are passive gears (gill nets, lines, traps and pots, traditional fixed fisheries "charfia"). However some traditional active gears are used, such as small beach seines (tilla, damask or sautade, hlig and kiss).

It is important to notice the existence of several specific fisheries, assimilated to the small-scale fishery. These fisheries are the lobster fishery which is practiced mainly with trammel nets, the coral and sponges fisheries, and the clam fishery, practiced essentially by women, without vessel.

Turkey

By far the largest numbers of Turkish fishermen are employed in the small-scale fishery sector. As much as 85% of the Turkish fleet is composed of small vessels under 10 m length. A typical "two-men operation" uses an open boat of 8 m length with a 10–25 hp diesel engine (<http://www.fao.org/fishery/facp/TUR/en>). Larger fishing vessels of 10 m may have three fishermen onboard. Some are equipped with depth recorders or fish finders. Most small-scale fishing vessels use basic gears, such as trammel nets and longlines. These small boats are operated by a mixture of professional (i.e. full-time), subsistence (i.e. part-time) and recreational fishermen.

Target species and production

Small-scale fisheries are basically a "species driven" activity and the gears used are very selective. In many cases fishermen report the targeting of more than one species at the same time.

Thus, it could be affirmed that national small-scale fleets operating in the Mediterranean region are oriented towards the catch of a high variety of species, up to one hundred different demersal fishes, crustaceans and some small and large pelagic species. What species are targeted depends on the distance from the coast of the fishing grounds, depth, bottom characteristics and the different periods of the year. In any case, small-scale fisheries production is of high economic value as the catch is generally sold fresh in local markets or directly to private consumers or restaurants. In some countries parts of the production of small-scale fishing are almost all exported. Examples include clams production in Tunisia (ArtFiMed, 2009) or blackspot seabream captures in Morocco (ArtFiMed, 2010).

An important aspect of small-scale fisheries is that they target most of the priority species listed by the GFCM. Many times small-scale fleets capture those species which are evaluated by the scientific working groups on demersal and small pelagic species of the GFCM Sub Committee for Stock Assessment. Regardless, these captures are in many cases not included in the assessments because they are not reported in the national statistical systems. To improve the status and knowledge of the main stocks it is hence necessary for the GFCM to evaluate the contribution of small-scale fisheries in the Mediterranean based on the total annual landing by species and country.

Fishing areas and periods

Due to the extreme variability of the fisheries and to the multispecificity typical of the region, the definition of fishing grounds cannot be easily made. However, it is generally possible to geographically determine a certain number of distinct and well localized fishing grounds. Small-scale vessels mainly operate from small ports and landing sites relatively close to the

resources which are fished. They mainly exploit inshore areas and areas that would be difficult targets for trawlers, like the rocky bottoms or the canyons on the continental shelves.

They are generally very small areas and correspond to those where the exploitation of a species or a group of species by a local or regional group of fishermen using the same fishing technique during a certain period of the year occurs. There is generally a total or partial overlapping among these areas and their complete topographic illustration results in a complex patchwork. This is the direct consequence of the said multispecificity of the region and the distribution of patterns and seasonality, but also of the polyvalence of small-scale fishing units.

Although fishing grounds exploited by small-scale fisheries are mainly located in the continental shelves, in many countries there are also important coastal lagoons separated or connected with the sea where small-scale fisheries, normally very specialized, take place. Coastal lagoons, and also delta rivers, are hence hubs for the development of small-scale fisheries due to the high biodiversity and productivity of this areas and their proximity with locations and sites of relevance to fishermen. An inventory of fishing grounds based on coastal morphological features (e.g. lagoons, deltas and others) and small-scale fisheries interconnected with them would have to be undertaken.

Some examples of the different national situations are as follows:

- In Albania the fishing activities take place at sea but there are also several lagoon areas where fish capture occur (i.e. Lagoons of Patok, Karavasta, Nartë, Vlorë, Gulf of Drini River and Lake Butrint). The same situation is known to occur, among others, in French coastal lagoons.
- The French marine small-scale fishery is operated near the coast (generally within 12 miles) and about 60 % of the activities of the fleet are operated in the shallow waters of the coastal zone, between 0 and 20 m depth. Some of the biggest boats also fish at depths of more than 100 m and even in the canyons of the continental slope, in particular the gillnetters targeting the hake.
- In Egypt the fleet is concentrated mainly in the coastal area of the Nile delta region. There is a closed season in May and June.
- In Lebanon the fishing area is usually limited within 6 nautical miles from the shoreline (Sacchi and Dimech, 2011), with 78% of the fishermen fishing within this limit, and less than 10 vessels operate beyond the 6nm.

Number of fishworkers and associated employments

At present small-scale fishermen represent the largest part of the population active in the fishery sector in the Mediterranean Sea. Usually, small-scale fisheries revolve around family-based businesses as the owner of the boat goes himself at sea, often times together with other members of the family. Many fishermen are also known to run other businesses on land (i.e. part time activities focusing on fishing and agriculture). Many small-scale vessels fish only for a few months during the year and it is not uncommon for them to be operated by retired people which are legally licensed as fishermen..

