COMMISSION OF THE EUROPEAN COMMUNITIES

INTERNAL INFORMATION ON FISHERIES

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The regional impact of the EEC fisheries policy

The economic and social situation and outlook for the fisheries sector in certain regions of the Community:

SICILY

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COMMISSION OF THE EUROPEAN COMMUNITIES

DIRECTORATE GENERAL FOR FISHERIES

Directorate B: Market and structure

Structural Policy Division

P R E F A C E

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The research for the report was carried out by the *Istituto Nazionale di Economia Agraria* (I.N.E.A.), Rome.

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This report does not necessarily reflect the views of the Commission of the European Communities and in no way anticipates the Commission's future attitude to the subject.

C O N T E N T S

PART IV - OBJECTIVES TO BE PURSUED AND NECESSARY MEASURES

INTRODUCTION

The report that follows is an analysis of the fishing industry in certain regions of Italy.

Its purpose is to describe the organizational structure of the industry in the regions surveyed, highlighting the problems that arise in connection with resources, production, the fishing fleet, organization of work, fish marketing and processing, port and shipyard facilities and vocational training, so that it will be possible to specify the objectives that should be pursued in the light of EEC policy and propose action in the fields of production, structure, organization, finance, legislation and promotion.

A preliminary point that should be made is that research on the fishing industry in Italy is sparse and fragmentary.

A factor that should be borne in mind is that catch statistics are under-estimated at source by the local bodies responsible for their collection. The situation in this respect is unsatisfactory in some other countries as well, but in Italy the difficulty is aggravated by the facts that fishing is very widely dispersed in a large number of ports and docks and that the markets do not operate efficiently, so that only a low percentage of the actual catch goes through this channel.

The statistics are thoroughly investigated by Italy's central statistical body, the Istituto Centrale di Statistica (ISTAT), when assessing the "creation of assets" at national level, and it adds to the figures to allow for the shortfall. This means that there may be divergences from the actual situation at the territorial level.

The result is that the quality of our information on the main features of the fishing industry is too low. The position is aggravated by the difficulty of evaluating the resources, as is essential before a rational fishing policy for Italy can be drawn up.

Subject to these reservations, based on official statistics production by Italy's maritime fishing industry over the five year period from 1973 to 1977 appears to have been about 367,000 tonnes a year, the trend falling in the case of fish and rising in the case of crustaceans.

Maritime fishing industry production (tonnes)

	Fish				Molluscs		Crus-taceans	Total
	Anchovy, sardine, mackerel	Tuna	Other fish	Total	Total	Cuttle-fish, octopus, squid		
1973	106,560	1,640	179,590	287,790	57,560	23.170	18,790	364.040
1974	123,040	2,550	171,590	297,180	71,370	25.320	18.890	387.440
1975	95,200	4,170	157,990	257,360	89,630	24.820	19.590	366.580
1976	93,360	3,500	169.260	266,120	92,630	23,540	19,830	378.580
1977	84,220	2,370	164,380	250,970	66.380	22,750	20.640	337.990

Source: ISTAT - Annuario statistico italiano, 1978, Rome.

When output is broken down according to region, the leader is Sicily, followed in order by Emilia-Romagna, Apulia, the Marches, Lazio, Veneto, Campania, Tuscany and the Abruzzi with an overall annual catch of 10,000 tonnes.

In a breakdown of output by coastal area, on the other hand, the Adriatic accounts for approximately 51% of production, the Tyrrhenian coast for about 21%, the Sicilian coast 18%, the Ionian Sea 4% and the Sardinian and Ligurian coasts 3% each.

During the five year period in question, a steady increase in the number, gross tonnage and engine power of motor vessels was recorded, combined with a reduction in the number of non-powered boats.

Fishing vessels (at 1 January)

	Engine-powered craft						Sailing and rowing boats	
	Trawlers			Motor boats				
	no.	g.r.t.	HP	no.	g.r.t.	HP	no.	g.r.t.
1973	4,206	201,173	701,995	16,278	51,705	338,726	26,195	33,135
1974	4,213	202,990	716,356	16,531	55,360	364,247	25,332	32,147
1975	4,230	206,356	740,654	16,653	56,420	375,408	24,223	30,893
1976	4,308	210,613	771,438	16,919	58,962	395,549	22,850	31,035
1977	4,335	211,051	784,958	17,100	60,083	410,773	22,388	28,036

Source: ISTAT - Annuario, op. cit.

As of 1 January 1977, the Italian fishing fleet was reported as consisting of 21,435 motor vessels with gross tonnage 271,138 t. and 1,195,731 horse power, and 22,388 sailing or rowing boats, gross tonnage 28,036 t.

According to the breakdown of the fishing fleet by coastal area, the Adriatic accounted for 29% of the number of motor vessels, 40% of gross tonnage and 38% of engine power; the Sicilian coast 27% in number, 26% in tonnage and 24% in engine power; the Tyrrhenian accounted for 26% in number, 20% in tonnage and 26% in power; while the Ligurian, Sardinian and Ionian coastal areas accounted for the balance of 18% in number, 14% in tonnage and 12% in power.

According to ISTAT estimates, the Italian fishing industry's gross saleable output at current prices was Lit.393,000 million in 1977, intermediate consumption Lit.135,000 million and value added of Lit.258,000 million.

Value added by fish at market prices ('000 million lire)

Year	Saleable output	Intermediate consumption	Added value
1973	186	54	132
1974	233	84	149
1975	272	94	178
1976	331	120	211
1977	393	135	258

At constant prices (1970), it appears that net output reached its peak in 1974 at Lit.115,000 million, falling to Lit.100,000 million by 1977.

In the regional breakdown of saleable output and value added, the leader is Sicily, followed by Lazio, Apulia, the Marches and Veneto.

Fishing makes only a small contribution to the national economy as a whole, its net output being barely 0.15% of the gross domestic product and slightly under 2% of the net output arising from agriculture, hunting and fishing.

Nevertheless, fishing is concentrated in specific regions and in the coastal areas of those regions, so that it may be of substantial importance to the local economy. If we relate the net output produced by fishing to the value added by agriculture, region by region, the percentage is over 4% in Lazio, the Marches and Sicily and over 3% in Liguria and Sardinia.

This report covers three regions in Southern Italy: Sicily, Campania and Calabria. The fishing industry is organized differently in each region and each one faces a different set of problems, as will be described in the regional analysis.

The report on each region is set out along similar lines. In each case, a foreword defines the role of fishing in the region and describes the limits of the survey. Part one discusses recent developments in the organizational structure, while part two takes up the points outlined in the analysis and highlights the problems. In the third part, an attempt is made to specify the objectives that should be pursued and propose the measures that are needed.

THE ECONOMIC AND SOCIAL SITUATION IN SICILY AND THE PROSPECTS FOR FISHING

F O R E W O R D

The importance of fishing to the Sicilian economy is obvious from the statistics.

According to Italy's central statistical body, ISTAT, the gross saleable catch - and it is widely held that the figures are underestimated - exceeded a value of Lit.65,000 million in 1976 and Lit.69,000 million in 1976, approximately 24% and 21% of national saleable production respectively. Value added was over Lit.43,000 million in 1976 and over Lit.68,000 million in 1977 (table 1).

The national gross domestic income at factor cost stood at about 1% of earnings in the private sector and 4% of earnings in the primary sector; in certain provinces (such as Trapani), its contribution to those earnings exceeds 10%.

Subject to the reservations expressed above on the fairness of estimates, the size of the catch is 70,000 tonnes a year, 75% in the form of fish, 13% molluscs and 12% crustaceans. Sicily accounts for 20% of the fish caught in the country as a whole and 10% of molluscs, 42% of crustaceans.

Sicily has 22% of the number of Italian trawlers - 24% of gross tonnage and 24% of engine power. It has 28% of motor fishing boats, with 31% of gross tonnage and 25% of power; and it has 27% of rowing and sailing boats used for fishing, representing 29% of gross tonnage.

The engine-powered fishing vessels in service are manned by 31% of manpower employed as crews on comparable fishing boats in the nation as a whole.

Table 1 - Value added to market prices in Sicily by fishing, and percentage of fishing-generated added value in Italy

	Value, in million lire			Sicily as % of Italy		
	1975	1976	1977	1975	1976	1977
Gross saleable output	65 334	69 089		24,0	20,9	
Intermediate consumption	21 237	26 061		22,5	21,8	
Added value	44 097	43 028	68 085	24,7	20,4	26.3

Source: ISTAT

In Sicily, many fishing methods are employed, both nets and other gear being used. Most of the fleet - in terms of gross tonnage rather than number of boats - is engaged upon trawling, which is practised essentially by engine-powered trawlers in the Sicilian Channel between the islands of Lampedusa and Pantelleria and Tunisian waters or, in other cases, between Levanzo and Talbot Bank or off the Sicilian coast.

In order of importance after trawling come: multiple and other methods, usually employed by motor boats and rowing and sailing boats, in the latter case for small-scale inshore fishing; fishing with trammel nets and with long-lines, also practised by motor boats and rowing and sailing boats; and encircling methods. Among the special fishing methods are tuna fishing using fixed or flying tuna nets, and swordfish methods.

The number of people engaged in fishing is hard to specify, for two reasons: employment in the fishing industry fluctuates somewhat, and a sizeable proportion of those engaged in fishing work part-time. According to the 1971 census, 12,743 people were fishermen by calling, but the figure seems unrealistic and is contradicted by the ISTAT figure for the crews of trawlers only, i.e. 19,209 men in 1977. According to our own estimate, the number of men engaged in fishing as of this time is 33,000, 20,800 of whom (approximately 63%) work full-time.

Fishing plays a widely differing role in individual provinces of Sicily. This depends not only on the length of coastline, the abundance of fish in coastal waters, the availability of port facilities and the type of fleet, but also on factors linked with local tradition and temperament. The province in which the fishing industry is of greatest importance is Trapani, followed at a distance by Agrigento, Palermo, Catania and Siracusa. It plays only a small part in the provinces of Messina and Ragusa.

Table 2 - The role of fishing in Sicilian provinces (1974)

Province	Gross domestic income at factor cost (Lit.m.)						Fishing as percentage of agriculture	Fishing as percentage of local economy
	Fishing		Agriculture and forestry		Private sector			
	Value	%	Value	%	Value	%		
Agrigento	6 623	16.3	102 868	11.1	321 863	7.2	6.4	2.0
Caltanissetta	534	1.3	57 315	6.2	262 823	5.8	0.9	0.2
Catania	5 554	13.6	166 189	17.9	806 220	17.9	3.3	0.7
Enna	-	0.0	46 020	5.0	169 496	3.8	-	-
Messina	999	2.5	79 888	8.6	616 550	13.7	1.2	0.2
Palermo	5 844	14.4	149 747	16.1	1 156 566	25.7	3.9	0.5
Ragusa	3 448	8.5	99 132	10.7	249 798	5.6	3.5	1.4
Siracusa	4 622	11.4	111 788	12.0	498 133	11.1	4.1	0.9
Trapani	13 002	32.0	115 033	12.4	412 429	9.2	11.3	3.2
SICILY	40 626	100.0	927 980	100.0	4 493 978	100.0	4.4	0.9

Source: Pompei A.: Il reddito prodotto nelle province italiane nel 1974, Sintesi Economica, no.1 -2, 1976

Table 2 sets out some of the factors that demonstrate the importance of fishing in Sicily's nine provinces, giving a fairly good picture of the situation, even though it refers to 1974. It is also of interest that the trawlers registered in the province of Trapani account for 49.0% of gross tonnage in Sicily and 35.4% of engine power in the island's fleet of motor vessels.

Looking at the provinces individually, we find that fishing is highly concentrated in specific areas in some provinces and, in others, is spread out all along the coast. Most of the areas in which fishing is concentrated are to be found in the provinces of Trapani and Agrigento. The fleets based in Trapani, Mazara del Vallo and Porto Empedocle in particular appear to be larger than anywhere else on the coast.

It is the objective of this report to describe the problems in Sicily's fishing industry. We shall review the changes that have been taking place in recent times, both spontaneously and in response to the pressure of outside events, in an attempt to specify the aims that should be pursued in the light of EEC policy and to suggest the steps that should be taken with these in mind.

As we have pointed out, it is not easy to analyse the structure of the fishing industry, because the figures available are incomplete and not very reliable and because the industry varies widely.

Any action to restructure the industry must obviously be based on knowledge of the existing and potential resources. Unfortunately, the shortcomings mentioned mean that we have to arrive at very rough estimates, here as in other cases, built up from information gathered from those working in the fishing industry rather than from generally significant statistical documentation.

During the course of our research, we have tried to shed light on certain points by direct enquiries in specific areas only. While the areas were selected as characteristic in terms of the subject under review, the findings cannot be generalized and do not represent all the different aspects of the industry to be found in Sicily.

On the subject of production markets, for instance, a specific survey was conducted on the markets in Mazara del Vallo, Trapani and Sciacca; when investigating consumer markets, on the other hand, enquiries centered on Palermo; and Sciacca, Mazara and Trapani were surveyed to throw light on the processing of fish.

It is obvious, then, that the report that follows has its limits. Although it provides general information on the way in which the fishing industry is organized in Sicily, only certain aspects have been covered in depth and only some of the problems that exist are highlighted.

PART I

ORGANIZATIONAL STRUCTURE - RECENT TRENDS

1. PRODUCTION

1.1 Fishing area

The great distance to which the continental shelf extends between the southern part of Sicily and Tunisia means that a large part of the Sicilian Channel is held to be one of the main fishing areas in Italy's territorial waters.

In practice, the fishing limits depend on the type of fishing practised and on the size of fishing vessels. Speaking generally, an area extending up to approximately three miles is fished on a small scale by rowing boats or boats with low engine power and with trammel fishing gear. Within a range of three to twenty miles from the coastline, the area is fished by larger motor vessels, most of them equipped mainly with trawling gear.

Various areas within and beyond the twenty mile limit are fished with ring nets or with flying trammel nets, depending on the season and the species of fish being caught.

In addition to the statutory restrictions on fishing (the ban on trawling within three miles of the coastline, etc., Law 963 governing fishing at sea and the body of regulations issued in pursuance of the Law, Sicilian Region Provincial Decree 5929, 3 December 1971), there are restrictions on fishing in areas of heavy maritime traffic such as the Straits of Messina.

Calculations have been made of the total area of sea fished by the main methods, small-scale inshore fishing (within three miles of the coast) and trawling (between the three mile limit and a depth of 200 isobathic metres, and sometimes even farther afield).

The area within the limit of three miles from the Sicilian coast is approximately 1,800 square miles.

It is more difficult to estimate the continental shelf fishing area: in eastern and northeastern Sicilian waters, the shelf is narrow, while it extends out a long way in the strip between the Sicilian and Tunisian coasts.

According to a rough estimation of that part of the continental shelf that lies within the 200 isobathic metre limit, the area is about 100 square miles. The fishing grounds may reliably be estimated as three times that size, since it is fished up to a depth of 500 metres, in other words covering the whole of the extra-territorial waters in the Sicilian Channel. The fleets that operate from this part of the Sicilian region are often equipped to fish in deep fishing grounds and may sail hundreds of miles from the coast.

A bathymetric chart showing the continental shelf area up to an isobathic depth of 200 metres is given on page 15.

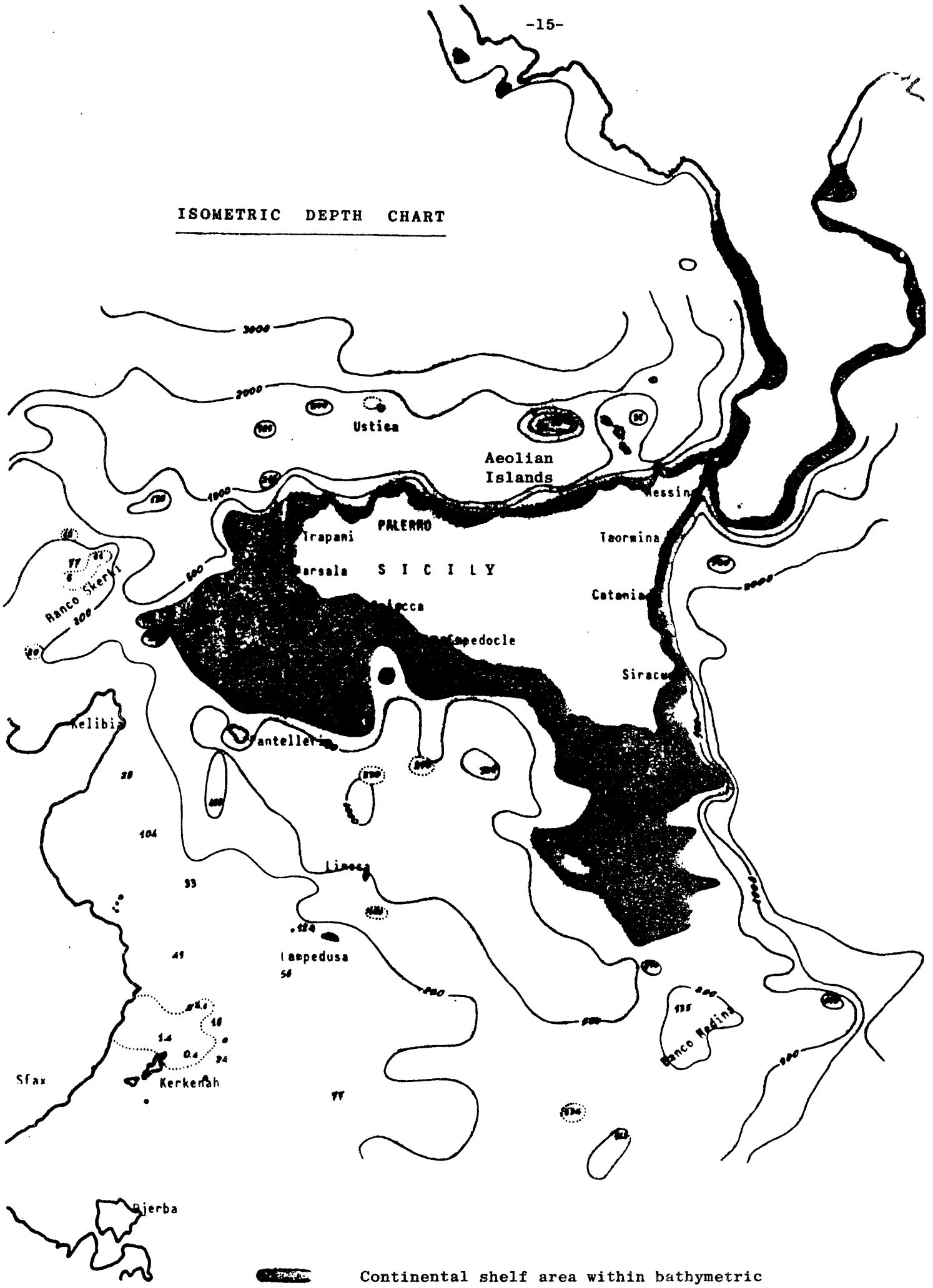
The fishing grounds normally serving certain bases are as follows:

a) Mazaro del Vallo (main fishing method: trawling).
Area west of Sicily towards Kelibia; Talbot Bank; the areas opposite Sardinia; the Pantelleria Banks; the Tripoli fishing grounds (up to the Near East shoreline); the southern part of the Italian peninsula (Sirte Bay, up to 60 miles); Fondaletta (36/40 miles S/SE of Lampedusa); the Parallel deep sea area; Bestia (50/60 miles SE of Lampedusa); and the international waters opposite the African coast; in the case of engine-powered vessels, the "ancient seas" between Mazara and Selinunte.

b) Trapani (purse-seine fishing).
Fishing sandbank five miles from Capo Grosso; Kerkesi Sandbank; Galita Bank (ten miles N of Galita); Talbot Bank; fishing grounds near Pantelleria and Lampedusa; and areas facing Tunisia and Sardinia.

c) Marsala
Talbot bank; areas opposite Tunisia and Sardinia.

ISOMETRIC DEPTH CHART



Continental shelf area within bathymetric depth of 200 metres

1.2 The quantity and composition of the catch

For the purpose of comparison in the survey of recent trends in the Sicilian fishing industry, we have taken the official statistics for 1968 to 1977, even though we are aware that they are probably much lower than the true figures (Appendix 1). Graph 1 is a diagram of catches in 1968, 1972 and 1976.

The statistics show that the size of the catch rose by 37.6% overall between 1968 and 1977. It appears that there has been a fall in the quantity of tuna caught (- 25.5%) and in the quantity of anchovy, sardine and mackerel (- 9.0%), and a rise in the quantity of "other fish" of 45.1%. The general increase for all fish has been 24.0%, and there has been a rise of 58.0% in molluscs and 189.7% in crustaceans.

To judge from the statistics, the value of the catch, at constant prices, has probably risen even faster, since the species of fish that fetch the higher prices on the market are well represented.

It should be pointed out that the figures reported by the eight administrative districts in Sicily for 1977 add up to a total catch that is over 20% greater than the figures listed by ISTAT. In addition, a survey conducted by the Centro Regionale di Ricerche Statistiche (regional statistical research centre) on behalf of the department of the Councillor for Industry[1], which is restricted to the province of Trapani, provides information on which it can be estimated that fish production in the province was 97,317 tonnes, as opposed to the estimate of 50,008 tonnes made by the harbourmaster departments for Trapani and Mazara del Vallo for 1977.

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(1) *Esperimento pilota per una riforma delle statistiche della pesca, typed document. In carrying out the survey, a sample survey was made and, in addition, all the fish unloaded in individual ports was counted. The findings of these two forms of investigation bore each other out to a marked degree.*

Table 3 may be of interest, as it compares some of the summary figures from this survey with the figures as reported by the harbourmaster department and used to a great extent in compiling official statistics, even though the latter refer to 1977.

Even allowing for the fact that two different years are being compared, the widest divergences are to be found under the heading of "anchovies, sardines and mackerel". Looking at the comparisons based on the fishing centres, production figures for Trapani appear to have been substantially under-estimated, again because of the "fatty fish", as do the figures for Mazara del Vallo, in this case because of the "molluscs".

1.3 Breakdown of catch over the fishing year

Appendix 1 sets out the official figures for fish caught in each month of the years 1968, 1972, 1976 and 1977.

The months in which the catch is largest are the spring and summer months from May to September. There are two reasons: sea conditions are easier, and fishing for the fatty species is more successful in that period.

Another point is that the main month for tuna fishing is May, while the best swordfish season runs from June to September.

1.4 Fishing concerns: size and method of management

In general, the number of fishing concerns is the same as the number of fishing craft since there are few that have more than one vessel. Almost every concern is in the name of a family business, with the owners and the crew of most boats consisting of members of a given family.

Table 3 - Fish caught in the province of Trapani, tonnes

Composition of the catch	Castellammare del Golfo	Favignana	Marsala	Mazara del Vallo	Pantelleria	S.Vito Lo Capo	Trapani	Bonagia Levanzo Marettimo	Total
				a) survey data (1978)					
FISH:	54	485	1 786	28 895	105	47	40 111		71 484
tuna	3	370	46	-	2	1	370		792
anchovy, sardine, mackerel	21	25	-	382	..	18	36 030		36 476
other fish	30	90	1 741	28 513	103	28	3 711		34 216
MOLLUSCS	6	19	72	18 135	65	4	298		18 599
CRUSTACEANS	3	3	106	6 719	2	5	396		7 234
TOTAL	63	508	1 964	53 749	172	56	40 805		97 317
				b) Harbourmasters' data (1977)					
FISH:	190	526	645	23 500	18	48	9 635	403	34 965
tuna	77	450	15	-	-	-	85	-	627
anchovy, sardine mackerel	40	3	50	700	2	5	6 000	61	6 861
other fish	73	73	580	22 800	16	43	3 550	342	27 477
MOLLUSCS	15	5	73	8 500	5	16	1 050	8	9 672
CRUSTACEANS	5	2	51	5 000	2	4	300	8	5 372
TOTAL	210	533	769	37 000	25	68	10 985	419	50 009

Except in the case of rowing and sailing boats when the fisherman is also the owner and in the case of small motor boats manned by their part-owners, contractual relations are always established when the fishing concern (the owner) is separate from the worker (the crew member).

The owner may on occasions sail as the master of the boat, so that he has two-fold status as entrepreneur and worker.

The only contractual relationship between the two is based on a share of the proceedings, specifying the percentage of the value of the catch after deducting out-of-pocket spending on rations on board, fuel and lubricants, ice, gas for cooling and cooking, boxes and other materials, the repair and maintenance of nets and electronic instruments and, where appropriate, transloading of the catch and fishing permits. The profits are divided into two, with a certain percentage going to the owner and the remainder to the crew.

"Profit-sharing contracts" between the representatives of the owners and the crews abide by the same general principles but may vary from one fishing centre to another or even within a single fishing centre, depending on factors such as fishing grounds[1] and type of fishing, for which a different size of crew may be needed.

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(1) *The criterion used to classify fishing in the Sicilian Channel under the headings of "distant water fishing", "middle water fishing" and "local" or "inshore fishing" may be based on the engine power of the fishing vessels used, the period away from home or the fishing locations. "Distant water fishing" is the type of fishing done by fishing boats with engine power of over 200 HP that are away from their home base for 20 or perhaps 30 days. "Middle water fishing" is done by boats with engine power of 100 to 200 HP on trips lasting 10 to 12 days, or perhaps no more than a week. "Local" or "inshore fishing" is done by boats with engine power of no more than 100 HP working territorial waters over a period of 24 hours.*

The clauses common to all contracts specify the procedures and period of notice for unloading, the minimum strength of crew and who is responsible for any excess. It gives a breakdown of the "shares" on the basis of jobs, stating the percentage payable by the owner (i.e. the proportion of the net proceeds) to the crew in respect of holiday entitlements, Christmas bonuses and days off. It establishes the amount of pay for work done on land (careening, painting, work on the engine) and regulates matters such as the rest day during the week, the duration of continuous periods at sea for the purpose of calculating the "shares" (with a maximum of three trans-shipments) and the minimum guaranteed earnings.

