

Chapter 6

The fisheries information system

Introduction

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Fisheries information systems play a central role in providing support to elaborate and define management strategies aimed at ensuring a correct balance between fishery resource conservation and the economic benefits arising from exploiting these same resources.

The demand for statistical information relating to fisheries has undergone a significant increase over the last few years following the increasing attention paid to management-related matters and to the number of Italians, EU nationals and members of the international community involved in fisheries. The traditional task of managing fisheries by national and community Authorities and Regional Fisheries Management Organizations (RFMO), is now being shared with other institutional players.

In particular, the changes to Title V of the Italian Constitution, which assigned roles and responsibilities to regional and provincial governments, required more detailed information on fisheries.

The development of such a system is to be linked to the changes in the long-term strategic policy choices that occurred at EU level and were implemented in the Common Fisheries Policy. The guidelines for this policy were set out in the Council Declaration of 30 May 1980 regarding Common Fisheries Policy, which specified “rational and non-discriminatory Community provisions for managing resources, and safeguarding and rebuilding stocks to guarantee that they be exploited on a lasting basis, and on suitable social and economic conditions”.

The following paragraphs contain a careful examination of the main statistical sources for the fisheries supply chain, in particular:

- marine fisheries, distinguishing between fishing fleets, fishing effort, national and regional production data,*
- aquaculture,*
- fish product processing.*

The chapter ends with a brief study of the EU programme for the Italian fisheries data collection.

6.1 Fleet structural data

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A fishing fleet is defined as a set of vessels with a fishing licence according to Council Regulation (EEC) 3690/93. The fishing fleet is subject to the regulations laid down by the navigation code. From a geographical point of view up to 2011 there were: 15 Maritime Directorates, 54 Port Authorities (maritime departments), 48 District Maritime Offices, 126 Local Maritime Offices and 38 Beach Boards.

Fleet statistics prior to 1984

Prior to Law 41/1982 “A Plan to Rationalise and Develop Sea-fishing”, fishing was subject to “Fishing permits” being issued on the basis of a request made to the Shipping Registrar’s Office as established in Art. 12 of Law 963/1965, and by Art. 74 of Presidential Decree 1639/1968.

Decree 1639/68 established fishing equipment to be classified as nets, hooks and other tools and equipment, to be further subdivided according to type. Fishing permits contained a large number of systems that generated a considerable number of equipment/species/fishing area combinations that could be associated with a vast system of permit types that were not at all easy to compare. For example, there were more than 300 different permit types for local coastal fishing alone.

The official fleet monitoring system run by the Italian National Statistics Institute (Istat) up to 1983 was administrative in type (based on fishing permits) and global in nature (census).

Fleet statistics from 1984 to 1994

Law 41/1982 introduced licenses as a replacement for the previous permit-based system with a view to setting up controls and managing fishing effort. Licences were not issued automatically as was the case with permits, but were governed by possible management provisions to reduce the number of licences, or to modify the fishing areas or equipment allowed. As a consequence of the introduction of fishing licences, a register of licensed fishing vessels (the Fishing Licence Register,FLR) was created at the Directorate-General of Fisheries and Aquaculture of the Ministry for Agriculture, Food and Forestry Policies (then the Ministry of the Merchant Navy).

At the same time, to face up to the need for up-to-date and reliable information, the Italian National Statistics Institute (Istat), with the approval of the Ministry for the Merchant Navy, set up a new survey of vessels equipped for fishing. Carried out until 1994, the survey was based on updating a special archive system in Istat.

Fleet statistics from 1995

Between 1994 and 1995, the Fishing Licence archive became fully operative and was the official data source on Italian fishing vessels. The information recorded for each individual vessel follows Community regulations which set up a Community Fishing Vessel Archive System as part of the Common Fisheries Policy (Community Regulation EEC 163/1989 and (EC) 109/94).

Council Regulation (EEC) 2930/86 defined the characteristics of fishing vessels as comprising: overall length, length between perpendiculars, gross tonnage and engine power, which effectively identify fleet fishing capacity. Council Regulation (EC) 3259/1994 established that gross tonnage

must be established as per the London convention of 1969. Hence, from 2004 the existing gross tonnage measurement termed gross registered tonnes GRT (a volumetric measurement equal to 100 cubic feet, that is 2.832 cu metres) remains as a national measurement which is used alongside the measurement based on the 1969 convention, defined as tonnage in gross tonnes (GT) by Council Regulation (EC) 26/2004.

A limitation of the investigation is the lack of real statistical information about the fishing techniques used by motorised fishing vessels. The roots of the problem lay in the mainly routine nature of the investigations, which did not manage to adequately photograph how fishing firm operations were managed. Italian Ministerial Decree of 26 July 1995 regulated the allocations of fishing licence, and, amongst other articles, defined in art. 11 the fishing systems that could be licensed (one or more) along with the associated equipment to be used for fishing operations. An overall 13 systems were identified: seine fishing, beach seines, bottom trawling, mid-water trawling, shellfish trawling, boat rake, hydraulic dredges, anchored gear, anchored drift nets, small-mesh drift nets, long lines fishing, lines, harpoons. As from 2002 driftnets, also known as “*spadare*”, are no longer allowed, at present only 12 systems are recognised.

More than 75% of the vessels with Fishing Licence Register (FLR) registration in December 2010 were authorised for more than one fishing system, therefore, a routine paper-based investigation can only classify these vessels as “multipurpose”.

