Small-scale fisheries in Italy

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Abstract
Statistics on Italian capture fisheries are collected by Irepa through a National Observatory. In the year 2002, out of the total fishing fleet of 15 915 vessels, 10 296 belonged to the small-scale segment, 2 983 of which operated in the Adriatic and employed 4 875 fishers. The landing volume from the Italian Adriatic small-scale fishery amounted to more than 24 000 tonnes. The performance of the Italian small-scale fishing fleet operating in the Adriatic is analysed through a set of biological, economical and social indicators and associated reference points. Key-factors to be taken into account for the sustainability of small-scale fisheries and their management are proposed. Possible options for the future development of the sector in terms of income integration (e.g. fishery tourism) and fishery management (e.g. rights-based management) are presented.

Keywords: artisanal fishing; indicators; economic analysis; socioeconomic aspects; fishery management; Italy

1. The definition of small-scale and/or artisanal fishery currently adopted in Italy

The small-scale fleet segment is composed of vessels with total length (LOA) of less than 12 m. They are only allowed to use passive gears excluding towed gears of whatever type. The definition adopted coincides with that provided for in European Commission Regulation (EC) No 2091/1998 of 30 September 1998 concerning the segmentation of the European Community fishing fleet and fishing effort in relation to the multi-annual guidance programmes. This definition is also provided for in Commission Regulation (EC) No 1639/2001 of 25 July 2001 establishing the minimum and extended Community programmes for the collection of data in the fisheries sector and laying down detailed rules for the application of Council Regulation (EC) No 1543/2000.

2. Status of the national small-scale fisheries

2.1 Role in the whole fishery

The small-scale fleet segment is the most important of the Italian fisheries. A total of 10 296 vessels are involved and they account for almost 50 percent of total employment. In terms of capacity the small-scale segment makes up only 15 percent of the national Gross Registered Tonnage (GRT), but covers 65 percent of fishing boats in number and 65 percent of the total days at sea (Table 1). The average size of these vessels is 2.6 GRT and 25 kW, while the

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average size of national fleet is 11 GRT and 79 kW. Small-scale vessels are older than other segments of the fleet, 28 years on average.
The small-scale fisheries segment accounts for about 18 percent of the national catch and for 26 percent of national value of landings. The difference between these two figures depends on the species targeted by small-scale gear, which are mostly of high value. The vessel owner usually fishes with an additional person. The number of fishers in 2002 was 19 358, that is the highest level of employment by fleet segments.

Table 1. Italian fishing fleet by segment, 2002.

Fleet segments	N. of vessels	GRT	kW	Days at sea	Employment
Bottom Trawler	2 353	91 092	509 557	441 421	9 029
Midwater Pair Trawler	126	6 784	41 651	22 264	806
Purse seiner	180	7 836	43 479	20 645	1 321
Dredger	714	7 399	76 780	71 892	1 503
Small-scale fishery	10 296	27 081	255 334	1 657 952	19 358
Multi-purpose	2 051	27 501	270 408	317 927	5 395
Tunas	195	10 650	55 969	28 436	948
Total	**15 915**	**178 344**	**1 253 177**	**2 560 539**	**38 360**
% small-scale fishery/total	**65**	**15**	**20**	**65**	**50**

Source: Irepa-Mipaf.

The number of small-scale vessels registered in the Adriatic regions is 2 983; they account for 29 percent of the total number in the segment and cover 23 percent of total GRT for Italy (Table 2).

Table 2. Geographical distribution of small-scale vessels, 2002.

	Adriatic regions	Tyrrhenian and Ionian regions	Italy
Absolute values			
Number of vessels	2 983	7 313	10 296
Total GRT	6 336	20 746	27 081
Total kW (1000)	78	178	255
Days at sea (1000)	511	1 147	1 658
Employment	4 875	14 484	19 358
Average values			
GRT	2.1	2.8	2.6
kW	26.0	24.3	24.8
Days at sea	171.3	156.8	161.0
Employment	1.6	2.0	1.9

Source: Irepa-Mipaf.

2.2 Main trends

In recent years, the Italian small-scale fleet has undergone a huge reduction where all the capacity and economic indicators. In the period 1998-2002, there has been a reduction of 18 percent in total GRT. The total number of vessels has decreased by more than 2 thousand

units (Table 3). This trend is due to the decommissioning scheme under the EC Multi Annual Guidance Plan (MAGP) IV. Between 1998 and 2002 total production decreased, reaching 55 562 tonnes in 2002. The value of landings witnessed a less significant reduction, thanks to the increase in average prices. Prices mostly increased in the last quarter of 2000 as a consequence of a change in consumers preferences due to the Bovine Spongiform Encephalopathy (BSE) crisis; in the following months, prices continued to rise.

Table 3. Main trends in effort indicators of Italian small-scale vessels.