As a general rule, after the out-of-pocket expenses mentioned above have been deducted from the "net catch value", the owner retains a percentage of 42% to 45% from trawling and about 25% from purse seine fishing. The balance is allocated to the crew members on the basis of their jobs, usually as follows: 2 or 3 shares to the skipper; $1\frac{3}{4}$ or 2 shares to the fishing master; $1\frac{1}{2}$ or 2 shares to the chief engineer; $1\frac{1}{4}$ or $1\frac{1}{2}$ shares to the second engineer; and 1 share to the crew members. A share is set aside for personnel working on shore (bookkeeper, etc.).

This means that actual earnings for any given value of a catch are inversely proportional to the size of the crew, although they are higher for men working on large fishing boats with more crew members as their work is more productive.

2. THE FISHING FLEET

2.1 The size of the fleet in each maritime district

In 1977, Sicily's fishing fleet numbered 888 trawlers with gross tonnage of 48,729 tonnes and 180,082 HP, plus 4,105 motor boats with gross tonnage of 15,920 tonnes and 90,720 HP. It was reported that 117 trawlers and 793 motor boats were laid up.

Appendix 3 shows the number of motor vessels in commission from 1968 to 1977.

There was a 23% increase in the number of trawlers over the period under review, slightly less than 5% in the number of motor boats.

Appendix 4 gives the numbers of engine-powered vessels in commission during the years 1968, 1972, 1976 and 1977 in each maritime district.

The most substantial increase in the number of fishing vessels occurred in the districts of Trapani and Mazara del Vallo; in the case of motor boats, it occurred in Messina and Catania.

There has been a steady decline in the size of the rowing and sailing boat fleet fitted out for fishing. Today it consists of only slightly more than 6,000 boats with gross tonnage of approximately 8,600 tonnes.

2.2 Nature of the fleet

2.2.1 Tonnage

Engine-powered vessels may be classified according to gross tonnage, based on the official statistics for the fleet as a whole, both in and out of commission.

Appendix 5 shows the changes in total tonnage in individual districts in Sicily in 1968, 1972 and 1976.

Comparing the figures for 1968 and 1976, the following comments could be made: while there was a 10.9% increase in the number of craft, their gross tonnage rose by 37.5%, i.e. from an average gross tonnage of 9.74 to 12.09 tonnes per vessel.

There was a reduction in percentage terms both in gross tonnage of boats in the 20 tonne and lower class; in the 21 to 50 tonne class, the number increased and gross tonnage remained stable; in the 51 to 100 tonne class, the number of vessels remained stable while gross tonnage fell; and both the number and the gross tonnage increased in the over-100 tonne class. In this latter category, average gross tonnage fell from 254.2 tonnes per vessel to 183.2 tonnes in 1976.(1)

Looking at the figures for individual maritime districts, it will be noted that the type of fishing vessel has gradually become better suited to the type of fishing practised. Trapani and Porto Empedocle have more than tripled the size of their fleet and its gross tonnage in the larger class, while there has been a decline in Messina, Palermo and Syracuse.

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(1) *As a general guideline, the class of boats with gross tonnage of up to 20 tonnes includes boats whose overall length is 12 to 13 metres; 21 to 50 tonne boats are equivalent to those whose overall length is about 16 metres; the 51 to 100 tonne class to 18 or 19 metre vessels; and the over 100 tonne class to vessels whose length is over 20 metres.*

2.2.2 Engine ratings

Appendix 6 is also based on the total fleet, giving a breakdown of the number of vessels in each class, defined on the basis of the power of their engines, with reference to 1968, 1972 and 1976.

There is a fairly clear tendency towards increasing engine power. The class of vessels with engine ratings of up to 109 HP formerly accounted for 91.0% of the number of vessels, but by 1976 it included only 85.6%. There were increases in all the other classes, especially the "over 250 HP" class, which rose from 1.9% of the vessels in number to 4.0%.

With reference to 1977, it could be added that the gross tonnage of vessels with engine ratings of up to 10 HP is an average of 1.6 tonnes, 3.8 tonnes for 11 to 25 HP craft, 8.2 tonnes for 26 to 69 HP craft, 16.1 tonnes for 70 to 109 HP vessels, 25.6 tonnes for 110 to 149 HP vessels, 34.3 tonnes for 150 to 199 tonne vessels, 46.4 tonnes for 200 to 249 HP vessels and 125.8 tonnes for vessels with engine power of over 250 HP.

2.2.3 Type of fishing equipment

According to the official statistics, the fleet of engine-powered boats is classified according to the fishing method used. The categories are: trawling, fishing with ring nets, long-lines or trammel nets, other methods or multiple methods.

The classification is not always completely apt, since in many cases it was based on the situation when the boat was first commissioned.

Appendix 7 and Graph 2 compare the figures for the same three years as before.

The figures show that the number of fishing boats using all methods except trawling has been falling in relative terms over the period covered. There has been a substantial increase in the gross tonnage of trawlers and a limited increase in fishing vessels using multiple methods.

Here again, there are marked differences between maritime districts. Trapani has doubled the gross tonnage of vessels fitted out for trawling, and considerable increases are also to be found in Porto Empedocle, Catania and Augusta. There has been a fall in Messina, although in this province and in Catania the tonnage of the fleet fishing with trammel nets, "other methods" and "multiple methods" has increased.

As is apparent from the statistics, trawling(1) is the method used by more than half of the gross tonnage; it is the method of greatest importance in the southwestern part of Sicily.

Other methods in common use, especially in certain fishing centres, are those using ring nets, particularly methods using the "*cianciolo*"(2) (Palermo, Trapani and Porto Empedocle) and the "*palangrese*"(3) (Catania and Messina).

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(1) *Strascico, or trawling, when used as an inshore fishing method, is done by motor fishing boats of up to 300 HP with a minimum crew of five. When used in middle and near water fishing, it is carried out by 300 to 450 HP vessels with a minimum of eight men on board. When used in deep-sea fishing, it is carried out by 450 to 1,400 HP fishing vessels with a minimum of twelve men. The fishing boat usually carries eight trawling bags, four for catching deep-sea fish (from the shell-covered sea-bed) and four for shallow-sea fish(melmous sea-bed), each equipped with balls and chains. Trawling speed is usually 3 m.p.h. The trawling operations usually last for 40 to 70 minutesin deep water, three to four hours in shallower water. In daylight, the net is cast up to nine times in deep water and twice in shallower water. The average daily catch may vary greatly but is about 100 to 150 boxes, each box holding approximately 7 kg.*

(2) *Cianciolo, or purse-seine: this method is used by a motor fishing boat backed up by three towing boats, two of which have lamps (6000 candela) and one of which (the* "battello dell'ozza") *pulls on the line. The crew usually numbers fifteen men, six for the small boats and nine for the parent boat. This may have an engine of 100 to 300 HP or even more if she is also used for trawling. The net is 350 to 500 metres in length and about 50 metres wide.*

2.2.4. Classification according to age of vessels

The official statistics can also be used to break down the motor fleet according to the age of the hull, as has been done for 1968, 1972 and 1976.

The following conclusions can be drawn: boats built more than 21 years ago, in other words old boats, account for 36% of gross tonnage and approximately 30% of engine power. Over the past decade, there has been no marked change in the engine power of boats whose hulls are up to five years old, but there has been a slight percentage decrease in their tonnage and a marked decrease in their number, an indication of the trend towards replacing old vessels with new ones of greater tonnage and above all with greater individual engine power.

Trapani is the district in which changes have been most rapid.

The figures for 1977, as set out in Table 4 below, give even less cause for satisfaction; they show that it has been in very recent years that the rate at which the fishing fleet is replaced has been falling.

Table 4 - Engine-powered fleet - breakdown according to age of hull - 1977

Age category	no.	%	g.t.	%	HP	%
up to 5 years old	597	10.1	11,874	16.4	60,765	19.9
6-10 years old	908	15.4	19,705	27.2	75,210	24.6
11-20 years old	1,858	31.5	15,390	21.2	68,781	22.5
over 20 years old	2,464	41.7	25,982	34.9	99,074	32.5
age unknown	76	1.3	255	0.3	1,384	0.5
Total	5,903	100.0	72,516	100.0	305,214	100.0

(3) (continued from previous page)

Palangrese, or long-line: this method is used by motor fishing boats with engine power of 50 to 300 HP, with a crew of eight men. The lines are 5 mm in diameter and 8,000 to 11,000 metres in length. Large hooks are spaced out at a distance of 20 yards, with a ball float every 50 yards and a warning light every 1,000 metres. The line is cast in the evening and pulled in next morning.

Boats whose hulls are five years old or less account for only slightly more than 10% of the whole in number, 16% in tonnage and 20% in engine power, while boats that are more than 20 years old account for 42% of the whole in number, 35% in tonnage and 32% in power.

The survey conducted by the Centro Regionale di Ricerche Statistiche[1] in 1978 was restricted to the province of Trapani, but it can be used to compare the categories based on "age of hull" and "age of engine" separately according to the trawlers and motor boats surveyed (288 and 414, corresponding to 86% and 75% of the trawlers and motot boats respectively considered by ISTAT as being in commission in 1977). These figures are set out in Table 5 below.

Table 5 - Breakdown of trawlers and motor boats according to age of hull and engine in the province of Trapani (1978)

Age of engine, in years	Age of hull, in years: up to 5		6 - 10		11 - 20		over 20*		Total	
	tr.	mb	tr.	mb	tr.	mb	tr.	mb	tr.	mb
under 2	4	12	-	-	6	3	2	4	12	19
3 - 5	24	25	1	5	5	13	8	5(+1)	38	49
6 - 10	13	6	61	45	10	19	3	17(+4)	87	91
11 - 15	2	2	10	5	37	32	20	31	69	70
over 15	-	2	2	1	19	47	57	111(+4)	78	165
age unknown	2	1	-	2	-	8	2	8(+1)	4	20
Total	45	48	74	58	77	122	92	176(+10)	288	414

* the figures in brackets are the motor boats whose age is unknown.

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(1) *Esperimento pilota, etc., op. cit.*

In the case of trawlers, the categories with the highest scores are vessels whose hull and engine are between six and ten years old (21.2%), those whose hull is 11-20 years old and whose engine is between 11 and 15 years old (12.8%), and those with a hull of over 20 years of age and an engine of over 15 years (19.8%). In the case of motor boats, the highest concentration is in the category of boats with a hull of over 20 years of age and an engine of over 15 years of age (26.8%), followed by the category with a hull aged 11 to 20 years and an engine aged over 15 (11.3%), and boats with both engine and hull of between 6 and 10 years of age (10.8%).

The table also shows that very old boats have sometimes had new engines installed; the opposite situation also arises, i.e. old engines are installed in new hulls.

2.2.5 Other features

The official statistics can also be used to derive further information on the auxiliary navigation equipment and fishing gear on board (radar, radio-telephone, echo-sounder and ichthyoscope), as well as fish product storage plant.

A total of 175 boats were apparently equipped with radar in 1977: 9 with radar on its own, 38 with radar and a radio-telephone, 5 with a radar and echo-sounder, 99 with radar, radio-telephone and ichthyoscope and 16 with all four instruments. In addition, 220 boats had a radio-telephone only, 260 a radio-telephone and echo-sounder and 5 a radio-telephone, echo-sounder and ichthyoscope. A further 100 boats had an echo-sounder alone and 4 were equipped with an echo-sounder and ichthyoscope; 30 had an ichthyoscope alone; 187 had other equipment and 4,900 were without any equipment.

The 1977 situation with respect to plant used to conserve the catch is as shown in Appendix 9.

The figures given show that 78.8% of the motorized fleet has no equipment for storage of the fish, only 5.4% has a refrigerator, 14.16% an ice-box and 1.2% both of these. If, however, we take a breakdown of the fleet according to tonnage and power, we find that the boats without this equipment represent only 24.3% of the total tonnage and 31.7% of power, the average being 3.79 tonnes and 20.8 HP. In other words, most of the boats in question are small and essentially engage in inshore fishing.

3. PORT STRUCTURES AND BOATYARD ACTIVITY

3.1 Size and distribution of ports

The position of Sicilian ports is extremely discouraging: while the number of landing stages or fishing bases is large, only a few of them have any form of infrastructure that could justify calling them a fishing port. In other cases, serious problems arise with lack of space, silting up and inadequate shore facilities and areas, detracting from the working capacity of the ports.

Despite the shortcomings to be found both in ports and at landing stages, they are being used to a greater extent and their importance is growing in the districts of Palermo, Trapani, Mazaro del Vallo, Porto Empedocle and Messina.

In Palermo maritime district, of special note are Palermo, Mondello, Isola delle Femmine, Sferracavallo, Cefalù Balestrate, Terrasini, Termini Imerese, Porticello and Aspra. With the exception of Palermo, Porticello, Terrasini and Termini Imerese, they can serve only low tonnage motor boats and rowing or sailing boats, which practise a wide range of fishing methods (with a "*menaide*" - a rectangular drift net used to catch sardine and anchovy - or purse-seine, a trammel net, lobster pots, a net for catching gurnard, long-lines, harpoons, ordinary lines, etc.). The main form of fishing used in Terracina is with ring-nets.

Of special note in the district of Porto Empedocle are Porto Empedocle, Licata, Gela, Lampedusa and Sciacca.

The main places in the district of Trapani are Trapani, Marsala, Pantelleria, Castellammare del Golf S. Vito Lo Capo, Bonagia, Favignana Levanzo and Marettimo. The port of Trapani is used mainly by motor boats using ring nets and by trawlers, while Marsala serves boats using trawling nets and long-lines. The smaller boats, which are to be found in the other ports in particular, fish mainly with trammel nets and long-lines, although they also use the *menaide*, lobster pots, gurnard nets, drag-nets, small trawling nets for shallow water, etc.

The district of Mazara del Vallo consists of the port of the same name, the major port in Sicily; this has problems of space, infrastructure, facilities and maintenance.(1)

The water is too shallow for the type of boats calling at the port; in addition, the wharves are not extensive enough and the facilities fall short of what is required. This means that berthing may often be hazardous and it slows down the unloading of fish and the loading of ice and provisions. The time wasted as a result has an effect on the financial returns from fishing.

In the district of Messina, of special interest are Messina, Milazzo, Lipari, Oliveri, S. Agata di Militello and Giardini. The fleet consists of lower tonnage fishing boats, which fish mainly for fatty species (from Lipari, Oliveri and S. Agata) or swordfish, using surface long-lines during the authorized season.

The ports in other districts include Catania, Augusta, Siracusa, Pozzallo, Marzameni and, above all, Portopalo, the home base for many fishing vessels.

3.2 The organization of facilities for the fishing industry

There are also shortcomings in the facilities provided for the fishing industry. In practice, the services providedconsist of no more than fuel stations managed by the oil companies or by fishermen's cooperatives who have obtained a concession to supply fuel, a few winches to haul in small boats or occasionally a slewing crane to hoist the boats (here again managed by fishermen's cooperatives) and ice production units run by private firms. In a few cases the cooperatives of fishermen have created slipways, stores for gear and tackle, etc.

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(1) *A new port whose docking facilities are now almost completed has not yet been used by the fishing fleet because of the absence of shore equipment.*

Table 6 below sets out the figures for the facilities to be found in the districts of Palermo, Trapani, Porto Empedocle and Mazara del Vallo. These figures were taken from reports made by the harbourmasters' offices. In the district of Porto Empedocle, only the fuel distributors and slipways were reported; in the district of Mazara, fuel distributors and ice production units only were reported.

Some of the ice factories are fitted out with modern equipment for the production of sheet ice (5 x 500 mm) and snow ice which is essential for the smaller fish. The price of ice on board is Lit.14,000 per tonne.

Table 6 - Facilities in ports within the districts of Palermo, Trapani, Porto Empedocle and Mazara del Vallo

Port	Fuel distributors No.	Ice Factories No.	Winches and cranes No.	Gear storage No.	Slipways No.
Palermo	4	5	2	-	-
Ustica	1	-	-	-	-
Porticello	2	2	-	-	-
Termini I.	2	-	-	-	-
Terrasini	2	1	-	-	-
Isola delle Femmine	-	1	-	-	-
Sferracavallo	2	1	-	1	-
Mondello	-	-	1	-	-
Cefalù	-	-	2	-	-
Balestrate-Trappeto	-	-	-	-	2
Trapani	5	4	-	1	9
Marsala	2	-	-	-	-
Castellammare del Golfo	2	-	-	-	-
Favignana	1	-	-	-	-
Porto Empedocle	5	-	-	-	2
Licata	4	-	-	-	-
Gela	1	-	-	-	-
Sciacca	4	-	-	-	3
Lampedusa	1	-	-	-	-
Mazara del V.	5	5	-	-	-

3.3 Boatyards

3.3.1 Number and breakdown

The number of boatyards on the coast of Sicily would seem to be reasonable and sufficient to cope with requirements. The 1971 census of industry and trade listed 53 yards building timber boats, employing 254 people, and 18 yards engaged in building metal craft and in scrapping boats, employing a labour force of 4,931. The latter group included the four largest yards: one in Palermo (3,987 employees), one in Trapani (241) and two in Messina (500). If these are excluded, the figure is 14 yards with a labour force of 444.

As far as the maritime district of Palermo is concerned, detailed information is available on the location of yards building fishing vessels and on their work in 1977. In the case of Trapani district, information is available on location and the total number of boats built during that year.

Table 7 - Number of boatyards and output during 1977

Location	no. of boatyards	Trawlers built		Motor boats built	
		no.	g.	no.	g.
Palermo	6	-	-	-	-
Terrasini	2	-	-	7	13
Cefalù	1	1	10	-	-
Porticello	7	16	115	4	11
Termini I.	1	-	-	-	-
Trapani	14	2	49	14	60
Marsala	3				

In certain places (Sferracavallo and Pantelleria) there are small yards building timber boats and carrying out minor repairs.

In the districts of Palermo and Trapani, there is also a fair number of mechanical repair workshops: five in Palermo, two in Termine Imerese, three in Porticello, five in Trapani and four in Marsala. There are four yards, employing 28 people, and ten workshops, employing 35, in Mazara.

The following exist in the maritime district of Porto Empedocle: two slipways in Porto Empedocle associated with mechanical repair workshops and timber and metal boatbuilding workshops; four boatyards in Licata engaged in the construction of timber hulls of up to 150 tonnes; a boatyard of the same type in Gela; three slipways in Sciacca associated with yards building hulls of up to 50 tonnes and six mechanical workshops repairing engines of up to 200 HP; and one boatyard and workshops for the repair of engines of up to 300 HP in Lampedusa.

3.3.2 Classification according to type of work done

The 45 yards in the districts of Palermo Trapani and Porto Empedocle, as mentioned above, are all fitted out for the construction of medium tonnage trawlers and motor boats, but many of them in fact do no more than caulking, careening and minor repairs.

4. The procurement of fishing supplies

4.1 Volume, location and origin of fishing requisites

In most cases, items required by the fishing industry are procured in the larger fishing industry centres, with traders in Trapani, Palermo, Mazara del Vallo and other fishing towns stocking standard supplies.

In other cases, the more substantial owners or those fitting out a new boat may deal direct with the dealers or manufacturers on the mainland.

Most equipment is procured from the Italian mainland, with the exception of fish boxes, as they are usually produced locally.

There are two factories in Mazara del Vallo producing steel cables, although they import their raw material (steel wire) from West Germany. The places where nets are procured are Ancona, Civitavecchia, S. Benedetto del Tronto, Anzio, etc.

There are three wholesale dealers in fishing products in Sciacca.

A firm in Trapani makes up fish boxes, collecting the alder wood it needs ready prepared in Calabria, so that the only work to be done is machine stitching. It employs a work force of three to eight people and its daily output is 7,000 boxes, sold at Lit.280 each. Another firm producing plastic boxes has not been successful on the market.

In Marsala there is a firm that makes up nets, importing some of its materials from net manufacturers on the mainland.

5. MARKETING STRUCTURES

5.1 The markets, their organization and the hinterland

Only 13 of the 77 Sicilian fishing centres have their own fish market (Palermo, Termini Imerese, Porticello, Porto Empedocle, Licata, Sciacca, Trapani, Mazara del Vallo, Marsala, Castellammare del Golfo, Messina, Catania and Siracusa), although there are about thirty collection centres.

Since the markets are inadequate and their premises and equipment not up to standard, most fish is disposed of outside the market.

A distinction is commonly made between producers' markets, mixed markets and consumers' markets, but the differences between them are sometimes blurred. Palermo, Messina, Catania and Siracusa, however, are undoubtedly looked on as consumers' markets.

Messina is one of the best equipped markets. It also serves as a collection centre for fish caught in the maritime district and fishing centres both on the mainland of Italy and in foreign countries. It has five cold chambers providing total space of 75 cubic metres for the storage of fresh fish and one 75 m^3 chamber for frozen fish. The market in Siracusa also has cold chambers (seven, total volume 350 m^3), but they have never been brought into operation. The market in Catania has no such facilities.

The largest consumers' market is in Palermo, which handles an annual flow of 4,000 to 5,000 tonnes of fish, approximately two thirds from ports in the Trapani district, one fifth from ports in the Palermo district, one tenth from the Agrigento district and the remainder from other sources.

Table 8 shows the quantities of fish recorded every month in Palermo market for 1976 and 1977, with a breakdown according to source.

Table 8 - Monthly quantities of fish marketed on Palermo fish market - breakdown according to origin

(100 kg)

	Month	Palermo coastal area	Palermo province	Trapani	Agrigento	Catania	Messina	Naples	Other provinces	Foreign	Total	%
1976	J	315	275	1 529	264	109	10	-	193	700	3 395	8.3
	F	551	361	1 700	305	75	36	18	113	-	3 159	7.7
	M	536	345	1 938	269	29	87	-	77	-	3 281	8.0
	A	503	91	2 306	332	67	84	40	142	-	3 565	8.7
	M	524	100	5 062	149	7	20	-	273	-	6 135	14.9
	J	558	130	2 842	128	-	9	-	567	-	4 234	10.3
	J	381	119	1 804	484	5	38	-	299	-	3 130	7.6
	A	379	162	1 611	452	8	129	-	351	-	3 092	7 5
	S	390	265	1 625	627	5	102	30	140	-	3 184	7.7
	O	443	261	2 034	290	35	5	-	140	-	3 208	7.8
	N	373	251	1.420	211	10	5	-	195	-	2 465	6.0
	D	466	220	1 192	220	23	10	-	128	-	2 259	5.5
	1976	5 419	2 580	25 063	3.731	373	535	88	2 618	700	41 107	100.0
	%	13.2	6.3	61.0	9.1	0.9	1.3	0.2	6.3	1.7	100,0	
1977	J	477	286	1 532	182	-	50	-	37	-	2 564	6.0
	F	401	175	1.672	315	5	35	-	60	-	2 663	6.2
	M	569	202	2 624	310	40	35	-	145	-	3.925	9.1
	A	465	191	2 078	237	70	15	-	130	-	3 186	7.4
	M	524	230	4 983	279	60	5	-	150	-	6 231	14.1
	J	580	208	2 691	305	-	-	-	115	-	3.899	9.1
	J	520	166	1 985	268	20	-	-	90	-	3 049	7.1
	A	598	160	2 157	221	30	-	-	80	-	3 246	7.5
	S	639	190	2 813	243	45	30	-	100	-	4.060	9.4
	O	626	203	2 845	285	65	-	-	170	-	4.194	9.7
	N	427	163	2 010	191	-	-	-	50	-	2.841	6.6
	D	517	175	2 161	240	-	-	-	80	-	3 173	7.4
	1977	6 343	2 349	29 551	3 076	335	170	-	1,207	-	43 031	100.0
	%	14,7	5.5	68.7	7.1	0.8	0.4	-	2,8		100,0	

The market in Palermo is built on a site of over 8,000 m^2. It consists of four buildings, fitted out as a sales hall, offices, a storage shed for empties and the custodian's accommodation, a bank and a bar.

The fish is auctioned by six commission agents and one representative who operate on the market; selling by private negotiation is also permitted.

The fish is brought into the market in lorries that can carry fairly small loads and that are merely insulated, belonging to private road hauliers and reaching the market between 5 and 8 a.m. No more than two or three motorboats take the catch directly to the market, mooring at a small jetty nearby.

The lorries come up to the sales hall and are unloaded. The fish is handed over to the commission agents or the representative and selling starts at 6 a.m., sometimes earlier, ending at approximately 10 a.m.

Any fish brought in the previous evening is stored in a cold chamber in the same building as the sales hall, although this serves as no more than a store: the boxes of fish packed with ice are left in the chamber.

At each concessionaire's stand are two scales for weighing the fish. Selling is conducted by an auctioneer in the presence of a market official, who is responsible for issuing statistical and accounting certificates; a veterinary officer in the building carries out health checks.

The market does not operate efficiently since the fish is brought into the sales hall while selling is going on and because selling is conducted at several different stands. This means that the prices for fish of the same quality may differ widely because it is sold by different agents.

Buyers pay for their purchases over the market bank counter. On buying, they are issued with a payment voucher and payment is collected by the bank two or three days following the purchase. It arranges for non-transferable money orders to be issued and sent out to the producers or suppliers.

The fish that has been bought by the retailers is transported by van or even by smaller vehicles.

Marketing services account for approximately 8% of the purchase price, the breakdown being as follows: 4.40% to the commission agent or representative; 0.80% to the auctioneer; 1.00% to the bank; 1.25% to the market management body; and 0.25% to a guarantee fund set up by the producers to cover the risk of the retailers' insolvency. The charge for veterinary services is Lit.100 per 100 kg fish, while porterage is charged at Lit.35 per box.