In order to obtain a realistic picture of fleet size by fishing system at the end of the 1990s, the government, in agreement with the Institute for Economic Research for Fisheries and Aquaculture (Irepa) and Italian National Statistics Institute (Istat), set up a permanent monitoring system. The system required a network of surveyors to be set up throughout the country which was given the lists of FLR registered motor fishing vessels for the necessary checks to be made and to find out the gear effectively used by each vessel. The process was gradual given the large quantity of vessels that had to be surveyed at the initial stage.

It was thus possible to carry out a technical classification by the type of fishing gear prevalently used.

The evolution in fleet size and fishing system distribution

In December 1983, prior to the survey modifications made in 1984, the fishing fleet, estimated on the basis of the permits recorded at the Port Authorities, was 23,385 vessels amounting to 323,500 tonnes GT. The changes that took place in 1984 produced a completely different picture of the fishing fleet; in particular the overall size fell to 19,155 motor fishing vessels. In December 2000, more changes were recorded with the completion of the Fishing Licence Register (FLR) review and more than 3,000 non-motorised vessels were included, which were not considered at the initial stage of archive completion. The total fleet exceeded 18,000 vessels.

In later years, during which activity to monitor the main fishing systems was consolidated, technical classification underwent several adjustments.

Overall fleet size tended to decrease pushed down by EU and national management measures taken to adapt fleet fishing capacity to available resources and carry out sustainable fisheries.

Table 6.1 - The Italian fishing fleet by fishing system.

System	Number of vessels					
	1983	1984	1994	2000	2005	2010
Purse seine	1,081	512	84	235	307	275
Dredge	....	455	261	728	706	709
Multipurpose	4,807	6,595	12,719	1,092	93	54
Longline	....	707	43	....	391	190
Passive gear	8,824	6,014	897	12,382	9,700	9,445
<i>Rapido</i>	....	....	....	....	84	72
Bottom trawl	5,653	3,994	1,588	3,821	2,871	2,606
Midwater trawl	....	110	27	132	152	148
Other	3,020	768	179	....	....	....
Ocean	....	....	....	24	23	16
Italy	23,385	19,155	15,798	18,414	14,327	13,515

Source: Istat for 1983, 1984, and 1994; processed from the Fishing Licence Register (FLR), MiPAAF - Irepa Observatory for 2000, 2005, and 2010.

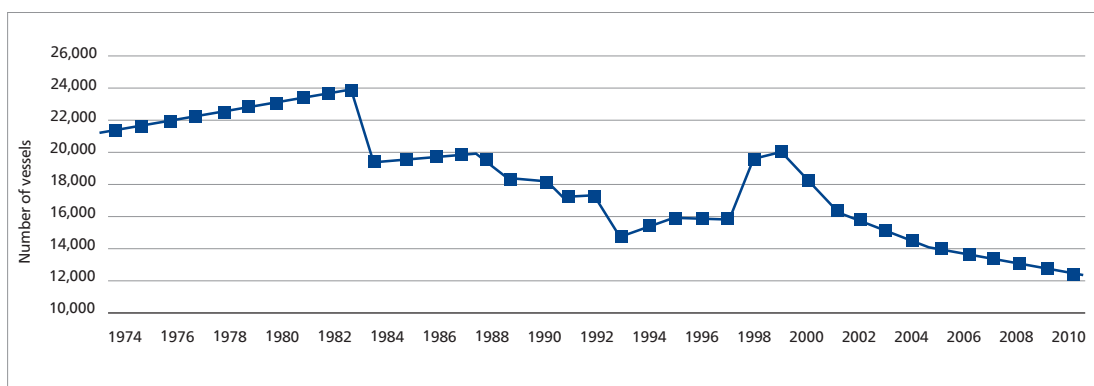


Figure 6.1 - Trend of national fleet size, 1974-2010 (Source: Istat up to 1994; processed from the Fishing Licence Register (FLR), MiPAAF - Irepa Observatory from 1995 onwards).

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6.2 Fishing effort data

Pinello D.

Effort data collection

Fishing effort is the set of production factors that contribute to the capture of fisheries resources. Effort measurements allow one, therefore, to ascertain the pressure placed by fishing activities on fish stocks.

In Italy, the data relating to effort began to be collected in a uniform and detailed manner as from 2000 pursuant to Council Regulation (EC)1543/2000. This regulation laid down that detailed data concerning effort be collected, and that a distinction be made between “active” and “passive” equipment requiring there to be different variables for the two system categories.

For towed fishing gear (namely gear that is used by exploiting vessel engine power), the fishing effort expended by the vessel is calculated combining the fishing capacity with the period of time in which the activity is carried out. For static fishing gear (all gear that is not towed by the vessel) fishing effort estimates take into account gear size and time spent in the water.

At EU level, as indicated in Council Regulation (EC) 1543/2000, effort for “active” gear is calculated by multiplying the vessel capacity (GT and kW) by its activity (fishing days), whereas for “passive” gear the gear size values are multiplied by the time spent in the water.

Community regulatory activity allows for two different ways to calculate effort. One, which is administrative, set out in EU Council Regulation (EC) 2091/98 regarding EU fishing fleet segmentation and fishing effort based on Multi-Annual Guidance Programmes (MAGPs). A second way is made possible via the parameters and variables shown in table 2 and made available after Council Regulation 199/2008 was approved.

Table 6.2 - Effort variables required by Council Regulation (EC) 199/2008 (Appendix VIII).