	1998	**1999**	**2000**	**2001**	**2002**
Fleet - number of vessels	12 480	12 482	11 990	10 775	10 296
Fleet - total GT (1000)	33.2	33.1	31.7	28.4	27.1
Fleet - total kW (1000)	304.0	302.8	290.4	264.3	255.3
Days at sea (1000)	2 105	2 116	2 047	1 830	1 658
Employment on board (FTEs[1])	25 539	25 387	24 668	20 844	19 358
Invested capital (million Euro)	468	477	522	487	477

Source: Irepa-Mipaf.

Small-scale fishery shows low capital intensity and it is highly affected by climate conditions, market fluctuations and by the interaction with trawlers fishing the same species, often in the same grounds, which substantially reduce the availability of fish.
With respect to revenue, gross cash flow decreased steadily from 1998 to 2002 (-20 percent). The reduction is a consequence of external factors; in particular the rise in costs (mainly fuel prices) had a large impact on fishing activity. Fuel costs, which is the main cost item in fishery accounts, increased continually from the spring of 1999 until the last months of 2000. The increase in operational costs has had a negative impact not only on the profitability of the fishery sector, it has also caused a reduction in the crew share (Table 4).

Table 4. Main trends in economic indicators of Italian small-scale vessels (million Euro).

	1998	**1999**	**2000**	**2001**	**2002**
Value of landings	449.6	456.8	495.7	414.8	360.2
Fuel costs	32.1	37.5	39.6	35.5	32.3
Other running costs	50.7	49.9	52.2	45.7	40.7
Vessel costs	30.2	32.0	34.4	32.9	32.7
Crew share	120.1	118.6	129.4	106.5	95.6
Gross cash flow	216.4	218.8	240.0	194.3	158.9
Depreciation	20.5	20.6	22.3	15.3	20.1
Interest	3.9	3.7	3.5	2.8	2.7
Net profit	192.0	194.4	214.2	176.3	136.1
Gross value added	336.5	337.4	369.4	300.8	254.5

Source: Irepa-Mipaf.

However, the economic performance of the small-scale vessels is very different from one area to another (Table 5). In Adriatic regions, both landings and value per effort unit are

[1]Full-time employees were considered to be those who perform a full day's work for the entire week in the local unit. Source*: The Eurostat Concepts and Definitions Database (CoDeD)*

higher than in the other regions; this difference is due to factors such as the lowest effort and the different composition of the landings.

Table 5. Landings and value of landings for small-scale vessels, year 2002 (M = million).

	Adriatic regions	Tyrrhenian and Ionic regions	Italy
Absolute values			
Volume of landings (t)	24 459	31 102	55 562
Value of landings (M Euro)	148	212	360
Price (€/kg)	6.05	6.82	6.48
Average values			
Landings/vessel (t)	7.5	4.4	5.4
Value/vessel (1000 Euro)	45.3	30.2	35.0
Landings/days (kg)	42.7	28.7	33.5
Value/days (Euro)	258.5	195.5	217.2

2.3 Sustainability analysis

Questions of sustainability are now the most important considerations in fisheries management. Also the reform of the EU Common Fisheries Policy (CFP) is aimed at achieving biologically, environmentally and economically sustainable fisheries.
In order to describe in simple terms the extent to which the objectives set for sustainable development are being achieved at regional level, some indicators of sustainability are reported. The purpose of these indicators should be to show whether a fishery is currently economically, socially, and biologically sustainable, and if not, whether it is capable of being exploited in a sustainable manner.
Among different indicators, and following FAO (1999) and OECD (2001) studies, the following were used:

- Ecological sustainability: Landing per unit of effort (LPUE);
- Economic sustainability: Gross revenues/effort;
- Social sustainability: Gross value added/employee.

2.3.1 Ecological sustainability

The processing of the data collected from 1998 to 2002 on the small-scale fishery segment operating in the Adriatic Sea shows a tendency towards the stability of unitary productivity until the year 2001, and a contraction in 2002 (Figure 1).

The pattern of unitary productivity registered until 2001 is due to the stability of the fishing effort and of the total catches. Although fishing capacity, measured in terms of tonnage and engine power, has constantly decreased over the last few years, the total fishing days over the same period increased and until it reached its highest level in 2001 (about 197 fishing days for small-scale fishery vessels operating in the Adriatic).
On the contrary, a reduction both of the fishing effort and of the catches was registered in 2002. The decrease registered in the catches was proportionally higher than the effort reduction (respectively –30 percent and –23 percent), which led to a decline in productivity.