In practice, the Palermo fish market serves only the city, in fact only part of the city. The rest of the province of Palermo is supplied by other markets, in particular by Porticello at a distance of 15 kilometres from Palermo. Monthly sales reach their peak in May when 14% or 15% of the total for the year is sold. If it is assumed that all the fish going through the market, and only that fish, is used to supply the population of Palermo, the annual per capita consumption of fresh fish would be approximately 6.3 kg, which seems on the low side.

In fact, some of the retailers and restaurants obtain their supplies directly from other markets, mainly Porticello, or from small producers. Another factor is that frozen fish does not normally go through the fish market. According to an estimate based on information gleaned from the trade, the consumption figure mentioned above should be multiplied three-fold.

The fish market at Mazara del Vallo is no more than a reference point: it handles only the catch brought in by inshore boats and a few consignments that are stored temporarily by local dealers - according to certain estimates, less than 5% of output. The estimates drawn up by the harbourmaster's office are as follows: in 1976, 23,000 tonnes fish (1,200 tonnes fatty fish), 4,500 tonnes crustaceans, 7,500 tonnes molluscs, totalling 35,000 tonnes; in 1977, 27,800 tonnes fish (5,000 tonnes fatty fish), 5,000 tonnes crustaceans and 8,500 tonnes molluscs, totalling 41,300 tonnes; in 1978, 33,500 tonnes fish (1,800 tonnes fatty fish), 9,000 tonnes crustaceans and 8,500 tonnes molluscs, totalling 51,000 tonnes.

Most of the catch which, according to estimates of local people in the trade, amounts to a value of 150,000 to 180,000 million lire today (almost three times the value stated by ISTAT for the whole of Sicily) is purchased while it is still at sea; the dealers agree to a price with the owner on shore, having obtained information on the quantity and quality of the catch by radio. On the day on which the boat is due to arrive, the dealer sends his own insulated lorries to the wharf and the fish is loaded into them after repacking with ice if necessary.

About 60% of the catch in Mazara is despatched to the national markets immediately, while the remaining 40% goes to the regional market. Some of the fish may be temporarily stored in cold rooms owned by the dealers or some of the dealer/boat owners.

The quantities that have gone through Mazara fish market over the past three years are as shown in Table 9. One of the points that will be noted is that the figures have been steadily declining during this period.

Table 9 - Quantity of fish handled by Mazara fish market (100 kg)

	1976	1977	1978
Fatty fish	14,593.83	9,786.22	6,249.74
Other fish	485.25	369.43	523.65
Total fish	15,079.08	10,155.65	6,773.39
Molluscs	1,793.56	1,338.17	822.56
Crustaceans	1,037.00	724.00	428.85
Total	17,909.64	12,217.82	8,024.80

In Sciacca the fish market consists of no more than a temporary structure covering an area of approximately 250 m^2 (funds of Lit.1,500 million have been allocated towards the building of a new market), but it is one of the best run. It is managed by the local cooperative, which has assigned a manager, a secretary, a vet, six auctioneers and seven clerks.

The market is held from 3 or 4 p.m. to 6 to 7 p.m., depending on the time at which the fishing boats return. The fish is passed to the four auctioneers' stands from outside through hatches, and is sold to the highest bidder. The producers collect payment on the subsequent day through the market bank, where purchasing tradesmen are accredited or have credit facilities.

Approximately 70% of the catch that is landed goes through Sciacca market, the remainder being consumed locally or going to the processing industry.

Table 10 sets out the summary figures for this market.

Table 10 - Sales on Sciacca fish market in 1978

	quantity, 100 kg	Value, Lit.1,000
Fatty fish	24,888.63	814,701.6
Other fish	15,268.70	1,256,772.0
Total fish	40,157.33	2,031,473.6
Molluscs	5,734.24	509,781.6
Crustaceans	6,947.46	1,295,614.7
Total	52,839.03	3,876,869.9

Of the fish sold on the fish market, 60% is bought by local dealers who send it on to Mazara (25%-30%), Palermo and Porticello (20%-25%) and Catania (5%). About 30% is purchased direct by dealers from Palermo, Catania and Messina, while the balance of 10% is bought by local retailers.

Market charges account for 4.8% of the price. The reason why this percentage is low is because there is no commission agent.

The market at Trapani can be considered to be a mixed producers' and consumers' market, with the same negotiating and selling procedures as those described above. Less than 20% of the catch unloaded goes through the market, and most of this is fatty fish.

Table 11 - Sales of fatty fish on Trapani fish market, 100 kg

	Sardine	Mackerel	Anchovy	Total
1975	32,700	21,000	13,500	67,200
1976	22,100	11,550	2,450	36,100
1977	33,319	16,000	2,726	52,045
1978	30,517	15,500	5,202	51,219

5.2 Storage and processing facilities

Most of the cold storage rooms that exist are privately owned and linked with ice factories, while others are owned by cooperatives. In addition there are a few freezer units and refrigerated or insulated vehicles for the transport of fish, often owned by cooperatives. The figures on the capacity of some cold storage rooms are quoted in cubic metres, in tonnes in the case of others and, in other cases, in terms of boxes. In other instances, all that is known is that such storage exists.

Large capacity cold storage units are to be found in Palermo, some of them attached to a processing company that is no longer operating; these are used to store the fish unloaded from Atlantic fishing vessels and frozen tuna.

One cooperative has a 47 m^3 cold storage room, and there are two units in Isola delle Femmine, another unit in Cefalù (30 m^3) and four in Terrasini (125 m^3).

In Porticello, a private firm owns 1,300 m^3 cold storage space used to store fish coming in from Porto Empedocle, Mazara, Sciacca and Trapani, as well as a 300 m^3 freezer. Another private firm has a 20 m^3 cold storage room.

There is substantial cold storage capacity in Trapani, including 2,400 m^3 space owned by a private firm. A producers' cooperative owns a plant with a freezing tunnel capable of freezing 1,500 boxes of fish a day to a temperature of - 40°C; it also has cold storage for 60,000 boxes. In Favignana, the local plant that processes tuna is equipped for storage as well.

In the district of Messina, premises have been fitted out for cold storage in Messina (230 m^3), Milazzo (180 m^3), Sant'Agata (90 m^3) and Lipari (a single 5 m^3 cold store).

Siracusa and Marzamemi are reasonably well equipped with approximately 500 m^3 and 210 m^3 storage space respectively, while Portopalo has only one unit for 800 kg fish.

On the whole, storage capacity seems to be sufficient to satisfy existing requirements, based on the marketing channels for the fish being caught in Sicily today.

Most of the catch is unloaded and then forwarded direct to the consumer in insulated lorries. The cold storage rooms that exist in the fish markets in the leading consumer towns may not even be used since the fish that comes into the market is sent out again within the space of a few hours. The cold storage mainly used is that owned by the wholesalers, especially in the centres for fishing or sorting, or by producers' or processors' cooperatives.

6. MARKETING METHODS

6.1 Species and markets

There are several phases in the preparation of fish for the market, some occurring at sea while the vessel is returning to port or, in the case of vessels spending several days at sea, in the intervals between fishing; others occur on shore after the catch has been unloaded.

The catch is roughly sorted at sea to eliminate foreign bodies and fish that is too small to be marketed. The fish is then sorted according to species and size before being packed into containers and stored.

If the fish is graded according to species and size, the boxes can be packed with fish of the same type except in the case of varieties of which there is a smaller number; these are packed in boxes of mixed fish, although even so their contents are comparable in quality and the method of cooking for which they are suitable (frying, fish for soup).

The way in which fish is packed in the containers will depend on the species. Fatty fish, molluscs such as squid, octopus and cuttlefish and small crustaceans are normally packed loose in the box. Bivalve molluscs are put into bags of a specified weight. Fish of a single given species measuring over 15 cm or so in length are carefully laid out in the box, heads uppermost, with each layer overlapping.

Once the boxes have been packed they are hosed down with plenty of salt water and the preserving phase begins.

The boxes may be placed in the vessel's cold chamber straight away, where this exists, or in an ice box after being covered with ice. On boats with neither a cold storage chamber nor an ice box, they may be piled up on deck until they can be unloaded.

On arrival, the catch is landed and taken by small vehicles to the distribution point; this may be a fish market, a collection centre or the landing wharf itself.

When the fish has been purchased by the retailer or dealer or forwarded to other markets, perhaps by the producers themselves, it may undergo further handling; for instance, boxes that have not been treated at sea may be packed with ice, other boxes may be repacked with ice of further graded or transferred to smaller containers in which the fish is laid out in some other way to suit the end market.

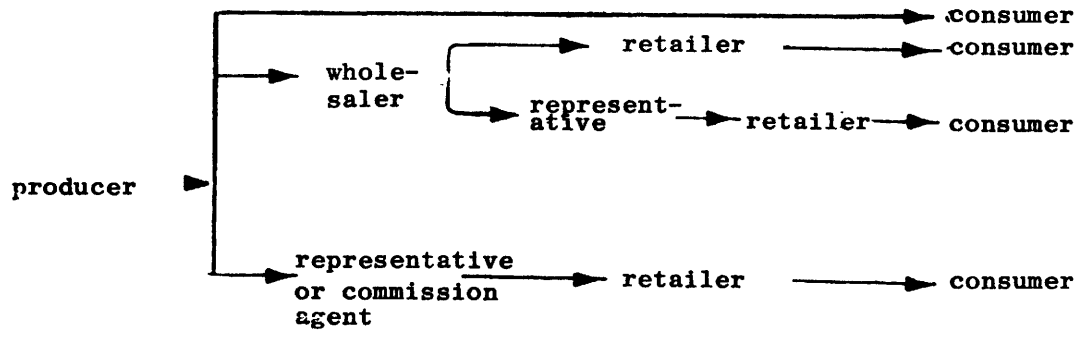
6.2 Marketing channels

The ways in which fish travels from the producer to the consumer are many and various, depending on many factors: the nature of the production unit, the type of fish, the requirements of specific consumers or market organization in general in terms of the infrastructure available, its efficiency and the parties involved.

One method of marketing fish is direct sale by the producer to the consumer. This is common in small fishing centres or in tourist spots during the summer and on occasions as a supplement to the supplies procured by restaurants that offer the local fish. The kind of producer who engages in this type of marketing will obviously be the small fisherman with a small motorboat, perhaps even a rowing boat, who fishes locally in inshore waters.

Another form of marketing is one that involves the wholesaler and that may take place inside or outside the fish markets. In general, the producer sells to the wholesaler direct outside the market; the wholesaler in turn distributes the fish to the retailers or takes it to the fish market, where he sells through a representative. In other cases, it will be the producer himself who takes the product to the market for sale through a representative or commission agent.

Other marketing channels involving two or more wholesalers are less common.



In the case of fatty fish, products going to processing firms are usually sold by direct agreement between the producer and the firms without going through the market. It is a channel basically used for local fish. In other cases, the processors may bid for supplies at fish auctions through a commission agent on markets that are not necessarily close at hand.

In the case of crustaceans (shrimp) for deep-freezing, firms find it difficult to obtain their supplies direct from the producer and are forced to go through the wholesale dealer, who is in a position to commit the whole of the catch landed by individual boats (fish, crustaceans and molluscs) and who would not buy consignments from which the better quality grades have been removed.

7. DESTINATION OF FISH CAUGHT IN SICILY

7.1 The market inside and outside the region

The surveys commissioned by the Bank of Sicily's planning section can be used to estimate the island's trade with foreign countries and other Italian regions, although the estimates will be very approximate, especially insofar as inter-region trade is concerned.

It appears that there has been a consistent deficit in Sicily's foreign trading in fish: Lit.3,937 million in 1974, Lit.4,062 million in 1975, Lit.5,025 million in 1976 and Lit.5,849 million in 1977.

The main items imported are fresh and frozen fish, accounting for about 47% of imports, salted cod and dried cod (14%) and other dried and salted fish (10%); other items are of only minor importance.

Fresh and frozen fish represent 54% of Sicily's exports, and anchovy and small sardines preserved in salt (14%) and other dried or salted fish also contribute. There is satisfactory growth in the preparation of fish under every heading, although as yet this sector has made only a modest contribution to exports.

Table 12 - Sicily's foreign trade in fish products

	Imports (tonnes)			Exports (tonnes)			Net balance (Lit.'000,000)		
	1975	1976	1977	1975	1976	1977	1975	1976	1977
Fresh and frozen fish	6 810	3 480	4 220	510	240	540	-2 626	-2 594	-4 540
Small sardines and anchovies, salted	-	-	-	150	230	230	+ 93	+ 166	+ 198
Herrings	100	60	30	..	..	..	+ 99	- 66	- 50
Salted or dried cod	210	380	180	..	..	..	- 712	-1 650	- 831
Other dried or salted fish	800	510	270	80	80	80	- 714	- 843	- 365
Prepared fish	40	..	..	..	..	30	- 8	+ 78	+ 99

Apart from herrings, salted cod and dried cod, there is a surplus balance in all items. In terms of quantity, fresh and frozen fish is the largest export and import item. Table 13 gives details of each category.

Table 13 - Sicily's inter-regional trade in fish products (tonnes)

	Imports			Exports		
	1975	1976	1977	1975	1976	1977
Fresh and frozen fish	2 520	2 240	2 220	3 440	2 630	3 070
Salted sardines and anchovies	-	20	-	260	400	310
Herrings	70	70	30	10	10	-
Salted or dried cod	2 210	1 970	1 960	200	90	100
Other dried, salted or smoked fish	210	100	90	1 430	740	650
Prepared sardines and anchovies	10	20	20	110	290	20
Prepared tuna	440	130	300	500	670	600
Other prepared fish	200	10	10	1 410	1 120	450

A slight worsening in Sicily's position in inter-regional trade will be noted, mainly due to exports, although it appears from preliminary figures available for 1978 that there has been some improvement.

There are good grounds for the belief that a fair proportion of inter-regional trade is not included in official figures today. The Straits of Messina are no longer the only way in which goods can be taken to the mainland: there are ferry services from Palermo, some fish products are despatched by air and a quantity of fish, in many cases in processed form, is shipped as part of grouped consignments and is not listed separately in checks.

The ports providing fish for trade with other regions are in Western Sicily, basically Mazara del Vallo, Sciacca, Trapani and Porto Empedocle.

Except in the case of a few vessels from certain fishing bases which land their catch direct in towns on the mainland (Bari, Salerno), most goods are sent by land today, usually by insulated or even refrigerated vehicles. There are several advantages in despatching fish by road: the building of new motorways has made road transport faster; road vehicles can use the ferry service between Palermo and Naples; goods can be taken to several markets on one journey; and a load can be found for the return journey. The type of fish sent by rail is the lower grade and travels better (shark, skate, etc.). Air transport is usually used for very high quality fish and crustaceans.

The goods tend on the whole to be sent to the larger cities on the mainland of Italy, i.e. Rome, Milan, Turin and Naples, but they are also despatched to towns such as Venice, Taranto and Bari.

The statistics on both landings and inter-regional trade are so imprecise that it is very difficult to draw up a balance sheet on the quantity of fish entering and leaving Sicily. Disregarding dried, salted and smoked fish, a category in which there was a deficit of 1,545.4 tonnes and 1,020.0 tonnes in 1976 and 1977 respectively, and prepared fish, a category in which there was a surplus of 1,893.7 tonnes and 740 tonnes in those years, ISTAT's statistics on trade, as discussed above, and on production would mean that the quantity consumed within Sicily was 72,752 tonnes in 1976, 65,267 tonnes in 1977.

Table 14 - Balance of trade in fish in Sicily (tonnes)

	1976	1977
Landings	69,902	62,437
Imported from foreign markets	3,480	4,220
Imported from other regions	2,240	2,220
Total resources	75,622	68,877
Exported to foreign markets	240	540
Exported to other regions	2,630	3,070
Consumed locally	75,752	65,267

Based on these figures, per capita consumption in 1977 would be about 13.2 kg, 95.7% of that consumption being supplied from Sicily's own resources.

A separate attempt to draw up a balance sheet has been made, using the per capita consumption figures reported by ISTAT in the light of sample surveys[1] and comparing the findings for 1973 and 1977.

Table 15 - Balance of trade in fish in Sicily

	1973	1977	Index (1973 = 100)
Per capita consumption, kg	15.60	14.47	92.7
Population at 31.12 ('000)	4,771.3	4,936.2	103.5
Total consumption, tonnes	74,431.6	71,426.5	96.0
Landings, tonnes	53,072.5	62,437.0	117.6
Shortfall, tonnes	21,359.1	8,989.5	42.1
Supplies from own resources, %	71.3	87.4	122.6

(1) *ISTAT, I consumi delle famiglie nel 1977.*

Based on this estimate, the deficit was 9,000 tonnes in 1977, as opposed to 2,830 tonnes according to the first estimate, which gave internal consumption as 6,159.5 tonnes higher.

Comparing the figures for 1977 with those for 1973, the increase in the percentage of consumption obtained from local resources is apparently due to an increase in the quantity of fish landed (+ 17.6%) and a reduction in total consumption (- 4.0%) brought about by the marked decline in per capita consumption (- 7.3%).

Despite the official figures, it seems that the percentage production of fish in Sicily by comparison with consumption is in fact higher than 100%; the divergences in the figures arrived at in the attempts to estimate these factors should be attributed to the fact that production has been considerably under-estimated.

7.2 Storage and processing

Once the catch has been landed at the port, it is forwarded to its various places of destination as described in section 6. A proportion of the catch - in fact the largest proportion - goes straight to the consumer or is sold through the market or outside the market.

Another portion is stored before it reaches the consumer, usually in the wholesalers' cold storage rooms or, in some cases, in cold storage attached to the fish markets.

Finally, a proportion is used for processing, here again straight away or after a period in cold storage at the wholesalers or the processing companies.

Large quantities of anchovies and sardines are processed, as well as some of the mackerel and tuna caught. The processing industry also imports tuna to supplement local supplies.

It is almost impossible to estimate the quantity of fish caught in Sicily that is consumed fresh, goes into storage (refrigeration or freezing) and is taken up by the processing industry (for salting or preserving in oil).

In the case of sardines and anchovies taken up by the processing industry, based on the assumption that Sciacca - the leading processing centre in the island - accounts for about half of the production of Sicily's salted anchovies, the total quantity of raw materials going to the industry would be about 12,000 tonnes a year, roughly equivalent to the production figures for anchovies, sardines and mackerel given in official statistics.

8. PROCESSING STRUCTURES

8.1 Number and location of processing units

According to the 1971 census of industry and trade, in 1971 there were 72 local units engaged in the processing and storage of fish-based food products, employing a total of 744 people.

Table 16 is a breakdown of those units by province and by the size of the labour force employed. It shows the extreme fragmentation of this sector and the very small number of firms that could be classified as operating on an industrial scale. In most cases, firms are small-scale family-type businesses which do no more than salting fatty fish (sardines and anchovies). Only in a few instances does production work include the preserving of fish in oil (anchovies, sardines and mackerel), and rarely is it as sophisticated as preparing tuna.

Table 16 - Firms processing and preserving fish-based food products

Province	units employing up to 5		units employing 6-19		units employing 20-49		units employing 50-100		T o t a l	
	units	no. employed	units	no. employed	units	no. employed	units	no. employed	units	no. employed
Trapani	3	11	4	36	4	102	2	154	13	303
Palermo	9	31	2	12	-	-	1	90	12	133
Messina	5	8	1	6	-	-	-	-	6	14
Agrigento	17	45	13	145	3	79	-	-	33	269
Catania	1	1	-	-	-	-	-	-	1	1
Ragusa	1	1	-	-	-	-	-	-	1	1
Siracusa	5	13	1	10	-	-	-	-	6	23
	41	110	21	209	7	181	3	244	72	744

A survey conducted in the province of Palermo revealed the existence of two industrial-scale processors in the capital, Palermo, and one of these, essentially engaged in the processing of imported frozen tuna, has gone out of business. The survey also found many small-scale firms producing salted sardines and anchovies.

There is a cooperative in Balestrate preserving anchovies, sardines and mackerel in salt and in oil. In Termini Imerese there are only two small firms, both salting fatty fish. In Aspra (Porticello), five small processors are operating with a total labour force of 55, also engaged in the salting of fatty fish and some preserving of fish in oil; these co-exist with many small-scale firms producing salted fish.

Within the maritime district of Porto Empedocle, processors are to be found in Lampedusa (8 local units) and Sciacca.

The leading town for processing fatty fish in the island as a whole is Sciacca, where 6,000 tonnes of fresh fish are handled annually - some from local sources (20% - 25%), some from other fishing centres in Sicily (Mazara, Trapani, Marzamemi) and the rest from Adriatic centres (Bisceglie, Bari, Trani, Vieste, Giulianova, San Benedetto del Tronto and Cattolica) and from the Tyrrhenian (Piombino, Anzio, Viareggio, Terracina). The town produces about 4,500 tonnes of salted sardines and anchovies and about 30 tonnes of anchovy fillets in oil. There are 46 local units, but only 6 of these produce fillets in oil as well as salted fish.

The units may be listed under three headings based on production potential, the number employed and their organization:

a) Companies processing 2,500 to 3,500 tonnes of fish to produce 6,000 to 10,000 crates a year, each containing 40 kg. Twelve local units come under this heading, and these include the six

firms which also produce anchovy fillets in oil. Their production areas range from 150 to 300 m^2, one of the units having an area of 800 m^2.

Some of the storage warehouses are owned and some rented by the companies, and most of them are old. The number of people employed on production varies depending on the season: three or four skilled workers are employed full-time throughout the year; from March or April to the end of November the labour force is increased to 18 to 22, and 10 seasonal workers are brought in to work in June, July and August.

Those processors producing fillets in oil employ 8 to 15 workers in January to March.

b) Small-scale industrial concerns processing 75 to 150 tonnes of fish and producing 2,000 to 4,000 crates. The number of local units in this category is 10, their production area ranging from 100 to 150 m^2. Here again, warehousing is old, some of it owned and some leased by the concerns. It is often so inadequate as to force the producers to sell their output before it has matured.

These concerns employ one or two skilled workers, including the employer himself, throughout the year, taking on 8 to 10 people from March or April until the end of November and an additional 2 to 4 seasonal workers from June to August.

c) Small-scale firms processing 20 to 50 tonnes of fish, producing 500 to 1,500 crates. There are 24 such units locally, their production area ranging from 30 to 100 m^2. Their storage buildings, either owned or rented, are old and are too small to store their output, once again often making it necessary to sell off

their output before it is properly seasoned and on occasions to suspend production for a few days until the prepared products can be moved. In these units, the skilled worker is always the entrepreneur himself. From March or April to November he will take on 5 to 8 people, usually members of his own family, and an extra person or two from June to August.

Approximately half of the skilled workers are the entrepreneurs themselves and the full-time workers, most of them from the entrepreneurs' own families; the other half are young people, mainly girls.

In the case of seasonal workers too, most of the labour force is recruited from the entrepreneur's family circle or consists of occasional workers recruited from among friends, students, etc.

The common method of payment for both unskilled and seasonal workers is piecework, based on the number of cans produced. The rates vary according to weight of the can: Lit.300 to 400 per 10 kg can, Lit.250 per 5 kg can, and Lit.80, Lit.60 and Lit.50 respectively per 2 kg, 1 kg and 0.5 kg can.

On the assumption that entrepreneurs take the same pay as that of a skilled worker, estimated earnings are over Lit.1,100 million, with approximately Lit.445 million going to the pieceworkers.

The table below sets out significant figures emerging from the survey and gives additional information on the individual categories of local units.

Table 17 - The fatty fish processing industry in Sciacca

	Total	Scale of unit, based on annual tonnage of fish processed		
		over 250 t.	75 to 150 t.	under 50 t.
No. of local units	46	12	10	24
Fresh fish processed, tonnes	6,000	4,000	1,150	850
Labour force, no. employed:				
skilled	81	42	15	24
unskilled	452	288	80	144
seasonal	186	120	30	36
Labour force, days worked:				
skilled	22,680	11,760	4,200	6,720
unskilled	63,560	34,440	10,400	18,720
seasonal	7,440	4,800	1,200	1,440
Fresh fish processed, kg/day	64	78	73	32

Labour accounts for about Lit.248 of the cost per kilogram of the end product (Lit.185 per kg fresh fish). Of special note is the marked difference in the rate of productivity between the larger and the smaller units.

Prawn processing is a different type of production work and one that is carried out in Mazara del Vallo and Trapani.

In Mazara, the "Italgel" plant, a company set up by the Ente Siciliano per l'Industrializzazione (the Sicilian industrialization board, E.S.P.I.), has been in operation only since January 1979. The total area of its site is 40,000 m^2, with 4,500 m^2 ground area buildings. It has 1,800 m^3 cold storage space.

The plant employs one manager, an office staff of six, a technical staff of three (a refrigeration and a hydraulic engineer and an electrician), and thirteen processing workers; it is expected that the latter will be increased to 60 or 70 once the plant is operating at full capacity of 1,000 tonnes a year (10% to 15% of landings in Mazara, estimated at 6,000 to 9,000 tonnes a year).

Current production work is based on the freezing of whole prawns in four size ranges (40-60 prawns/kg to 120 prawns/kg) and shelled prawns in size ranges of 300-400 and 400-450 prawns/kg.

Prawns for shelling are purchased locally through dealers and also on other Italian markets or, when specifically requested in other countries, on foreign markets. One such species that has been processed has been the *Pandalus borealis*, imported from Norway and Denmark.

Italgel markets its end products through Findus and Frigodaunia. It is planning to extend its production range by processing cuttlefish, baby octopus, squid, etc.

In Trapani, the largest fish processing concern with a diversified range is Castiglione, which also owns two tuna traps (Bonagia and San Giuliano), a large processing plant in Trapani and another plant in Lampedusa.