The availability of data on crew members depends largely on the existence of public services in charge of monitoring the fishermen for social, economic or security purposes. The inclusion or the exclusion of a sailor in the crew list of is directly linked to the activities of the

fishing vessel concerned. In periods of inactivity (i.e. repair, winter) some members of the crew may remain be “landed”, so the employment rate is variable and not always well known.

Combining various sources available, it can be estimated that approximately 250.000 people have been employed during the year 2008, in the sole Mediterranean fishery sector. More than half of the fishermen (55%) were working in the small-scale fisheries sector. This distribution, however, understated the strength of small-scale fisheries as national statistics do not usually account for fishermen without a boat, not motorized and, especially, the large population of occasional fishermen.

Ancillary activities such as processing, net/gear making, ice production, boat building/maintenance, fish processing equipment, packaging, marketing distribution, engine repair and maintenance, etc. can also provide additional fishery related employment and income opportunities in fishing communities.

year 2008	TRW					ART	TOTA	
	L	PS	PLV	PST	MAD		L	
ALBANIA	729	97				158	984	0,40%
								15,60
ALGERIA	4480	20780		112		13480	38852	%
CROATIA	4000	5600				5200	14800	5,94%
CYPRUS	48	12	112			754	926	0,37%
EGYPT	3675	2206	647	96	70	2152	8846	3,55%
France	455	240	95	512		1101	2403	0,97%
GREECE	1866	2529	1789	32		15138	21354	8,58%
ISRAEL	248	399				776	1423	0,57%
								12,25
ITALY	10965	2277	1153	736	420	14953	30504	%
LEBANON		840				8194	9034	3,63%
LIBYA	560	1320		464		5313	7657	3,08%
MALTA	68		460	48		1527	2103	0,84%
MOROCCO	1785	3900	1568		70	8922	16245	6,52%
MONTENEGR O	120	135				255	510	0,20%
PALESTINE (Gaza Strip and West Bank)	90	670				2528	3288	1,32%
SLOVENIA	100	108				228	436	0,18%
SPAIN	8760	4760				4478	17998	7,23%
SYRIA	252	100	165			3471	3988	1,60%
								19,55
TUNISIA	5426	5508	1249	384		36106	48673	%
TURKEY	1500	3340	149	1376		12590	18955	7,61%
TOTAL	45127	54821	7387	3760	560	137.324	248.979	
	18,12							
	%	22,02%	2,97%	1,51%	0,22%	55,15%		

Table 7. Number of fishermen by group of *métier* and country; TRWL: trawlers; PS: purse seiners for small pelagics; POLY: polyvalents boats > 12 m; ART: artisanal fishing; PST: large purse seiners; MAD: traps. (source, Sacchi 2011)

Conflicts (between SSF, with other fisheries, with aquaculture, with other activities).

Small-scale fisheries often compete and conflict with industrial fisheries. The pros and cons of the one or the other depend on local contexts and are difficult to generalize. When there is competition for the resource, this can lead to the overexploitation and the demographic imbalance of certain stocks or to illegal (IUU) fishing. This type of competition often leads to mutual allegations of destruction of juveniles or spawners between small-scale and industrial or semi-industrial fleets. Competition for the resources (Charles, A.T. 1992) could contribute to illegal activities as the use of illegal gears, fishing in prohibited areas etc. Despite the wide range of possible conflicts, they can be organized in a relative small number of categories. They are mainly related to competition for target species, space and markets, but also with local aquaculture, coastal users (e.g. tourist industry, pollutant industries) and administrations (e.g. construction of big ports and other infrastructures). Four categories of conflicts are cited by the referenced author:

- i) Fishery jurisdiction: involving fundamental conflicts over who owns the fishery, the management form and what should be the role of the administrations in the fishery;
- ii) Management mechanisms: concerning the implementation of fishery management plans, involving fishers/government conflicts over harvest levels consultative processes and enforcement;
- iii) Internal allocation of fishery resources: involving conflict within the fishery system, different groups or gear types, as well between fishermen, processors and other players;
- iv) External allocation of fishery resources: incorporating the wide range of conflicts arising between fishery and “outsiders”, including foreign fleets, aquaculture farmers, non-fishing industries (such as tourism and forestry) and indeed the public at large.

Each conflict appears to fit under at least one of the four headings although some will fall under more commercialization of fishing products out of the legal channels, etc. Another conflict is related with “gear wars”, namely the identification by the fishermen of certain gear as more selective than others and, as consequence, more sustainable.

There is often a competition for space: many fishing areas are exploited jointly by several fleets which often causes the destruction of the fixed gear used by the small-scale vessels. Otherwise, illegal or derogative incursions of trawlers in the coastal strip whose exploitation is generally authorized only for the small-scale vessels are a very common source of conflict between the two activities. The traditional places for casting fish nets are everywhere a point of dispute and most of the times fish workers communities end up as losers of this battle.