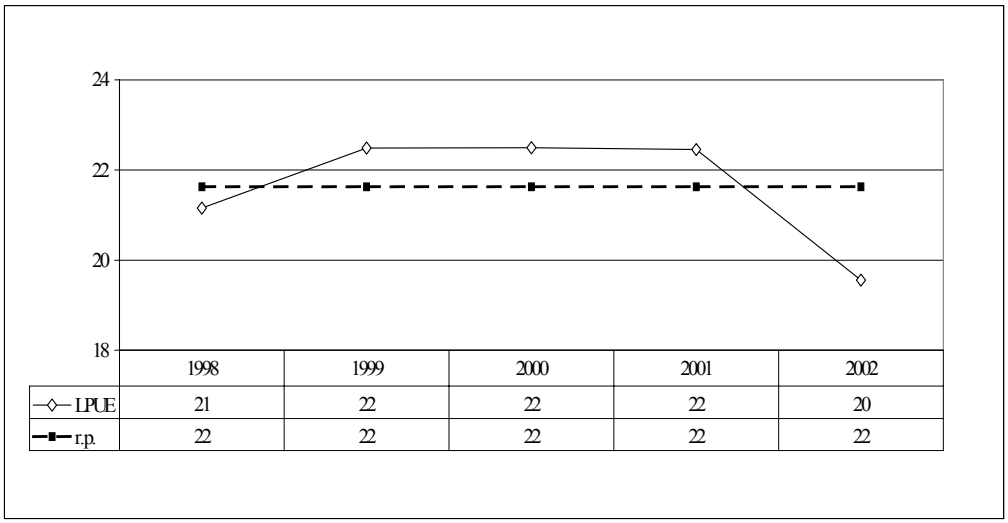


Figure 1. LPUE - Adriatic small-scale fishery, 1998 – 2002.

The increase in the days at sea registered until 2001 was partly generated by the positive trend of prices. Despite the constant reduction of catches, the fishers increased their fishing activity and, thanks to the positive trend of sales, this strategy has proved successful. In the year 2002, on the contrary, in order to minimize risks, fishers reduced their fishing trips with a view to optimising in economic terms the time spent at sea.

2.3.2 Economic sustainability

The economic effectiveness of the fishery sector was estimated by the economic productivity indicator, conceived as the ratio between the daily value of landings and the tonnage used by each fishing system.

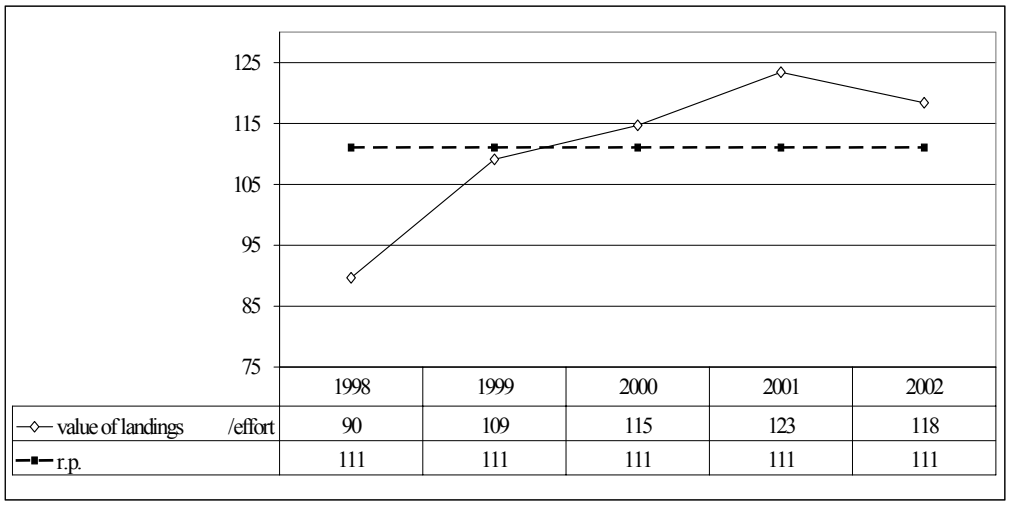


Figure 2. Economic productivity - Adriatic small-scale fishery, 1998 – 2002.