The concern in Trapani owns approximately 20,000m^2 covered premises and employs 60 to 65 workers throughout the year. It has a - 65°C freezing tunnel capable of freezing 300 tonnes of fish in five hours, and three vast cold storage chambers at a temperature of - 45°C. Its output is about 3,000 tonnes of tuna and bonito and 1,500 tonnes of fatty fish, mainly mackerel. Frozen sardines are also processed, most of which are exported to France and, in recent times, to Germany.

Some of the fish for processing is acquired locally, some abroad.

The tuna caught in its own nets (about 1,000 tonnes) is disposed of in three ways: one third is processed in its own plant, one third sold fresh on Sicilian markets and one third sold to the Japanese. In addition, the company buys in foreign fish (Korea, Formosa, Japan, Spain and France) on the basis of agreements negotiated on the Milan market and through agents: frozen tuna, long-finned (white) tuna weighing 4-5 kg and skipjack tuna weighing 2-3 kg.

After processing, the tuna and mackerel are sold on Sicilian and mainland markets (Rome, Milan, Turin, Venice and Padua) through agents. Some of the skipjack-based products are also despatched to Germany and, as already mentioned, all the frozen sardines are exported to France and Germany.

Another Trapani concern has also been exporting this product to France for the past three years (COFRIT). Exports to France are by contract with foreign transporters in France, being sent by 20-25 ton road vehicles. The cost of shipment to Mediterranean France is Lit.65/kg, to Atlantic France Lit.85/kg.

Sardine sales are based on the size of fish, ranging from 18-20 to 27-30 sardines per kg.

In Trapani there is also a company producing fish meal that uses tuna and fatty fish scraps discarded by the tuna processors as well as sardines delivered by the Government body responsible for measures on the agricultural market, A.I.M.A. (Azienda statale per gli Interventi sul Mercato Agricolo).

8.2 Processing technology

8.2.1 Methods of processing fatty fish

As has already been mentioned, in essence the raw materials used by the processing industry are fatty varieties of fish (sardines and anchovies), and most processed products are those preserved in salt.

The products are processed in small-scale factories by hand. The procedure is as follows.

First the fresh fish is marinated in brine for about two hours to make it release its blood and absorb the salt. The heads are then cut off (in the case of anchovies) and the fish is gutted. It is graded according to size and washed in salt water.

At this juncture, the fish is ready to be placed in cans containing different weights (10, 5, 2, 1 and 0.5 kg). The layers of fish are alternated with layers of salt in a sheet of semi-rigid plastic lining the tin. When the fish reaches a level slightly higher than the edge of the tin, a weight is placed on top to pack it down and the tins are stacked in alternating layers in a tower-shaped pile.

The preliminary seasoning period is about 40 days. During this time, the tins are kept unsealed and their contents are sprayed daily with salt water. After this initial period of maturation (known as *sgrassatura*, i.e. fat removal), the lids are placed on the tins, which are sealed with the help of a semi-automatic lidding machine.

The tins are then transferred to the warehouse where their contents are left to mature for a further period of three to four months. The tins are then stowed in crates holding 40 kg weight, the number of tins depending on their size.

Larger fish is usually set aside for filleting. During the first phase, the process is identical to the one described for salted fish. The fish is packed with salt in the same way, although the containers used are 10 kg tons or 50 kg barrels, which are stacked in towers.

During the first two months of the 5-6 month seasoning period, the fish is sprayed with brine daily; after that time, it is sprayed weekly.

When the fish has matured it is removed from the container and is filleted, here again by hand. Filleting consists of removing the skin manually with synthetic sponges and taking out the backbone. The fillets are packed in small tins or jars and oil added. Once they have been hermetically sealed, they are ready for the market.

8.2.2 Methods of processing prawns

The crustaceans are brought into the factory by insulated vehicles and are tipped out of the boxes in which they are delivered into a hopper, which takes them to a conveyor belt. A visual check is made as they travel on the belt and any foreign matter such as fish or seaweed is removed. The crustaceans are taken to an automatic scale and are then collected in plastic containers and sprinkled with a layer of ice. They are stored in a cold room to await subsequent processing.

When the products are taken from the cold room they are conveyed to a machine where they are washed and the ice removed. They are inspected again and are taken by conveyor to the grading machine which sorts them into three sizes, each one of which undergoes a different production process. Large prawns are packed manually in plastic-lined containers, which are weighed and taken by trolley to the tray-type freezing line and thence to the cold rooms where the

finished products are stored. In the case of the medium-sized prawns, the heads are removed manually and the decapitated prawns are taken by conveyor belt to the packing area where they are weighed and bagged. They then go on to the air-freezing line and to the storage rooms. The small prawns go to an automatic line where their heads and shells are removed and they are graded by size and washed. After this, they are taken by conveyor belt to the continuous deep-freezing plant. Once they are frozen, they are automatically vacuum-packed in small packs, placed in cartons and taken to cold storage.

8.2.3 Methods of processing tuna

Both fresh and frozen tuna is cut up, decapitated and gutted. It is then opened out in four quarters and hung for twelve to sixteen hours. After that time it is cut into slices, cooked, canned in olive oil and sterilized.

The cans are placed on timber platforms in the warehouse to mature for about three months. By September the tuna is ready for the market. The can sizes range from 250 grams to 5 kilograms.

8.2.4 Fish meal production

The factory obtains most of its raw materials from concerns engaged in the preserving of fish in salt and oil, taking their processing waste. The rest of its raw materials are fish that cannot be disposed of on the market (horse mackerel) and fish collected from A.I.M.A.

This is a brief description of the process by which tuna scraps are made into meal. They are first cooked in an autoclave at 120°C at a pressure of 0.5 to 0.8 atm. and are then compressed by a hydraulic press (300-350 atm.) to extract the oil which, after centrifuging and blanching, is used as a denaturing agent (up to 6° acidity) for powdered milk or for other industrial purposes (in paint and tanning technology, etc.). The pressed solid mass is dried and vacuum-sterilized at a temperature of 80°-90°C, ground, bagged and labelled with a statement of the protein content. Its users are animal feed producers and livestock breeders.

9. EMPLOYMENT IN THE FISHING INDUSTRY

9.1 Number employed

The number of people employed in the fishing industry may be assessed only by using an estimate based on partial data derived from different sources that in many cases are not readily comparable.

The figures provided by population censuses are not only out of date by now but must also be considered merely as general guidance, since the criteria used in opting for one occupation or another in the case of people with more than one calling are somewhat subjective(1).

More recent figures, here again from ISTAT sources(2), relate solely to the crews of engine-powered craft in commission, the fleet being classified as motor fishing vessels and motorboats.

Records of persons insured with the Cassa Marittima, the health scheme for those employed in shipping and related callings, provide further figures, also partial, on persons engaged in fishing who are crews of motor vessels with gross tonnage of over 10 tonnes and with engine power of over 12 HP.

A final set of figures, though only estimated, is provided by the port harbourmasters. The figures, however, are not sufficiently reliable when they are assessed for individual fishing centres and when these centres are small.

According to the 1971 census, subject to the reservations expressed above, the number of people engaged in fishing was 12,743, a reduction of 6,841 compared with the figures reported in the 1961 census (34.1%).

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(1) *If a person has two or more occupations, the census takes his principal individual work into account; by this is meant the job that is to be considered as the more substantial in terms of continuity of work or financial reward.*

(2) *ISTAT: Annuario statistico della zootecnia, pesca e caccia.*

In the breakdown of employment by province, the province of Palermo is in the lead with 27.2% of those employed in the fishing industry; it is followed by Trapani with 26.7%, Catania with 13.8% and Agrigento with 13.2%. A smaller number of people is engaged in fishing in the provinces of Siracusa (8.7%) and Messina (8.2%), and a very small number is recorded in Ragusa (2.1%), Caltanissetta (0.1%) and Enna.

From a comparison with the 1961 figures, the only province in which there appears to have been an increase is Enna, where the percentage has risen from zero to 5%. There has been a decline in all other provinces.

As we have said, the figures published by ISTAT in its statistical yearbooks on livestock farming, hunting and fishing refer solely to the crews of motor vessels in commission, with a breakdown according to maritime district. The figures for the past three years are set out in Table 18.

Table 18 - Crews of engine-powered vessels in commission

Maritime district	Trawlers			Motor boats			Total		
	1975	1976	1977	1975	1976	1977	1975	1976	1977
Messina	90	101	106	2 538	2 578	2 608	2 628	2 679	2 714
Palermo	808	816	784	5 375	5 240	5 148	6 183	6 056	5 932
Trapani	3 075	3 036	1 305	1 659	1 667	1 284	4 734	4 703	2 589
Mazara del Vallo (1)	-	-	1 757	-	-	336	-	-	2 093
Porto Empedocle	1 393	1 361	1 374	1 009	991	975	2 402	2 352	2 349
Siracusa	527	512	527	756	749	747	1 283	1 261	1 274
Augusta	64	64	64	380	369	381	444	433	445
Catania	368	358	355	1 397	1 419	1 458	1 765	1 777	1 813
Sicilian coast	6 325	6 248	6 272	13 114	13 013	12 937	19 439	19 261	19 209

(1) The district of Mazara del Vallo was formed in 1976, the territory being taken from the district of Trapani.

It will be noted from this table that about two thirds of employees are members of the crews of motorboats, only one third serving on motor trawler vessels, although the ratio differs widely from one district to another.

There appears to be a fairly stable ratio between engine ratings in motor trawler vessels and their crew (an average of 0.03 man per HP), and a more variable ratio between gross tonnage and crew (an average of 0.13 man per tonne with plus and minus variations of over 25% between districts). In the case of motor boats, the ratios between size of crew and engine rating or gross tonnage vary to a far greater degree. It should be explained that the crew of an engine-powered boat will vary not only according to gross tonnage (or engine power which, to a certain extent, may be taken as correlated to tonnage) but also according to the type of fishing in which the boat is engaged. On a motor boat, for instance, the crew may be a single man (skipper/engineer) or more commonly two men if the boat is small, generally less than 5 tonnes, and if it fishes inshore waters. On the other hand it may consist of six men (skipper, engineer, a deck crew of three and one cabin boy) on motor boats of up to 25 tonnes purse-seining in inshore waters.

In the case of trawlers, the crew varies from seven (skipper, engineer, four members of the deck crew and a cabin boy) on vessels of up to 50 tonnes fishing in local coastal waters, to twelve and over (skipper, engineer, second engineer, fishing master, six deck crew and two cabin boys) on larger tonnage vessels sailing to Mediterranean fishing grounds.

The figures taken from the Cassa Marittima records are also incomplete, since they relate only to the crews of motor vessels whose gross tonnage is over 10 tonnes and whose engine rating is over 12 HP. For 1978, the total number of men employed in the fishing industry in the whole of Sicily is recorded as being 5,043: 4,970 in Mediterranean and 73 in ocean fishing grounds.

Table 19 provides a breakdown by maritime district, showing the number of vessels and the number of days worked.

Table 19 - Vessels and those engaged in fishing who are insured with the Cassa Marittima (1978)

District	no. of vessels	Mediterranean fishing		Ocean fishing	
		crew members	days worked	crew members	days worked
Messina	51	106	17 622	-	-
Palermo	239	721	227 110	59	13 979
Trapani	124	875	234 029	4	305
Mazara del Vallo	187	1 427	456 973	10	2 049
Porto Empedocle	297	1 075	325 011	-	-
Siracusa	145	422	126 184	-	-
Augusta	9	29	9 004	-	-
Catania	114	315	88 900	-	-
Sicilian coast	1 166	4 970	1 484 833	73	16 333

Some comparison is feasible between these figures and the ISTAT statistics on motor trawlers, all of which should be covered by those figures.

Whereas the number of vessels insured with the Cassa Marittima is shown as greater than the number of trawlers - and this is quite possible, since boats may be insured with the scheme provided that they satisfy the requirements - the number of crew members insured with the same scheme is smaller than the number of crew members on trawlers alone, a point that is rather puzzling.

The information furnished by the harbourmasters is an estimate, but on occasions it is very detailed, covering both those who go out to sea, including the crews of rowing and sailing boats, and those employed on secondary jobs on shore. This means that the figures are considerably higher than those reported by the sources already mentioned, depending on the number of motor, rowing and sailing boats in the different maritime districts.

Seamen are normally classified as category 1, in other words fishermen ranking as qualified seamen who would also be entitled to be taken on as members of the crew of merchant ships, and as category 3 in all other cases, i.e. a category mainly made up of fishermen sailing on small motor, sailing and rowing boats. Some of the districts give a more detailed breakdown: the figures reported by Trapani, Palermo, Mazara del Vallo, Porto Empedocle, Messina, Siracusa and Augusta are set out in Table 20 on page 68.

The figures for the district of Trapani appear to be closest to reality, whereas the figures for Palermo seem to have been over-estimated, especially in the case of category 3 seamen whose main occupation is fishing. According to these estimates, the number of seamen in the seven districts in question whose main occupation is fishing is 25,246, those for whom fishing is a secondary calling number 5,626, in addition to those working on tuna traps and fixed installations (285) or on subsidiary jobs (1,283).

According to a preliminary and very rough estimate, the total number of seamen employed in fishing is about 33,000, and approximately 1,500 people are engaged in subsidiary jobs on shore.

Table 20 - Persons engaged in fishing and subsidiary jobs in the maritime districts of Palermo, Trapani, Mazara del Vallo, Porto Empedocle, Messina, Siracusa and Augusta

Persons employed on fishing and subsidiary shore jobs	Maritime districts of:						
	Palermo	Trapani	Mazara del Vallo	Porto Empedocle	Messina	Siracusa	Augusta
1 Fishermen	12 277	5 885	3 250	3 604	3 994	2 395	340
A - crew members	12 277	5 600	3 250	3 604	3 824	2 021	306
a - whose main occupation is fishing	11 297	3 525	2 800	3 185	2 509	1 714	216
category 1	3 503	2 165	2 500	2 850	502	1 016	126
category 3	7 794	1 360	300	335	2 007	698	90
b - whose secondary occupation is fishing	980	2 075	450	419	1 315	307	90
category 1	84	1 405	300	227	266	176	77
category 2	896	670	150	192	1 049	131	13
B - employed on tuna traps	-	285	-	-	-	-	-
2 - Those employed on subsidiary shore jobs	155	240	300	80	170	304	34
TOTAL	12 432	6 125	3 550	3 684	4 164	2 699	374

In 1978, a survey[1] was conducted in the districts of Trapani and Mazara del Vallo on the fishing fleet in commission, including rowing and sailing boats. One of the subjects investigated was the size of the crew on individual boats. The figures in Table 21 are based on the findings.

Table 21 - Crews on fishing fleet in commission in the districts of Trapani and Mazara del Vallo

Type of vessel surveyed	number	crews
Trawlers	301	2,468
Motor boats	452	1,259
Rowing and sailing boats	225	472
Total	978	4,199
Employed on tuna traps	45	345
Total	1,023	4,544

A comparison between these figures and the information furnished by the harbourmasters reveals a substantial measure of agreement on Trapani-based trawlers, while the number of motor, rowing and sailing boats in both Trapani and Mazara as reported by the survey was far smaller than the number furnished by the harbourmasters. This means that the number of crew members would also be lower.

It should be pointed out that the figures cannot be applied to Sicily as a whole on the basis of the number of craft registered, since the proportion of individual types of craft varies considerably, as do individual fishing methods.

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(1) *Research by Centro Regionale di Richerche Statistiche, op. cit.*

9.2 Breakdown according to fishing method

It is not easy to distinguish between fishermen on the basis of the fishing method used. A distinction may be made between the crews of rowing and sailing boats, estimated as about 13,000, and the remaining 20,000 men who man engine-powered boats, i.e. approximately 7,000 on trawlers and 13,000 on motor boats.

It may be estimated that about 75% of boats classified as trawlers (*motopescherecchi*) are in fact engaged in Mediterranean and inshore trawling, the remainder in purse-seining or fishing with entangling nets. Some of the motorboats fish with entangling nets or long lines, while others use encircling nets as well as fishing gear such as long lines and trammel nets in inshore waters. Rowing and sailing boats fish with trammel nets and long-line gear and also use lesser fishing methods.

Using the data reported by the Centro Regionale di Ricerche Statistiche it is possible to specify the number of fishermen engaged in the main types of fishing based in certain fishing centres (Table 22).

Out of a total of 4,544 men, 345 of whom work on the tuna traps, 2,468 man trawling vessels (an average crew of 8.2 men), 1,259 work on motor boats (average crew 2.8) and 472 work on rowing or sailing boats (average 2.1).

The number of men engaged in trawling is estimated as 2,026 fishermen, 44.6% of the total; in fishing using surrounding nets as 391, i.e. 8.6% of the total; in fishing with long-lines 757, 16.6% of the total; and in other types of fishing 745, or 16.4%. The number of fishermen using multiple methods is estimated as 280 or 6.2%, while 345 men, 7.6% of the total, work on the tuna traps.

The preponderance of trawling is due to the fact that approximately half of Sicily's total tonnage of trawlers is to be found in the districts in question.

Table 22.- Number of fishermen, with breakdown according to fishing method employed

Type of craft	Fishing method	TRAPANI		CASTELLAM.		S.VITO L.C.		FAVIGN.		MAZARA		PANTELLERIA		MARSALA		TOTAL	
		(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
Trawlers	trawling	48	454	-	-	-	-	2	9	162	1 490	-	-	9	42	221	1 995
	encircling	39	242	-	-	-	-	2	15	-	-	-	-	-	-	47	257
	long-line	9	45	-	-	-	-	-	-	1	3	-	-	2	9	12	57
	other methods	1	4	-	-	-	-	-	-	2	10	-	-	6	32	9	46
	multiple	5	46	-	-	-	-	-	-	10	56	1	2	2	9	18	113
	Total	102	791	-	-	-	-	4	24	175	1 559	1	2	19	92	301	2 468
Motor boats	trawling	3	17	-	-	-	-	-	-	-	-	2	6	-	-	5	23
	encircling	20	69	2	11	3	14	5	26	1	3	-	-	2	7	33	130
	long-line	59	161	23	51	25	70	17	52	-	-	22	50	37	112	183	496
	other methods	59	128	1	3	3	10	25	69	48	148	42	80	2	9	180	445
	multiple	10	35	-	-	20	72	1	2	10	30	10	26	-	-	51	165
	Total	151	410	26	65	51	166	48	149	59	179	76	182	41	128	452	1 259
Other boats	trawling	2	8	-	-	-	-	-	-	-	-	-	-	-	-	2	8
	encircling	-	-	-	-	-	-	1	4	-	-	-	-	-	-	1	4
	long-line	11	32	5	8	5	10	8	24	-	-	-	-	16	130	92	204
	other methods	-	-	-	-	13	99	3	6	11	22	102	127	-	-	129	254
	multiple	-	-	-	-	-	-	-	-	1	2	-	-	-	-	1	2
	Total	13	40	5	8	18	109	12	34	12	24	102	127	63	130	225	472
Tuna traps		16	81	4	23	-	-	25	241	-	-	-	-	-	-	45	345
Total		282	1 322	35	96	69	275	89	448	248	1 762	179	291	123	350	1023	4 544

(a) number of craft (b) number of seamen

9.3 Full-time and part-time nature of fishing jobs

The discrepancy between the population census figures and the figures for the crews of engine-powered boats and between the latter and the information furnished by the harbourmasters shows the practical difficulties that arise in determining the true number of people engaged in fishing, making any more detailed breakdowns highly subjective when, for example, we need to find out how many fishermen work full-time and how many part-time.

As a general rule, the crews of trawlers in commission are considered as working full-time, whereas the crews of motor, rowing and sailing boats and those working on tuna traps are considered as full-time only in some instances.

Trawling vessels, especially those over a certain tonnage, that are equipped for several methods of fishing and that are engaged in deep-sea fishing are at sea throughout the year except when returning to port to land the catch or for repair. Motor boats, on the other hand, are often seasonal in their fishing, either because their gear is suitable for only one fishing method or because legislation restricts the use of certain methods to specific times of the year, or again because they can work only when the sea conditions are right. Crews working on such boats may have other self-employed, casual or seasonal jobs (such as signing on for journeys on merchant ships).

Part-time working is still very common among the crews of rowing and sailing boats. They usually fish at night, they are more susceptible to bad weather and, during the tourist season, there are more frequent opportunities to use the boats in different ways and other types of work are more plentiful.

If we assume that a realistic estimate of fishermen in Sicily is 33,000, 13,000 of whom work on rowing and sailing boats, 13,000 on motor boats and 7,000 on trawlers, we may hazard a guess at the breakdown as follows:

Type of craft	Total fishermen	full-time	part-time
Trawlers	7,000	6,500	700
Motorboats	13,000	9,100	3,900
Boats	13,000	5,200	7,800
Total	33,000	20,800	12,400
%	100	63	37

The rapid decline in the number of rowing and sailing boats used for fishing has considerably reduced the number of men working part-time, while the expansion in engine-powered craft has increased the number of full-time seamen.

0.4 Job organization on board

The way in which work is organized on board may differ depending on the type of boat and the fishing method employed.

On small boats with a crew of one to three men, all of whom are usually the joint owners of the boat, no differentiation is made in the tasks done. These boats fish the inshore waters and are at sea for 24 hours at most, for instance, sailing in the evening and returning next evening.

Tasks are organized on larger boats, for example on 250-400 HP trawlers sailing from Mazara to fishing grounds off Kelibia (trawling for shoal and bottom-dwelling fish) or, in the case of vessels with engines of over 400 HP, even further afield from Mazara to Lampedusa and the Tunisian and Libyan coasts right up to Benghazi.

In the former case, the journeys last six or seven days and are followed by one day's rest on shore; in the latter, they last twelve to fifteen days. The fishing period (after which the "poundage", or share of the value of the catch assigned to crew members, is worked out) is 40-50 days in both cases, followed by five days' rest on shore.

A normal crew would include the skipper, a first and second engineer, the fishing master, helmsman and cook and at least three seamen for inshore fishing and six for deep-sea fishing, totalling a minimum of 9 to 12, including the skipper.

With these larger crews, there is a certain apportionment of the tasks to be done, even though the same person may at times be both the skipper and the fishing master; in the same way, the helmsman and the cook may not spend the whole of their time on these specific tasks.

Whereas the skipper and the engineers have specific vocational skills, the fishing master who has overall responsibility for fishing operations and the helmsman, who takes over from the skipper at night, are seamen of special ability with more than ten years' experience who are capable of carrying out the tasks with which they are entrusted.

The cook is often a seaman, sometimes a young boy and occasionally a "clandestine" member of the crew such as a pensioner.(1)

The seamen do any kind of work on board: besides the actual fishing work, they grade, gut and stow the fish, pack it with ice and store it in the cold chambers and then unload it. They also do the routine work of stocking and making ready for sailing.

When the boat is out at sea, the working day is 16 to 20 hours.

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(1) *According to a survey in Mazara del Vallo, the number of Tunisians working on board may be estimated at about 500.*

10. PRODUCTIVITY OF THOSE EMPLOYED IN THE FISHING INDUSTRY

10.1 Productivity and earnings

With the very uncertain nature of the figures for the catch, in terms of both quantity and value, and for the number of people employed on fishing, it is extremely difficult to estimate productivity.

Taking ISTAT's estimate of gross marketable output in 1977, about Lit.68,000 million and dividing it by our own estimate of the number of people employed in the fishing industry (33,000), average output is approximately Lit.2 million; this figure is quite unrealistic, even allowing for a proportion of part-time workers.

In the light of a survey of those working in the industry in Mazara del Vallo, it would seem that earnings are substantially higher, even bearing in mind that they relate only to trawlers and also to what may be more profitable fishing grounds.

The value of the "poundage", or share in the value of the catch, per 40 to 50 day trip (the period used for accounting purposes), in the light of the survey findings, depends on the category of boat and the type of fishing in which each one is engaged, but it would seem that it is about a million or a million and a half lire in the case of fishing vessels engaged in deep-sea fishing (200 vessels with a total of approximately 2,500 crew members), and up to Lit.1.7 million in the case of ten or so vessels. In the case of fishing vessels engaged in inshore fishing (over 100 with about 900 men on board), the poundage may be Lit.800,000 to Lit.1,000,000 per trip.

Taking these figures as a basis, the annual earnings of a seaman on a trawler would range from 8 to 12 million lire a year, while the skipper would earn two or three times that amount.

Physical productivity can also be estimated from the survey carried out by the Centro Regionale di Ricerche Statistiche, one that we have mentioned several times. The findings for the fishing bases that were surveyed are set out in the table below.(1)

Table 23 - Productivity per gross registered tonne and per crew member in province of Trapani (1978)

Port	Catch (100 kg)	g.r.t.	crew (no. of men)	100 kg fish per gross tonne	100 kg fish per man
Castellammare del Golfo	639	77.69	96	8.22	6.66
Favignana	5 075	373.52	448	13.59	11.33
Marsala	19 640	808.22	350	24.30	56.11
Mazara del Vallo	537 494	20 643.25	1 762	26.04	305.05
Pantelleria	1 716	116.79	291	14.70	5.90
S. Vito Lo C.	557	207. 93	275	2.68	2.03
Trapani	408 045	5 108.24	1 322	79.88	308.66
Total	973 166	27 335.64	4 544	35.60	214.17

The figures on the quantity of catch per man vary enormously, from just over 200 kg to more than 30,800 kg; the average catch is 21,417 kg.

This diversity depends on various factors, such as differences in the composition of fleets, the fishing methods employed (in Favignana, 370 tonnes out of the total catch of 507.5 tonnes consist of tuna fished in a two month period, May and June), whether most crews work part-time or full-time and the fact that boats registered in one port (such as Castellammare and San Vito) land their catch at different ports (such as Trapani).

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(1) *An estimate based on the figures furnished by the Centre.*

In San Vito Lo Capo, 51 out of the 69 boats surveyed were motor boats (a very great majority 3 tonnes or less) and 18 were rowing boats. The number found in Trapani was 91 trawling vessels (46 of which were in the 35 to 100 tonne range), 152 motor boats and 29 rowing boats. In Mazara del Vallo, 175 out of the 247 boats surveyed were trawlers (62.9% with gross tonnage of 100 to 200 tonnes), 60 were motor boats and only 12 were rowing boats.

