

ITALY - EVALUATION OF SOCIO-ECONOMIC INDICATORS FOR SUSTAINABLE FISHERY IN SICILY. PART 2 - CASE STUDY - CONTRIBUTION TO THE STUDY ON ECONOMIC AND SOCIAL SUSTAINABILITY INDICATORS FOR FISHERIES

1. Introduction

1. The paper reports a synthetic analysis of data produced by the “National Observatory for monitoring techno-economic data of the fishing fleet and the evaluation of socio-economic parameters”. The aim of the study is to provide the OECD Committee for Fisheries with a snapshot of national and regional fisheries analysed by processing economic and social sustainable indicators.

2. Using the methodology presented in Part I, this study addresses such issues as the prospects for future evaluation of indicators capable of analysing sustainable development of the sector. In this framework a set of national indicators is reported and a specific case study regarding fisheries in Sicily is presented. In detail the case study regards an analysis propaedeutic to the draft of a regional management plan. This management action occurs in a delicate transition period where all active segments are engaged in restoring the declining productive capacity of the industry. Such a situation has been recently analysed and the public administration deputed to fisheries management intends to undertake measures to offset the decline of the industry. The adoption of a coherent planning framework, in fact, could allow the negative trend to be reversed. This analysis is a first contribution to bring in a planning document much of the information available on fisheries in Sicily, where objectives, tools and means have to be identified and made consistent with the need to restore and rehabilitate the region's fishing industry.

2. Macroeconomic framework of the Italian fishery sector

Production

3. In 2000, Italian landings reached 392.000 tons, corresponding to 3.000 billion Italian lire. Compared to the previous year, production decreased by about 6%, which corresponds to a reduction of about 24.000 tons of fishing product. Many events that occurred during the year influenced the decrease in the production levels:

- 1) a variation in the composition and in the consistency of the fishing fleet;
- 2) a reduction of fishing activity;
- 3) a situation of over-exploitation of coastal resources and a change of fishing areas.

As regards the first point, the fishing fleet in 2000 decreased both in number (-7%) and in gross tonnage (-10%). In fact, all through 2000 a great impetus has been given to the reduction of fishing effort: the constant reduction of productivity and profitability, especially for certain fishing segments and for particular fishing areas, and the increases in operational costs, due in particular to fuel cost increases, induced many vessel owners to ask for financial support for permanent withdrawal during the year.

4. In the last few years it has also been possible to better identify the gears which have been effectively used by fishing vessels. Many multipurpose vessels (vessels that have licence to fish with more than one gear) have been reallocated as bottom trawl vessels.

Table 1. Indicators of fishing effort by gears, years 1999 and 2000

Gears	Number of vessels		GRT		Power engine kW		Fishing days ^(*)	
	1999	2000	1999	2000	1999	2000	1999	2000
Bottom trawler	2,370	2,803	102,647	108,841	520,578	590,445	384,843	496,581
Mid water pair trawler	147	132	9,261	8,605	50,506	47,392	22,474	23,083
Purse seiner	277	235	16,516	14,123	80,302	69,119	33,173	29,286
Dredges	755	728	7,633	7,583	80,857	78,606	88,210	84,848
Small-scale	12,482	11,990	33,091	31,725	302,781	290,355	2,115,522	2,047,237
Multipurpose	3,767	2,502	60,871	36,673	499,261	329,012	563,007	396,780
Total	19,798	18,390	230,018	207,550	1,534,284	1,404,929	3,207,228	3,077,816

Source: Italian Fishing Fleet Register, Ministry of Agricultural and Forestry Policies

^(*) IREPA - National Observatory

5. The decline in production has also been influenced by the lower level of fishing activity, even if the decrease in days at sea (DAS) did not concern bottom trawlers and purse seiners. This outcome is explained by the much lower number of DAS during the previous year, due to the long period of temporary withdrawal in summer months; on the contrary, small-scale and multipurpose fishery activity show a strong reduction in DAS; in particular, the presence of mucilage in summer, has limited fishing activity in the Adriatic Sea. The increase in the price of oil products (in 1998 fuel's mean price was 350ITL while in the first six months of 2000 the mean value reached 700 ITL, which corresponds to an increase of 100%) has certainly contributed to the reduction of the total number of fishing days. Many vessels limited fishing effort in order to reduce operational costs. Furthermore, in many coastal areas, many vessels fished in areas closer to the coast in order to reduce the impact of fuel's price increase; this has determined a lower mean productivity and therefore a lower level of catches.

Earnings and prices

6. In 2000 earnings didn't vary much compared to the previous year due to the increase in mean prices; these have almost reached 7.700 ITL/kg in 2000 as compared to 7.100 ITL/kg in 1999. The positive trend of prices has certainly been affected by the lower supply of product, but it must be pointed out that the positive trend has occurred in the last quarter of the year (it increased by more than 30%). In previous months prices were stable compared to 1999. This trend is due to changes in consumers' preferences. As matter of fact, in the second half of the year the BSE disease on bovine animals caused a decline in bovine meat sales in favour of fish sales and this led to an increase in fish prices. The growth concerned all fishing gears and all fishing species. In particular, the price of the group of species "other fish" reached 8,900 ITL/kg compared to 8,600 ITL/kg in the same month in the previous year; important variations also occurred for clams and molluscs.

Analysis by fishing gears

7. The analysis by fishing gears gives additional explanations. Fishing days at sea of bottom trawlers increased by 29%, with a corresponding increase in catches of 19%. Even though catches showed an increase in 2000, they have been lower than those occurred in 1998 (more than 120.000 tons). The crisis of bottom trawler in 1999 has therefore continued over 2000, where productivity hasn't reached previous levels.

8. Fishing days of small-scale vessels diminished by 68 thousand days compared to the previous year (a decrease of almost 3%). The decrease has concerned mostly the Adriatic fishing areas, because of mucilage. The reduction in catches hasn't been counterbalanced by the increase in prices. The situation has

therefore changed in 2000; in fact, in 1999, small-scale vessels reached high levels of production and earnings, thanks to the temporary withdrawal of bottom trawlers due to the war in Balcan area.