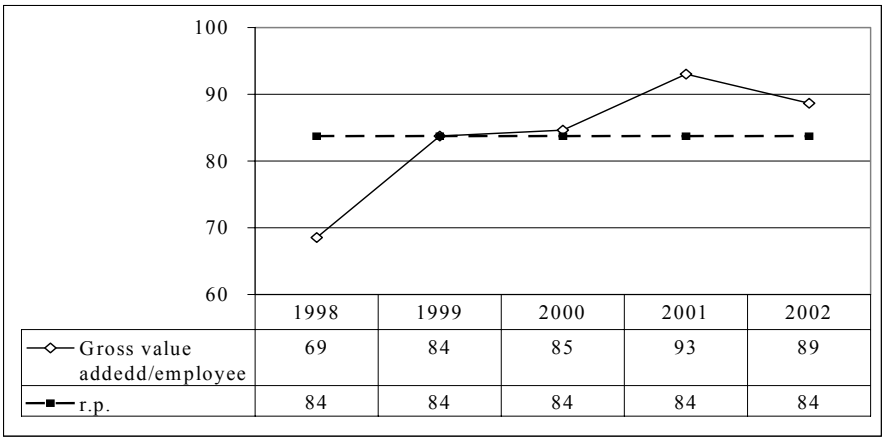
The state and the economic achievements of small-scale fishery in the Adriatic represent the synthesis of different trends registered in the catches and the prices of landings. The period considered covers a full economic cycle. Namely, two years (1998 - 1999) characterized by stability of prices and a slight increase in production, and three years (2000 - 2002) over which, thanks to the increase in prices that compensated for the reduction of landings, the economic trend was clearly favourable. From the year 2000 onwards the economic productivity exceeded the reference point until the highest value was reached in 2001 (123 Euro per effort unit; Figure 2).
The improvement of the economic productivity registered over the last few years does not imply a well-balanced exploitation of the fishery stock and the economic as well as biological appropriateness of fishing capacity and effort. Indeed, the economic productivity for each vessel benefited from the positive trend in the prices of products which was influenced by the reduction of offer and a more effective marketing system. This issue becomes relevant since this price trend, which has been mainly caused by mechanisms not directly linked to the process of production and that led to a rise in sales, generates behaviour aimed at increasing fishing effort.
As previously highlighted, high levels of activity have coincided with periods of high in price rises, so that the above-mentioned processes threatened to further endanger the state of the fishery resources.

2.3.3 Social sustainability

The long-term safeguard of employment as well as of the economic welfare of manpower is the main objective of sustainable development. The achievement of this aim does not coincide with the rational exploitation of fishery resources. Indeed, measures such as the reduction of fishing capacity, the introduction of marine protected areas and the closure of fishing areas have had a negative impact in terms of employment and income of those communities strictly dependent on fishery.
Over the last three years, about 8 600 jobs were lost (equal to 18 percent of the total number of onboard workers). This shrinking concerned all fishing systems even though coastal trawling and small-scale fishery were most strongly affected. From 1998 until today, small-scale fishery vessels registered a loss of 4 500 workers. Among them, 1 800 units were working on vessels operating within the Adriatic area.
Over the last few years, several factors increased the loss of jobs in the sector:
- The decline of physical productivity;
- The rise in operative costs;
- The incentive allocated for the withdrawal of vessels (permanent withdrawal);
- The re-conversion into activities either linked to the fishery sector or not;
- The ban on several fishing techniques;
- The overall reduction of incentives and benefits (allowances, subsidies);

Since these factors entail the reduction of labour remuneration, they have worsened the economic state of onboard workers.
In the context of small-scale fishery, the added value per employee has been chosen as an indicator of social sustainability, instead of fishers' income.
The crew of this segment is often composed of a single person who is both the vessel owner and fisherman. Consequently, the economic account of these fishing boats is extremely

simplified. In fact, given that the labour cost item is absent, the added value, which represents the remuneration both of the labour and the capital, can be obtained by deducting the consumption from the income.
Although the percentage increase of the above-mentioned indicator registered from 1998 to 2002 was lower than the economic sustainability indicator, the former has shown the same trend as the latter. Over the past five years, the added value for each worker has grown by 29 percent (Figure 3), whereas the saleable gross production for each effort unit has increased by 32 percent. This difference is due to the higher relevance assigned to the operative costs in the last few years compared to the past. Particularly, since the year 2000, the price of fuel has grown remarkably and its percentage of the total intermediate consumption is higher than other costs.



	1998	1999	2000	2001	2002
Gross value addedd/employee	69	84	85	93	89
r.p.	84	84	84	84	84

Figure 3. Gross value added per employee -Adriatic small-scale fishery, 1998 – 2002.

However, the level of annual income registered in the small-scale fleet is still low compared to other productive activities. Over the years, the persistence of such standards of revenues could even lead fishers, who are socially and culturally closer to seafaring life, to quit the activity. This phenomenon is mainly registered where the fishing industry is larger, such as, for example, the Sicilian provinces and the largest Adriatic fisheries centres.
Given the inadequate level of revenues, it is only the high degree of ownership share due to the artisanal feature of fisheries that prevents the fishers from quitting the activity. In conclusion, the owner working on board can compensate for the decrease in the manpower income with the increase in the gross profit share. The overlapping of ownership and crew, which prevails among small-scale fishery vessels, is also widespread among fisheries characterized by a bigger fleet with a crew of 4-5 people.