In general, it has been observed that the productivity of the small-scale fisheries is strictly linked with the importance of the offshore semi-industrial fisheries. All the scientific studies dealing with the interactions between fisheries show that a decrease in the fishing effort of the large boats -particularly the trawlers- will result in a substantial increase of the small-scale vessels catch per unit effort. In fact, many of the species targeted by the small-scale fishermen are also exploited by the offshore fleets which apply an intensive fishing effort on the stocks.

Incompatibilities between fish farming and small-scale fisheries potentially exist and conflicts are most common than synergies. Conflicts can increase fishing pressure if wild sources of seed and feed (low value/trash fish) are accessed. Intensive cage fish farming can restrict local access to fishing grounds, modify the marketing flow by the introduction of new products from aquaculture and the possibility to introduce or transfer diseases to the natural resources.

Production of small-scale fisheries

Small-scale fisheries traditionally represent an important share of the fish caught in the GFCM Area, although no information at regional level exist neither on the captures nor on its socio-economic dimension. Official fisheries statistics generally do not distribute the production by type of fleet. Since fishing operations and vessels vary in so many different ways there are numerous criteria that can be used to divide a fishing fleet into sectors, contributing to the lack of consensus on how to classify the fishing operations. Different countries use different criteria in their national statistics. The FAO, through its Fisheries and Aquaculture Department, has never attempted to allocate systematically world catches to one or the other of the two categories. Hence, it is very difficult to evaluate precisely the proportion of the catches and/or landings which come from the small-scale component.

In general, it can be said that small-scale fisheries production is a high quality one, composed of species of fish, crustacean and molluscs which are much sought after by national consumers and have the major economic value on national markets although some important species as octopus or clams in Tunisia are mainly exported. Their high quality is mainly due to the shortness of the delay between fishing and landing and to the use of selective and non-harmless gears. This allows to avoid to spoil the fishes and to bring them on the market in a very condition of freshness and conservation.

Individual productivity is highly variable from one boat to another. Differences also exist between areas, seasons and gears. As an example, it has been calculated from scientific samples that the daily production of a small-scale vessel can vary from 10 to 90 kg, with an average of 45 kg/day for the April to October period in the coastal area of the Gulf of Lions. The same variability is observed in Mediterranean lagoons where the daily catch of a fisherman can be comprised between zero and 200 kg over a six months period. A COPEMED study has shown that the landings of the Tunisian site of Ghannouch could vary from 0.88 to 3.2 kg by pieces of net on average (considering 12 months from January-December). The same analysis gives an average in landing for vessels with engines or using oars of 50.03 Kg and 42, 58 Kg by fishing day, respectively. The different methods and units used in the different countries and studies to indicate the productivity also complicate the possibility in giving a figure of global production for small-scale fisheries in the Mediterranean Sea.

Landing, commercialization and marketing channels.

The landing places of small-scale vessels are widespread all along the Mediterranean coast because they generally ignore classical infrastructures (e.g. auctions, fish markets) which are quite exclusively used by the larger boats. Apart from some rare exceptions in the south and eastern countries and in most of the EU countries, the catches are landed directly in the place where the fishermen live or keep their vessels (small ports or beach). As a result, the fish is often sold immediately on the dock/beach. This production is almost never frozen or

transformed before the commercialization. First fish buyer or fish mongers are on the beach where the vessels arrive after fishing. Many times the buyers are also the provider of fishing material and baits, having a close relationship with the local fishermen and sometimes with fishermen from other landing sites. The buyers are really those who set the first selling price of the fishing products in most occasions.

All kind of direct sellings can be met: some fishermen own their balance, others weight their fish in a friend's shop on the beach, some others stock it in a cooler and sell it after some hours. In some places the direct selling to regular customers is the main way of marketing. In other places the fishermen traditionally are accustomed to sell their production in the surrounding markets. The direct marketing to restaurants or to tourists is also a very common and important practice. Often the commercialization of the catch is organized within the family of the fishermen whose wife or parents own a restaurant or a small shop or distribute the fish in the villages. But the marketing channels can also be more complex and involve several intermediates (e.g. retailers, wholesalers).

In some cases the marketing of some small-scale fishery products are well advanced. In Morocco the production of blackspot seabream (*Pagellus bogaraveo*) for instance, is a valuable product used for exportation mainly to Spain. Prices and channels for marketing (internal and exportation) are under a strict control by the main actors of the system (Fig 1).