9. Mid water pair trawlers catches didn't vary much in 2000 compared to 1999. This caused an increase in prices and a consequent increase in earnings. Especially in the Medium Adriatic area, fishermen organisations stakeholders controlled the level of catches and this determined a strong increase of prices (also due to the good quality of fish caught). On the contrary, purse seiners increased the level of catches and a consequent marginal reduction of prices occurred so that earnings remained stable.

10. Earnings of dredges increased as well as prices. The reduction of fishing days and of daily productive levels caused a decrease in production by 21%. This caused an increase in prices (2.438 ITL/kg in 1999 and 4.218 ITL/kg in 2000). The management policy carried out by the Consortia in the Adriatic produced this favourable situation. In fact, they have been able to determine the amount of catches and the days of fishing necessary to determine a level of prices compatible with economic objectives and stock sustainability.

Table 2. Catches, earnings and prices for fishing gears and species, years 1999 and 2000

Gears	Catches (tons)		Earnings (bln)		Prices (ITL/kg)	
	1999	2000	1999	2000	1999	2000
Bottom trawler	99,727	118,490	945	1,193	9.475	10.064
Mid water pair trawler	44,081	44,466	68	82	1.545	1.852
Purse seiner	50,595	52,328	149	152	2.943	2.899
Dredges	37,874	29,883	92	126	2.438	4.218
Small-scale	92,385	96,939	884	960	9.573	9.901
Multipurpose	91,737	50,177	825	499	8,988	9.944
Total	416,400	392,284	2,963	3,011	7.116	7.676

Group of species	Catches (tons)		Earnings (bln)		Prices (£/kg)	
	1999	2000	1999	2000	1999	2000
Anchovies	57,108	62,543	169	174	2.958	2.775
Sardines	42,407	31,778	52	39	1.232	1.225
Other fish	188,090	170,766	1,618	1,523	8.604	8.919
Clams	34,766	27,953	80	115	2.300	4.100
Molluscs	60,183	63,203	504	560	8.383	8.867
Crostateans	33,846	36,042	539	601	15.931	16.666
Total	416,400	392,284	2,963	3,011	7.116	7.676

Source: REPA - National Observatory

3. Sicily reference framework

11. Marine compartments in Sicily represent the most important productive area of the Italian fishery sector. This is due both to the high number of people employed and fishing companies present along the 1500 km of the region's coastline and to the global high levels of production.

12. The need to establish a management plan in order to allow sustainable and rational exploitation of resources is due to the suffering of certain fishing stocks that causes a critical economic situation for stakeholders.

13. Sicily's marine environment is very heterogeneous according to the different depths and to their morphological and hydrological conditions, to the great variety of species and to the great variety of productivity conditions.

14. Fishing traditions and the ecological conditions of different fishing areas produce many different situations, which call for the implementation of different management measures. In particular, the different species present in a given fishing ground and the interactions determine a particular situation of equilibrium between species, so that the introduction of conservation measures that does not necessarily correspond to an increase of biomass for all species.

15. In addition, in a marine ecosystem (especially in a coastal and multispecific one) interventions on a single component of the biological community can have repercussions on the other components.

16. It is therefore necessary to carry out actions to protect biological resources so that each species is not considered separately but as part of a more complex situation. In fact, in the Mediterranean fishery, most of the fishing gears target different species (apart from tuna, swordfish, clam and red shrimps) and therefore management actions by species cannot be carried out. In conclusion, management measures for the protection of resources cannot refer to a single species, but should consider the different elements of the biological community in order to specify, amongst the possible biological equilibria, the one that is most convenient to the fishery.

17. The complexity of the regional productive sector makes it necessary to deal separately with the different productive fleet segments. In this framework it is necessary to distinguish between vessels of greater dimensions that fish highly migratory pelagics or in deep waters, from vessels of smaller dimensions. According to the National Fleet Register (Archivio Licenze di Pesca – ALP), updated in December 2000, 4,329 vessels (corresponding to 68,000 tons) belong to the fishing fleet in Sicily.

18. Apart from some marine compartments, such as the one of Mazara del Vallo, small vessels represent the most important segment in Sicily, reaching 2,982 vessels and corresponding to 8,524 GRT and to 63,235 kw horse power.

19. There are 611 bottom trawlers; to these we must add 200 multipurpose vessels, that have other licences in addition to bottom trawling. Bottom trawlers, with a mean dimension of 61 GRT and 229 kw, represent the most important productive national segment; most of the vessels that have bottom trawl licences in Sicily belong to the marine compartments of Mazara del Vallo and Porto Empedocle; all bottom trawlers with a tonnage greater than 100 GRT belong to the compartment of Mazara del Vallo.

20. In addition to the vessels that belong to the small-scale and bottom trawl segments, there are 447 multipurpose vessels that possess more than two fishing licences, excluding the bottom trawling licence, and 89 pelagic seiners.

21. In order to identify the fishing fleet that could be subject to a management plan, regional administration analysed the major economic and social characteristics of the two greatest segments of Sicily's fleet (small-scale fishery and bottom trawler) and to point out the major problems and weaknesses of the sector.

Table 3. Fishing fleet in Sicily by gears – 2000

Gears	Number	GRT	KW
Small scale	2,982	8,524	63,235
Bottom trawlers	611	37,428	139,913
Pelagic seiners	89	5,451	25,185
Multipurpose vessels	647	16,505	113,060
Total	4,329	67,908	341,393

Source: Italian Fishing Fleet Register, Ministry of Agricultural and Forestry Policies

4. Impact of fishing effort on resources

22. In order to take advantage of the biological cycle of the species present along the Sicilian coast, small-scale vessels and trawlers fish with different gears. The species caught are mainly demersal, but, according to seasons, pelagic species are also caught.

23. Biological monitoring of the resources caught by bottom trawlers in Sicily up to depths of 800 metres is carried out every year. The study provides data on the distribution, the abundance and the composition per age group of resources. Data are gathered separately for the three sides of Sicily's coastline.