Taking the average price obtained for the fish landed as being Lit.1,500 per kg[(1)], gross productivity per man on board would be Lit.32,100,000 per year (21.4 tonnes x Lit.150,000), a figure that is higher than the estimates of individual earnings as worked out above.

Since the figures for the quantity of fish landed per gross registered tonne are less variable, an estimate of the quantity of the catch in Sicily would appear to be more realistic if it is based on an average of 3,560 kg/g.r.t. Including rowing and sailing boats, the gross registered tonnage of craft in commission in Sicily during 1977 was 73,200 tonnes. With a gross catch of 260,600 tonnes, productivity per man (33,000) would be 7,900 kg fish. This estimate seems to reflect the average situation in Sicily more closely. Productivity per man would then be Lit.11,850,000 per year.

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(1) *In 1977, the harbourmaster's department in Trapani stated that the average price fetched by the catch was Lit.1,595/kg fish, Lit.2,500/kg molluscs and Lit.8,000/kg crustaceans.*

10.2 Productivity and earnings assessed on the basis of the accounts of fishing concerns

Notwithstanding all the difficulties in obtaining facts and figures, we have managed to build up what we feel are three average/optimum balance sheets for the fishing centres taken into consideration (Mazara del Vallo and Trapani).

In all three cases, the vessels are fitted with engines with higher power than is strictly necessary for their tonnage (a tendency which has been apparent for several years now); they fish throughout the year; in cases 1 and 2, they are engaged in trawling, while in case 3 the vessel is a purse-seiner.

For the purpose of comparison with the figures given above (Table 23), figures are quoted on productivity per man and per gross registered tonne, in terms of both weight and value of the catch.

Fishing concern	1	2	3
100 kg fish per gross tonne	17.5	9.3	85.9
100 kg fish per crew member	131.2	169.0	224.0
Value of catch, Lit.'000 per g.r.t.	4,267	2,470	4,770
Value of catch, Lit.'000 per crew member	32,000	44,909	12,456

A point of interest is that trawling vessels produce considerably less in terms of weight of catch than vessels engaged in purse-seining, but considerably more in value; trawling is a method of catching more highly prized fish with a high percentage of crustaceans.

The financial results as they emerge from the balance sheets would seem to confirm - at least insofar as they refer to the fishing centres and types of fishing concern taken into consideration - the findings described in section 10.1 using an estimate based on the quantity of catch per crew member. As has been said, however, these findings are not generally applicable to all fishing centres or all fishing concerns operating in Sicily.

Other factors emerge from the balance sheets set out below: for fishing concerns engaged in trawling, the net proceeds (excluding provision for depreciation) after tax is about 75% of the value of the catch; wages account for 55% of the gross value and the owner takes about 20%. In the case of purse-seining, expenses account for the same percentage, the crew's earnings account for over 68% and the owner takes about 6% of the value of the catch.

A seaman's net income (inclusive of food on board) ranges from Lit.10,500,000 to Lit.16,500,000 if he works on a trawling vessel, but is Lit.5,000,000 to Lit.6,000,000 on a purse-seiner.

Fishing concern balance sheet

Case 1

Maritime district of Mazara del Vallo

1. Nature of fishing vessel

Gross registered tonnage	60 tonnes
Length (Overall length)	18 metres (23 metres)
Current cost if new	Lit.250,000,000
Engine	200 HP
Year of manufacture	1965
Current cost if new	Lit. 38,000,000
Current cost of radio and electrical equipment if new	Lit. 16,000,000
Current cost of fishing gear if new	Lit. 35,000,000
Total cost	Lit.339,000,000

2. Nature of fishing

Fishing method	trawling
Main fishing grounds	offshore from Tunisia (winter); fishing grounds near Pantelleria, Kuriatt, Cape Bon, island of Zembra.
Months in commission	12: 11 months fishing, 1 month maintenance.
Crew	8, plus net hands on shore
Fishing trips	35 a year lasting 8 days, followed by 2 days in port

3. Method of apportioning the value of the catch

The operating expenses deducted from the gross proceeds are: food on board, fuel and lubricants, ice, *ghiotte*, i.e. bonuses paid to the crew, fish boxes, additives for prawns, radio service, market charges, forwarding agent, fishing permits and miscellaneous items.

The net value of the catch is apportioned as follows: 57.85% to the crew (48.00% of the net value + 5.85%, i.e. 1½ share paid out by the owner, + 4.00% in respect of holidays, rest days and Christmas bonus) and the balance of 42.15% to the owner.

4. Gross saleable catch and incoming payments

	Quantity tonnes	Price Lit/kg	Value Lit.million
Fish	45	1,466	66.0
Molluscs	25	2,000	50.0
Crustaceans	35	4,000	140.0
Total	105	2,438	256.0
Fuel grant			5.0
Total earnings			261.0

5. Expenses to be deducted from total receipts

Cost of food on board	Lit. 8,150,000
Fuel and lubricants	15,076,000
Ice	1,260,000
Fish boxes, paper, twine, additives, etc.	2,660,000
Radio services for fishing and repair of electronic equipment	200,000
Forwarding agent for supplies	200,000
Market charges[1]	941,000
Fishing permits	52,000
Other expenses	700,000
Crew bonus payments	2,720,000
Total deductible expenses	Lit.31,959,000

6. Net proceeds

Value of incoming payments	Lit.261,000,000
Fishing expenses	Lit. 31,959,000
Net proceeds	Lit.239,041,000

7. Apportionment of net proceeds

Share payable to the crew (57.85%)	Lit.132,500,000
Share payable to owner (42.15%)	96,541,000

8. Expenses borne by the owner

Maintenance of boat and engine	Lit. 7,030,000
Maintenance and replacement of fishing gear	2,862,000
Provision for depreciation of boat (20 year life)	12,500,000
Provision for depreciation of engine (10 year life)	3,800,000
Provision for depreciation of other equipment	4,100,000
Insurance on vessel	800,000
Remuneration to third parties, consultants, etc.	1,000,000
Social security contributions for crew	6,000,000
Other expenses	500,000
Total expenses borne by the owner	Lit. 38,592,000
Owner's net income	Lit. 57,949,000

9. Amount received by crew

Net proceeds payable to the crew (including payments for holidays, rest days, etc.)	Lit.132,500,000
Food on board	8,150,000
Bonuses at end of trips	2,720,000
Total share to which crew is entitled	Lit.143,370,000

10. Apportionment of amount receivable among crew members

	No. of shares	Share in net proceeds Lit.	Share in other benefits Lit.	Total Lit.
Skipper	3.0	27,413,795	1,358,750	28,772,545
1st engineer	2.5	22,844,825	1,358,750	24,203,575
Fishing master	2.0	18,274,860	1,358,750	19,634,610
2nd engineer	1.5	13,706,895	1,358,750	15,065,645
Seamen	4.0	36,551,730	5,435,000	41,986,730
Net hand	1.0	9,137,930	-	9,137,930
Bookkeeper	0.5	4,586,965	-	4,568,965
Total	14.5	132,500,000	10,870,000	143,370,000

Summary

Incoming payments	Lit.261,000,000	100.0%
Outgoings		
Operating expenses (excluding food and crew bonuses but including remuneration to third parties)	22,589,000	8.6%
Cost of maintenance and replacement	9,892,000	3.8%
Provision for depreciation	20,400,000	7.9%
Insurance (boat and crew)	6,800,000	2.6%
Amount received by crew	143,370,000	54.9%
Owner's net income before tax	57,949,000	22.2%
Gross return on capital (Lit.339 million)	17.1%	

Fishing concern balance sheet

Case 2

Maritime district of Mazara del Vallo

1. Nature of fishing vessel

Gross registered tonnage	60 tonnes
Length (Overall length)	27 metres (23 metres)
Current cost if new	Lit.700,000,000
Engine	800 HP
Year of manufacture	1974
Current cost if new	Lit.130,000,000
Current cost of radio and electrical equipment if new	Lit. 30,000,000
Current cost of fishing gear if new	Lit. 80,000,000
Total cost	Lit.940,000,000

2. Nature of fishing

Fishing method	trawling
Main fishing grounds	Lampedusa, Mammellone, off the coasts of Tunisia and Libya
Months in commission	twelve: 11 months fishing and 1 month maintenance
Crew	11, plus net hands on shore
Fishing trips	31 a year lasting 8 days, followed by 3 or 4 days in port

3. Method of apportioning the value of the catch

The operating expenses deducted from the gross proceeds are: food on board, fuel and lubricants, ice, *ghiotte*, i.e. bonuses paid to the crew, fish boxes, additives for prawns, radio service, market charges, forwarding agent, fishing permits and miscellaneous items.

The net value of the catch is apportioned as follows: 57.85% to the crew (48.00% of the net value of the catch + 5.85%, i.e. a 1½ share paid out by the owner, + 4.00% in respect of holidays, rest days and Christmas bonus), the balance of 42.15% going to the owner.

4. Gross saleable catch and incoming payments

	Quantity tonnes	Price Lit/kg	Value Lit.million
Fish	60	1,500	90.0
Molluscs	50	2,000	100.0
Crustaceans	76	4,000	304.0
Total	186	2,656	494.0
Fuel grant			12.0
Total earnings			506.0

5. Expenses to be deducted from total receipts

Cost of food on board	Lit.13,623,000
Fuel and lubricants	39,309,000
Ice (the vessel has a freezer on board)	686,000
Fish boxes, paper, twine, additives, etc.	4,650,000
Radio services for fishing and repair of electronic equipment	250,000
Forwarding agent for supplies	500,000
Market charges (fish is exported direct)	-
Fishing permits	-
Other expenses	500,000
Crew bonus payments	3,720,000
Total deductible expenses	Lit.63,248,000

6. Net proceeds

Value of incoming payments	Lit.506,000,000
Fishing expenses	63,238,000
Net proceeds	Lit.442,762,000

7. Apportionment of net proceeds

Share payable to the crew (57.85%)	Lit.256,138,000
Share payable to owner (42.15%)	186,624,000

8. Expenses borne by the owner and his net income

Maintenance of boat and engine	Lit. 5,451,000
Maintenance and replacement of fishing gear	9,347,000
Provision for depreciation of boat (life 20 years)	35,000,000
Provision for depreciation of engine (life 10 years)	13,000,000
Provision for depreciation of other equipment	7,500,000
Insurance on vessel	2,000,000
Remuneration to third parties, consultants, contribution to associations, etc.	1,000,000
Social security contributions for crew	11,200,000
Other expenses	1,000,000
Total expenses borne by the owner	85,498,000
Owner's net income	101,125,000

9. Amount received by crew

Net proceeds payable to the crew (including payments for holidays, rest days, etc.)	Lit.256,138,000
Food on board	13,623,000
Bonuses at end of trips	3,720,000
Total share to which the crew is entitled	Lit.273,481,000

10. Apportionment of amount receivable among crew members

	No. of shares	Share in net proceeds Lit.	Share in other benefits Lit.	Total Lit.
Skipper	3.0	45,200,000	1,576,636	46,776,636
1st engineer	2.5	37,667,000	1,576,636	39,243,636
Fishing master	2.0	30,135,000	1,576,636	31,711,636
2nd engineer	1.5	22,600,000	1,576,636	24,176,636
Seamen (7)	7.0	105,462,000	11,036,456	116,505,456
Net hand	1.0	15,067,000	-	15,067,000
Total	17.0	256,138,000	17,343,000	273,481,000

Summary

Incoming payments	Lit.506,000,000	100.0%
Ougoings		
Operating expenses (excluding food and crew's bonuses but including remuneration to third parties)	47,895,000	9.5%
Cost of maintenance and replacement	14,798,000	2.9%
Provision for depreciation	55,500,000	11.0%
Insurance (boat and crew)	13,200,000	2.6%
Amount received by crew	273,481,000	54.0%
Owner's net income before tax	101,125,000	20.0%
Gross return on capital (Lit.940 million)	10.76%	

Fishing concern balance sheet

Case 3

Maritime district of Trapani

1. Nature of fishing vessel

Gross registered tonnage	47 tonnes
Length (Overall length)	17 metres (20 metres)
Current cost if new	Lit.250,000,000
Number of rowing boats	2
Current cost if new	Lit. 2,000,000
Boat with auxiliary engine	1
Current cost if new	Lit. 5,000,000
Engine	190 HP
Year of manufacture	1967
Current cost if new	Lit. 35,000,000
Current cost of radio and electrical equipment (two sounding sets + radio)	Lit. 16,000,000
Current cost of two power generators and lighting sets	Lit. 4,000,000
Current cost of fishing gear if new	Lit. 46,000,000
Total cost	Lit.358,000,000

2. Nature of fishing

Fishing method	purse-seining
Main fishing grounds	inshore fishing in winter, off Tunisian coastline in summer
Months in commission	twelve: 10 months fishing and 2 months maintenance
Crew	18 men
Fishing trips	90 trips lasting 24 hours + 1 day's rest (from October to March)
	20 trips lasting 6-7 days + 1 day in port (from April to September)

3. Method of apportioning the value of the catch

The operating expenses deducted from the gross proceeds are: food on board, fuel and lubricants, ice, fish boxes, radio service for fishing vessels and repair of electronic equipment, fishing permits and miscellaneous expenses.

The net value of the catch is divided into 38 shares, 9.5 shares going to the owner and 28.5 to the crew (25% and 75% respectively).

4. Gross saleable catch and incoming payments

	Quantity tonnes	Price Lit/kg	Value Lit.million
Sardine	242	300	72.6
Mackerel	110	1,000	110.0
Other fish	52	800	41.6
Total	404	555	224.2
Fuel grant			3.5
Total incomings			227.7

5. Expenses to be deducted from total receipts

Cost of food on board	Lit. 5,300,000
Fuel and lubricants	8,800,000
Ice	4,400,000
Fish boxes, etc.	6,500,000
Radio services for fishing and repair of electronic equipment	100,000
Forwarding agent for supplies	300,000
Fishing permits	52,000
Other expenses	300,000
Total deductible expenses	Lit.25,752,000

6. Net proceeds

Value of incoming payments	Lit.227,700,000
Fishing expenses	25,752,000
Net proceeds	Lit.442,762,000

7. Apportionment of net proceeds

Share payable to the crew (75%)	Lit.151,461,000
Share payable to the owner (25%)	Lit. 50,487,000

8. Expenses borne by the owner and his net income

Maintenance of boat and engine	Lit. 2,500,000
Maintenance and replacement of fishing gear	1,500,000
Provision for depreciation of boat (life 20 years)	12,850,000
Provision for depreciation of engine (life 10 years)	3,500,000
Provision for depreciation of other equipment	4,000,000
Insurance on vessel	450,000
Social security contributions for crew, payments for holidays, rest days, etc.	12,000,000
Other expenses	300,000
Total expenses borne by the owner	Lit. 37,100,000
Owner's net income	Lit. 13,387,000

9. Amount received by crew

Net proceeds payable to the crew	Lit.151,461,000
Food on board	5,300,000
Total share to which the crew is entitled	Lit.156,761,000

10. Apportionment of amount receivable among crew members

	No. of shares	Share in net proceeds Lit.	Share in other benefits Lit.	Total Lit.
Skipper	3.00	15,943,250	294,450	16,237,700
1st engineer	2.50	13,286,050	294,450	13,580,500
Fishing master	2.50	13,286,050	294,450	13,580,500
Mate	1.75	9,300,270	294,450	9,594,720
Apprentice engineer	1.25	6,643,020	294,450	6,937,470
Lampmen (2)	4.00	21,257,680	588,800	21,846,480
Seamen (11)	13.50	71,444,680	3,238,950	74,983,630
Total	28.50	151,461,000	5,300,000	156,761,000

Summary

Incoming payments	Lit.227,700,000	100.0%
Outgoings		
Operating expenses (excluding food but including other expenses)	20,752,000	9.1%
Cost of maintenance and replacement	4,000,000	1.8%
Provision for depreciation	20,350,000	8.9%
Insurance (boat and crew)	12,450,000	5.4%
Amount received by crew	156,761,000	68.8%
Owner's net income before tax	13,387,000	5.9%
Gross return on capital (Lit.358 million)	3.7%	

11. VOCATIONAL, ADMINISTRATIVE, RESEARCH AND COOPERATIVE STRUCTURES

11.1 Vocational organizations

In Sicily there are vocational institutes providing training in seamanship in Palermo, Catania, Trapani, Porto Empedocle, Mazara del Vallo, Sciacca, Riposto, Siracusa and Lampedusa (IPSIAM). Those completing the course are qualified as skippers or class 2 auxiliary engineers.

11.2 Research

The bodies concerned with research on fishing in Sicily are the fishing research section of E.S.P.I. (Sicilian industrialization board) in Messina and Palermo University's Institute of Zoology. The Consiglio Nazionale delle Ricerche (C.N.R. - national research council) has taken preliminary steps towards the establishment of a body for applied research on fishing in Mazara del Vallo.

11.3 Administration

The table that follows shows how Sicily is divided into merchant shipping territories.

Sicily is divided into eight *compartimenti marittimi*, or maritime districts, the supervisory bodies being eight *capitanerie di porto*, or harbour offices. Under these offices come the *uffici circondariali marittimi*, or district maritime offices, the *uffici marittimi locali*, or local maritime offices, and the *delegazioni di spiaggia*, or beach delegations in individual fishing centres.

S I C I L Y

Harbour Office	COASTAL JURISDICTION				Jurisdiction (for maritime purposes) within the provincial areas specified below
	District maritime office	Territorial limits of district maritime office	Local maritime office	Beach delegations	
Messina	Lipari	Aeolian islands		Filicudi e Alicudi' Salina (island) Rinella Canneto Panarea Stromboli (island)	Messina
	Milazzo	From mouth of R.Pollina to mouth of Torrente Gallo		Castel di Tusa S. Stefano di Camastra Caronia Marina S. Agata di Militello Capo di Orlando Gioiosa Marea Patti Marina Oliveri Spadafora	
		From mouth of Torrente Gallo to mouth of R.Alcantara		Torre di Faro Scaletta Zancica Nizza Sicilia S. Teresa di Riva Letoianni Giardini	
Catania	Riposto	From mouth of R.Alcantara to Acireale (excl.)			Enna Catania, excl. communes of Palagonia, Scordia, Militello in Val di Catania, Grammichele, Licodia, Eubea, Vizzini, Mineo.
		From Acireale (incl.) to mouth of R. Simeto		Pozzillo S. Maria La Scala Capo Molini Aci Castello Ognina	
Augusta		From mouth of R. Simeto to Magnisi peninsula lighthouse		Brucoli	Catania, restricted to communes of Palagonia, Scordia, Militello in Val di Catania, Grammichele, Licodia, Eubea, Vizzini, Mineo. Siracusa, restricted to communes of Augusta, Buccheri, Ferla, Francoforte, Carlentini, Lentini, Melilli, Sortino.

Harbour Office	COASTAL JURISDICTION				Jurisdiction (for maritime purposes) within the provincial areas specified below
	District maritime office	Territorial limits of district maritime office	Local maritime office	Beach delegations	
Siracusa		From Magnisi peninsula lighthouse to mouth of R. Dirillo	Pozzallo	Avola Marzamemi (Pechino) Portopalo Donnalucata (Scicli) Marina di Ragusa Scoglitti (Vittoria)	Siracusa, excl. communes of: Augusta, Buccheri, Ferla, Francoforte, Carlentini, Lentini, Melilli, Sortino
	Licata	From mouth of Palma di Montechiaro (incl.)	Gela	Marina di Palma di Montechiaro	Agrigento Caltanisetta
Porto Empedocle		From Palma di Montechiaro (excl.) to mouth of R. Belice, incl. islands of Lampedusa and Linosa	Sciacca Lampedusa (isola)	Siculiana Marina Porto Palo di Menfi Linosa (island)	
Mazara del Vallo		From mouth of R. Belice to Punta Torrazza		Marinella	Trapani
Trapani	Marsala	From Punta Torrazza to mouth of Torrente Birgi			
		From mouth of Torr. Birgi to border of commune of Balestrate (excl.), incl. Aegadian islands and island of Pantelleria	Pantelleria	Favignana (island) Marettimo (island) Levanzo (island) Bonagia S. Vito Lo Capo Castellammare del Golfo	
Palermo		From Balestrate (incl.) to Sant'Elia (excl.)		Balestrate Terrasini Isola delle Femine Mondello Ustica (island)	Palermo
	Termini Imerese	From Sant'Elia (incl.) to mouth of R. Pollina		Porticello (Solanto) Trabia Cefalù	

11.4 Cooperative structures

In the fishing industry, there are a number of group organizations in the form of cooperatives with limited liability, associations, *de facto* partnerships, etc.

We shall not dwell on the associations of joint owners of fishing boats, known as *caratisti*: individuals, usually fishermen themselves, who have shares (*carati*) in a boat. Nor shall we discuss the cooperatives - usually of a family nature - which are formed to qualify for the facilities granted towards the building of boats but which cease to perform any function once the grants have been obtained.

The most common joint bodies are fishermen's or owners' cooperatives. These cooperatives, or at least the active cooperatives, perform a very wide range of tasks. Some are solely mutual aid societies, while others play a financial role in the catching of fish and its marketing, transportation and processing.

Fishermen's cooperatives rarely own their own boats but they may have set up their own collection centres and, in some cases, have a few refrigerated vehicles of their own.

The partners usually give the cooperative 2% of the value of their catch in return for the services rendered.

A cooperative will sometimes own cold storage or perhaps an ice factory to supply its members' boats with ice; it may also operate a fuel distribution point. Some cooperatives have successfully applied for the right to manage fish markets (Marsala, Gela, Sciacca).

The best equipped cooperative in Sicily is a limited liability cooperative partnership in Trapani, Europesca, whose membership includes the owners of all 36 purse-seining fishing vessels in Trapani. It

has obtained official recognition from the organization of producers in the maritime fishing industry and since March 1977 it has also been withdrawing fish from the market as envisaged by EEC regulation 100/76.(1)

The cooperative has a very large site on which the following plant has been installed: a deep-freezing tunnel capable of freezing 1,500 boxes of fish per day at a temperature of - 40°C; two cold storage chambers holding 60,000 boxes of fish; an ice factory and cold storage room; a very big fish processing workshop; a plant manufacturing fish boxes; and office space.

Another fairly enterprising cooperative is the Cooperativa Pescatori di Sciacca with about 1,800 members. It is split into two sections: fishermen and owners. It runs the local fish market and operates a fuel distribution point.

In Balestrate there is a cooperative for the processing of fatty fish, producing salted sardines and anchovies and anchovy fillets and mackerel in oil.

In Mazara del Vallo there is a road hauliers' cooperative.

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(1) *In 1977, EUROPESCA withdrew 1,147,896 kg sardines from the market with compensation of Lit.149,261,300; in 1978 it withdrew 948,798 kg with Lit.132,339,760 compensation. In 1977, 755,700 kg was disposed of to a fish meal factory and the remainder was destroyed.*

12. NATIONAL AND REGIONAL POLICIES

12.1 National Policies

Under the intervention policy that has prevailed over the past thirty years, little attention has been paid to the fishing industry on either regional or national level. The legislative measures designed to provide incentives for structural improvements in the sector date back to 1957. They are based on Law 634, 29 July 1957, which empowered the Cassa per il Mezzogiorno to make grants of not more than 40% towards the cost of procuring and improving boats and their equipment, building, purchasing and extending structures and equipment for the storage and processing of fish products and by-products and for ice production, repairing and making nets and other tackle and transporting fish products and by-products. These grants may be added to the assistance with the payment of interest on mortgages on fishing vessels for which provision is made in Law 16, 10 January 1952, which provided for a 3% grant towards interest.

The beneficiaries of the grant proved to be fishermen's cooperatives and consortia thereof, individual fishermen using their own boats to fish and undertakings not organized on a cooperative basis.

During the twenty years of its life, the law has stimulated investment totalling Lit.235,000 million, almost Lit.90,000 million of which was related to projects in Sicily.

As of 31 December 1977, the position was as shown in Table 30 below.

Table 30 - Cost of structures and equipment eligible for grants, up to 31 December 1977

Category	Amount (Lit.m.) Italy	%	Amount (Lit.m.) Sicily	%	Sicily as a % of Italy
New craft	150 733	64.1	56 000	62.3	36,5
Improvements to craft	4 125	1.8	1 740	1,9	42.1
Engines	27,029	11.5	8 483	9,4	31.4
Fishing and other gear	45 952	19.5	21 265	23,7	46,3
Refrigeration equipment on board	2 452	1,0	964	1,1	39.3
Offshore installations	424	0.2	27	..	6.4
Shore installations	3 249	1.4	1 180	1.3	36.3
Transportation	956	0.4	155	0.2	16,2
Tax, packing, transport	306	0.1	64	0.1	20,9
Total	235 226	100.0	89 878	100.0	38,2

As may be noted, Sicily accounts for a substantial percentage of investment on structures and equipment in Italy as a whole; it should be pointed out, however, that the total amount is still on the low side considering the lengthy period over which the aid has been given.

Larger amounts have been allocated to the replacement and modernization of the fishing fleet: the cost of new craft, engines and fishing gear amounts to 95.1% of national investment, 95.4% of investment in Sicily.

The number of beneficiaries of grants is 17,783 at national level, 6,214 in Sicily. Total grants made by the Cassa per il Mezzogiorno are Lit.69,150 million, Lit.27,239 million of which went to Sicily.

Most beneficiaries were individual fishermen, followed very far behind by *de facto* partnerships; only a few cooperatives benefited by the grants, to which reference was originally made in article 5 of Law 634.

As of 31 December 1977, the position regarding grants according to the legal status of the beneficiaries was as follows.