Variables	Gear
Number of vessels	
Days at sea	All types of gear
Energy consumption	
Fishing hours	Dredgers and trawlers
Fishing days	All type of gear
kW*Fishing days	Dredgers and trawlers
GT*Fishing days	Dredgers and trawlers
Number of fishing trips	All types of gear
Number of fishing operations	Purse seines
Number of nets, length	Nets
Number of hooks, number of lines	Hooks and lines
Number of pots, traps	Traps
Soaking time	All fixed gear

The trend of fishing effort in Italy

There has been a decline in fishing effort over the last few years. In the 2004-2010 period, the reduction of effort in terms of GT per vessel working days was 17%, and 19% if the kW were considered. This reduction can be attributed to several factors. Foremost amongst these is the result of management policy directed at controlling and reducing fishing capacity (three generations of Multi-Annual Guidance Programmes (MAGPs) entry/exit schemes introduced by art. 21 of Council Regulation (EC) 1198/2006).

Another factor that favoured the reduction in effort via activity reductions was the increase in production factor costs, above all the average fuel cost, which modified fishing habits, favouring a reduction in time spent at sea, and therefore of fishing days.

Table 6.3 - Trend of the effort expended by the Italian fishing fleet.

Year	Days	Effort (GT*days)	Effort (kW*days)
2004	2,205,333	31,303,628	188,781,798
2005	2,022,659	30,135,908	177,591,651
2006	1,983,155	29,819,516	177,183,741
2007	1,810,706	28,877,507	166,495,963
2008	1,588,223	25,241,900	148,878,290
2009	1,781,440	26,366,838	157,909,373
2010	1,667,835	26,005,496	153,721,600

Source: MiPAAF-Irepa.

Effort can be used to aid management if inversely related to catches. The resulting indicator is defined as Catch Per Unit Effort (CPUE) and is an indirect indicator of the state of resources and fishing productivity. Specific effort measurements were introduced in order to estimate the effort expended by a single resource. This parameter therefore does not measure total vessel activity but only relates to the catches of a single species.

A further improvement towards the creation of a more complete and systematic information system was again supplied by Council Regulation (EC) 199/2008. It specified that data should be gathered relating to spatial distribution of effort, namely knowing the marine biocoenosis effectively targeted by the effort. In order to manage this component it is essential that the new satellite monitoring systems be used. The new requirements of the Common Fisheries Policy allowed further indicators to be defined for assessing the impact of fisheries on the marine ecosystem, such as fishing activity distribution and aggregation, and identifying the areas that have not been affected by the use of towed bottom gear.

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6.3 Catches in fisheries statistics

Sabatella R. F.

Marine fisheries production pertains to fish products, distinguished by species, caught by Italian vessels in the Mediterranean Sea and in ocean waters and landed on Italian land.

The available data pertaining to marine fisheries production, albeit with differing levels of detail, covers the period from 1921-2010.

In 2005, the survey, originally based on census survey methods, changed to the sample survey method, and more detailed and specific data was made available pertaining to production according to fish species, type of fisheries and fishing areas.

On the basis of the available historical dataset, the trend of fish production over the period 1921-2010 rose initially and then decreased beginning in the early 1990s. In 2010, marine fisheries production in Italy was estimated to be 224,275 tonnes, for a turnover of 1,115 million Euros. It supplied 18% of home demand for fish products which is therefore mostly covered by imports (a volume of 941,000 tonnes in 2010) and a minimum part by aquaculture (162,000 tonnes).

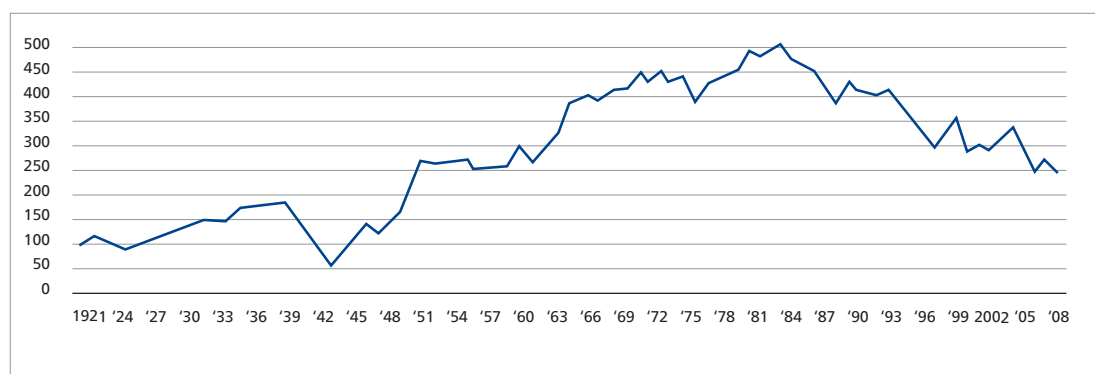


Figure 6.2 - Sea and lagoon fishing production - 1921-2010 (in 000 tonnes) - (Source: Istat).

Sources of fisheries statistics

Official data regarding production per species, administrative area, and fishing sector is estimated via a sample survey carried out as part of the National Statistics Programme (NSP). In this context, Istat is responsible for the methodological aspects, whereas Irepa, is responsible for organisational, and implementation-related aspects and for computing the statistical data.

The survey is carried out on a sample of vessels registered in the fishing licence archive of the Ministry for Agricultural, Food and Forestry Policies. The sample, representative of the national fleet, consists of about 1,500 units equating to around 11% of the national total.