24. Data that emerge from this analysis point out that:

- 1) general tendencies for some species show that variations in the biomass are similar to those that occur for the same species in other fishing areas of Italian seas. These variations are therefore due to weather conditions that influence the different areas rather than to fishing activity;
- 2) the small-scale fishery in Sicily does not fish on the whole area of distribution of species; some species are target species only for a short period of time as a consequence of their biological cycle. Environmental conditions influence the fleet's activity in a coastal area, which is a limited part of the area of distribution of species;
- 3) most small-scale vessels use fixed gears (set gillnets, fish pots, longlines) on rocky depths in order to catch valuable species and to avoid the damage of their gears by bottom trawlers.

5. Small-scale segment

25. Data on economic performances are monitored by the National Observatory for monitoring techno-economic data of the fishing fleet and the evaluation of socio-economic parameters. As mentioned above, the small-scale fishery segment comprises 2,982 vessels. These vessels use passive gears and are characterised by a low level of specialisation. This feature of the small-scale fishery creates difficulties for the sector such as the improbability of obtaining concentration of catches large enough to make a profit. Another weakness is due to weather conditions: it is interesting to note that the high concentration of Sicily's small-scale fishery per km of coast is about 2 vessels/km compared to a national value of 1.6 vessels/km. Due to the limited capacity of movement, (a characteristic of vessels of small dimensions) many fishing gears have been adapted to weather conditions, to the amount of resources and to the morphology of depths.

26. The productive structure of the small-scale segment has also led to poor economic management of the production units resulting in high costs per unit of product and unsatisfactory yields. Often, especially for small vessels, yields provide enough to sustain the vessel owner and his family, leaving nothing to re-invest.

27. The small-scale segment is also characterised by a high degree of obsolescence; the mean age of vessels is greater than 27 years. The degree of obsolescence of fishing vessels is a significant indicator for the evaluation of the efficiency of the fleet and of the growth of capital as an element of fishing effort. In general, the age of the fleet determines the progressive reduction of efficiency of fishing activity. Furthermore, the low degree of technological innovation that characterises an obsolete fleet prevents the use of lighter material and of more efficient equipment that improve the productive performance and permits higher efficiency. As time goes by, there is a loss in efficiency of vessels that produces a progressive reduction in the use of capital and in the efficiency of the fleet.

28. These considerations only explain part of the losses in the levels of production and yield. In fact, these losses are due both to low efficiency of the fleet (low specialisation and obsolescence) and to the diminishing of the biomass: overcapacity and overexploitation affect the small scale fisheries in Sicily.

5. Costs and earnings statement of small scale fishery

29. Data on regional fishing activity confirms the crisis of small-scale fishing activity in Sicily. The crisis is confirmed by the decrease of catches and by the reduction of revenue of fishing companies. The reductions are due to price inflexibility that, regardless of the reduction of supply, do not reach the high levels of previous years.

30. This trend appears even more negative if we consider the fact that the reduction of production levels affects small-scale fishery in Sicily but not in the rest of the country. In fact, comparing 2000 data with 1998, the Italian small-scale fishery production decreased by 3.5%, while in Sicily this percentage amounts to over 10%. Furthermore, in the rest of the country over the last two years, prices increased by 14%. This positive trend has supported the growth of revenues in Italy (+10%). However, in Sicily the increase of prices has not reached the same level and this has resulted in a decline in revenue of 6% over two years.

31. The reasons of the atypical trend in Sicily are not easy to identify, since many factors are responsible. To begin with, regardless of lower production, the fishing effort remained steady in the last few years; in fact, fishing days at sea have slightly increased. Moreover, the variety of species caught is slowly changing. The incidence of valuable fish is diminishing in favour of other species such as small pelagics, that are sold at lower prices. An action aimed at controlling fishing effort would therefore allow the recovery of the fishing resources and this would help fishing activity in the future.

Table 4. Small scale fishery in Sicily: Catches, earnings and prices -2000

	Value	Average value by vessel
Catches (ton)	30,187	10.12
Earnings (mln lire)	262,600	88.06
Prices (ITL/kg)	8,699	

Source: REPA - National Observatory

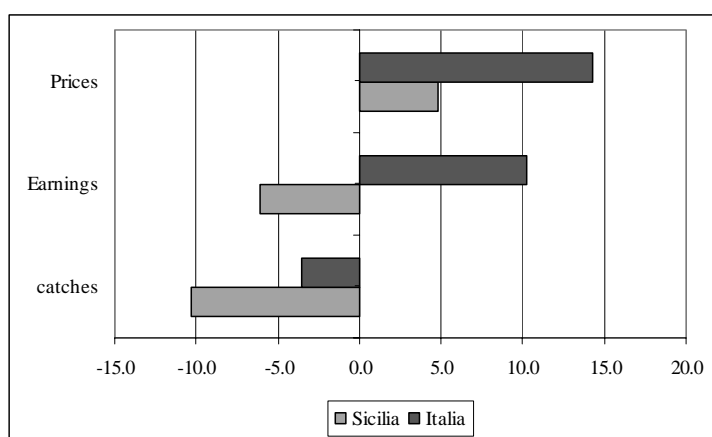
Table 5. Small scale fishery in Sicily: Catches, earning and prices

(percentage variation 1998/2000)

	Catches	Earnings	Prices
Absolute value			
Sicily	-10.3	-6.1	4.8
Italy	-3.5	10.3	14.3
Average value by vessel			
Sicily		-8.9	-4.6
Italy		0.4	14.8

Source: IREPA - National Observatory

Graph 1 – Small scale fishery in Sicily: Catches, earning and prices



(percentage variation 1998/2000)

Source: IREPA - National Observatory

32. The situation of the sector appears even more critical when it is recognised that the profitability of fishing has been compromised by a consistent increase in fuel prices. Fuel costs have increased by about 66% compared to the first few months of 1998. The increase in costs has resulted in a decrease in gross profit by about 15% compared to 1998. On average, the profit from the activity of a small-scale fishing vessel has dropped from 45 million Italian lire in 1998 to 39 million Italian lire in 2000.