Table 31 - Beneficiaries - breakdown according to legal status - 1977

Legal status	Italy				Sicily			
	No.	%	Cost of structures (Lit. million)	%	No.	%	Cost of structures (Lit. million)	%
Fishermen	13 792	77.6	146 459	62.3	4,733	76.1	61 519	68.4
De facto partnerships	3 895	21.9	63 708	27.1	1,459	23.5	23 256	25.9
Cooperatives	62	0.3	4 575	1.9	18	0.3	2 586	2.9
Established partnerships	34	0.2	20 484	8.7	4	0.1	2 517	2.8
Total	17 783	100.0	235 226	100.0	6.214	100.0	89 878	100.0

Over the past twenty year period, 48 grants were made towards deep-sea fishing, the total eligible for the grants being Lit.38,001 million expenditure, with grants of Lit.5,928 million being made. In Sicily, there were eight grants, eligible expenditure amounting to Lit.6,868 million and actual grants of Lit.1,010 million.

12.2 Regional Policies

In Sicily, only recently has a regional policy for measures to assist the fishing sector been evolved. The policy was set out in Law 5, 13 May 1975, "*Provvedimenti per la pesca*" (fishing measures), and Law 1, 4 January 1980, "*Provvedimenti per la razionalizzazione della pesca marittima in Sicilia*" (measures to rationalize saltwater fishing in Sicily), which is currently being challenged by the State Commissioner's Department. This law embodies the 1975 regional law and, while making a series of amendments, it also supplements and genuinely clarifies the earlier law.

It is not thought that substantial changes will be made to the content of the 1980 Law if it is upheld against the challenge, but we shall summarize only two of the measures it contains.

The beneficiaries of the facilities enacted in the 1975 law are fishermen and owners, either individually or in association. The facilities consist of low interest loans and non-repayable grants.

In essence, the facilities and obligations specified in the law were as follows:

a. low interest loans and non-repayable grants for:

(i) the building of 30 to 200 tonne trawler vessels, engine power not less than 80 HP, against an undertaking to scrap one or more craft whose gross tonnage totals not less than 80% of the tonnage of the vessel to be constructed;

(ii) building of motorboats for fishing with gross tonnage of not more than 15 tonnes, against an undertaking to scrap craft of an equivalent tonnage and not to use the motorboats for trawling on completion;

(iii) increasing the size of, converting, repairing and improving existing trawlers and motor boats and replacing engines in fishing craft already in commission.

Loans and grants may not exceed 80% of the actual cost.

b. The maximum rate for non-repayable grants is 25% in the case of trawlers, 30% in the case of motor boats. The rate of interest on loans payable by the borrower is 3%, and the term of the loan is up to 15 years.

Since one of the purposes of the law is to provide incentives for cooperation, additional facilities are offered to cooperatives. Newly formed cooperatives all of whose members are fishermen do not have to give an undertaking to scrap old boats. A concession granted to all cooperatives is that the ceiling for loans and grants is raised to 100% of expenditure incurred, while the ceiling for the non-repayable grant is raised to 45% for fishing vessels, 50% for motorboats.

c. Non-repayable grants of Lit.100,000 per gross registered tonne for the scrapping of vessels of over 30 tonnes, with the grant being increased to Lit.120,000 if the vessel is scrapped and not replaced on winding up a fishing concern.

d. Low-interest loans and non-repayable grants for:

(i) the purchase of nets and for the purchase and installation on board of tackle and instruments designed in the light of the latest technology, the maximum grant being 40%;

(ii) the acquisition of plant and equipment for aquaculture, mollusc farming or saltwater farming in general, the maximum grant available being at the rate of 30%. Here again, the interest on loans payable by the beneficiary is 3%.

e. With sole reference to cooperatives, associations and consortia of fishermen and owners, low interest loans and non-repayable grants are available for subsidiary equipment and structures for fishing and the processing and marketing of fish, such as refrigeration

plant, non-production premises for communal use, storage depots, collection and sales points, retailing fittings, container production machinery and insulated vehicles. The grant is 20% of expenditure incurred and all lending bears interest of 3% payable by the borrower. For cooperatives and consortia of cooperatives, a renewable fund has been created, to be administered by I.R.C.A.C., for the granting of subsidized interest credit.

A subsidiary guarantee fund has been created, to be administered by I.R.F.I.S. (regional institute for the financing of industry in Sicily), as cover for the risks associated with the funding operations created by the law in question.

To increase the efficiency of the marketing of fish products arriving at the market, the law also provides for the funding of fish market building or extension projects, the modernization or purchase of fish storage and processing plant and for auction equipment and devices, conveyor belts and mechanical equipment.

The law also deals with the protection of biological resources and with marine biology research applied to fishing, providing for funds for multiannual research and development programmes.

Finally, it covers the question of sickness and accident insurance for fishermen who are not members of the Cassa Marittima health scheme in Southern Italy.

The following financial resources have been earmarked by the law to the fishing industry:

a. Lit.500 million in 1974 and 1976 - grants towards the payment of interest on loans to individual owners and fishermen;

b. Lit.500 million per year from 1974 on - grants towards the payment of interest on loans to cooperatives and consortia;

c. Lit.2,500 million in 1974-1976 - non-repayable grants;

d. Lit.2,000 million in 1974-1976 - I.R.C.A.C. renewable fund;

e. Lit.300 million - Region of Sicily's contribution to the I.R.F.I.S. guarantee fund;

f. Lit.4,000 million in 1974 - funding of market structures and facilities;

g. Lit.300 million in 1975 and 1976 - funding of research;

h. Lit.2,000 million in 1975 and 1976 - sickness and accident insurance.

Under the policy of promoting cooperation in the Region of Sicily, Law 34, 10 August 1978, entitled "*Interventi straordinari per il sostegno e lo sviluppo dell'economia e per il potenziamento delle strutture civili*" (extraordinary measures to support and promote the economy and to reinforce civil structures), allocates further funds for cooperatives only, as a follow-up to the non-repayable subsidies specified by Law 5, 13 May 1975; it assigned Lit.4,000 million for 1978 and increased the I.R.C.A.C. renewable fund by Lit.2,000 million for 1978.

The 1978 law also provided for measures based on a special plan for port facilities in category II, class 2, 3 and 4 ports, thus launching a policy of implementing planned measures in the fishing industry. The measures in question relate to the creation of maritime structures which are too urgently needed to be deferred and to completion projects and non-routine maintenance, to include minor equipment connected with commercial activities.

The amounts earmarked for port structures amounted to Lit.14,500 million for 1978 and 1979.

The law on urgent measures to rationalize saltwater fishing in Sicily has already been published in the Sicilian Region's official gazette[1] despite the fact that it has been challenged. Its aim is to reformulate and define fishing policy in Sicily and to plan for measures in the three year period 1980-1982.

The measure authorizes total expenditure of Lit.74,350 million, of which Lit.56,350 million would be paid out during the three year period. The funds would go towards upgrading the fishing fleet and installations serving the fishing industry, encouraging the winding up of fishing concerns and the purchase of fishing gear, granting subsidized interest credit for fishing activities and promoting scientific research. The law also covers the membership and duties of the regional fishing council, the formation of fishing partnerships, the processing, storage and marketing of fish products, fish farming measures, fixed tuna traps and the fish processing industry. It entrusts the member of the Regional Council responsible for cooperation, trade, crafts and fishing with the task of taking steps to establish biological protection areas, protecting fish life and increasing fish stocks (by active repopulation).

The measures to upgrade the fishing fleet include the making of non-repayable grants and low interest loans (at a rate that is one third of the official discount rate) to finance up to 80% of the cost of the following (100% in the case of cooperatives):

a) 30 to 200 tonne fishing vessels with engine power of over 80 HP, designed mainly for fishing with gear that does not drag the sea bed; a condition of the finance is that fishing craft whose tonnage is not less than 80% of the tonnage of the vessels being built must be scrapped (although this condition does not apply to those who have lost a boat or to cooperatives consisting solely of fishermen who do not own boats of their own).

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(1) *Gazzetta Ufficiale della Regione Siciliana no. 2, 12.1.1980.*

b) motor boats with gross registered tonnage of up to 15 tonnes, on the conditions that they will not be used for trawling and that boats at least equivalent to 60% of their tonnage will be scrapped (the same exceptions being made as those described in a) above).

c) increasing the size, conversion, repair, maintenance, storage and improvement of fishing boats and replacing engines in existing fishing boats.

d) acquiring craft already in commission and registered in Sicilian maritime districts for newly formed cooperatives, all of whose members are fishermen not owning their own boats.

This law makes a preliminary choice of the type of craft which is to be encouraged until such time as more objective information can be obtained as knowledge of the fishing sector is extended.

It should be pointed out that there is a discrepancy between the choices made by Regulation 1852/78 and those in the regional law.

The measures in favour of subsidiary fishing installations include refrigeration units to store and deep-freeze fish products, insulated, refrigerated or refrigerating vehicles, communal premises, storage depots, collection centres, wholesaling and retailing centres and their fittings and refrigerated counters, and machinery for the production of fish product containers.

The facilities, consisting of grants of up to 40% of expenditure and low interest loans of up to 60%, are available only to cooperatives, associations and consortia of fishermen and owners.

The grants to encourage fishing concerns to cease operations, with the scrapping of boats, are commensurate with tonnage (Lit.300,000 per gross registered tonne) and, to a lesser extent, are also given when scrapping is followed by the building of new boats (Lit.100,000 per tonne up to 20 tonnes, Lit.70,000 per tonne in the case of vessels over 30 tonnes).

Grants of up to 40% of expenditure and low interest loans are also given for the purchase of fishing gear, nets and refrigerated vehicles to individual or affiliated fishermen and owners. This measure does not apply to craft of up to 80 tonnes fitted out for a method of fishing that involves dragging the sea bed.

The law also states that a grant will be made towards the payment of interest on working loans (with the borrower paying 6%). If the guarantee fund is inadequate, it will supplement the I.R.C.A.C. renewable fund and the regional guarantee.

The member of the Regional Council with special responsibility for cooperation, trade, crafts and fishing is authorized to fund applied research and experimental programmes, one of the ways being to reach agreements with the National Research Council, E.S.P.I. (the board promoting industrialization in Sicily), university institutes and specialist centres and bodies. Five two-year scholarships are also established, based on conventions to be agreed with the National Research Council.

The regional fishing council decides on the subjects for research programmes, proposes ways in which those programmes should be funded and takes note of the findings. It has an advisory function in that it expresses its views on the application of the law or other points as requested by individual members of the Regional Council. It may also propose legislative and administrative measures relating to research in the sector.

The law authorizes E.S.P.I. to form companies in which individuals are involved and companies in which the State has a holding, whose objects include the production, processing, storage and marketing of fish products.

Non-repayable grants of up to 30% of expenditure (40% in the case of fishermen's cooperatives) and subsidized interest loans of up to 40% may be given to projects for the expansion and completion of plant and equipment for rearing fish, crustaceans and molluscs in salt or brackish water.

These facilities may not be accumulated with the benefits provided by State or EEC measures. Here again, there is a discrepancy by comparison with Regulation 1852/78, which provides for a grant of up to 50% of expenditure in the South of Italy, provided that the Member State contributes at least 5% and the beneficiary at least 25%.

In the case of fixed tuna traps, a grant of up to 30% may be made towards the cost and maintenance of boats serving the traps, and towards fishing gear and nets. Working capital credit may also be provided at a subsidized interest rate.

The regional authority may also bear 50% of the social security and insurance costs relating to personnel employed on seasonal work from April to July.

The law also provides for grants towards the payment of interest on loans associated with installations for the processing and storage of catch; here again, the grants may not be accumulated with EEC or State aid or with the refinancing aid available under article 17 of Regional Law 5, 13 March 1975, on fish markets.

As part of the efforts to preserve fish stocks, the law appoints the member of the Regional Council with responsibility for cooperation, trade, crafts and fishing to adopt measures associated with the biological protection areas described in article 98, Presidential Regulation 1639, 2 October 1968; he also determines the periods (of not more than two months a year) and the areas in which trawling is to be forbidden or restricted and decides on active fish restocking measures, for which special agreements will be reached with the local bodies concerned.

Finally, underwater fishing is forbidden except for the type of fishing done with surface breathing apparatus.

On the whole this law is commendable, but it must be recognized that the lack of detailed information, especially on potential resources, makes it impossible to achieve the comprehensive and structured action that is desirable.

PART II

PROBLEMS IN THE FISHING INDUSTRY

1. STATISTICS ON FISHING

It is well known that fishing statistics may be used for econometric purposes, for formulating socio-economic development policies and for assessing the degree to which fish stocks are being exploited (and, when combined with biological information and knowledge of population trends, for achieving more rational management of resources).

Figures on catches together with the figures (or indices) for the fishing effort that has been deployed to achieve those catches, correlated to produce a set of ratios over a period of time, may be used (through simple mathematical models) to furnish valuable information on a level at which resources are being exploited.

Taking this information as our starting point, we can plan the statutory, technical and financial measures most likely to bring about the rational use of the stocks being fished.

To ensure that this working information is valid, steps must first be taken to organize the fishing industry in such a way as to guarantee that the figures are reliable, at least for the purpose of statistical information.

If the statistics are reliable, we shall have up-to-date information on different aspects of the industry and the way in which it is structured (the quantity of fish produced, the value of the catch, the structure and nature of the fishing fleet, the number and nature of those employed on the fleet, etc.), and we shall also be able to forecast developments and formulate hypotheses on the management of resources which would otherwise be impossible or hazardous, as has unfortunately been the case in the past.

One of the first steps taken by countries with a more progressive fishing industry has been to establish a statistical system capable of producing reliable facts and figures, since they have been aware that statistics are the essential prerequisite for any policy - of support, development, the management of resources, etc. - in this sector.

An efficient and standardized statistical system will help us to formulate policies that are coordinated with the policies of other countries exploiting common fishing stocks.

Standardized statistical methods that can be coordinated with those of other countries may be used to produce data lending themselves to corroboration, facilitating the work of international committees and *ad hoc* working groups. The need has become all the more pressing because of international regulations governing the exploitation and management of shared resources (new measures as part of the Law of the Sea, economic zone, etc.).

The body responsible for fishing statistics in Italy is the *Istituto Centrale di statistica*, ISTAT, which serves as a central point for processing the figures received within the system. The data-gathering bodies (in other words, the peripheral sensors) are the wholesale fish markets,which record the quantity of fish landed and the quantity sold through the markets.

The harbour offices also compile data: acting on their own account or through their local sections, they make a check on the figures recorded and supplement the statistics provided by the markets by estimating the quantity of fish landed and marketed through channels other than the fish markets.

The harbour offices not only compile data on catches but also maintain statistical records of the fishing fleet (gross registered tonnage, engine power, breakdown based on fishing methods used, etc.) and its crews.

These data are forwarded to ISTAT and to the Ministry for Merchant Shipping, which used to edit and publish a memorandum on fishing statistics of its own.

On the subject of catches landed, Italian fishing statistics have certain shortcomings and gaps, and in many cases are unreliable. Unfortunately, the rate of reliability of statistics is constant neither in time nor in space. Furthermore, there is no information on the location of fishing by fleets or on the intensity of fishing in individual areas with a breakdown by fishing method and the catches achieved by those methods.

Back in 1958, a special ISTAT committee planned a "fishing journal" that would furnish information on fishing areas, fishing efforts, the resulting catches and their location. That journal, unfortunately, stayed on the drawing board and never came into being.

It will readily be appreciated how difficult it is for a biologist specializing in fishing matters to estimate resources. How much more arduous is the task and how much less reliable the findings as one progresses from estimates of macrophenomena (whole seas, fleets and overall fishing effort, total catches landed along a given coast-line, for instance) to smaller areas of sea which, for instance, may be fished by fleets from other areas (so that the fishing effort is over-estimated) or may be correlated with landing points where the issue may be confused by the fact that fish is brought in from other zones.

The factors that determine the reliability of our fishing statistics are many and diverse. Some are difficulties of a practical nature that cannot be avoided: the variety of marine environments in the Mediterranean and the wide range of species being fished; and the fragmentation of landing points and the quantities of catch landed by motorboats amd small fishing vessels.

Other points should be made: not every landing centre has its own fish market or central statistics-recording point. Products fished in large quantities (fatty fish, molluscs, etc.) do not go through the fish markets (if they did, the markets would become clogged and there would be a bottleneck in the buying and selling that take place there). Law 125, 25 March 1959 (known as the "market liberalization" law), states that fish may or may not be channelled through the markets, at the producers' discretion, and the introduction of new tax laws is no incentive to the producers to sell their catch on the market.

In addition to all these factors, the statistics are made less reliable for other reasons, further complicating matters.

The harbour offices' estimates of landings that do not go through the markets are subjective. On certain markets, the composition of the consignments being sold, in terms of species, is not recorded in the contract note. Further confusion is caused by the different local names for the same species of fish, leading to mistakes in the records.

An aggravating factor is that personnel employed on keeping records are not very well qualified to do so. They view the work of compiling figures as only secondary to their other duties and no special allowance is paid to them for so doing. All this gives some idea of the shortcomings from which our statistical system suffers.

It has become necessary to reform the statistical system in Italy.

Working along the same lines as have already been adopted in the sectors of livestock farming, agriculture and trade, we must change from a statistical system based on census (which has the inherent shortcomings described above) to one that is based on sampling.

The National Research Council's fishing technology laboratory (in Ancona) is conducting a preliminary "frame survey" whose aim is to sample the "statistical universe" and establish the necessary sampling stratification.

This survey, covering a period of years, has been funded by the Ministry for the Merchant Navy in pursuance of Law 588.

As far as this report is concerned, the statistical data should be viewed with caution and circumspection. They should be seen not so much as absolute values but for the significance and the trends which they express.

With this in mind, through a comparison and correlation of the data with other analytical findings (evaluation of resources by the *ad hoc* working group within F.A.O.'s general committee on maritime fishing, special surveys by research bodies on specific stocks in given areas, etc.) it has been possible to confirm and corroborate the trends and significance expressed by these data.

For example, the curves for catches per unit of effort (C.P.U.E.) for demersal fish stocks in the regions covered by this report show trends analogous to those found in the course of other surveys, both more general (international analyses of demersal fish stocks in the Tyrrhenian and the Sicilian Channel) and more specific and restricted to small areas, as has been stated.

Nonetheless, it is justifiable to express very great reservations regarding the absolute values and quantities shown by those data.

The trends and significance of the overall regional data may well be confuted by the findings of more general analyses (surveys of macrophenomena), but on the other hand they are rarely supported or confuted by local data (from individual harbour offices or maritime districts) within the regions. The latter data are often incomplete, their subjectivity even more marked. The objective and subjective factors that affect the reliability or unreliability of the data within the whole system, as described above, have an even greater bearing, because they affect statistical microphenomena to a more marked degree than the overall picture.

It is for these reasons that even though local data have been compiled they have been disregarded in this report, except when quoting certain specific facts and figures or when discussing certain specific categories, provided that they are statistically confirmed by a reliable alternative source.

2. THE RESOURCES

2.1 Resources based on individual fishing areas

The lack of a detailed breakdown of statistics makes it impossible to analyse resources according to fishing area. Furthermore, as has been pointed out several times, the catch figures set out in Appendix 1 and Graphs 3, 4, 5, 6 and 7, which refer to the maritime district as a whole, undoubtedly contain errors that make it inadvisable to break them down in further detail in an attempt to evaluate the resources.

Subject to all the reservations already expressed, however, to obtain some guidance as to the situation, an attempt has been made to analyse the official data on the ten year period from 1968 to 1977, on the (unconfirmed) assumption that the validity of the figures for catches is weakened by systematic errors proportional to those figures.

Yields per given area unit have been worked out on the basis of the sea bed area that could in theory be used, specifically by calculating the ratio between the quantities of demersal and benthonektonic species caught annually and the areas of sea that can be trawled around the island, estimated as 53,000 square miles.

A similar calculation has been made of demersal fish only (i.e. excluding molluscs and crustaceans), and the two sets of figures are reflected in Table 32 and Graph 8.

Looking at the figures, we find that there was a preliminary three year period of stability in the yield of dermersal fish, molluscs and crustaceans, after which the yield steadily increased to a peak index of 178 (100 in 1968) in 1975. This was followed by a decline to 159 in 1977.

Looking at the yield of fish alone, we find that the trends are very similar, the figures rising from 1971 to a peak in 1976, when the index reached 169. In 1977, productivity fell off somewhat, with the index standing at 145.

Table 32 - Yields per unit area

	Landings, in tonnes		tonnes per square mile	
	Demersal and benthonektonic species	including: tonnage of demersal species	Demersal and benthonektonic species	including: tonnage of demersal species
1968	31 437	22 872	593	432
1969	30 487	21 853	575	412
1970	30 960	22 449	584	424
1971	34 039	25 147	642	474
1972	38 388	28 527	724	538
1973	39 806	28 232	751	533
1974	41 986	29 289	792	553
1975	55 955	38 013	1 055	717
1976	55 313	38 696	1 043	730
1977	50 045	33 188	944	626

The conclusion may be drawn that the increase in yields over the period in question was due to the larger proportion of molluscs and crustaceans in comparison with fish.

It should be pointed out that a wide range of factors undoubtedly influenced these trends: the greater speed of fishing craft, for instance, improvements in trawling gear, the discovery of new fish shoals in the Sicilian Channel and offshore from the Trapani coastline and - a decisive factor - the widespread use of increasingly sophisticated echo sounders and the fact that trawling vessels can go further and further afield (over the past few years to the Gulf of Sirte and even close to the Egyptian coast).

In an attempt to evaluate resources, an estimate has been made of the fishing effort deployed in the light of available data. The quantity of catch in tonnes (Appendix 1) has been expressed as a ratio by comparison with the total power of the fishing fleet employed (Appendix 3) and also by comparison with its gross registered tonnage. The findings are set out in Table 33 and Graph 9.

Table 33 - Quantity of catch per HP and g.r.t.

Year	Tonnage of catch per HP	Tonnage of catch per g.r.t.
1968	0,267	0,997
1969	0,240	0,884
1970	0,240	0,900
1971	0,231	0,880
1972	0,240	0,929
1973	0,232	0,918
1974	0,240	0,964
1975	0,275	1,120
1976	0,269	1,108
1977	0,230	0,966

The figures show that the catch per unit of effort (CPUE) fluctuated throughout the decade between 0.230 and 0.275 tonne/HP and between 0.880 and 1.120 tonne/g.r.t.

Trends in the two sets of figures are reasonably similar, although over the past few years the gross tonnage ratio has tended to be slightly higher due to the fact that tonnage has been increasing less rapidly than the power of fishing vessels.

The fall in 1977, especially if it is confirmed in subsequent years, might well point to a decline in resources, probably due to the gradual impoverishment of some parts of our sea. It should be pointed

out, however, that the stock of pelagic fish (fatty fish) influences these figures; it is well known that this stock fluctuates considerably from one year to the next. Experience has shown that it has not been adequately exploited.

It could be remarked that it is in fact the years in which the ratios are at their lowest (1971 and 1977) that the lowest catches of fatty fish are reported.

In conclusion, based on the official figures for catches of demersal and benthonektonic species during the ten years under review, productivity per square mile was about 0.770 tonne; the yield of demersal fish alone was about 0.544 tonne. These figures should be almost doubled if we assume that the true quantity of fish caught in Sicily was about twice the quantity shown in the official statistics.

Once again on the basis of our own calculations, it is difficult to express an opinion on existing resources.

After a decline between 1968 and 1969, yields by comparison with fishing effort over the past decade fluctuated until 1974, when they rose sharply. This trend fell off in 1976 and in 1977 the level, in terms of catch per HP, was at its lowest in the whole period.

Fluctuations in fact were within a fairly small margin by comparison with the average over the ten year period: within a range of + 11.6% and - 6.7% in the case of catch per power, and within a range of 15.9% and - 9.0% in the case of tonnage, although no clear-cut trend has emerged.

Here again, the official statistics on landings are not reliable enough to express firm views.

2.2 Resources based on fishing methods

In contrast with fatty fish (anchovy, sardine, mackerel and tuna), the stock of the main demersal and benthonektonic species is characterized by far greater population stability and and greater consistency in repopulating from immature fish.

These essential features make any study of catches of demersal species particularly significant when attempting to evaludate the level of exploitation of fishing grounds. Other factors to be borne in mind are the higher prices that can be obtained for most bottom species and that some of the leading Sicilian fisheries specialize in trawling, especially those in Western and Southern Sicily.

CPUE trends for demersal species have been analysed by working out the ratio between the quantities of catch and the total tonnage of the fleet used for trawling. Due to the absence of data, it has been impossible to use engine power as a parameter for fishing effort.

Table 34 and graphs 10 and 11 set out the ratios between the quantities of demersal species (including fish, molluscs and crustaceans) and the quantities of demersal fish only caught in a year on the one hand and, on the other, gross registered tonnage of boats fitted out for trawling.

Table 34 - Quantities of demersal species caught per g.r.t. of fishing fleet equipped for trawling

	g.r.t. fitted out for trawling	tonnage of demersal and benthonektonic species caught per g.r.t.	tonnage of demersal fish caught per g.r.t
1968	23 473	1,339	0.974
1969	26 640	1.144	0.820
1970	27 379	1.131	0.820
1971	28 602	1.190	0.879
1972	31 132	1.233	0.916
1973	33 246	1.197	0.849
1974	35 360	1.187	0.828
1975	37 497	1.473	1,014
1976	38 154	1.450	1,014
1977	39 125	1,279	0.848

Except in the first and last years of the period, yields of both categories - all demersal species, and fish only - tended to increase. Here again, the maximum and minimum variations from the average yields over the ten year period (1.262 and 0.806 tonnes/g.r.t. in the two categories) come within a range of + 16.7% and - 10.4% in the case of all demersal species, + 13.2% and - 8.5% in the case of fish only.