In order to obtain disaggregated information at a geographical and fishing technique level, the survey provides for stratified sampling being carried out. The stratification criteria are as follows:

- geographical registration area of the vessels;
- technical sector according to the most often used fishing gear;
- vessel size.

Today, evolution in the statistical system for producing data is still ongoing. Although much has been done as regards data availability and reliability, procedure validation and reducing estimate errors, the new guidelines for scientific research and management are indicating that further extensions to the statistical information concerning fish production are needed.

Availability and spread of data

National and regional production data are available in the national statistical archives (Istat and the Irepa/SISTAN), in the European (EUROSTAT) and in the international (Fish-Stat, FAO) archives. Annually, Irepa publishes the “The Economic Observatory on Sea-Fishing Production Facilities in Italy” which has reached its XIX edition. A summary of the statistics produced by Irepa is reported in Table 6.4.

Table 6.4 - The main statistical information provided by the “The Economic Observatory on Sea-Fishing Production Facilities in Italy”.

	Trends in national fishing fleet capacity from 2004
	Technical characteristics and crews of the Italian fishing fleet by fishing systems
Capacity and fishing activities	Average values of the main capacity and fishing activity indicators according to fishing systems
Source: National	
Statistics System (SISTAN)	Trends in fishing activity by region and fishing system from 2004
	Absolute values and percentage incidence of the main fishing capacity components by Region
	Average values of the main capacity and fishing activity indicators by region
	Trends in catches from 2004
	Trends in revenues from 2004
	Distribution of catches by system and region
	Distribution of revenues by systems and regions
	Prices based on systems and regions
	Catches by species and systems
	Revenues by species and systems
Catches, revenues and Prices	Prices by species and systems
Source: SISTAN	Trends in catches by species from 2004
	Trends in revenues by species from 2004
	Trends in prices by species from 2004
	National fleet physical and economic productivity indicators by systems and by region:
	1. Annual catches by vessel from 2004
	2. Daily catches by vessel from 2004
	3. Gross saleable annual production per vessel from 2004
	4. Daily gross saleable production per vessel from 2004
Sustainability indicators	National fleet environmental sustainability indicator Catches Per Unit of Effort (CPUE)
Source: SISTAN	National fleet economic sustainability indicator (gross saleable production (GSP)/effort)
	Distribution of total intermediate costs by fishing system (absolute values, per vessel and percentage composition)
Production costs and income statement	National fleet income statement according to fishing system (absolute values, by vessel and percentage incidence on revenues)
Source: PN Council	
Regulation (EC) 199/08	Distribution of total intermediate costs by region (absolute values and by vessel)
	Income statement by region

Fish production in Italy by main captured species, fishing systems and regions

The composition of catch per species highlights the multi-species nature of Italian fisheries, with a high number of commercially important species present in catches. If anchovies, the species that was most caught by the national fleet, with a production of about 54,000 tonnes in 2010 (see Table 6.5), are excluded, total production is distributed over more than 200 fish species.

Table 6.5 - The composition of national fleet catches and revenues by main species, 2010.

	Percentage			Percentage	
	Catches (t)	Income		Revenues (mln €)	Income
Anchovies	54,095	24.3	Hake	90.06	7.7
Clams	19,748	8.9	Anchovies	75.95	7.4
Sardines	16,274	7.3	Rose shrimps	75.67	5.9
Hake	11,528	5.2	Sword fish	67.42	5.8
Rose shrimps	10,264	4.6	Scampi	61.86	5.3
Cicarelle (Mantis shrimp)	6,217	2.8	Clams	52.78	5.2
Other species	104,879	47.0	Other species	679.00	62.6
Total production	223,005	100	Total production	1,102.74	100

Source: MiPAAF - Irepa.

Bottom trawling, with a production of 78,000 tonnes in 2010, was the most important segment both as far as quantities are concerned (35% of national production) and in economic terms (50.4% of all fisheries sales).

Table 6.6 - The composition of national fleet catches and revenues by fishing systems, 2010.

	Percentage			Percentage	
	Catches (t)	Income		Revenues (mln €)	Income
Bottom trawl	78,182	35.1		555.47	50.4
Midwater trawl	44,393	19.9		46.52	4.2
Purse seine	31,506	14.1		52.71	4.8
Dredge	21,794	9.8		63.00	5.7
Small-scale fishery	33,559	15.0		275.58	25.0
Multipurpose	8,426	3.8		65.81	6.0
Longline	5,148	2.3		43.66	4.0
Total	223,007	100		1102.76	100

Source: MiPAAF - Irepa.

In absolute values, the data regarding both the production structure and the production and revenue levels confirm the importance of the fishing sector in Sicily and Apulia: indeed about 36% of total production (both as regards quantity and value) comes from these two regions.

Table 6.7 - Breakdown of catches and revenues by region, 2010.

	Catches (t)	Percentage Income	Revenues (mln €)	Percentage Income
Liguria	3,745	1.7	30.85	2.8
Tuscany	10,629	4.8	44.85	4.1
Lazio	5,441	2.4	46.80	4.2
Campania	14,089	6.3	64.21	5.8
Calabria	9,205	4.1	53.01	4.8
Apulia	34,842	15.6	184.00	16.7
Molise	2,099	0.9	18.60	1.7
Abruzzi	10,914	4.9	43.02	3.9
Marche	29,622	13.3	120.35	10.9
Emilia Romagna	22,181	9.9	56.72	5.1
Veneto	23,428	10.5	64.49	5.8
Friuli Venezia Giulia	3,724	1.7	19.34	1.8
Sardinia	8,056	3.6	62.73	5.7
Sicily	45,033	20.2	293.77	26.6
Total	223,007	100	1102.76	100

Source: MiPAAF - Irepa.