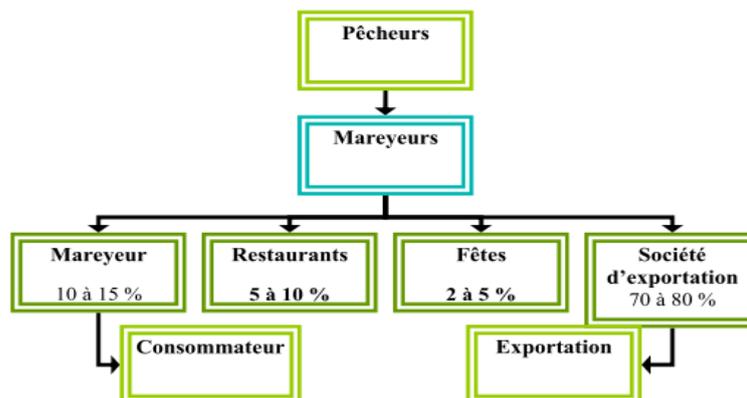


Fig. 1.- Marketing circuits of the artisanal products landed in Dikky (Morocco). *Source: FAO-ArtFiMed (2010)*

1.2 Social elements

Small-scale fisheries are accorded special recognition by the 1995 FAO Code of Conduct for Responsible Fisheries, and are, in fact, the only fisheries sub-sector specially mentioned in the Code. Article 6.18 of the Code states: "Recognizing the important contributions of artisanal and small-scale fisheries to employment, income and food security, States should appropriately protect the rights of fishers and fishworkers, particularly those engaged in subsistence, small-scale and artisanal fisheries, to a secure and just livelihood, as well as preferential access, where appropriate, to traditional fishing grounds and resources in the waters under their national jurisdiction."

For many small-scale fishers and fish workers, the sector represents a way of life and it embodies a diversity and cultural richness that is of global significance. The sector is diverse and dynamic and its characteristics vary from one location to another. It tends to be strongly rooted in local communities, reflecting their traditions and values. Many small-scale fishers and fish workers (employed in associated jobs, in particular in fish processing, distribution and marketing) are self-employed and engaged both in directly providing food for their household and in commercial fishing, processing and marketing. The family is not only the support to the fishermen but many times the manpower needed for basic fishery-related activities. The importance of small-scale fisheries and their role as a contributor to social cohesion, poverty alleviation, food and nutrition security, and economy growth are increasingly being recognized, although fairly unknown in the Mediterranean.

Small-scale fisheries provide food for local, national and sometimes international markets and make important contributions to nutrition. In addition to full and part time works, seasonal or occasional fishing and related activities, they often provide vital supplements to livelihood activities of coastal communities.

In the small scale fisheries the know-how is generally transmitted via the activity at sea. Many fishermen prefer still this empirical knowledge but several procedures exist of professional training in various countries to obtain basic qualifications to enter the profession and there is a significant increase in the number of people directed at the artisanal activities after a professional training course.

Gender equity: role and situation of women

While typically men are engaged in fishing and women in fish processing and marketing, women are also known to engage in near shore harvesting activities and men are known to engage in fish marketing and distribution.

In some GFCM countries women have an important active role in small-scale fishery production. In Tunisia, the clam fishery in the Gulf of Gabès was developed from 1960 onward. Initially women caught some clams to add some revenues to the family traditionally based on agriculture (ArtFiMed, 2009). This fishery is a clear example of women's participation in the fishery capture process, although men are main actors in the commercialization and control the women activity. For instance the Clams Producers Organizations (local) have an important role in the organization and the commercialisation and export of the product under the direction of a Committee of six members where the chair and the treasurer are men.

Improved policy for small-scale fisheries, and appropriate attention to the post-harvest sector, could have the benefit of mainstreaming women's and gender concerns in development policy and planning.

Fishers organizations

The fishermen belong generally to professional syndicates and structures, some of which are very old and quite obsolete in some areas. On the contrary, they are still active in other countries, like in France where "prud'homies", which are professional organizations created by the fishermen themselves and directed by elected members of the regional communities, exist. Their main roles are the representation of the fishermen during negotiations with

people, the regulation of the internal relations between fishermen during the exercise of their professional activity and the application of the fisheries policies.

The small-scale fishermen also belong sometimes to modern socio-economic structures, like cooperatives and organizations of producers. Several kinds of cooperatives exist, some of them are oriented at providing goods and supplies, others specialized in the organization of the distribution of the landings or in the administrative and technical organization of ship-building and repair. Some examples follow:

- The case of the Egyptian General Cooperatives Union for Fisheries Resources is worth mentioning. This is a non-governmental organization grouping roughly 100 local cooperatives, each one counting up to 100 members under the umbrella of the General Authority for Fish Resources Development (GAFRD). It was created in 1959 and encompasses four sub-unions whose main objective is to protect the interests of the Egyptian fishermen. The union deals with many social and technical aspects and has a great importance in the sector of financing the building of fishing boats. The Union plays also an important role in the management of the fisheries, encouraging the fishermen to apply regulations. It regularly publishes an informative newsletter, including scientific information regarding the sector. The Union is a member of the GAFRD board and also cooperates with the Egyptian social fund project for the realization of small and medium projects in support to the decision making process in the fishery sector. Money are currently managed through a bank although talks are ongoing now on a possible system to be put in place to allow the Union to be directly funded. The Union also manages an insurance fund for ships and manpower. The fishing boats have to own an individual fishing license which is linked to a type of fishing activity. According to the Union the country counts 210.000 individual licenses, from which 80.000 are for the aquaculture sector.
- Lebanon is another interesting case as the fishing community is organized into 29 cooperatives and 5 syndicates, although cooperative membership covers only some 43% of those involved in the industry (Pinello and Dimech 2013). Most of the cooperatives are based in their respective ports, with usually more than one cooperative in larger cities. The greatest part of the fishermen is found in the northern region of Lebanon, where the breadth of the continental shelf is broader and fishing grounds are more abundant. There is neither a contract of employment in Lebanon for fishermen nor any social security cover in place, which could protect them in case of disability, loss of employment and retirement. Salaries are generally low, with approximately 13 USD per day and per crewman (i.e. for a crew of three men and one captain) and with some fluctuations depending on the fish prices.
- There are two fishermen cooperatives in Malta and all professional fishermen are affiliated to either one or the other (i.e. Ghaqda Koperattiva tas-Sajd Ltd. and Koperattiva Nazzjonali tas-Sajd). These cooperatives offer various services to all professional and part-time fishermen, including fish purchasing and sales (e.g. exports and imports), supply of ice, fishing gears and other inputs, cold storage facilities, insurance coverage, and facilities for packing and processing of fish.
- In Tunisia 60% of small-scale fishermen of Ghannouch are affiliated to the Union Tunisienne de l'Agriculture et de la Pêche (UTAP), a syndicate whose purpose is to defend the interests of its affiliates, to supervise them and to solve the problems among various fishing sectors.

- In Croatia coastal areas, and particularly the islands, are characterized by numerous fishermen communities, where the majority of the population is employed in the fishery sector. In some areas, fishermen are organized in cooperatives (e.g. two large cooperatives are based in Istra. With the development of tourism, traditional fishermen communities are difficult to be identified and generally there is low number of larger fishermen organizations, such as cooperatives.

2 IDENTIFICATION OF KEY ELEMENTS DIRECTLY OR INDIRECTLY LINKED TO SMALL-SCALE FISHERIES FOR PLANNING AND MANAGEMENT PURPOSES

The FAO SSF Guidelines recognize the need for a wide range of information in support of decision-making, including bio-ecological, social, cultural and economic data in order to apply The Ecosystem Approach to Fisheries and integrated development approaches. They also promote the use of combined scientific data and local, traditional or indigenous knowledge and research for enhancing the understanding of small-scale fisheries governance, development needs and opportunities.

As of several years the GFCM has been highlighting the necessity to elaborate fishery management plans that should identify the salient traits of the fisheries concerned, including major stakeholders, agreed objectives, covering the economic, social and ecological components of the fishery, and specific rules and regulations that would apply.

A first step should be the improvement of the knowledge on Mediterranean small-scale fisheries. At the same time, it would be necessary an improvement of the quality of the - statistics in general. It requires also for certain number of species an improvement of the knowledge on the biological and biogeographical parameters. Studies on interspecific and - trophic relationships seem also to be of paramount importance, as well as the understanding of the mechanisms of biomasses fluctuations in space and time. Still at the fundamental level, the works allowing explaining the determinism of recruitment linked to the environment and those of the fleets' dynamics become of principal importance too. Last but not least a particular attention is needed for new alien species in the Mediterranean both from Atlantic and lessepsian origin that are extending their distribution, as in some cases they are targeted by small-scale fisheries.

For planning and management purposes a first necessary action should be to determine where the information on small-scale fisheries is stored, who is collecting this information at national level and who should participate in its analysis at regional level (e.g. national administrations, research institutions, stakeholders, NGOs, etc.). Part of the information needed can be qualified as temporal in nature: inventory of small-scale fisheries communities by country, inventory of ports, landing sites, vessels, gears, fishermen, etc. It is also necessary to collect spatial information, such as spatial analysis of the activities of national fleets and resources distribution. Finally, information on the social and economic aspects is fundamental for planning and management.

In general terms, the classical data that can be used to analyze small-scale fisheries include some elements directly linked with the characteristics of the fleets, gear and resources:

- Type of craft/vessel

- Size of fishing craft/vessel and engine
- Fishing gear/techniques
- Ownership
- Fishing grounds
- Knowledge and technology

A certain number of socio-economic indicators would be also also needed. Main indicators should include:

- Production
- Commercialization
- Income
- Employment
- Wages
- Productivity per investment
- Prices and Profits

The data collected should then be capable to provide a snapshot on the dimension of the effort (defined as investment and employment) and to measure the impact in the socio-economic domain as consequence of changes in the state of the resources. They should also allow to evaluate the cost of transition from an unbalanced situation to one in equilibrium, in case of demonstrated situation of overexploitation of resources.

Key data collection for small scale fisheries in the Mediterranean Sea. An example.