3. PRODUCTION

3.1 Quantity and composition of catch - breakdown by maritime district

The quantity and composition of catches in the eight maritime districts into which Sicily is divided vary considerably depending on a whole range of factors, including the size of the continental shelf and the areas suitable for trawling, the productivity of fishing grounds, the type and composition of the fleet fitted out for fishing, the types of fishing practised and the level of skills.

The districts that lead in terms of quantity and to an extent the quality of catch are in Eastern and Southern Sicily. In Trapani, Mazara del Vallo and Porto Empedocle in particular, landings have been estimated at about 80% of the fish caught in Sicily as a whole.

The data for 1977, derived from the reports from harbour offices except those in the district of Catania (which we have estimated ourselves), are set out in Appendix 10. Table 35 gives a percentage breakdown.

Table 35 - Composition of catch according to maritime districts, 1977

Maritime district	Tuna	Anchovy Sardine Mackerel	Other fish	Total fish	Mol-luscs	Crust-aceans	TOTAL
MESSINA	3.6	25.4	55.1	86.1	11.6	2.3	100.0
PALERMO	0.9	44.8	30.0	75.7	20.6	3.7	100.0
TRAPANI	4.8	47.4	35.9	88.1	9.0	2.9	100.0
MAZARA V.	-	1.9	61.6	63.5	23.0	13.5	100.0
P. EMPEDOCLE	0.1	37.3	38.0	75.4	12.9	11.7	100.0
SIRACUSA	11.5	29.5	42.6	83.6	10.6	5.8	100.0
AUGUSTA	2.5	24.3	61.0	87.8	7.3	4.9	100.0
CATANIA (1)	3.7	22.1	55.1	80.9	18.4	0.7	100.0
TOTAL'	1.7	20.1	50.9	72.7	17.9	9.4	100.0

(1) our own estimate

Of interest is the differing proportions of the classes of fish in individual districts. Tuna fishing is still fairly substantial in the maritime districts of Siracusa, Messina and Trapani, whereas the "fatty fish" group accounts for a large percentage of the catch in Trapani and Palermo in terms of quantities, and is also important in the district of Porto Empedocle.

The breakdown also shows that the district of Mazara del Vallo produces the highest quality of catches, both because a large proportion is in the form of crustaceans and molluscs and also because it produces almost no "fatty fish" in the fish categories.

High percentages of crustaceans are also to be found in the district of Porto Empedocle, and molluscs in Palermo and Catania.

Referring to the absolute figures set out in Appendix 10 which, as we have said several times, are known to have been under-estimated, we find that about 70% of the crustaceans caught in Sicily come from the district of Mazara del Vallo and 65% of the fatty fish from Trapani and Porto Empedocle. Trapani also accounts for about 50% of the tuna catch.

3.2 Structure of fishing units

As we have already shown, production units in Sicily are organized along very simple lines, with very few fishing concerns having more than one boat.

One result is that in practice the entrepreneur will often be both the owner and the skipper of the fishing boat.

Partnerships of joint owners of a boat usually include the crew as well so that, here again, no problems arise.

Working relationships in which the crew is entitled to a share in the proceeds of an undertaking are governed by collective labour agreements. Over a period of time, the negotiators of those agreements have made certain improvements and obtained certain guarantees for the workers (holidays, days of rest, minimum guaranteed earnings, regulations governing work on shore, etc.).

Working conditions at sea are still extremely tough because the working day is very long and because of the conditions under which the work is done.

Although earnings as shown by the balance sheets could be considered as reasonable, even good, on an annual basis, the long hours worked for those earnings should also be borne in mind.

It is still difficult for the crew to monitor actual earnings of a fishing concern because of the selling methods used (with the owner dealing direct with the dealer outside the market) and because the balance sheets as submitted to the tax authorities do not reflect the real position.

4. THE FISHING FLEET AND THE ORGANIZATION OF LABOUR

4.1 The composition of the fishing fleet

Over the ten years under review (1968 - 1977), there has been an increase in the Sicilian fishing fleet in numerical terms (+ 23.2% (+ 23.2% trawlers and + 7.8% motor boats) and a more than proportional increase in its gross tonnage (+ 42.2%) and power (+ 61.2%) in an effort to adapt to fishing conditions in the various fisheries.

There have also been qualitative improvements in safety at sea, with the widespread introduction of radio and radiotelephones, and in fishing equipment (echo sounders).

Despite the incentives offered, only 15% of the total number of boats in the engine-powered fishing fleet have been built less than five years ago, compared with 36% built 21 years ago or more. It should be pointed out, however, that while boats aged 10 years or under account for no more than 34% of the fleet in numerical terms they represent more than 50% of gross tonnage and 52% of total power, confirming the recent trend towards larger tonnage and above all greater power.

From the figures it seems that there is above all a need to replace certain types of boat: the average tonnage of boats aged 11 to 20 is 7.65 tonnes, that of boats built more than 20 years ago 10.45 tonnes. It is very likely that these include a large proportion of motorboats.

In any effort to modernize the fleet, a clear statement should be made of what type of craft should be encouraged and what the specifications should be, with reference to individual fishing centres or groups of centres; the decision should be based on the types of fishing which are likely to be developed in the future. At the same time, there should be disincentives for those types of craft that are unsuited to local conditions.

If this approach is adopted, the first requirement is a thorough, detailed study of the ocean resources traditionally fished from each fishing centre; after this, consideration should be given to the boat or boats that are most suitable in tonnage, engine rating and gear.

This might also prevent the race to increase engine power to eve higher levels. There may be advantages in higher power (greater fishing effort per unit, improved safety) but if it goes beyond certain limits it is an unjustified waste in practical terms.

Recent trends in the fishing centre of Mazara del Vallo have been to acquire 180 to 200 tonne fishing vessels with engine ratings of about 600 HP.

4.2 Organization of labour on board

The small size of the fishing concerns and the type of fishing in which they are engaged make it impossible to differentiate between the duties carried out on board in any detail, except in the case of the skipper, engineer and fishing master, and their second officers where they exist.

Because of higher engine power, there has been a tendency to shorten the periods spent out at sea, and this in turn has lessened the need for other specialists on board (refrigeration engineers, radio operators, etc.).

One of the consequences is that vocational skills are almost always learned on the job and are rooted in usage and tradition.

Since there is little differentiation in the tasks done on board, work is more flexible, although it calls for a 16-to 20-hour working day.

It would be difficult to alter this situation. If shift work were to be introduced, the size of the crew would have to be greater and labour would cost more, disrupting the financial equilibrium of the concern or reducing the earnings of individual members of the crew to the detriment of their family budgets.

5. MARKETING METHODS AND THE MARKETS

5.1 Marketing methods

Given that marketing and the markets, together with port facilities, are the fishing industry's weak points, it should be pointed out that existing methods of marketing fish products are due only in part to the shortage of suitable structures, although the creation of such structures is a vital prerequisite for any rationalization of distribution.

Under the current system, the wholesale dealer is the arbiter of the market with a fairly wide measure of discretion to regulate quantities and prices.

Wholesale prices for the catch are determined outside the market as a result of direct negotiation between the owner of the fishing vessel and the dealer, the latter being the owner of the facilities for storing the fish and thus being able to decide when it should be brought into the market.

Up to this time, little attention has been paid by the fishermen to the subsequent phase of marketing. There are a few owners of fishing vessels who deal in (and sometimes process) the fish on their own account, even buying in other people's catch, although they act more as detailers than as producers. There are also cases of cooperative associations that operate markets (as in Sciacca) or sell the fish caught by their members in a few small fishing centres. In general, however, fishermen returning to port tend to take no interest in the outcome of their labours.

The existing marketing systems not only have the disadvantages already mentioned but they also provide no guarantee of compliance with health regulations, since most fish evades the type of inspection that is carried out only in the fish market.

5.2 Market organization

Any judgement of the way in which the markets are organized must inevitably be totally negative. Even the physical structures are absent or unsatisfactory; in the rare cases in which such structures exist or are adequate to cope with the demand made on them, they are always badly organized.

For instance, some markets have their own refrigerated storage but it is not used because the wholesale dealers have their own, and most of the fish brought into the market passes through their hands.

The premises used for the sale of fish are usually unsuitable, so that at times the auction procedure is conducted merely as a matter of form.

Even within a single market, there may be no uniformity: auctions will be conducted simultaneously at several stands, i.e. only a section of potential buyers attends each auction.

The presentation of the merchandise leaves much to be desired and there is no guarantee of uniformity. The use of wooden fish boxes detracts from hygiene and increases the health risk.

Both health and food inspection services are very sketchy and it is likely that no check of any kind is made of a portion of the merchandise brought into the market.

Much of the infrastructure external to the market is located in what are considered unsuitable areas in terms of the poor connections with the port, urban centres and other retailing and distributing markets.

6. PROCESSING

6.1 Plant

Although there are a few companies with up-to-date equiment engaged above all in the deep-freezing of crustaceans, on the whole the processing of fish is carried out by small or medium-sized firms using unsophisticated methods.

These firms appear to make a reasonable living, but there are two negative aspects, one being the premises on which the work is conducted and the other being the relations with the labour force employed, most work being based on forms of piecework.

In the case of firms engaged in the processing of fatty fish, it is recognized that the technological content of the work is low but it must be pointed out that many of the premises used are far from suitable. There are problems of food hygiene and the health conditions for the workers, and there are problems of space, with semi-finished goods having to be sold off because there is not enough space to store them until they are ready for the market.

Productivity could also be increased by the introduction of a few simple machines, for instance conveyor belts or, in the case of firms preserving fish in oil, filleting machines.

6.2 Organization

The problems of concerns that preserve fish in salt or oil should be viewed separately from the problems of firms engaged in deep-freezing.

In the former case, work is highly seasonal and the kind of problems that arise are associated with labour. Up to this time, the processors have coped in peak periods by taking on people not having a paid job - housewives, students or sometimes children - or by bringing in members of the family who are normally engaged in other occupations.

It is the same problem as is faced by other concerns linked with agriculture (tomato and beet processors, for instance) and, in the same way, it could be solved or mitigated by technical and financial investigation followed by provision for preserving the raw materials to be processed for a certain period. This would lessen the load in peak periods (June to August) and extend the period of work (from April to November).

It is widely held that the "fatty fish" resources in the sea fished from Sicilian centres are under-exploited, and there should be no supply problem in the near future. This factor, on the contrary, should provide the incentive to seek other uses for the resource in question. For example, the production of frozen sardines has been successfully launched and could be expanded in the future.

The frozen food industry, based essentially on prawns, is different in that it faces problems of procuring supplies. In acquiring its raw materials it has to compete with the market serving consumers of the fresh product, who are prepared to pay high prices; in addition, it has to overcome all the problems related to the methods of selling that we have already described.

Since the wholesaler takes all the fish caught on a given fishing trip, an industrial concern cannot obtain its supplies of prawns alone direct from the owners of fishing vessels but is forced to go to the wholesaler.

Further problems sometimes arise in disposing of the finished products on the market. Except in a few cases when the processor deals direct with foreign importers, the company has to go through large frozen food producers and distributors. Here again, it would be reasonable to look for diversification, broadening production to include other fish and molluscs.

7. PORT AND BOATYARD FACILITIES

The shortage of fishing ports in Sicily has already been described in Part 1. In this section, we should like to go into further detail not only of the port facilities - all of which require action - but also of everything that now exists in some of the Sicilian fishing centres to serve the fishing industry.

We have taken the fishing ports of Trapani, Maxara del Vall and Porto Empedocle as our subjects for this more detailed analysis.

7.1 Trapani

From the local authority viewpoint, the maritime district of Trapani includes the district office of Marsala and the local maritime office of Pantelleria. The beach delegations of Favignana, Marettimo, Levanzo and Bonagia, San Vito Lo capo and Castellamare del Golfo also come within the district.

Apart from Favignana, with its tuna fishing, the centres made only a small contribution to fish production in the district as a whole, as approximately 85% of production is concentrated in Trapani itself.

The civil engineering authority recently carried out work to extend the fishing port of Trapani, but even so it is unable to handle all the traffic. The wharf is only about 400 metres long and it not enough for all the fishing boats that wish to berth there: they have to moor in three or four rows against the wharf.

Steps are being taken to set up two Diesel fuel distributors (120 m^3) on the fishing jetty; before this time, boats had to obtain their fuel supply from the commercial port at a distance of about 2 km.

In 1978, consumption of Diesel fuel was 3,770 tonnes, plus 516 tonnes of lubricants.

Registrations with the Trapani office alone as of 31 December 1977 amounted to 77 trawlers with total tonnage of 3,720 g.r.t. and 16,754 HP, 182 motorboats with total tonnage of 752 g.r.t. and 393 rowing boats (1,528 g.r.t.).

As of that date, the harbour office assessed the value of the engine-powered fleet as over Lit.8,000 million, its gear and equipment as Lit.1,000 million.

All the motor fishing boatsin the district engaged in purse-seining are based in Trapani. About 18 fishing boats have obtained and use a permit to fish with purse-seine nets in Tunisian waters (from May to August), working the sea within the maritime district waters during the rest of the year.

There are three permits for trawling, six for fishing with long-lines.

In Trapani there are 14 boatyards and five mechanical workships (one officially recognized) and nine slipways.

The Trapani fish market, run by the local authority, is sited behind the fishing port near the jetty. Its premises are dilapidated, consisting of a hall measuring 12 x 35 metres with four mechanical scales and stands, two rooms for office use, two rooms for files and records, a small store and another room where the Banca del Popolo di Trapani has a counter to handle market business.

Refrigeration of the fish landed and ice production are often combined. There are six ice factories, only two of which are fully operational. The largest is near the wharf (Messrs. Lazzera); it has a daily production capacity (working 24 hours a day) of 22.8 tonnes of ice chippings and 14 tonnes of sheet ice. Other factories are on a small scale (Guaiana and Parrinello).

The "Cooperative Europesca", which is equipped for ice production, has in fact ceased to manufacture ice because of its distance from the wharf and because it could produce only block ice which has to be crushed before it can be used for packing fish in boxes.

Another ice factory is the one managed by the "Cooperativa Piccola Pesca S. Alberto".

In Trapani, refrigeration capacity seems to be fairly substantial: five dealers have their own cold storage rooms, S.p.A. Inia e Di Gaetano (COFRIT) has a fish storage plant and a spacious depot with cold storage rooms with overall capacity of 3,200 m^3; the "Cooperativa produttori pesca di Trapani" had a depot with four cold storage rooms, each with about 3 tonne capacity; Guaiana has four cold storage rooms capable of storing 2,500 boxes each; ISPICA has three cold storage rooms; and Europesca has cold storage capable of maintaining 100,000 boxes at a temperature of - 20°C.

The only cooperative of fishermen is the S. Alberto mentioned above. Europesca, a group of owners of boats engaged in purse-seine fishing, has obtained recognition as a producers' association and is empowered to withdraw fish from the market on behalf of A.I.M.A. (Azienda statale per gli Interventi sul Mercato Agricolo).

Both small and medium-sized concerns make up the town's processing industry. Of special note are: Castiglione, with plant in the village of S. Cusumano, a producer of canned tuna, frozen sardines, mackerel and sardines and anchovies in salt or oil; COFRIT, which produces frozen sardines; Europesca; and a number of family concerns producing sardines and anchovies in salt.

The fish meal industry is represented by an old-established concern, Crespi, with a daily processing capacity of 35 tonnes of fish (or 15 tonnes fish scraps) and a work force of ten.

The group of factories manufacturing products used in fishing include two producing steel cables (with labour force of 8 and 6), GIER PLASTIC, manufacturing plastic fish boxes (6 workers), and Leonardi, which assembled wooden boxes (3 to 8 workers).

Fishing based in the fishing centre of Trapani has been augmented over the past few years by the "harvesting" of red coral, following the discovery of large coral beds in the fishing grounds of Scherchi Bank. A number of boats have been converted for the purpose. Coral is fished with a device known as an "*ingegno*", cross-shaped gear to which nets are attached that is sunk with ballast and that scrapes up loose pieces of coral from the bed; alternatively, underwater divers are used.

The value of coelenterate production was officially stated as Lit.250 million in 1977, but in fact it is likely to have been a few thousand millions.

The existence of salt-mines along the coast that are no longer being worked today might act as an incentive for their use as fish farms, either on a semi-intensive basis for breeding white fish (gilt-head bream, common bream (*Sargus sargus)*, bass, grey mullet, etc.) or intensively, given the mild winter temperature of the water and the lack of extremes over the year.

7.2 Mazara del Vallo

From the administrative viewpoint, the maritime district of Mazara was created in 1975, its territory being taken from the district of Trapani. The beach delegation of Marinella comes within its area.

Mazara del Vallo is the leading fishing port in Sicily, incorporating the old canal port at the mouth of R. Mazaro.

It suffers from the problems of silting up and lack of space, due to the growth and size of the fishing fleet calling at the port. In 1940, for instance, the fleet based in Mazara numbered 90 boats, 40 of which were rowing or sailing boats or at most were fitted with small motors; today, there are 395 boats, giving an idea of the problems created by the inadequate facilities and the smallness of the wharves.(1)

There are five fuel distribution installations, with 1978 consumption estimated as 40,000 tonnes of Diesel fuel and 360 tonnes of lubricating oil.

As of 31 December 1977, 217 trawlers with total tonnage of 24,095 g.r.t. and total power of 75,334 HP were registered in Mazara del Vallo, as well as 100 motor boats whose total tonnage was 334 g.r.t.

The average tonnage of the engine-powered fishing fleet is 111 g.r.t., average power 347 HP.

Records of registrations show that 9 engine-powered fishing vessels were built before 1940 (average 87 g.r.t.), 31 between 1940 and 1949 (average 45 tonnes), 15 in 1974 and 3 in 1976. The average tonnage of these more recently built boats is 177 g.r.t., average power 601 HP, with most of them close to the mean.

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(1) *There are plans for another port northwest of the existing port.*

Four boatyards and ten mechanical workshops are operational in Mazara.

Communications between the fish market on the one hand and the port and traffic highways on the other are extremely difficult and are now quite inadequate from every point of view.

The five ice factories have a production potential of 40,000 tonnes a year, far greater than the actual requirement of about 15,000 tonnes. Refrigeration capacity is also adequate (1,260 tonnes).

There are ten or so cooperatives for small-scale fishing, all of them recently formed except one, the Cooperativa del Mazaro, which has long been established. In addition there are two associations of free-lance owners and many joint ownership partnerships.

The processing industry consists of medium-sized concerns engaged in the freezing of crustaceans and molluscs (squid) and one firm (Strazzera e Figli) producing fatty fish in salt or oil and employing two clerical workers and a labour force of eight. Over the past two years, the firm has been operating a fish meal production plant with capacity of 15 to 20 tonnes of fish (or 7 to 9 tonnes of scraps) a day, employing five people.

Finally, Mazaro has two steel cable factories.

7.3 Porto Empedocle

In administrative terms, the maritime district of Porto Empedocle contains the district maritime office of Licata, the local maritime offices of Gela, Sciacca and Lampedusa and the beach delegations of Marina di Palma di Montechiaro, Siculiana Marina, Porto Palo, Menfi and Linosa.

The leading fishing centres in terms of quantity of fish caught are Sciacca (47% of the catch), Porto Empedocle (28%) and Licata (14%).

Sciacca is the most important centre in terms of fatty fish and crustaceans, Licata for molluscs and Porto Empedocle for other fish.

Porto Empedocle is the leading port in terms of the number of boats based there and their tonnage.

The shortcomings in the port facilities are not a matter of overwhelming concern, although there is room for improvement. The three fuel distributors are sited on the North wharf and the second arm of F. Crispi jetty.

As of 31 December 1977, nine trawlers, 3,909 g.r.t. and 820 HP, were registered as based in Porto Empedocle, as well as 69 motor boats with gross tonnage of 214 g.r.t.

The value of the engine-powered fleet has been estimated as Lit.1,720 million, its gear and equipment as Lit.1,300 million. Of interest is the difference in tonnage (49.5 g.r.t.) and average power (10.4 HP) by comparison with the Mazaro-based fleet.

Two repair yards working in timber and with their own slipways are operational in Porto Empedocle, as is one mechanical workshop.

The fish market is managed by the local authority. Although it has no cold storage space of its own, the refrigeration capacity owned by the wholesale dealers is considered as adequate to cope with current needs, as is ice production capacity.

Only one fishermen's cooperative exists: Madonna del Carmine, with a membership of 90. Porto Empedocle has no fish preserving industry.

8. VOCATIONAL SKILLS

8.1 Training centres and activity

As already stated in section 11 in Part 1, there are a few vocational institutes in Sicily training young people for work in the fishing industry; at the end of the course they can obtain certificates as skippers and class 2 auxiliary engineers.

The structural facilities of these institutes should be reinforced and their curricula brought up to date in the light of the new specialist skills that are needed today.

There is little in the way of training projects designed for those already employed in the fishing industry, so that vocational skills are improved and updated almost exclusively by learning on the job.

Difficulties have been faced as a result when making up the crews of boats. In the case of small boats, for instance, it is not easy to find people who have the requisite maritime certificates as they prefer to sail on large boats where they can be sure of work over a longer season and where their earnings are substantially higher. Even on the larger vessels, however, the shortage of qualified men is beginning to be felt, one of the reasons being a slight reduction in the influx of younger men, who are reluctant to devote their lives to such a tough job.

PART III

OBJECTIVES TO BE PURSUED AND NECESSARY MEASURES

1. EEC POLICY AND ITS IMPACT ON THE REGION

EEC policy for the fishing industry is implemented by both structural and market measures.

On the subject of processing and marketing facilities, the structural measures are based on Regulation (EEC) No 355/77, 15 February 1977 (joint action to improve the conditions for processing and marketing agricultural products). On the subject of aquaculture and the fishing fleet, they are based on Regulation No 1852/78 of 25 July 1978 (interim common measure for restructuring the inshore fishing industry) amended by Regulation No 592/79, 26.3.1979.

The market measures are based on Regulation (EEC) No 100/76 of 19 January 1976 (on the common organization of the market in fishery products).

The structural efforts funded by the European Agricultural Guidance and Guarantee Fund (EAGGF) from 1972 to 1977 took the form of seventeen projects involving 6,588,883 UA aid, some of the projects relating to Sicily.

Sicily has taken part in the market measures by its withdrawal of sardines from the market, acting through the Trapani-based Europesca Association. The quantity withdrawn in 1977 was 1,147,895 kg, for which Lit.149,261,300 compensation was paid; in 1978, the quantity was 948,798 kg, for which Lit.132,339,760 was paid.(1)

Regulation No 355/77 provides for assistance in financing investment projects designed to rationalize or develop the storage and processing of fish products, improve trading channels and add to knowledge on prices and price formation.

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(1) *AIMA, Notizie no. 3, December 1978.*

Investment projects designed to create the kind of structures which are few and far between in Sicily, such as market structures and certain branches of the processing industry, obviously come within the category specified in Regulation No 355/77. There seems to be no problem in Sicily, however, regarding the fish meal industry, since the meal producers that already exist obtain only occasional supplies of fish from the intervention body responsible for withdrawing fish from the market, the bulk of their raw materials being the fish scraps discarded by the food manufacturers.

Under the EAGGF aid, up to 50% of the finance is contributed towards such projects in the case of Sicily.

With regard to Regulation No 1852/78 and the amendments made to that measure by Regulation No 593/79, in which provision is made for the funding of aquaculture ventures (with the EAGGF contributing up to 50% of the finance), efforts might well be made in Sicily that would qualify for such aid, both in the West (Trapani, Marsala and Mazara del Vallo) and in the East (Siracusa). It seems that a few ventures are already in the air, with the possible participation of companies in which the State has a holding.

There are no clear-cut, reliable policy guidelines for any restructuring of the inshore fishing industry and its fleet in particular, for several reasons: little is known about the resources; there is uncertainty as to the future of fishing in areas opposite the African countries; and not enough research has been done to define the optimum specifications for fishing craft for the different types of fishing that could be done.[1]

Article 3, Regulation 1852/78, specifies the length or tonnage that will qualify fishing craft for aid.

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(1) *The Community has already adopted its own guidelines on this subject, the objective being to restrict trawling.*

In general, the qualifying length is from 12 to 24 metres; alternatively, the qualifying gross tonnage is between 25 and 130 tonnes. In the case of vessels fishing by methods other than trawling or purse-seining, those over 6 metres in length or over 10 tonnes may also be eligible.

Out of 217 motor fishing vessels registered in the district of Mazara del Vallo, no fewer than 84 exceed 130 tonnes, with 8 having a gross tonnage of less than 25 tonnes, although even these are greater than 10 tonnes. Of the 100 motor boats registered in the same district, the gross tonnage of 30 is less than 10 tonnes. On the other hand, only one of the 71 motor fishing vessels registered with the fishing centre of Trapani exceeds 130 tonnes, with 11 coming within the 10 and 25 tonne category and 9 being less than 10 tonnes.

Bearing in mind that the prevailing trend in the Mazara del Vallo fishing centre is towards trawling, while the trend in Trapani is towards purse-seining, it could be observed that, although the trends in both centres are rational, the restrictions imposed by European Community regulations fit in better with the conditions under which fishing is conducted in Trapani than with those in Mazara.

In the case of Mazara, if fishing is to be conducted under the same conditions and in the same sea areas as in the past, and provided that the potential resources permit, fishing boats of up to 200 tonnes should also be eligible for funds; on the other hand, it would have little interest in the incentives for craft up to 25 tonnes or even up to 50 tonnes, as this category includes a total of 41 motor fishing vessels.(1)

On the other hand, doubt could be expressed on whether the choice of tonnage made by the entrepreneurs is rational. The figures in the "balance sheets" in Part 1 should be viewed with some caution, but even so a

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(1) *Regional Law no. 1, 4.1.1980, provides incentives for the building of motor fishing boats of up to 200 tonnes; since it conflicts with Regulation No 1852/78, it has been blocked within the Community.*

comparison between the balance sheets for the first two concerns, both of which are engaged in trawling in the same district, shows that the return on capital is higher in the case of the concern having a smaller boat (60 tonnes); the income of a concern having a larger vessel (200 tonnes) does not increase in proportion to tonnage since expenses are disproportionately higher even though the return for the work done is larger in absolute terms (the apportionment of proceeds under the share contract remaining equal).