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6.4 Aquaculture statistics

Cozzolino M.

Data gathering in aquaculture began almost simultaneously with the onset of the activity being defined as an economic and production sector clearly distinct from capture fisheries. While significant historical datasets are available for structural statistics, the same is not true for economic data which began to be collected as from 2008.

Sources of aquaculture statistics

Initially, the gathering of statistical data for fish farming in marine and brackish water was characterised by methodological excesses, since aquaculture was associated with and considered as a "quota part" of fisheries. This methodology is the backbone of the historical fish production dataset, in which Istat, the main official source, included the aquaculture quota as an integral part of the macro-aggregate "fish production in inland waters". In 1974, aquaculture produced mainly freshwater species which represented more than 77% by volume, namely about 13,670 tonnes, of the aggregate "fish production in inland waters". In 1986, there was further

growth of the “freshwater-farmed” sector volume, which settled at 81%, or 35,500 tonnes, of the entire aggregate “fish production in inland waters”. The historical aquaculture dataset pertaining to the 1980s is not totally representative of the total achieved by the production segment, since the production of euryhaline species was still included in fisheries. The need for greater detail concerning the real contribution that aquaculture makes to the entire “fisheries” segment induced API (Associazione Piscicoltori Italiani, the Italian Fishfarmers Association) to publish the 20 year historical set of estimated and reconstructed national trout production data. API, which grouped together only a part of the total number of Italian fish farmers in the 1970s and 1980s, started to publicise its own observations at the same time as Istat. API approved methodology is an indirect assessment of gross saleable production (GSP) and derives from estimates, based on the Food Conversion Ratio per individual species, of the volume of feeds used by producers in one tax year. As regards the number of workers employed, the first census was carried out by the API in 1987. It indicated that the number of workers employed in the entire intensive aquaculture-related industry was 8,000.

In 1989, the Central Institute for Scientific and Technological Research applied to Marine Fisheries (ICRAP) carried out a new census in which 5,000 workers were found to be employed only in the intensive production sector, excluding other industry-related activities. The data gathered by API relating to turnover and volumes for the aquaculture sector played a strategic role in producing National Plans, whereas the data gathered by Istat was the same sent to EUROSTAT to be analysed and used as a basis for international planning. The coexistence of two “parallel” sources of statistical data, was the critical aspect of the aquaculture data gathering system for over two decades. Combining and comparing the available statistical sources of the 1980s and 1990s, it was found that the data from the Italian Ministry of Agriculture, Food and Forestry Policies (MiPAAF), Istat, the Organization for Economic Cooperation and Development (OECD) and the EEC was, on average, in line with FAO data. In the 1980s, ICRAM started the first set of programmed statistical and economic orientation activities, guaranteeing official statistic production together with API. Istat continued to be the official source, although it took Ministry data into account, and therefore API-ICRAM data was used as official data and sent to Eurostat. The API-ICRAM statistical dataset does not provide information about the number of workers employed per production sector or about the technologies or facilities used. To satisfy new requirements, the Italian Ministry of Agriculture, Food and Forestry Policies started single-subject investigations to gather more data. In 1996 the UNIMAR consortium [Single Centre for Cooperative Research - Federcoopesca, Lega Pesca, and A.G.C.I. Agrital Research Institutes] launched the first Italian census of fish farming facilities dedicated to euryhaline species farming. This survey contributed to defining the MIPAF 5th and 6th three-year plans. Though in 2000 UNIMAR updated the fish and shellfish farming company database, there still was a lack of an overall picture of the entire Italian aquaculture world.

Data availability and dissemination

Statistical data at a national level was realigned as a result of Council Regulation (EC) 762/2008 concerning the submission of aquaculture statistics by member States to EUROSTAT. Italy submitted statistics about all aquaculture-related activities carried out on Italian land, in both fresh and in brackish water. The first reference calendar year was 2008.

The data submitted annually concerns:

- annual aquaculture production (unit volume and value)
- annual aquaculture input (unit volume and value) based on catches
- annual production of hatcheries and nurseries;
- aquaculture sector structure.

The regulation specifies that data be submitted by Member States as from 2008 and then at three year intervals. All data were accompanied by a methodological report describing the data gathering and statistical compilation methods. Italy immediately implemented the regulation. As regards economic data gathering, the European Commission directed that Council Regulation (EC) 199/2008 (which entails that data be gathered for the fishing and processing sectors) also be extended and applied to aquaculture in 2008. EU regulations established that data be gathered according to sector segmentation. Segmentation is based on farming technologies and species, and ensures that data is gathered for numerous categories. This, in turn, allows the economic variables that characterise the macro-aggregate turnover of Italian aquaculture to be determined. The first economic data gathering campaign began in 2009 and concerned calendar year 2008. Italy had to monitor new sectors representing the universe of companies that in 2006 comprised 715 "legal entities". For sectors whose population was < 10 active companies, no sampling occurred. Information was gathered by defining a representative sample of each segment. All the economic parameters of a company, on the basis of the instructions in Appendix of Commission decision 2010/93/EC, were estimated applying statistical techniques that allow estimate reliability to be ascertained.

Conclusions

In late of 2011 the European Commission evaluated and calculated the economic performance indicators for the national aquaculture sector. The data submission request was made by the Commission in the first semester of 2011, and Italy accordingly responded with a data submission. The parameters were gathered on an annual basis and according to production sector, as set out in Appendix XI of Commission Decision 2008/949/CE.