The FAO Regional Project COPEMED offered the possibility of starting a program of work to study the small-scale fishery sector in depth in Algeria, France, Italy, Libya, Malta, Morocco, Spain, and Tunisia.

The first step of this project was to establish a preliminary inventory survey by country of all the small-scale fisheries communities in the region by collecting the following data:

Characteristics of Fishing Ports: *Name of the port where small-scale activities occur, Region or province (administrative) where they are located; geographical localisation of the Port (latitude and longitude); brief description identifying the port or locality, expected number of small-scale fishing units present in the port, expected number of small-scale fishermen present in the port, any ancillary information relevant.*

Description of métiers by port: *Target species, associated species, fishing zones;*

Fishing season by métier: *Periodicity and seasonality in use*

These data were collected in all the participating countries with a varying degree of coverage. A relational database management system (the “ArtFiMed Database”) was developed for data editing and a CD-ROM was published to present all the information collected.

Source: CopeMed FAO Regional Project, 2000

Identifying the questions that need to be addressed in acquiring information about small-scale fisheries

	Questions
Needs	<ul style="list-style-type: none"> • What are the information needs at the different levels (macro, meso, micro), under different management approaches? How are these needs communicated and linked? • How does the information system serve to describe the value and social importance of small-scale fisheries?
Process	<ul style="list-style-type: none"> • How do you integrate data from different sources (biological, economic, social), different sectors, different time and spatial scales and different frequencies of collection? • How do you ensure feedback to the source group from the ‘processor’ and ‘user’ (e.g. macro to micro levels)? • How do you handle (process and store) qualitative data as it moves from micro to macro levels? • How do you disassociate it from the person? • How do you introduce it to policy and institutional memory? • How do you turn qualitative data to quantitative data, or data useful to policy? • What is the best technique for moving information? How do you move it without moving people? • What is the link between ‘statistical’ systems and research project data? • How do you ensure continuity in the collection of small-scale fisheries data? • How do the different information sources get ‘weighted’ in the use of the data and what is the impact of this? • What are the limitations of information systems?
Input	<ul style="list-style-type: none"> • What is the reliability of the data and how do you verify and ensure this? • What are the ‘barriers’ to people providing data or reliable data? • What are the constraints to data collection – confidentiality, legal? • How do you capture qualitative and traditional/indigenous knowledge? • What are the appropriate data collection techniques for small-scale fisheries? • Can you design and implement one information system? • What information systems/data collection is already in place and how can we modify these for fisheries? • Who collects what sort of data? e.g. how do you adapt national census data to support fisheries? • How do you disaggregate data with respect to gender? • How do we go back and retrieve and use old data?

Source: ACFR Working Party.

3 DATA AND INFORMATION GAPS AT DIFFERENT LEVELS (BIOLOGICAL, ENVIRONMENTAL AND SOCIO-ECONOMIC)

In order to provide a full picture of small-scale fisheries in the GFCM Area some information are still missing and/or requiring to be further elaborated for some GFCM Members. As it has been already pointed out, no precise quantitative information at regional level exist, neither on the captures nor on the socio-economic dimension of small-scale fisheries, although in some subregions in depth analysis are carried out with the support of the FAO subregional projects. The need to improve knowledge about this sector has been underlined on many occasions.

It is worth recalling that in 1980 already, the GFCM was calling for “*the definition of a national strategy indicating in particular the place of artisanal fisheries in management schemes*” through resolution GFCM/15/1980/1. As of then, a few regional analyses of small-scale fisheries in the Mediterranean and the Black Sea have been periodically carried out. However, there are issues which have not been fully addressed due to the complexity inherent in defining strategies for encompassing small-scale fisheries in terms of monitoring, management and sustainable development actions. Studying the biological and dynamic parameters of the most important stocks as well as the fleets dynamics and interactions, catch

and effort statistics remain the main weakest link. In several countries suggestions have been made to improve those data. But the majority of the statistical data are still often very far from reflecting the reality. Depending on the situation, underestimations of catches are detected in that they could be suspected to represent more than a third of the real quantities, as well as overestimations of some productions. This is directly linked to the fact that an important part of the small-scale fisheries production often eludes traditional circuits created for gathering information (e.g. auctions, markets, etc.).

As for the inventory of small-scale fleets, sparse information is available. The statistics does not describe precisely the structure and the capacity of the fleets, which depend on heterogeneous factors such as the depth of the fishing grounds, the type of fishing activity, the economic level of the fishermen, the shipbuilding, traditions etc... Particularly in connection with small-scale fleets the files available in national administrations are quite incomplete. An underestimation of about 50%, compared to the real figures, could not be far-fetched and, of course, important biases in the analysis would follow.

Up to now there is often a lack of biological data collection system for small-scale fisheries along the Mediterranean coast. Pilot projects on biological sampling, like the ones developed by the EastMed, AdriaMed and CopeMed FAO Regional Projects, are aimed at training staff and field samplers and at preparing the elements for the setting up of biological sampling networks covering the main landing ports, with the participation in the process of the fishworkers. In certain cases FAO projects cover sampling on specific fisheries and target species during limited periods, nevertheless the main remaining problem in the region is the lack of continuity in these activities which cannot be carried out only with the efforts of the Regional Projects.