33. In conclusion, small scale fishery in Sicily strongly depends on the fishing resources present in a limited fishing area. The trend of production and profit levels in the last three years points a critical situation for this segment, due essentially to the depletion of resources and to the poor management efficiency of productive structures. In addition to the decrease in production, the Community regulation regarding the reduction of the fishing effort and the limits to the use of specific fishing gears such as drift nets led to additional changes in the sector. It is consequently very relevant to adopt management measures

aiming both to fish stock conservation and to the development of an economically sustainable fishing activity.

Table 6. Costs and earnings statement of small scale fishery in Sicily – 2000

	Earnings	Costs	Gross Added Value	Labour Cost	Gross Profit
Value (bln)	263	67	195	80	116
Average value by vessel (mln)	88.1	22.5	65.5	26.8	38.8

Source: IREPA - National Observatory

Table 7. Percentage variation (1998/2000) of costs and earnings statement - Small scale fishery in Sicily

	Earnings	Costs	Gross Added Value	Labour Cost	Gross Profit
Value	-6.1	4.4	-9.2	-0.3	-14.4
Average value by vessel	-4.6	6.0	-7.7	1.3	-13.1

Source: IREPA - National Observatory

6. Bottom trawl segment

34. The analysis of social economic indicators of this segment show a less critical situation. In fact, even though production decreased, the revenue is still increasing.

35. The trawler fleet in Sicily over the last three years has been characterised by a decrease in levels of productivity; catches per vessel have decreased from 64 tons in 1998 to 57 tons in 2000, a loss of 10%. The decrease in production levels is even more consistent if we analyse daily catches; in this case the decrease is more than 15% (from 328 kg/day in 1998 to 278 kg/day in 2000).

36. The decrease in production levels is due to the trend of the fishing effort, where the mean days of fishing have slowly increased and have exceeded 200 days in the last two years (210 in 1999 and 206 in 2000). The progressive increase of fishing days has a negative impact on productivity; the constant decrease in catches reveals that resources are overfished.

37. In monetary terms, the trawl segment in Sicily does not seem to suffer the decrease that has occurred in the levels of catches because prices have strongly increased (+18% in the two years). The increase in prices, that seems likely to continue in 2001, has resulted in mean profits per vessel being higher than those of the previous years (+6,5% in the last two years).

Table 8. Bottom trawler in Sicily: Catches, earnings and prices -2000

	Value	Average value by vessel
Catches (ton)	35,078	57
Earnings (mln)	374,500	613
Price (£/kg)	10,675	

Source: IREPA - National Observatory

Table 9. Bottom trawler in Sicily: annual and daily average value by vessel

Trawling	Annual fishing days (nr.)	Annual catches (ton)	Annual earnings (mln lire)	Daily catches (kg)	Daily earnings (mln lire)	Prices (£/kg)
1998	195	64	575	328	2,95	9,007
1999	210	61	641	291	3,05	10,482
2000	206	57	613	278	2,97	10,675
Var % 98-00	5.8	-10.1	6.5	-15.1	0.7	18.5

Source: IREPA - National Observatory

Conclusions

38. The application of a sampling methodology aiming at the elaboration of a set of socio-economic indicators is functional to the analysis of sustainable fishery in the Mediterranean: the need to monitor multi-species and multi-purpose fleet vessels requires a high level of segmentation and it is therefore very difficult to use a census-type methodology.

39. This case study has pointed out that, if data regarding a large set of variables are available (see Annexes), the analysis of the economic trend of specific fleet segments may be carried out by studying the main economic indicators that enable managers to:

- analyse the productive framework;
- estimate the performance of specific fleet segments;
- determine the management policies necessary to support regional fishery socio-economic sustainability.

On the basis of these results it is reasonable to define a set of management measures for small scale fishery in Sicily. At the present, in fact, the intensity of catches has determined a biological equilibrium that isn't able to grant the more convenient economic sustainability.

40. The trend of economic parameters points out that the equilibrium reached in the biological communities, which differs from area to area, has aggravated fishery problems in Sicily. This situation is also due to the fact that fishing exploitation is greater on longitudinal species, and this causes a reduction of the mean age (sizes tend to decrease) and a change in relationships among species, in which juveniles (for example some cephalopods) are advantaged.

41. It is therefore necessary to carry out some co-ordinated actions in order to gradually modify the equilibrium and consequently permit a better growth of some species. Such action must be gradual in order

to avoid sudden changes of abundance, with possible breaches of equilibrium and difficulties of assessment.

42. Since each fishing gear has more than one target species, it is important and difficult to decide on which species it is necessary to carry out a management policy able to control the fishing intensity and to restore the situation of resources.

43. In future, for small-scale fishery, other than coastal trawler, public decision-makers should try to let fishermen directly managing small fishing areas with homogeneous fishing typologies. These areas' management could be carried out by ad hoc consortia that could be supported by technical-scientific assistance necessary to carry out management measures more appropriate for that specific area.

44. At the moment the most appropriate measure in the short term seems to be fishing days control that could re-equilibrate fishing stocks and therefore to restore economic conditions adequate to the amount of capital invested and to companies' profit.

45. By adhering to the principle of responsible fisheries, this measure should involve all stakeholders aiming at the preservation of resources. The fisheries regional management plan should therefore introduce a regulation that assigns a certain number of fishing days to each shipowner: total allowable days. The shipowner could then autonomously decide, in the respect of the constraint on the total number of fishing days, in which period of the year to use the available days.