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6.5 The fish processing industry

Malvarosa L.

The fish product processing sector in the agro-allied industry constitutes a small part of the entire agro-allied industry supply chain (about 1% of overall turnover) and is a somewhat intricate sector. Over the last few decades, it has felt the effects of the renovation process that affected the entire Italian agro-allied industry. Furthermore, both the curing and canning, and frozen food industries can represent a launching pad for enhancing the value of typical Italian sea species.

Production facilities and income statement

Firms operating in fish processing were periodically surveyed by Istat, as part of the manufacturing sector.

Based on census data, the 1970s were a good time for the development of the sector and this was without any doubts due to the increase in fish products consumption (ISMEA 1996). In 1981, there were 360 firms providing employment for a total of 10,500 workers (with an increase of respectively 80% and 111% on previous census data). The previously mentioned food industry renovation process, including the processing industry, started in the 1980s. The resizing of the production system, brought about by technological innovation of production processes, gave rise to an increase in the number of companies and a reduction in workers, as can be seen in table 6.8.

Table 6.8 - Number of firms and workers in the economic activity sector 10.20 (Fish and fishery product processing).

Year	Number of firms	Number of workers
1971	202	5,007
1981	364	10,553
1991	402	7,658
2001	415	6,640

Source: Istat: Intermediate survey of industries and service, 1971-2001.

The census data were viewed alongside the collected data to provide company structural statistics (number of firms, number of workers employed, turnover, added value, gross investments, etc.) in compliance with Council Regulations (EC) 58/97, 2701/98 updated by Council Regulation (EC) 295/2008 and Council Regulation (EU) 251/2009. The data is available both in the national (Istat) and European (EUROSTAT) statistical archives.

Due to confidentiality-related problems, these statistics were not published in 2003-2007, but are available for subsequent years.

The systematic collection of structural and income data for the fish product processing industry was also included in the National Fisheries Data Collection System as set out in EC Regulation 1543/2000 and later modifications (Regulation (EC) 199/08).

Production data

The collection of production data, as regards the volume and value of cured and frozen fish products and of fish-based products is part of wider annual investigations carried out by Istat to collect industrial production structural data - PRODCOM, formerly (EC)3924/91. The PRODCOM

list is a harmonised list of industrial products to be surveyed, which was recently updated with the new ATECO 2007 economic activity classification which became effective on 1 January 2008. There are 26 categories of goods identified in the PRODCOM classification for products obtained from fish processing. The following table shows the value and volume of production items sold, as recorded by Istat, by fish processing product (PRODCOM 102 goods category), as indicated on the EUROSTAT site.

Table 6.9 - Sales volume and value by goods category (PRODCOM 102 code - Fish, crustacean and mollusc processing).

Year	Sales volume (tonnes)	Sales Value (thousands of Euros)
1999	6,759	33,748
2000	15,955	85,425
2001	4,430	32,976
2002	4,798	37,229
2003	2,664	22,701
2004	3,998	32,162
2005	13,408	70,786
2006	11,379	64,987
2007	6,891	46,789
2008	6,473	41,010
2009	8,407	35,724

Source: EUROSTAT, PRODCOM series.

On the production side, the PRODCOM survey was supported by the regulation relating to fish data collection which became effective pursuant to Council Regulation (EC) 1543/2000.

In the original version, the regulation established that there was also an obligation to collect production-related variables, such as the quantities of raw materials used in the production process (per species) and price (per product).

The difficulty in collecting data on raw materials, led to an overhaul of economic indicators by the fish product processing industry specified in the data collecting system. In the current version the data collecting regulation ((EC) 199/2008, effective since 2009) did not specify any obligation for member states to collect data regarding production volumes (raw materials, input, production and output). As already mentioned, official classifications do not allow for a detailed distinction between the canning and frozen foods sector.

The need to have more disaggregated statistics, in particular for the canning industry, given its importance at a national level, has in time given rise to specific sector-based data collections being made.

This survey was carried out by the National Fish Curing and Canning and Tuna Fisheries Association (ANCIT) which supplied more detailed statistics on the Italian fish curing and canning industry up to 2003. It provided estimates of production volume and value for the main products of the Italian fish curing and canning industry (canned tuna fish and sardines, salted anchovies, anchovy fillets in oil), and processed official Istat data on foreign trade of fish products.

Data relating to the fish curing and canning industry turnover is provided, up to the present date, in the FEDERALIMENTARE (Italian Food Industry Federation) statistics (of which ANCIT is a member). As regards the frozen fish foods sector, there is a specific study on this sector carried out by DATABANK.

Table 6.10 provides a summary of the above data collections.

Table 6.10 - Canned and cured fish and frozen fish food sector turnover for 2006-2010 (million Euros).

	2006	2007	2008	2009	2010
Fish curing and canning industry turnover	1,223	1,256	1,306	1,387	1,420
Frozen fish food industry turnover	131	128	116	....	....
Percentage weight of fish curing and canning/total agri-food industry turnover	1.1	1.1	1.1	1.2	1.1
Percentage weight of frozen fish food/total frozen food turnover	5.4	5.1	4.3		

Source: ISMEA (Institute for Farming Market Services) (2008 and 2010), Federalimentare (Italian Food Industry Federation) and Databank.

To conclude, it can be seen from the previous paragraphs that the system for producing food processing industry-related statistics is a continuously evolving one, in step with the changing information needs of management and scientific research.