3. A brief description of planned national and international programmes focussing on the small-scale fishery sector

3.1 European programmes

Small-scale fishery is managed at national level as a consequence of the fact that target stocks are primarily distributed in national waters and caught only by one member state. At

European Union level, some programmes focussing on the small-scale fishery sector have been presented in the last months, as a consequence of the activity of the revision of the Common Fishery Policy.
The Community Action Plan for the conservation and sustainable exploitation of fisheries resources in the Mediterranean Sea under the Common Fisheries Policy[2] is of particular importance as it recognises the individual nature of the Mediterranean Sea. This plan has been followed by the Council Proposal 589/2003 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea.
This proposal, in particular:
- Introduces new technical measures to improve gear selectivity;
- Strengthens the current ban on the use of towed gears in coastal areas;
- Limits the overall sizes of certain fishing gears that affect fishing effort;
- Introduces a procedure for establishing temporary or permanent closures of areas to specific fishing methods;
- Provides for the adoption in the Mediterranean area of management plans combining the use of effort management with technical measures;
- Introduces provisions to ensure that leisure fishing is conducted in a way that reduces interference with professional fishing and does not jeopardize the sustainability of certain resources;
- Delegates powers to member states to regulate fishing activities in their territorial waters and under certain conditions that do not have any significant Community dimension or environmental impact, including certain local fisheries currently authorised under Community law.

In order to weigh the social, economic and regional consequences of the restructuring of the EU fishing industry, the EC has published a plan[3] in which the socio-economic impact of fishing effort limitations and reductions in vessel numbers are evaluated and a review of all the existing means to alleviate such impact within the existing Community aid regimes are presented.
The restriction of aid for modernisation, as well as the elimination of aid for renewal and export of fishing vessels and the more attractive scheme to permanently reduce capacity are likely to have consequences for the sector.
Several measures exist to support the restructuring of the fisheries sector[4]. Notwithstanding this, financial aid measures in favour of small-scale fisheries have not had the desired effect of protecting this segment. On the contrary, the share of small-scale fisheries in the fleet has constantly diminished over the years.
To maintain employment in coastal areas and to mitigate the socio-economic impact of multi-annual management plans in coastal areas most dependent on fishing, the structural aid regime could also be adapted to tailor the needs of small-scale coastal fleets. In particular, for groups of vessel owners or fishing families involved in small-scale coastal fisheries, the

[2] Brussels, 09.10.2002 COM(2002) 535 final.
[3] Action plan to counter the social, economic and regional consequences of the restructuring of the EU fishing industry, Brussels, 6.11.2002 COM(2002) 600 final.
[4] Council Regulation amending Regulation (EC) No 2792/1999 laying down detailed rules and arrangements regarding Community structural assistance in the fisheries sector.

Financial Instrument for Fisheries Guidance (FIFG) may provide a lump-sum premium of up to €150 000 for integrated collective projects dealing with such domains as:
- Safety equipment on board and the improvement of sanitary and working conditions;
- Technological innovations (e.g. more selective fishing techniques);
- Organisation of the production, processing and marketing chain (e.g. promotion and added value of the products);
- Professional qualification or training;

Finally, for each Member State in the Community, a multi-annual guidance programme (MAGP)[5] sets objectives for reducing the size of the fishing fleet in order to bring fishing effort into line with available resources. The fourth generation of MAGPs, adopted in December 1997, sets targets for the period 1997-2001. This period was extended by Council Decision until the end of 2002.

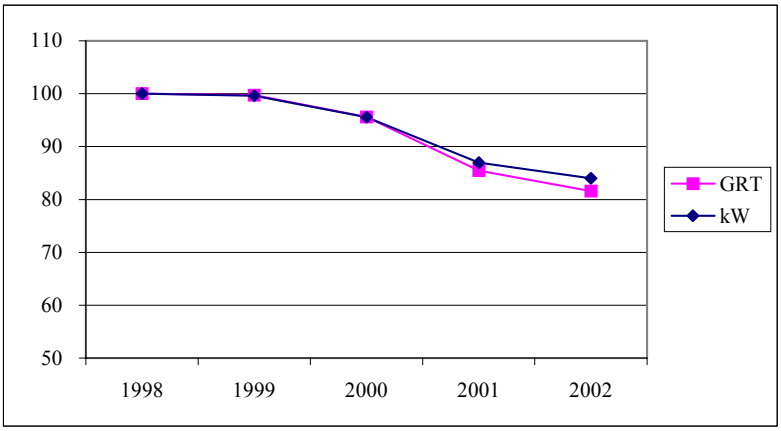


Figure 4. Trends in capacity indicators - Small-scale fishery, 1998 – 2002.

At 30 June 2002[6], all countries had met their overall intermediate target for kW. As for the Italian small-scale fishery segment, the achievement of the objective is registered in terms of tonnage, whereas, in terms of engine power a further reduction is required.
From 1998 till now, the small-scale fishery sector has endured a constant reduction, which accelerated as of 2000 (Figure 4).