ANNEX: 1. ECONOMIC AND SOCIAL SUSTAINABILITY INDICATORS FOR ITALIAN FISHERIES 1999

Segment		Catches/GR	Earnings/GR	Costs/GRT	Added Value/GRT	Gross Profit/GRT
Regions and gears		T Tons	T mln lire	mln lire	mln lire	mln lire
Liguria	Trawlers	0.5	8.0	3.5	4.5	1.6
Liguria	Purse seiners	3.7	12.7	3.5	9.2	3.6
Liguria	Small scale	1.6	21.4	2.5	18.9	14.0
Liguria	Multipurpose	0.6	9.6	3.3	6.3	1.8
Toscana	Trawlers	1.0	12.0	5.7	6.3	1.9
Toscana	Purse seiners	9.8	13.6	3.4	10.2	4.9
Toscana	Small scale	2.0	26.8	6.8	20.0	12.9
Toscana	Multipurpose	1.2	15.3	7.0	8.3	2.2
Lazio	Trawlers	0.7	8.6	3.3	5.2	2.2
Lazio	Purse seiners	1.7	5.7	1.7	3.9	1.4
Lazio	Dredgers	0.7	4.2	1.8	2.5	0.6
Lazio	Small scale	1.6	23.5	4.8	18.7	12.7
Lazio	Multipurpose	1.1	12.3	5.4	6.9	2.5
Campania	Trawlers	0.9	9.2	3.9	5.2	2.0
Campania	Purse seiners	1.4	6.9	2.1	4.8	1.9
Campania	Dredgers	0.3	2.3	0.8	1.6	0.8
Campania	Small scale	1.5	11.0	3.9	7.1	4.8
Campania	Multipurpose	1.4	9.0	5.1	4.0	0.7
Calabria	Trawlers	1.4	9.8	4.0	5.8	1.9
Calabria	Small scale	3.3	20.7	7.5	13.2	6.8
Calabria	Multipurpose	0.9	8.1	2.7	5.4	2.1
Puglia	Trawlers	1.4	11.4	4.9	6.5	2.1
Puglia	Pair trawlers	4.2	7.5	2.8	4.7	1.0
Puglia	Purse seiners	5.5	8.8	3.3	5.6	1.3
Puglia	Dredgers	4.3	14.6	2.5	12.1	5.4
Puglia	Small scale	3.8	41.7	8.4	33.2	22.1
Puglia	Multipurpose	2.4	21.1	6.8	14.3	6.7
Abruzzo	Trawlers	0.7	7.2	2.8	4.4	1.4
Abruzzo	Purse seiners	2.2	6.8	2.7	4.1	1.2
Abruzzo	Dredgers	5.8	7.9	2.1	5.8	2.4
Abruzzo	Small scale	2.6	33.5	6.2	27.3	18.3
Abruzzo	Multipurpose	1.4	12.2	5.6	6.6	1.9
Marche	Trawlers	0.8	7.3	3.1	4.2	1.3
Marche	Pair trawlers	2.9	4.3	1.5	2.8	0.6
Marche	Dredgers	5.5	11.8	3.0	8.8	3.9
Marche	Small scale	6.5	55.7	10.9	44.9	30.5
Marche	Multipurpose	3.4	24.3	10.7	13.6	5.3
Emilia Romagna	Trawlers	1.4	13.2	5.3	7.9	2.8
Emilia Romagna	Pair trawlers	7.0	10.1	4.0	6.1	2.2
Emilia Romagna	Dredgers	6.3	26.0	3.3	22.7	12.1
Emilia Romagna	Small scale	5.0	30.3	6.1	24.1	17.1
Emilia Romagna	Multipurpose	2.7	14.3	5.1	9.1	3.1
Triveneto	Trawlers	2.0	12.6	4.6	8.0	2.3
Triveneto	Pair trawlers	5.1	8.5	2.8	5.7	2.2
Triveneto	Dredgers	4.7	11.7	3.5	8.2	3.4
Triveneto	Small scale	3.8	33.4	11.6	21.7	14.1
Triveneto	Multipurpose	2.1	15.7	6.0	9.7	2.5
Sardegna	Trawlers	0.5	7.5	2.8	4.7	1.9
Sardegna	Small scale	1.7	22.9	8.9	14.0	8.2
Sardegna	Multipurpose	1.8	14.6	4.9	9.7	3.8
Sicilia	Trawlers	0.8	8.5	4.3	4.2	1.4
Sicilia	Purse seiners	2.6	10.6	3.8	6.8	2.5
Sicilia	Small scale	2.9	25.5	6.8	18.7	11.7
Sicilia	Multipurpose	1.0	11.5	5.0	6.5	1.8
Italia		1.8	12.9	4.7	8.2	3.7