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6.6 The EU fisheries data collection system in Italy

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The EU framework for the collection and management of fisheries data was adopted by the European Commission as from 2000 (EC Regulation No. 1543/2000) with the specific objective of improving the scientific opinions requested to support Common Fisheries Policy.

Setting up an EU data collection framework met the need for creating multiyear sets of aggregate data that were accessible to competent users and above all could be compared at a geographic scale. Data harmonisation and reliability are two features of fundamental importance and these principles are only guaranteed by a common EU system, on the basis of which Member States are expected to apply the same parameters, comply with the same levels of aggregation and assess data reliability using shared methodologies.

Regulatory aspects and operating procedures

Two phases of the EU data collection framework can be distinguished. The first phase covered the period from 2000 to 2008 (Council Regulations EC 1543/2000, EC 1639/2001 and EC 1581/2004). The second phase (Council Regulation EC 199/2008, EC 665/2008 and EC 93/2010), which covers 2009-2013, broadened the scope of national data collection system, bringing them into line with the new requirements of the Common Fisheries Policy and with the most recent management developments (regional approach, data collected according to fishing

metier and not only to stock, indicators showing fishing pressure on the ecosystem, and data accessibility and dissemination).

On an operating level, national administrations are responsible for implementing national data collection system. National programmes must be produced in accordance with Community regulations and respecting the guidelines provided by the EU. The programmes are approved by the EU on the basis of the opinion issued by the Scientific, Technical and Economic Committee of the European Commission (STECF).

National Administration is also responsible for the quality and completeness of primary data collected as part of national programmes, as well as for the detailed and aggregated data which are submitted to end users.

The salient features of the national fisheries data collection system

A salient feature of “data collection” from the onset was the need for a multidisciplinary approach in evaluating and managing the fisheries industry. In particular, the objective was to create a strong relationship between the economy and biology of fisheries, defining sampling schemes which could take the reporting requirements of both into account. “Data collection” entails the collection of biological, economic and “common” data (catches, capacity and effort) which is the base for both economic and biological analyses. It allows the two areas to be linked, thereby implementing bio-economic models which have become standard working tools.

A further crucial element in the community data collection framework concerns integration of the data regarding fishery and, therefore, fleet operations, with the population data for fish exploited in commercial fishing. Traditionally, the objective of biological sampling has always been the stocks and resources of a demarcated geographical area. Nevertheless, this information has not proved to be appropriate for describing and assessing multi-species and multi-gear fisheries. Hence the data collection regulations introduced the requirement for sampling based on metier (a combination of gear/species/ geographical area) for biological data as well as for catch (landings and by-products) and effort data. This approach, despite its greater methodological and statistical complexity, is more suited to the Italian and to the Mediterranean context.

Another salient feature of the community data collection framework is the so-called “regional approach” which allows aspects relating to national programme coordination to be assessed and, if necessary, recommendations to be formulated for a better integration of national programmes and for subdividing responsibilities amongst Member States. The different needs of regional fishery bodies (the FAO General Fisheries Commission for the Mediterranean in the case of Italy) can be considered and included in National Programmes by means of the regional coordination tool. Regional coordination is supported by international methodological coordination.

Management and use of collected data

The data collected as part of the National Programme allows the following to be assessed:

- the condition of exploited marine living resources;
- the level of fishing and the impact of fishing activities on marine living resources and ecosystems;
- the socioeconomic results obtained by the fisheries, aquaculture and processing industry both inside and outside the EU.

In particular, the parameters to be estimated are shown in table 6.11.

Table 6.11 - Parameters included in the National Programme for the collection of fisheries data 2009-2013.

Fisheries Industry Assessment Form

<p>Section concerning the collection of economic variables</p> <p>Parameters: Earnings, staff costs, energy costs, repair and maintenance costs, other operating costs, capital costs, capital values, investments, financial situation, employment, fleet, effort, number of firms, value of production according to fish species (Appendix VI Council Regulation EC 93/2010)</p>
<p>Section concerning the collection of biological variables</p> <p>Metier-related variables: quarterly distribution of species lengths in catches and quarterly discard volumes</p> <p>Recreational fishing: for the species red tuna fish and eels, quarterly breakdown of catches in terms of weight</p> <p>Stock-related variables (for the stocks listed in Appendix VII Council Regulation EC 93/2010): specific information relating to age, length, weight, sex, maturity and fecundity</p>
<p>Section concerning the collection of transversal variables</p> <p>Capacity: number, GT, kW, vessel age</p> <p>Effort: number of vessels, sea days, fishing hours, fishing days, kW*fishing days, GT*fishing days, number of fishing trips, number and length of nets, number of hooks, number of lines, number of cruives and traps, immersion times for passive gear</p> <p>Landings: Value of landings, (total and per species), live weight of landings (total and per species), price for each commercial species, conversion factor per species</p>
<p>Section for sea research campaigns</p> <p>Mediterranean International bottom trawl survey, MEDITS</p> <p>Pan-Mediterranean pelagic survey, MEDIAS</p>
<p>Form for assessing the economic situation in the aquaculture and processing industry</p>
<p>Section for gathering economic data concerning the aquaculture sector</p> <p>Parameters: Earnings, staff costs, energy costs, raw material costs, repair and maintenance costs, other operating costs, capital costs and value, net extraordinary expenses, investments, raw material volume, sales volume, employment, number of firms (Appendix X Council Regulation (EC) 93/2010)</p>
<p>Section for the collection of processing industry economic data</p> <p>Parameters: Earnings, staff costs, energy costs, raw material costs, other operating costs, capital costs and value, net extraordinary expenses, capital value, net investments, liabilities, employment, number of firms (Appendix XII Council Regulation (EC) 93/2010)</p>
<p>Form for assessing the impact of the fisheries sector on the marine ecosystem</p> <p>Indices: State of conservation of fish species, proportion of large fish, size at maturity of exploited fish species, distribution of fishing activities, aggregation of fishing activities, areas not affected by the use of active bottom gear, rejection rates for commercially exploited species, energy efficiency (Appendix XIII, reg. (EC) 93/2010)</p>

The data collected and aggregated as per the criteria established by EU regulations are inserted into the database to be accessed by authorised users and to allow exchanges between Member States and research scientists.