3.2 National programmes

With regard to national programmes focussing on the small-scale fishery sector, the fishery and aquaculture orientation and modernization act[7] is mentioned; this act equates the status of the fisher producer to that of the agricultural producer.
The fishery entrepreneur is defined as a person who " performs an activity directed to fishing or harvesting aquatic organisms within marine, brackish or fresh water habitats as well as the

5 Reg CE n.2792/1999 and decision 2002/652/EC prolonging the multi-annual guidance programmes until 31 December 2002.
6 Report from the Commission to the Council and the European Parliament on the intermediate results of the multi-annual guidance programmes for the fishing fleets at 30 June 2002 Brussels, 03.09.2002, COM(2002) 483 final.
7 Legislative Decree no. 226 of 15th May 2001.

activities associated with them, including the implementation of active management measures aimed at enhancing the production and the sustainable development of aquatic ecosystems". Accordingly, amongst the innovations provided for by the new regulation, fisheries have been entrusted with the multi-functional role of protecting the aquatic ecosystems and of acknowledging the legal status of fishery and fishery tourism.
In 1999, in order to promote fishers' integration, the Small-scale Fishery Plan was adopted[8]. The Plan introduces consortia aimed at orientating, coordinating and managing fishing activities
The consortia shall be established by fisheries that represent at least 70 percent of the small-scale fishing vessels operating within the pertinent territory.
The consortia shall have the following objectives:

a. Draw up and enforce a plan for the management of resources. To monitor the compliance with self-regulation rules;
b. Promote initiatives directed to preventing conflicts with other fishing activities conducted within the same area of concern;
c. Build up on shore structures aimed at supporting productive activities (i.e. small fish markets, collection and storage centres, transport etc.);
d. Foster initiatives aimed at improving the quality of the members' catch.

4. The identification of priorities and main gaps related to the Italian small-scale fishery sector concerning management issues

The complexity of the small-scale fisheries, in terms of species and diversity of fishing techniques and practices, together with its economic structure, enables fishers to be flexible, adapt quickly and to counteract undesired effects of external factors, including management measures. Therefore a global and coherent management approach is needed which will make use of the various available tools in an integrated way.
In order to identify the priorities concerning management issues, the following "key factors" have to be considered:

Technological interactions: different fishing gears catching the same species are quite frequent and might involve small-scale artisanal fisheries, bottom trawlers and other towed gears. In particular, there are about 650 trawlers with length (LOA) less than 12 metres.

Competition with other uses: sport and recreational fisheries, tourism.

Old age of fishing vessels: the average age of the fishing vessels in the Mediterranean fishing industry is quite old (28,5 years). This makes working, living, health and safety conditions on board far from optimal.

Lack of recruitment: fishing activities, which have represented traditional working opportunities in fisheries dependent areas, are not attracting young generations anymore.

Labour-intensive nature of small-scale fishery: small-scale coastal fishery accounts for the most important production segment and registers the highest number of fishers. Given

8 Decree issued by the Italian Ministry of Agricultural and Forest Policies on 14th September 1999 (as subsequently modified by the Ministerial Decree of 30th May 2000).

the labour-intensive nature of this segment, any restrictions to the fishing effort could have a serious impact on employment.

Fragmentation of the production and low concentration of the landings.

4.1 Opportunity of the existing management measures

Over the last few years, the opportunities for redevelopment offered to the marine fishery sector have included activities such as marine aquaculture and fishery tourism. Particularly, the latter is growing rapidly and spreading throughout the country especially in areas mainly devoted to tourism. This activity offers professional fishers the opportunity to take tourists aboard their fishing boats on daily excursions. For this reason, it represents a real opportunity to supplement fishers' income.

Another significant aspect of fishery tourism concerns the possibility to increase the use of traditional fishing gears since on this type of vessel the use of trawl gears is strictly forbidden. Other expected advantages are represented by the development of structures as well as infrastructures. Moreover, activities associated with tourism and recreational fishery should be performed with a view to disseminating the knowledge of the sea and fishery amongst the general public in order to raise people's awareness of professional fishery and to broaden the available information related to coastal habitats.

The establishment of marine protected areas (MPA) has also offered opportunities to supplement fishers' income. As a matter of fact, even though MPAs impose drastic changes in the fishing systems, they can nonetheless boost the development of new activities and so can be seen as a potential source of income integration. Particularly, as well as the activities associated with the establishment of marine protected areas, such as fishery tourism, catering, the promotion of quality trademarks, the rediscovery of fishery craft products manufactured locally, the possibility of involving fishers in monitoring and supervising environmental activities can also be considered.