Source: IREPA – National Observatory

**ECONOMIC AND SOCIAL SUSTAINABILITY INDICATORS FOR ITALIAN FISHERIES
(1999)**

Segment		Catches/fishermen	Earnings/fishermen	Costs/fishermen	Added value/fishermen	Gross Profit/fishermen
	Regions and gears	n Tons	en mln lire	n mln lire	mln lire	mln lire
Liguria	Trawlers	6.2	107.5	47.0	60.5	22.0
Liguria	Purse seiners	16.2	55.3	15.2	40.1	15.5
Liguria	Small scale	3.2	43.4	5.1	38.3	28.5
Liguria	Multipurpose	3.4	55.3	19.0	36.3	10.4
Toscana	Trawlers	10.0	114.7	54.6	60.1	18.5
Toscana	Purse seiners	63.0	87.4	22.1	65.3	31.7
Toscana	Small scale	4.6	60.8	15.4	45.4	29.2
Toscana	Multipurpose	5.4	71.5	32.9	38.6	10.2
Lazio	Trawlers	9.8	115.9	45.2	70.7	30.0
Lazio	Purse seiners	13.0	42.3	13.0	29.3	10.4
Lazio	Dredgers	3.1	17.9	7.4	10.5	2.5
Lazio	Small scale	3.8	55.0	11.3	43.7	29.6
Lazio	Multipurpose	7.9	86.3	37.7	48.6	17.3
Campania	Trawlers	9.7	102.9	44.2	58.7	22.8
Campania	Purse seiners	11.1	53.8	16.7	37.1	14.6
Campania	Dredgers	1.4	10.8	3.5	7.3	3.5
Campania	Small scale	2.1	14.9	5.2	9.6	6.4
Campania	Multipurpose	6.9	44.1	24.7	19.4	3.6
Calabria	Trawlers	12.7	90.8	36.9	53.9	17.8
Calabria	Small scale	2.2	14.1	5.1	9.0	4.6
Calabria	Multipurpose	4.7	43.8	14.7	29.1	11.4
Puglia	Trawlers	11.3	95.5	40.8	54.6	18.0
Puglia	Pair trawlers	30.7	54.2	20.4	33.9	7.5
Puglia	Purse seiners	27.1	43.8	16.2	27.6	6.7
Puglia	Dredgers	19.4	66.2	11.2	54.9	24.4
Puglia	Small scale	5.3	57.8	11.7	46.1	30.7
Puglia	Multipurpose	13.4	120.1	38.7	81.5	38.0
Abruzzo	Trawlers	7.7	80.1	31.4	48.7	15.4
Abruzzo	Purse seiners	19.6	60.0	23.6	36.4	10.9
Abruzzo	Dredgers	30.0	40.6	10.6	30.0	12.4
Abruzzo	Small scale	3.2	41.1	7.6	33.5	22.4
Abruzzo	Multipurpose	9.8	87.6	40.2	47.4	13.6
Marche	Trawlers	9.9	87.1	37.5	49.6	15.9
Marche	Pair trawlers	40.5	59.6	20.8	38.8	8.5
Marche	Dredgers	29.7	63.7	16.2	47.5	21.0
Marche	Small scale	7.5	64.1	12.5	51.6	35.0
Marche	Multipurpose	14.0	100.1	44.0	56.0	22.0
Emilia Romagna	Trawlers	11.2	108.2	43.5	64.6	22.9
Emilia Romagna	Pair trawlers	67.2	96.4	38.1	58.3	20.6
Emilia Romagna	Dredgers	30.9	128.2	16.4	111.8	59.6
Emilia Romagna	Small scale	10.2	61.6	12.5	49.2	34.9
Emilia Romagna	Multipurpose	9.4	49.7	17.9	31.8	10.8
Triveneto	Trawlers	12.3	76.9	28.1	48.8	14.1
Triveneto	Pair trawlers	51.4	85.7	28.7	57.1	22.1
Triveneto	Dredgers	20.7	51.5	15.2	36.3	14.9
Triveneto	Small scale	6.3	55.2	19.2	35.9	23.4
Triveneto	Multipurpose	6.6	50.0	19.2	30.8	8.1
Sardegna	Trawlers	7.1	98.7	36.6	62.1	24.9
Sardegna	Small scale	2.5	34.0	13.2	20.8	12.2
Sardegna	Multipurpose	11.8	94.1	31.5	62.6	24.5
Sicilia	Trawlers	8.9	93.7	47.7	46.1	14.9
Sicilia	Purse seiners	11.1	45.2	16.1	29.1	10.6
Sicilia	Small scale	3.1	27.7	7.3	20.4	12.7
Sicilia	Multipurpose	6.2	68.0	29.7	38.4	10.6
Italia		8.0	56.6	20.5	36.1	16.2

Source: IREPA – National Observatory

ECONOMIC AND SOCIAL SUSTAINABILITY INDICATORS FOR ITALIAN FISHERIES (1999)

Segment		Capital/catches	Costs/catches	Gross Profit/catches	Capital/earnings	Capital/gross profit
Regions and gears		lire/kg (000)	lire/kg (000)	lire/kg (000)	mln lire	mln lire
Liguria	Trawlers	43,8	7,5	3,5	2,5	12,4
Liguria	Purse seiners	5,1	0,9	1,0	1,5	5,3
Liguria	Small scale	20,0	1,6	8,8	1,5	2,3
Liguria	Multipurpose	40,6	5,5	3,0	2,5	13,5
Toscana	Trawlers	19,1	5,5	1,9	1,7	10,3
Toscana	Purse seiners	1,9	0,4	0,5	1,4	3,8
Toscana	Small scale	15,3	3,3	6,3	1,2	2,4
Toscana	Multipurpose	20,7	6,1	1,9	1,6	10,9
Lazio	Trawlers	26,4	4,6	3,1	2,2	8,6
Lazio	Purse seiners	11,0	1,0	0,8	3,4	13,8
Lazio	Dredgers	41,1	2,4	0,8	7,1	51,3
Lazio	Small scale	19,6	3,0	7,9	1,3	2,5
Lazio	Multipurpose	21,4	4,8	2,2	2,0	9,8
Campania	Trawlers	22,8	4,5	2,3	2,2	9,7
Campania	Purse seiners	12,4	1,5	1,3	2,6	9,5
Campania	Dredgers	97,4	2,5	2,5	12,8	39,3
Campania	Small scale	20,7	2,5	3,1	2,9	6,6
Campania	Multipurpose	17,5	3,6	0,5	2,7	33,4
Calabria	Trawlers	14,9	2,9	1,4	2,1	10,6
Calabria	Small scale	9,8	2,3	2,1	1,5	4,7
Calabria	Multipurpose	27,0	3,1	2,5	2,9	11,0
Puglia	Trawlers	14,7	3,6	1,6	1,7	9,3
Puglia	Pair trawlers	4,3	0,7	0,2	2,4	17,7
Puglia	Purse seiners	3,2	0,6	0,2	2,0	12,9
Puglia	Dredgers	7,0	0,6	1,3	2,1	5,6
Puglia	Small scale	8,3	2,2	5,8	0,8	1,4
Puglia	Multipurpose	11,0	2,9	2,8	1,2	3,9
Abruzzo	Trawlers	27,2	4,1	2,0	2,6	13,6
Abruzzo	Purse seiners	7,7	1,2	0,6	2,5	13,8
Abruzzo	Dredgers	5,0	0,4	0,4	3,7	12,0
Abruzzo	Small scale	12,3	2,4	7,0	1,0	1,8
Abruzzo	Multipurpose	16,5	4,1	1,4	1,8	11,9
Marche	Trawlers	21,5	3,8	1,6	2,4	13,4
Marche	Pair trawlers	5,7	0,5	0,2	3,9	27,1
Marche	Dredgers	5,2	0,5	0,7	2,4	7,4
Marche	Small scale	4,9	1,7	4,7	0,6	1,0
Marche	Multipurpose	7,9	3,1	1,6	1,1	5,0
Emilia Romagna	Trawlers	14,6	3,9	2,0	1,5	7,2
Emilia Romagna	Pair trawlers	2,6	0,6	0,3	1,8	8,5
Emilia Romagna	Dredgers	4,7	0,5	1,9	1,1	2,4
Emilia Romagna	Small scale	6,4	1,2	3,4	1,1	1,9
Emilia Romagna	Multipurpose	10,5	1,9	1,1	2,0	9,2
Triveneto	Trawlers	10,2	2,3	1,1	1,6	8,9
Triveneto	Pair trawlers	3,5	0,6	0,4	2,1	8,2
Triveneto	Dredgers	6,1	0,7	0,7	2,5	8,5
Triveneto	Small scale	8,3	3,0	3,7	1,0	2,3
Triveneto	Multipurpose	12,9	2,9	1,2	1,7	10,5
Sardegna	Trawlers	33,8	5,2	3,5	2,4	9,6
Sardegna	Small scale	18,8	5,4	4,9	1,4	3,8
Sardegna	Multipurpose	12,3	2,7	2,1	1,5	5,9
Sicilia	Trawlers	21,4	5,3	1,7	2,0	12,8
Sicilia	Purse seiners	6,8	1,4	1,0	1,7	7,1
Sicilia	Small scale	10,9	2,3	4,0	1,2	2,7
Sicilia	Multipurpose	19,7	4,8	1,7	1,8	11,4
Italia		12,1	2,6	2,0	1,7	5,9