The accessibility and availability of data is a central aspect of data collection regulations since it is the main justifying characteristic. Data is used in a variety of ways: from resource evaluation, to planning, and monitoring and control activities. The variety of uses implies that data can be requested at different levels of temporal, technical and spatial aggregation. Table 6.12 summarises data requests and their details according to the different types of user.

Table 6.12 - Example of how data aggregation levels can change depending on end users.

		USE		
		Monitoring	Evaluation	Planning
		Administration National and Regional	Committees Evaluation Communities	European Commission Administration
Users			Scientific, Technical and Economic Committee for Fisheries (STECF) - Mediterranean Sub Group (SGMED) and General Fisheries Commission for the Mediterranean (GFCM) - Scientific Advisory Committee (SAC)	National and Regional Economists Biologists Fishermen
Time resolution	Monthly	Quarterly	Quarterly/Annual	
Spatial resolution	Total Italy Administrative region	FAO Geographical	Total Italy Sub Area (Geographical Sub-Area (GSA)) and according to administrative region	
Technical resolution	Fleet segment	<i>Métier</i> (gear + species + fishing area)	Fleet segment	
Items required:				
Catches per species	x	x	x	
Fishing effort	x	x	x	
Catches according to age and length		x		
Abundance		x		
Economic data	x			x

The data collection regulation as part of the revision of the CFP

A further review of the legislative framework for data collection is currently under discussion. This revision represents one of the salient objectives of the Common Fisheries Policy reform which will become effective in 2014. The European Commission provides for an integrated European information system for fisheries management. This will respond efficiently to the needs of users, improve data quality and allow more advanced fisheries management, simplifying, wherever possible, regulations and communication requirements as well as reducing costs.

The process of revising the data collection regulations began with a review of the strong points and weaknesses of the entire EU framework and its prospects (table 6.13).

An important aspect of the regulation on data collection is transparency of the rules on data access and cooperation at a regional level. The possibility of implementing regional databases is being discussed in order to further reinforce these features. In these databases, Member States would share data and allow access to end users. The development of a regional database would increase the transparency of data collection methods thereby facilitating quality assessment.

Table 6.13 - SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of the data collection regulations.

Strengths	Weakness
Established since 2002	Too Ambitious
Data Availability	Too little focus on use of data
Common Framework	DCF incomplete
Financial Support	Inefficient use of resources
More transparency	Complexity
Harmonisation in data collection	Mismatch between needs and outputs (stratification
Introduced standards	Métier Information)
Co-ordination and Co-operation by MS	Administrative Burden
Quality Control	<i>Follow up of MS Actions</i>
Métier Approach	No Reporting website for Reference material
Bio-economic Framework	Métier data not used by RFMO
Regional Approach	At sea observations - monitoring difficult (other means?)
Good Dialogue with EU	Data quality
Included Data End User Input	No catalogue of recommendations for MS
Ensure redundant data are not collected	Dialogue with Data End Users could be better
	DCF output driven (Data Delivery) not Results Based driven
Opportunities	Threats
Maritime Policy - Support MSFD	Financial Climate
New DCF	Misaligned with National Priorities
Surveys - Link Environmental and Fisheries Data	MS resource base devoted to Fisheries
International exchange of experts	Complexity of DCF
Improve efficiency and experts	Data Deficiencies
Reduce administration burden	Non Compliance
Regional co-operation	Mismatch data delivery v's data needed
Driven by data end users and Managers	Métier data not used by RFMO
Integrated bio-economic advice	Easier to adopt a "Business as usual Approach"
Cooperation with Commission/RAC/MS/RFMO	Historical data consistency lost
More results based approach	
New CFP	
Co-operation with stakeholders	
Window of Opportunity	

Source: Scientific, Technical and Economic Committee for Fisheries (STECF), Reflections on the Present and Future Requirements of the DCF, Edited by Paul Connolly and Jarno Virtanen, EUR 24896 EN - 2011.

Conclusions

The EU data collection framework is a key element in the information required to support fisheries management, both at a national and EU level. The following are the key system items: precisely defined evaluation parameters, the use of shared methodologies, extreme care taken over assessing collected data quality and reliability, and homogeneous national programmes set up in all European countries.

The Italian national programme, implemented in compliance with this EU framework, is nowadays the reference instrument for statistical and scientific output in fisheries, aquaculture and the processing industry. The management of the programme is complex and requires there to be great synergy between national government and the research institutions involved. The efforts and resources expended over the last ten years have allowed a database to be built that is complete and available for use by the management and research community.

Data collection regulations are continuously evolving and the future challenge is to be able to combine precise parameter and method definition with a certain level of flexibility, in order to be able to satisfy the information requirements arising from changes in management scenarios.

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