Environmental data related to reproduction, nursery areas and recruitment of main target species are still far from what would be required to understand the relationship between marine ecosystems and exploited resources, including those targeted by small-scale fisheries. Information on the effects of climate change in the ecosystem and the associated marine exploited resources and the effects in the Mediterranean ecosystems and fish populations of the new species of lessepsians or Atlantic origin in the Mediterranean basin are other significant gaps. More socio-economic research is required in order to understand the links between macro-economics, fisheries and development policies and livelihoods. Socio-economic studies related to fisheries, like the regular survey of several indicators as the evolution of the investments and the capital, seems indispensable. The future research should also deal with studies about the price of the production factors and the profitability of fishing which are in general unknown.

Knowledge at post-harvest stage, which enhances the value of the product or the working conditions of the fishermen, is generally poor and its improvement should be encouraged based on better research, as it has a great socio-economic importance. For example, improved efficiency in small-scale fisheries post-harvest systems, marketing and the promotion of exports of products from small-scale fisheries could provide greater returns. Food quality and food safety, both in terms of impact on price as well of risks for human health, will also continue to be a major issue.

4 COMMON METHODOLOGIES TO MONITOR THE REGULAR COLLECTION OF RELEVANT DATA

A sampling strategy and methodology for assessment and monitoring of small-scale fisheries. An example.

In order to reach a quantitative assessment of the French Mediterranean small-scale fisheries, a strategy established in 1983 by the French Research Institute Ifremer consisted in the evaluation in space and time of the elementary fishing efforts and yields of every stratum and their corresponding variations, in order to evaluate the global productions and efforts. This strategy has been successfully applied along the French coast and after some light amendments to the Moroccan, Tunisian and Caribbean small-scale fisheries. The sampling strategy has been based on two types of inquiries aimed at the production of independent data series which concern essentially efforts and landings for each one of the space-and-time stratum.

The basic principles of such a strategy are the following:

- Within a given stratum, the fishing effort should be sampled in terms of activities of the fleets in order to define the number of active boats and of fishing days per gear or group of gears within a stratum.*
- Within the same space-and-time stratum the landings should be sampled in weight and value per species, gear and boat (these samplings will not necessarily take place during the same day the fishing effort of the fleet is sampled. In practice these two operations are generally very difficult to realize simultaneously).*
- The descriptors of the fishing effort linked to the landings samples concern the types, quantities and fishing times of the gears, the crew numbers and the trips durations.*
- The spatial distribution of the effort is described by the location of the fishing grounds (when known).*
- The economic descriptors are the types of commercialization of the fish.*
- The catches are detailed by gear, species and eventually by commercial categories accompanied by the corresponding weights and prices (considered as rough primary economic descriptors).*

Source: Farrugio H. and Le Corre G. 1993

Ameliorating the expertise of the team involved in field surveys and analysis is important value to obtain sound results. The gathering of information entirely depends on the installation of networks of samplers on the coasts. This requires a considerable investment in human and financial resources and the scientists are confronted with the problem of elaborating routine strategies, which would enable them to obtain information at a lower cost. In order to increase the quality of such systems the harbor facilities and access should be improved in the strategic landing sites.

Collecting data without some idea of the models to be used is generally not a very productive exercise but it may be necessary as a first step in order to provide the 'snapshot' which defines the system to be studied. However, it has to be kept in mind that the bio-economic models which are sometimes used for the study of fisheries traditionally refer to unsophisticated fisheries, or are made more simple by a game of suitable hypotheses, most of the time considering the exploitation of a single species by a homogenous fleet, and are poorly suited for the analysis of the composite fisheries, frequent in the region. The development of an original conceptual approach is in demand.

A standard methodology to collect socio-economic data in the Eastern Mediterranean: experience from Egypt, Gaza Strip, Lebanon and Turkey.

Source: Pinello D. and Dimech M., Eastmed FAO regional project.

The methodology proposed was based on a statistical design. The sampling unit was the single licensed fishing vessel and it was based on a stratified random sampling without replacement. Each sampling unit was chosen avoiding the possibility to be chosen more than once. The sample size was determined in order to have a large sample and to minimize as much as possible the variance. Since in all the countries such a survey was convened for the first time, the appropriate sample size could not be determined a priori, and hence a coverage rate from 15-50 % was used depending on the number of vessels in each fleet segment.

The stratification was carried out according to the GFCM Task I fleet segmentation which is based on the technical and dimensional characteristics of the vessels. The statistical design was the most important step in order to maintain a standard methodology in all the areas sampled. Subsequently, a questionnaire was designed to evaluate the socio-economic circumstances (costs and revenue) and activity of fishing vessels. The selected vessels were surveyed by means of direct interviews and the technical data on the fleet were obtained from the respective fisheries department. The socio-economic variables were the ones defined in the GFCM Task I, however some additional variables were also collected which were specific to the area concerned. The quality of the data was assessed using the coefficient of variation and modified for small populations. The methodology was successfully used in all the areas, where in general the data gathered had a low coefficient of variation showing that the statistical quality of the data was good.