Source: IREPA – National Observatory

ANNEX 2. Italy: National fleet, economic indicators, 1995-2000

	1995	1996	1997	1998	1999	2000
Costs and earnings (billion ITL)						
Value of landings	3,059.4	3,160.8	3,145.1	3,351.6	3,000.3	3,017.1
Fuel costs	350.0	389.8	378.0	409.6	421.1	506.0
Other running costs	316.2	367.0	370.4	415.9	390.4	354.5
Vessel costs	226.7	279.7	272.8	289.3	257.1	229.7
Crew share	1,034.0	1,096.3	1,034.0	1,192.1	1,071.1	966.1
Gross cash flow	1,132.6	1,027.9	1,090.0	1,044.8	860.6	960.7
Depreciation	204.5	207.9	209.2	208.2	201.0	194.6
Interest	79.6	74.8	64.0	38.8	36.8	32.5
Net (financial) profit	848.5	745.2	816.8	797.8	622.8	733.6
Gross value added	2,166.6	2,124.2	2,124.0	2,236.9	1,931.6	1,926.9
Other economic indicators						
Employment on board (FTEs)	48,606	51,486	49,837	54,369	51,840	46,938
Invested capital (billion ITL)	4,725.6	4,773.6	4,870.5	4,914.4	4,807.2	4,682.2
Effort (days 1000)	2,995.1	3,069.1	3,157.1	3,158.1	3,055.7	3,048.6

Italy: Trawlers, economic indicators, 1995-2000

	1995	1996	1997	1998	1999	2000
Costs and earnings (billion ITL)						
Value of landings	1,001.6	970.1	987.0	1,041.8	946.5	960.3
Fuel costs	136.4	145.5	148.7	160.1	193.5	230.2
Other running costs	95.3	98.0	113.2	122.8	127.9	125.1
Vessel costs	98.9	98.7	92.7	98.6	97.5	83.4
Crew share	380.6	340.5	352.6	398.2	358.8	322.6
Gross cash flow	290.4	287.4	279.7	262.0	168.7	198.9
Depreciation	72.5	66.3	68.5	70.8	70.2	66.1
Interest	23.7	20.4	18.1	11.7	11.6	10.1
Net (financial) profit	194.1	200.7	193.2	179.6	86.9	122.7
Gross value added	671.0	627.9	632.3	660.2	527.5	521.5
Other economic indicators						
Employment on board (FTEs)	9,015	9,207	10,031	10,258	10,297	9,259
Invested capital (billion ITL)	1,862.7	1,709.1	1,786.2	1,883.2	1,873.4	1,794.8
Effort (days 1000)	404.3	382.9	382.4	409.9	381.8	391.5

Italy: Purse seiners, economic indicators, 1995-2000

	1995	1996	1997	1998	1999	2000
Costs and earnings (billion ITL)						
Value of landings	97.9	111.3	146.7	137.5	130.0	129.5
Fuel costs	6.8	10.9	12.0	11.4	9.4	13.5
Other running costs	10.5	15.4	21.4	21.1	17.8	14.4
Vessel costs	6.2	6.2	10.6	11.4	7.0	9.6
Crew share	46.7	48.5	59.8	64.7	50.2	48.4
Gross cash flow	27.8	30.3	42.9	28.9	45.7	43.6
Depreciation	9.6	9.0	9.2	8.5	6.8	6.1
Interest	3.9	3.2	2.8	1.5	1.1	0.9
Net (financial) profit	14.2	18.1	30.9	19.0	37.8	36.6
Gross value added	74.4	78.8	102.7	93.6	95.9	92.0
Other economic indicators						
Employment on board (FTEs)	2,177	2,360	2,984	2,866	2,444	1,950
Invested capital (billion ITL)	226.8	213.3	226.6	224.3	184.8	168.8
Effort (days 1000)	38.4	35.0	35.9	32.1	27.4	24.7

Source: IREPA – National Observatory

Italy: Midwater pair trawlers, economic indicators, 1995-2000

	1995	1996	1997	1998	1999	2000
Costs and earnings (billion ITL)						
Value of landings	73.9	79.7	81.5	70.7	66.4	81.5
Fuel costs	9.1	9.8	12.1	11.3	10.5	13.6
Other running costs	5.6	8.5	9.9	9.0	9.1	10.9
Vessel costs	5.5	5.7	6.9	6.4	5.2	4.7
Crew share	25.7	29.1	30.3	28.7	28.1	32.4
Gross cash flow	28.0	26.6	22.2	15.4	13.5	19.9
Depreciation	5.8	6.2	7.7	6.7	6.0	5.9
Interest	2.2	2.3	2.3	1.3	1.2	1.0
Net (financial) profit	19.9	18.1	12.3	7.3	6.3	13.0
Gross value added	53.7	55.6	52.5	44.0	41.6	52.4
Other economic indicators						
Employment on board (FTEs)	907	758	1,017	951	874	805
Invested capital (billion ITL)	142.2	151.0	184.4	169.1	157.0	153.6
Effort (days 1000)	24.3	23.2	28.0	27.1	21.6	22.7