4.2 Further options for management measures

The expected management measures concerning small-scale fishery will be centred on the possibility of enforcing property rights on the country's actual situation. Of all the management measures available to managers, territorial user rights-based fishery management systems seem to have the best record of correcting the fundamental problem of nonexclusive harvesting rights and of reducing conflicts among users, producing superior economic performance while conserving fishery resources (Sutinen, 2002).

For small-scale fishery, it is difficult to establish a system of "strong" property rights because of the multi-specific nature of the activity, but it is possible to introduce the principle of "exclusivity" such as in the case of the self-managed fisher associations for bivalve molluscs fishery.

The small-scale fishery consortia are the operational instruments for the implementation, in the future, of rights-based management. The goals that this new management approach should achieve are:

- Reduction of over-capacity and fishing effort;

- Improving product quality;
- Increasing the value of landings;
- Reduction in exploitation cost;

In conclusion, a rights-based fishery management system is able to combine resource protection with economic and social objectives.

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Appendix 1

The Irepa national observatory for monitoring techno-economic data of the Italian fleet[a]

Data collection and estimates of economic parameters concerning the Italian fishing fleet are produced by IREPA (Institute for Fisheries and Aquaculture Economic Research) through a National Observatory, which dates back to the early 1980s. In 2000, IREPA started a process of rationalisation and harmonisation of the existing surveys on the fishery sector in collaboration with Italian National Statistical Institute (ISTAT) that also carries out the process of validation of the sample survey. The practical outcome of the process was the definition of a sample survey on the catches and the relative values whose objective is satisfying the EU legislation and, more in general, the national and international information needs.
The IREPA monitoring system for economic data on the Italian fishery sector is based on three main modules: fishing effort and activities, landings and prices by species, and economic data. In 2003, the number of small-scale vessels in the sample was 310 (3.5 percent of the total number of small-scale vessels).

1. Aims of the monitoring system

The aim of the statistical survey is to gather information on the most significant parameters of the fishery sector.
The existing observatory consists of three main modules:
- Module of evaluation of fishing effort and activity;

[a] In this Appendix, a synthesis of the Irepa methodology is reported. For detailed information: IREPA. (2001) IREPA implementation of a national monitoring system of socio-economic parameters of the Italian fishing fleet. In: AdriaMed (2001). Socio-economic Aspects of Adriatic Sea Fisheries. Report of AdriaMed Meeting on Socio-Economic Aspects of the Adriatic Sea Fishery Sector. FAO-MiPAF Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea. GCP/RER/010/ITA/TD-5. *AdriaMed Technical Documents*, 5: 32-41.

- Module of evaluation of landings and prices by species;
- Module of evaluation of economic and social data.

The survey is based on a single panel. Around 1000 vessels are monitored each week and elementary data are later expanded to the universe (the whole Italian fleet) using statistical sampling procedures.

2. Description of the survey

Data collection concerning the fishery sector in Italy is very complex due to the high number of species caught, the spreading of the fleet along the 8000 Km of coastline and the vast number of landing points available (estimated at around 800).

The National Fleet Register (Archivio Licenze di Pesca - ALP), where all Italian fishing vessels are included, constitutes the list from which the sampling units are extracted.

2.1 The questionnaire

Sample data are recorded by means of three specific questionnaires:

1. An annual questionnaire to record technical, dimensional and vessel–management information on the sample units and relevant socio-economic aspects (number of ship owners, their ages, their property quotas and the relationships between them);
2. A quarterly questionnaire to record data on fixed and variable costs, and on social aspects of property and crew;
3. A weekly questionnaire to record information reporting activity such as fishing time and area, average number of crewmembers, gears used, quantities, prices and revenues – as per species or group of species – and trade channel for sales;

A computerised questionnaire specifically processed for this survey is used for the gathering of information. The interviewers are provided with PCs to fill in the questionnaires and forward them via the Internet. Some examples of computer displays relating to the software used by interviewers to collect and transfer information to head office are shown in Figure 1.