CONCLUSIONS AND SALIENT ISSUES FOR THE MALTA SYMPOSIUM

The vision developed by the FAO Advisory Committee on Fisheries Research for small-scale fisheries is one which stresses their contribution to sustainable development. More precisely, it is a vision whereby:

- small-scale fisheries are not marginalized and their contribution to national economies and food security is recognized, valued and enhanced;*
- fishermen, fish workers and other stakeholders have the ability to participate in decision-making, are empowered to do so, and have increased capability and human capacity, thereby achieving dignity and respect; and*
- poverty and food insecurity do not persist; and where the social, economic and ecological systems are managed in an integrated and sustainable manner, thereby reducing conflict.*

Although the fisheries in the GFCM Area satisfy only a small part of the demand for food products, they have an important role to play in terms of sustainable development in the region, with a high value in terms of cultural identity (owing to the great diversity in their savoir-faire and fishing methods as well as in terms of employment).

In order to provide a full picture of small-scale fisheries in the GFCM Area, a various actions at regional level should be undertaken, consistent with a clear political mandate and within an agreed framework that encompasses all interested stakeholders. Some of the elements that should be taken into account to promote sustainable SSF in the GFCM Area are:

- Identify main gaps in national and regional statistics related to SSF and elaboration of a common regional data base is a priority for the future of the SSF.
- Develop a quantitative information system to collect at regional level data and information on the fleets and their activities, their production and the biological parameters of their target species, as well as the socio-economic dimension of small-scale fisheries. (The methods of stratified random sampling in space and time should be recognized as being particularly fit for the appraisal and the assessment of the artisanal Mediterranean fisheries).
- Draft a regional program to compile the technical and cultural information related with SSF in the Mediterranean Sea including: a description of all the types of gears and vessels, disappeared and existing fisheries and target species, their habitats and the characteristics of the exploited ecosystems; it is of considerable importance to indicate how the artisanal fisheries relate to, and are affected by, the large number and variety of human activities in the Mediterranean.
- Elaborate national catalogues of zones highly sensibles for SSF, including reproduction areas, eggs, larvae and juvenile's concentration, recruitment areas and periods and non take zones and MPA to protect and improve the status of the main SSF target fishing stocks.
- The main lessons that can be drawn from the studies realized so far are similar, regardless of the area in which they have been carried out. Those studies have demonstrated the possibility of underpinning the statistical demand. Abundant flows of valuable information should hence be obtained and their generalization could enable to envisage a complete approach of the dynamics of the main stocks exploited by small scale fisheries, as well as their interactions.
- The *International Guidelines for securing sustainable small-scale fisheries* (SSF Guidelines) are intended to support the enhancement of the sector's already important role. The SSF Guidelines intend to support small-scale fisheries governance and were developed through a participatory and consultative process, involving representatives of small-scale fishing communities, civil society organizations, governments, regional organizations and other stakeholders. They are consistent with, complement and support other international instruments and commitments such as the Code of Conduct for Responsible Fisheries. Users of the SSF Guidelines - including States, small-scale fisheries actors and other stakeholders - are encouraged to consult these and other relevant instruments for their applicable obligations, voluntary commitments and additional guidance.
- SSF communities and local SSF organisations (SSFO) may feel the need to defend their interests and socio-economic status vis-à-vis other community groups, including industrial and semi-industrial fishermen, in the pursuit of assurance of viability – of the community, if not of life itself. The analysis of the role of SSFO and communities as fundamental bricks to structuring the countries is needed. The influence of SSFO in the fisheries management and decision taking processes has also to be taken into account.
- In relation to that to build up on the existing organizations to create a Mediterranean Networking of SSFO is important and should need the support of the GFCM for: the identification of members, priorities, needs and organizational options. Links among the Mediterranean and international SSFO.

- Socio-economic circumstances and investment needs: Some fisheries are carried on year round (often with a change in the target species and/or the fishing gear deployed) and the present artisanal fisheries are mainly seasonal, rapidly subject to changes in the economic climate, hence precarious. Many artisanal fishermen are active only on a part-time basis, depending largely on the seasonal availability of other, easier, more-remunerative work and on the seasonal availability of many fish species. This inherent precariousness has always impeded investment and development. And the widespread failure of the general population and governments to recognize the artisanal fishery community as a specific socio-economic entity – a valuable stakeholder in the coastal zone – has also put a brake on investment.
- Finally the necessity of periodically updating of the information has to be highlighted and it should be of paramount importance not to lose the benefit of the training by the pilot projects and to ensure the continuity of the sampling of biological and socio-economic aspects of the SSF in the long term after its end in order to make available longer historical series of data for the fisheries assessment analyses.

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