Italy: Dredges, economic indicators, 1995-2000

	1995	1996	1997	1998	1999	2000
Costs and earnings (billion ITL)						
Value of landings	113.3	69.1	83.0	93.9	91.6	130.6
Fuel costs	6.4	6.2	6.6	6.0	7.8	11.5
Other running costs	3.4	3.8	3.5	3.2	3.1	10.5
Vessel costs	8.7	8.8	9.3	8.0	6.4	4.5
Crew share	38.3	27.0	27.8	34.8	38.5	43.1
Gross cash flow	56.5	23.1	35.9	42.0	35.8	60.9
Depreciation	12.9	14.5	13.7	13.2	12.6	12.5
Interest	6.6	6.7	5.3	3.0	2.8	2.4
Net (financial) profit	37.0	1.9	16.9	25.8	20.4	46.1
Gross value added	94.8	50.2	63.6	76.7	74.3	104.1
Other economic indicators						
Employment on board (FTEs)	1,720	1,847	1,760	1,644	1,570	1,521
Invested capital (billion ITL)	228.6	255.8	243.0	234.8	223.0	223.9
Effort (days 1000)	84.4	83.2	75.9	73.0	87.5	85.1

Italy: Multi-purpose trawling vessels, economic indicators, 1995-2000

	1995	1996	1997	1998	1999	2000
Costs and earnings (billion ITL)						
Value of landings	904.7	1,049.3	934.1	960.0	810.1	628.6
Fuel costs	130.4	137.5	119.7	138.4	125.1	146.1
Other running costs	130.8	143.4	117.7	138.8	125.6	78.1
Vessel costs	84.3	93.1	80.4	89.5	72.2	52.1
Crew share	343.6	439.0	353.5	364.7	333.5	218.4
Gross cash flow	215.5	236.4	262.9	228.7	153.6	134.0
Depreciation	41.1	49.8	48.3	48.7	51.6	47.8
Interest	17.5	19.5	16.1	10.1	10.5	9.0
Net (financial) profit	156.9	167.2	198.5	169.9	91.5	77.2
Gross value added	559.1	675.4	616.4	593.3	487.2	352.3
Other economic indicators						
Employment on board (FTEs)	7,863	12,436	10,211	11,019	11,079	8,275
Invested capital (billion ITL)	934.6	1,122.5	1,100.9	1,085.2	1,152.3	1,057.4
Effort (days 1000)	438.1	487.7	544.4	543.9	522.4	452.4

Source: IREPA – National Observatory

Italy: Small scale fisheries, economic indicators, 1995-2000

	1995	1996	1997	1998	1999	2000
Costs and earnings (billion ITL)						
Value of landings	669.8	681.8	658.4	819.4	851.4	963.2
Fuel costs	40.2	58.4	55.8	58.6	60.8	72.5
Other running costs	49.9	75.3	79.4	92.3	89.5	95.9
Vessel costs	28.8	45.4	51.7	55.0	57.1	63.9
Crew share	132.6	146.8	122.1	219.0	214.6	247.8
Gross cash flow	418.4	355.9	349.4	394.5	429.3	483.0
Depreciation	42.2	41.9	41.3	39.6	40.0	43.2
Interest	17.2	15.1	13.1	7.6	7.2	6.8
Net (financial) profit	359.0	298.9	295.0	347.3	382.1	433.0
Gross value added	551.0	502.7	471.5	613.5	643.9	730.8
Other economic indicators						
Employment on board (FTEs)	23,133	21,138	20,317	24,083	23,729	23,580
Invested capital (billion ITL)	936.0	930.6	927.0	905.3	923.7	1,011.4
Effort (days 1000)	1,916.6	1,957.1	1,985.0	1,978.5	1,977.4	2,029.1

Italy: Tuna fisheries, economic indicators, 1995-2000

	1995	1996	1997	1998	1999	2000
Costs and earnings (billion ITL)						
Value of landings	49.2	50.6	59.5	68.3	56.2	78.9
Fuel costs	2.8	2.3	3.0	4.2	4.9	8.4
Other running costs	7.7	6.2	8.1	10.8	10.6	14.5
Vessel costs	5.8	8.3	7.3	6.6	6.4	7.6
Crew share	18.8	17.7	25.6	30.9	28.6	38.5
Gross cash flow	14.0	16.0	15.6	15.8	5.8	9.9
Depreciation	9.2	8.8	9.3	10.1	9.3	9.5
Interest	3.7	3.3	2.8	1.9	1.7	1.7
Net (financial) profit	1.2	3.8	3.5	3.8	-5.2	-1.3
Gross value added	32.8	33.7	41.2	46.7	34.4	48.4
Other economic indicators						
Employment on board (FTEs)	773	708	746	815	793	769
Invested capital (billion ITL)	181.3	175.1	185.6	206.5	204.6	204.9
Effort (days 1000)	22.1	22.3	22.8	23.0	16.8	23.7

Italy: Swordfish fisheries, economic indicators, 1995-2000

	1995	1996	1997	1998	1999	2000
Costs and earnings (billion ITL)						
Value of landings	149.0	149.0	195.0	160.0	48.1	44.5
Fuel costs	17.7	19.3	20.1	19.7	9.1	10.2
Other running costs	13.1	16.3	17.2	17.8	6.8	5.1
Vessel costs	14.5	13.5	14.0	13.8	5.3	3.9
Crew share	47.7	47.7	62.4	51.2	18.8	14.9
Gross cash flow	56.0	52.2	81.3	57.6	8.1	10.4
Depreciation	11.2	11.4	11.3	10.5	4.4	3.5
Interest	4.8	4.2	3.4	1.8	0.8	0.6
Net (financial) profit	40.1	36.5	66.6	45.3	2.9	6.3
Gross value added	103.7	99.9	143.7	108.8	26.9	25.3
Other economic indicators						
Employment on board (FTEs)	3,018	3,032	2,772	2,732	1,053	779
Invested capital (billion ITL)	213.5	216.1	216.7	205.9	88.6	67.3
Effort (days 1000)	66.8	77.7	82.7	70.6	20.9	19.4

Source: IREPA – National Observatory