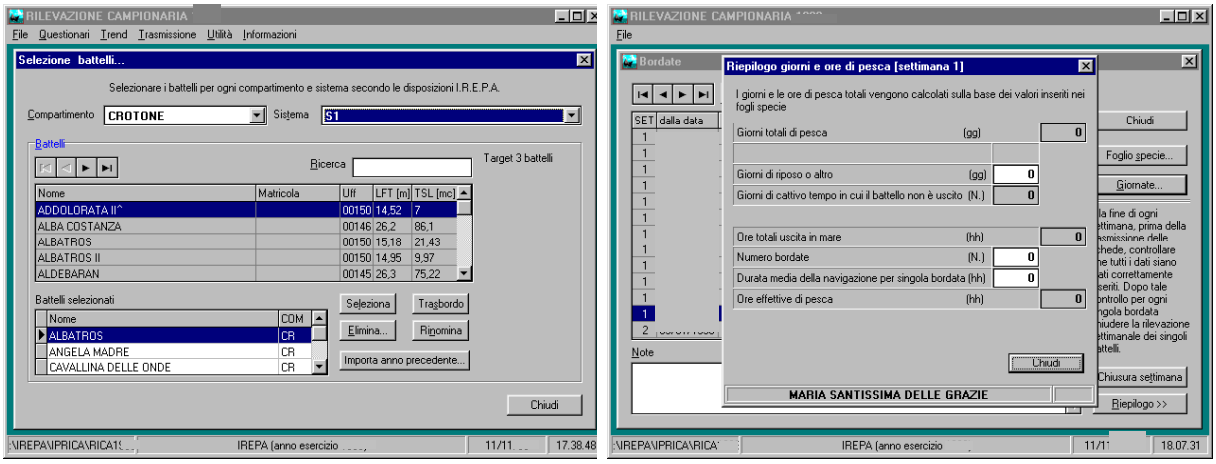

Figure 1. Display for the selection of vessels to be examined (left) and (right) display for assigning activities (fishing days, rest days, sailing hours, number of tacks, duration of sailing).

2.2 Sampling design: Single Stage Stratified Sampling

The sampling design is based on a single stage sample stratified over two variables (Figure 2). Stratification is carried out in order to create strata as homogeneous as possible, using characteristics correlated to the target variables.
The maritime regions of the Italian coast represent the first stratification variable from an administrative point of view. The sampling design considers only 13 of these 15 maritime regions, since there are no enrolment offices in Basilicata and, due to the small size of Molise's fleet (0.3 percent of the total number of Italian fishing vessels), the latter has been aggregated to Abruzzo. Some regions are further subdivided (Sicilia, Puglia, Calabria) in order to report data for FAO/GFCM Geographical Sub-Areas as well.
The second stratification variable is the fishing system used by the vessel; the fishing fleet is therefore divided in groups and each fishing vessel belongs to one of these groups according to the fishing system it uses. The identification of the fishing system follows the fishing systems actually present in the Italian fleet, while taking into account criteria of consistency with the segmentation considered under the EU regulation on data collection (EC Regulation n. 1639/01).

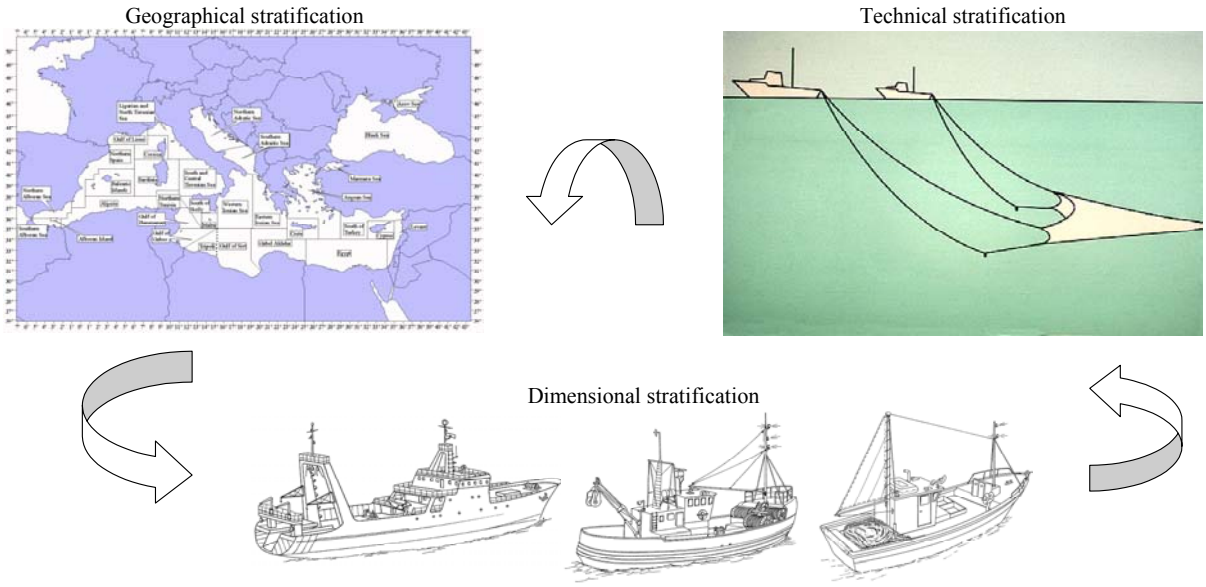

Figure 2. The process of stratification.

Furthermore, another stratification is carried out on the basis of the dimensional parameter LOA (length overall). This in order to obtain more homogeneous study domains and to take into account new EC regulations on data collection.
The statistical survey is composed of the following steps:

1. Calculation of the sample size and allocation across strata;
2. Expansion of the data trough appropriate expansion factors;
3. Control and validation of sampling data.