2. OBJECTIVES

2.1 Short-, medium- and long-term objectives

The objectives that should be pursued in any attempt to rationalize the fishing industry will depend on a wider and more detailed knowledge of the potential resources on the one hand and, on the other, on the legal arrangements that may be introduced in the Mediterranean for relations with the African States bordering the sea.

Whatever relations may be established with those nations, however, some of the objectives can already be stated; these are summarized below.

1. Ascertain the potential resources in each individual fishing ground traditionally fished by the Sicilian fishing bases:
   a) in any economic zone over which Italy has sole fishing rights;
   b) in any economic zone over which the coastal nations may have exclusive fishing rights.

2. Protect the natural environment and restore its balance by:
   a) creating disincentives for fishing fleets operating close in to the shore;
   b) establishing reserve and restocking zones;
   c) surveillance at sea;
   d) anti-pollution measures.

3. Introduce measures to promote aquaculture, backed by technical aid and facilities for the breeding of young fish.

4. Standardize the fishing fleet in the light of the information obtained in pursuance of objective 1, and achieve a balanced fleet in the different fishing centres.

5. Choose a reasonable number of fishing ports as being best suited for the enlargement of berthing and other facilities.

6. Install an electronic system of coordinates (Decca or Lorana) able to fix a vessel's bearings from shore to a high degree of precision.

7. Rationalize the links between fishing and fish marketing by reinforcing the market and storage structures, running those structures efficiently, complying with the marketing measures (applying Regulation No 103/76, 19.1.1976) and giving the fishermen's associations more muscle.

8. Set up an experimental centre for the fishing industry with the appropriate facilities to carry out research of a biological, technological and economic nature on fishing.

9. Raise the standards of seamanship of fishermen so that they can match their skills to the demands of today, by providing courses training them in the biological aspects of fishing and the operational aspects such as the proper use of equipment on board, one of the aims being greater safety at sea.

10. Take steps to improve structures in the fish processing industry and to help the industry adapt to demand.

11. Engage in promotion to popularize certain species of fish among consumers, having ascertained that those species are widely available; devise new ways of presenting the species if necessary.

Some of these objectives can be achieved without delay, while others will have to be based on sound information provided by the studies and research already mentioned; this research itself must be launched promptly.

Once the relationships with the African coastal nations have been clarified, joint companies may be set up; there is renewed discussion of such companies in periods of uncertainty. It should be pointed out that, in pursuance of Regional Law 1, 4.1.1980 (article 19), a partnership of shipowners has already been formed with capital of Lit.200 million, to which ESPI (Ente Siciliano per l'Industrializzazione) is also to contribute, whose objective is to create joint companies together with Tunisia and Libya.

3. PRODUCTION MEASURES

The list of production measures could include all those steps taken to increase production while preserving the biological balance, to reconstitute stocks when resources have been fished out, to improve and protect the marine environment, to raise the productivity of fishing concerns and to reduce their costs.

In essence, these are short- and medium-term measures to which general reference has been made in the previous section.

One form of action, however, is urgently needed and is a prerequisite for all the measures listed: the development and broadening of the structures for applied research on fishing. It is quite unthinkable for any plans to be made for the fishing industry or rational resource management without a greater research potential.

The following ventures should be taken into consideration for Sicily, a region with special statutes:

a) The institutional reorganization and expansion of the Messina Experimental Centre for Fishing (at present ESPI's research department);

b) Support for and cooperation with the Fishing Research Laboratory recently set up by the National Research Council in Mazara del Vallo, which is still not in operation;

c) The creation by the Sicilian Region of bursaries for study inside and outside Sicily and for attendance of specialist post-graduate courses in the biology and technology of fishing, to produce qualified specialists who can work in the research facilities described in a) and b);

d) The establishment of a regional statistics centre covering the agricultural and fishing sectors, since it is impossible to promote a sound development policy unless it is backed by a body of reliable facts and figures. Statistics are vital not only to economics, politicians and businessmen, but also to marine biologists.

e) The installation of a Decca or similar type of radio-navigation system for navigation and fishing in the Sicilian Channel. This is an infrastructural and inter-sector reform with long-term benefits, and one that would have many beneficial side-effects.

In the increasingly serious dispute between Tunisia and other African countries, a system that helps to pinpoint a boat's position without a shadow of doubt and that also helps fishermen to make their own fishing charts would give us an instrument that would allow of no alibis, whose cost could be included in production costs and that would add to the safety of human life at sea.

f) Formation of a regional committee for the management of resources, to be linked with the similar national committee now being set up, with sufficient technical and legal expertise to express a binding and definitive view on any factor relating to the management of resources, to include the issue of permits for new boat construction.

g) Planning for and implementation of a wide-ranging research campaign (possibly on an international scale) to evaluate pelagic and demersal resources, and the degree to which they are being fished, in the Sicilian Channel. The purpose in so doing is to build up a body of technical and scientific information on the stocks which could be fished by the various coastal nations and to provide a sound foundation for fishing agreements in the region. Research of this kind must be projected over a period of years.

3.1 Improvement and protection of the coastal marine environment

The aim is to promote all those ventures which will help to bring order to the human activities that are conducted on the coast and to defend, upgrade and augment the resources of the sublittoral zone.

Small-scale inshore fishing, which provides a not unreasonable financial return (since the catch fetches good prices on the market) is threatened both from the land - by unregulated industrial activity, pollution, terrigenous deposits and other disruptions of the ecology - and from the sea, because of the unlawful incursions of people using trawling nets within the three mile coastal area.

The establishment of restocking zones, the creation of "artificial barriers" and fish farming projects might solve many problems. There is a need for a detailed experimental and research project to be planned and implemented: artificial barriers positioned at various strategic points around Sicily, based on the experiment SE of Conero (Ancona) conducted by the National Research Council's Fishing Technology Laboratory. The attempts at fish farming that have been launched in the Trapani salt marshes andStagnone di Marsala should be expanded and coordinated.

3.2 Reorganizing production units

The trawling fleet should be restructured by taking the following action:

a) introducing disincentives for the 10 to 50 tonne category of inshore trawlers;

b) making it obligatory to scrap outdated boats when new boats are being built and introducing premiums for scrapping;

c) making it obligatory to obtain a fishing licence (from the resource management committee) before starting work on building new fishing craft;

d) providing incentives for the conversion of the fleet from demersal to pelagic fishing.

4. STRUCTURAL MEASURES

4.1 Port organization

Mention has already been made of the need to select the ports suitable for expansion, since it would be unthinkable to enlarge all the ports in existence.

This choice should be based on certain practical features, to include the physical and economic nature of the ports, the potential for organizing the necessary utilities around the port and the prospects for development in the different fishing centres.

In some cases, action should be taken to enlarge the space for manoeuvre at sea, lengthen the wharves and berths, make the protective structures safer, deepen the sea bed, augment and relocate supply facilities, improve communications with the market and roads, etc.

The ports to be taken into consideration undoubtedly include Mazara del Vallo, Trapani and the smaller ports of Sciacca, Porto Palo, Termini Imerese, Porticello, Palermo, Milazzo, Castellamare del Golfo and Terrasini[1].

The survey that has been conducted is not such as to enable us to go into details regarding the action that is needed in individual ports; special investigation is needed in this area. We may, however, point out that there are plans and projects for some ports that merit reconsideration to confirm their validity and that might then be updated and integrated before going on to the executive phase.

Steps should also be taken to ensure that ports of refuge and minor harbours can be used and operate satisfactorily, especially in the islands surrounding Sicily (the Lipari Islands, the Aegadian Islands, Linosa, Pantelleria and Lampedusa), since these are advance points for boats sailing to the fishing grounds.

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(1) *In a very recent measure issued by the office of the Regional Councillor for Public Works, Lit.1,000 million funds were provided for the first stage of a plan for the reorganization of the port of Sant'Agata Militello, representing a total investment of Lit.5,400 million.*

4.2 Boat yards and other facilities

Structures of this kind are closely related to the volume of fishing in individual ports. There appear to be sufficient boat yards and workshops working on repairs and maintenance to cope with current requirements. The capacity and efficiency of yards engaged in the building of new boats could be increased, depending on the policy guidelines on the future fleet; here again, a choice of the most appropriate ports should be made.

Facilities such as the supply of fuel and ice are also adequate to meet demand in general but in many cases they could be more suitably sited. This work will have to be done within the context of the reorganization of individual ports.

4.3 Marketing centres

We have already discussed the shortage of such structures and their shortcomings, even in the more important fishing centres such as Trapani and Mazara del Vallo, in Part 1, section 5.

The existence of inefficient markets, or markets that are less efficient than they could be, even though the physical structures are reasonably adequate, points to the need to tackle the problem of marketing from two angles at the same time: providing new facilities and improving old facilities on the one hand and, on the other, improving their management.

It would also be advisable to make a clearer distinction between first-stage markets (for selling by producers) and second-stage markets (selling to consumers).

To make fishermen's cooperatives or associations responsible for markets would seem to be one way of changing the relations between the fisherman and the dealer and of making better use of the facilities that already exist within the market but which are under-used.

There is a need for intervention measures to change the structures of almost all existing markets: their selling equipment (electronic auction installations, etc.) should be modernized; in some cases their reception and storage capacity should be augmented and access routes and communications with the port improved; and in other cases new structures should be brought into being at carefully chosen locations (Mazara del Vallo).

New fish markets in places that have none at present are not considered necessary, but it would be advisable to add to the number of collection centres and to expand existing centres.

4.4 Processing and storage facilities

A market designed along modern lines should also provide for the processing and storage of fish, at least up to the manufacturer/wholesaler stage, within the market itself.

The collection centres as they exist today are unused or under-used in the trading channels that now prevail, in which fish is sold by the producer direct to the wholesaler without going through the market. If the fish has to be processed and stored, this is done in the wholesale dealer's own warehouses.

While these structures are adequate in the wholesaler-retailer phase of marketing, if the marketing structure is reorganized the producer must also have the use of premises for processing and storage and, in this case, the most obvious location would be within the market itself.

Some of the markets already have adequate storage capacity, but all existing markets lack premises for processing.

The lack of facilities for the processing of fish has already been discussed in Part 1, section 8, and in Part 2, section 6, and we have urged the advisability of providing incentives for the modernization of the premises in which fatty fish is now being processed and also of the processing machinery.

Certain species may be in greater supply (fatty fish) and it may be possible to market some of the species in different forms. Thought should be given to ways of expanding the frozen food industry which, as things now stand, basically deals in crustaceans and molluscs.

One of the ventures that might be launched would be an industrial unit for the stocking, storage and processing of products on a large scale, particularly fatty fish, in the area of Sciacca. One way in which this might be done would be to bring different parties together in a partnership: the producers (through their cooperatives), the regional authority and SOPAL (a State-owned food company under EFIM, Ente Partecipazione e Finanziamento Industria Manifatturiera, the board through which the State takes holdings in and finances the manufacturing industries).

5. ORGANIZATIONAL MEASURES

5.1 Production structures

The existing production system is highly fragmented but it would be difficult to change the structure from outside because most fishing is on a small scale. It would be advisable, however, to encourage fishermen to band together for the procurement of their fishing materials and other supplies, the management of the facilities they need and the sale of their catch.

In the field of labour relations, during the periods in which collective contracts were renegotiated the unions won slight improvements to the terms of the traditional "share contract". At present, the unions are pressing for better social welfare and security arrangements and an increase in the "minimum guaranteed wage", a problem of concern only to a few smaller boats used for inshore fishing.

Another problem is the achievement of greater safety at sea, both by improving the boats themselves and by adding to the seamanship of the fishermen.

With this in mind, incentives should be offered for installing equipment on board that would make for greater safety, for the establishment of the kind of electronic coordinates system described and for the training of crews.

Further action is also needed to increase the number and skills of operating staff in the central and local authorities (harbour offices) for more intensive surveillance and to ensure that fishing regulations are being properly applied.

5.2 Marketing structures

We have already discussed the shortcomings in the distribution sector; a radical change in market organization is vital.

As already stated, the course of action is essentially to organize fishermen in cooperatives or other joint bodies that can run the productio markets efficiently. This would help fishermen to retain some of the profit margin now being taken by the wholesale dealers, estimated as a minimum of 30% of the added value of the catch. Above all, however, it would add to the efficiency of the marketing channels, not only in purely trading terms but also in terms of food quality, health and hygiene statistical records, etc.

The fact that there are already a few production markets run by cooperativ however lacking in adequate facilities, confirms the predictions set out above.

5.3 Processing structures

In attempting to achieve the objectives by improving processing structures a distinction should be made between the two types of industry already described: the family type firm, engaged in salting fatty fish and bottling it in oil; and the industrial freezing concern.

The former is highly traditional and greatly fragmented, although it tends to be concentrated in certain locations. This type of industry is very seasonal and is linked with fishing production, the result being that it employs very few permanent workers and avails itself widely of seasonal labour. In common with the fish processing industry as a whole, in obtaining its supplies of raw materials it is in direct competition with buyers of fish to be sold to the consumer; the prices fluctuate considerably, depending on the quantities on offer. This leads to difficulty in obtaining supplies at a reasonable price at certain times, At other times it is impossible to dispose of all the fish coming onto the fresh fish market however low the price. The consequences are all too familiar: withdrawal of fish from the market, its destruction, etc.

There appears to be difficulty in persuading the fishermen and the industry to come to agreements under which the quantities and prices of raw materials can be planned in advance, and it seems to be equally difficult to encourage fishermen to take a part in the processing phase by setting up their own associations.

One feasible method of stabilizing the market, however, or at least the very short term fluctuations in that market, would be to enable the producers (and the processors as well) to obtain access to public fish storage facilities.

If it were possible to process the fish for freezing it would help to overcome the problem of the seasonal nature of catches. This is a point that should be considered from the economic angle, however, as the raw material is a "poor" product and may not justify the high cost of storage while awaiting further processing.

Finally, it would be desirable - even in the case of some of the larger and better organized companies - to raise the quality of output by switching to the production of frozen foods, as these are less susceptible to competition from countries where wage levels are low.

There are other problems associated with the marketing of processed products. It might be profitable for the industry producing salted fish and fish in oil to set up producers' consortia placing their own products on the market, in particular by negotiating agreements with the major distribution chains; the consortia could also purchase the products needed in processing and storing its products (containers, oil, etc.).

In the frozen foods sector, on the other hand, the number of manufacturers is very small. In essence, they process high quality raw materials (crustaceans).

As is evident, the difficulties in obtaining supplies of raw materials are even more acute, there being keener competition from the consumer market. It is a problem that can be solved only in part by the rationalization of facilities and market reorganization.

This being so, it would appear desirable to extend the range of products not only to molluscs but also to fatty fish. At least in the limited quantities supplied in the past, fatty fish has been well received on foreign markets (such as France and Germany) and might also be attractive to buyers on the domestic market.

The plant already installed is technologically sound and, if adapted, might be used to produce more sophisticated merchandise (ready-prepared dishes), using raw materials in wider supply as the basis.

To rationalize the use of plant, another course of action would be to test the feasibility and advisability of combining the processing of fish products with the processing of certain agricultural products.

6. FINANCIAL MEASURES

6.1 Improved structures

The instruments developed by the European Community to improve structures and those suggested in the series of proposals for rationalizing the fishing industry are associated with EAGGF financial contributions towards the modernization and replacement of the fishing fleet, fish farming projects, applied research, further training of seamen engaged in fishing and information campaigns designed to encourage the consumption of little known species. Regulation No 355/77 suggests other projects in the marketing and processing of fish products.

The structural intervention measures that could be funded by EAGGF do not include projects associated with ports and port facilities. In the case of Sicily, however, such projects should be eligible for assistance from the Regional Fund.

Having established guidelines for intervention, the next step is to make an overall assessment of the figures involved. At the time being, these are difficult to evaluate, especially as the State and the Region are already engaged in planning.

6.2 Management activity

This heading could cover both financial compensation from EAGGF's guarantee section and any aid that might be given to producers' associations for their promotion campaigns. If the measures proposed with a view to increasing consumption of both fresh and frozen fish are implemented, it is not considered that undue importance will be given in the future to the fact that so much fatty fish has been withdrawn from the market.

7. LEGISLATIVE MEASURES

7.1 European Community measures

The thinking behind Community intervention in the fishing industry appears to be generally comparable to the policy already applied in certain agricultural sectors.

Unfortunately, our scanty knowledge of the fishing industry makes it far harder to plan for intervention, and there is an urgent need for searching analysis of actual production potential in the different regions of the Community. Priority should be given to such research, as inappropriate measures might otherwise be adopted.

In the meanwhile, the new measures undertaken by the Community on a provisional basis (Regulation No 1852/78), as has already been stated, relate to "the development of inshore fishing in regions where fishing potential makes this possible" and "the development of aquaculture in regions which are particularly suited to this activity".

With regard to the first point, the regulation specifies the technical conditions which will qualify fishing vessels for aid from the Fund. Until more specific data are available, however, this decision may be reviewed so that, as is hoped, distinctions can be made regarding the optimum size of fishing vessels according to their fishing base and the type of fishing in which they are to engage.

In the opinion of the experts, until such time as information is obtained on the potential demersal resources in the Sicilian Channel, the level of trawling /should be no higher than at present, at least for the time being. This is the line being taken by regional measures, however cautiously: they make the granting of funds for the building of new vessels conditional upon the scrapping of old vessels whose tonnage is equal to or, in some cases, less than, 20% of the new construction work.

One of the Commission's proposals was that a subsidy should be granted for the definitive reduction of production capacity (definitive stoppage subsidy). This idea has been incorporated in recent regional legislation, which has also extended the subsidy - at a lower rate - to vessels that are scrapped and replaced with newly built vessels.

Another of the proposals was a subsidy for temporarily laying up vessels. This should be granted only if the competent authorities decide at given periods to ban specific types of fishing, and would apply only to vessels fitted out for the prohibited fishing methods.

The Commission has also made what appear to be adequate proposals regarding Community contribution towards charges associated with compensation payable to fishermen as a result of those measures.

With regard to intervention at structural level, it is considered that the current provisions for financial support from the Community through its various funds (the European Agricultural Guidance and Guarantee Fund, the Regional Fund, the Social Fund) might be applied to all the action that is to be taken. The Community should enter into a more specific commitment to support research and surveillance at sea (for instance by assisting with the cost of building patrol boats to be allocated to the harbour offices), product promotion, consumer guidance and vocational training, since intervention in such matters comes within the sphere of joint action in implementation of EEC policies.

7.2 National measures

In essence, legislative measures should be designed to reorganize and improve the quality of departments with responsibility for fishing matters and to promote action in the fields of public works (ports and communications), research and experiment (by establishing experimental stations and supporting university institutes), teaching and vocational training, etc.

The Government should also insure that any action is consistent with measures adopted by the Community and the regional authorities, one of the purposes being to make arrangements for the financial aid required in participating in projects well in advance.

7.3 Regional measures

As expected, the Sicilian Region has already approved the law on "measures for the rationalization of the fishing industry in Sicily", although objections have beem made both by the Government Commissioner and by the Community regarding some of its clauses.

8. PROMOTIONAL MEASURES

8.1 Improving the marine environment

A plan is now being formulated for the construction of artificial barriers offshore from Terrasini, and similar projects might be planned elsewhere.

The creation of fish preservation and restocking zones is desirable, one of the aims being to increase the return from boats of lower tonnage and power that fish off the coast.

8.2 Consumer guidance

Promotional efforts are needed to publicize the type of fish that is in abundant supply, especially the fatty fish. There is a need for the planning and implementation of advertising and information campaigns at every level as well as experimental ventures in marketing and distribution (pilot sales outlets, etc.).

8.3 Vocational options for young people

Existing vocational training institutes run by the State (in Palermo, Catania, Trapani, Porto Empedocle, Mazara del Vallo, Sciacca, Riposto, Siracusa and Lampedusa), which train young people for diplomas as "sailing master on fishing vessels" and "class 2 engineer" should be expanded and courses should be introduced that provide training for diplomas as fishing master, refrigeration engineer, radar operator and net hand, jobs which are in increasing demand.

There is also a growing need for a college that would train youngsters to work and take managerial responsibilities in cooperatives, thus creating a core of competent and energetic people who would breathe life into the ideals of association.

9. INTEGRATED MEASURES

From our review of the fishing industry up to this point, we have seen that it is concentrated mainly in Western Sicily, more especially in that stretch of the coastline that extends from Trapani to Porto Empedocle. This is also the part of Sicily in which the greatest problems are to be found, and where there is most obvious potential for balanced growth in the industry.

The whole of this stretch of coast would be a suitable terrain for a wide-ranging integrated project, covering every phase from research to the processing and marketing of fish. Certain projects are already in existence, or in the pipeline, which could be integrated and coordinated to achieve very valuable results.

The following is a summary list of the projects that already exist and the steps that might be taken.

A. Research, education, training

1. Research laboratory now being set up by the National Research Council in Mazara del Vallo.
2. Fish farming research centre to be established in Trapano or Marsala.
3. State-run vocational training institutes in Trapani, Porto Empedocle Mazara del Vallo and Sciacca, which might be expanded.
4. Establishment of training courses for fishermen, in cooperation with laboratories, research centres, institutes and vocational and union bodies.
5. Establishment of a school to train managerial staff for cooperatives (in the field of production, processing and marketing).

B. Physical structures

1. Measures to expand and/or modernize ports and port facilities in Trapani, Marsala, Mazara del Vallo, Sciacca and Porto Empedocle.

2. Improvements to market structures in Trapani, Marsala, Mazara del Vallo, Sciacca and Porto Empedocle.

3. Measures to create fish storage capacity, to be managed by fishermen's cooperatives.

4. Improvements to the fatty fish processing facilities, particularly in Sciacca and other centres, including encouragement to change to freezing methods.

5. Creation of a unit breeding young fish in Trapani or Marsala.

6. Use of the salt marshes in Trapani and the shallow lake in Marsala for fish farming projects.

C. Organizational structures

1. Campaign for the creation of fishermen's cooperatives or associations to run their own markets.

2. Vertical integration of fishing and processing, one of the methods being to provide incentives for joint ventures.

3. Creation of marketing consortia to serve a group of processing firms.

CONCLUSIONS

Our research has highlighted the serious gaps in our knowledge of the fishing industry.

The absence of dependable information on landings and, as a consequence, the unreliability of calculations designed to assess existing and potential resources make it impossible to give confident guidance as to the advisability of incentives or disincentives for fishing efforts or as to the optimum type of fishing boat.

Nevertheless, in the light of the information compiled from experts in the industry, there is general recognition of the desirability of a temporary freeze on the size of the fleet (and fishing effort) used for trawling until further investigation has been carried out; it appears that there is further potential for the fishing of pelagic species, using ring nets, and for special types of fishing.

The report has emphasized the need for providing incentives for modernizing the fleet: especially in the lower tonnage categories, this includes a large proportion of old boats. At the same time, any increase in total tonnage is undesirable.

Research structures and bodies should be created and administration and statistical departments expanded and reorganized. In addition, efforts should be made to protect and preserve marine fauna. General measures should be adopted to stop even further pollution of the coastal waters, and specific measures should be taken to create preservation and restocking zones, place seasonal restrictions on certain types of fishing, form artificial barriers and promote fish farming.

The survey has also thrown light on the serious shortcomings in fishing industry structures and infrastructure (ports, markets, communications, utilities); the unsatisfactory links between production and marketing, which make it easier for the wholesale dealers, who own most of the fish storage capacity, to indulge in speculation; the deficiencies of the

traditional processing industry; and the problems of labour. The cases quoted as examples of the financial return obtained by fishing concerns and crews' earnings are average-to-optimum instances of fishing concerns operating from the larger fishing bases with the strongest tradition; it is clear that these cases are not necessarily typical of the situation in Sicily as a whole or of all crews. It should also be pointed out that the per capita annual earnings may seem high in some instances but they are for extremely tough and hazardous jobs with no set working hours.

These are the factors that discourage young people from coming into the fishing industry; an additional factor is the difficulty of acquiring qualifications except on the job.

Legislation on the fishing industry and measures under discussion in the European Community and in national and regional bodies provide for possible intervention in all aspects of that industry.

It must be acknowledged that the lack of information on the fishing industry and uncertainty as to future relations with North African coastal nations place restrictions on the choice of intervention measures. Nevertheless, there is a degree of interference and overlapping between the measures being proposed by the different decision-making bodies; in some cases, these measures are in conflict. This is a sign of lack of coordination and the failure to define individual spheres of responsibility.

The Mediterranean has special problems that do not arise in the other seas with which the Community is concerned, both in biological and in economic and political terms. Specific measures are needed, and it would be difficult to incorporate these in a body of regulations that is applicable to all waters. Within the general context of Community measures, it would be desirable for the regional authority to be allowed greater flexibility of choice when deciding on the courses of action that will achieve our shared objectives, since it has been given the statutory authority and power to deal with such matters.

LIST OF ENCLOSURES

Appendix 1 - Fishing yields in Sicily (tonnes)

	Tonnes	Anchovy Sardine Mackerel	Other fish	Total	Molluscs	Crustaceans	Total
1967	1 756	12 029	28 175	41 960	5 718	2 384	50 063
1968	1 461	12 423	22 871	36 757	6 042	2 522	45 321
1969	1 485	12 259	21 852	35 588	5 957	2 676	44 232
1970	778	15 002	22.449	38 229	5 840	2 671	46 740
1971	1 366	11 551	25.146	38 064	6 014	2 977	46 957
1972	1 296	12 456	28 527	42 279	6 203	3 657	52 140
1973	550	12 717	28 232	41 498	6 766	4 808	53 072
1974	1 146	14.151	29 289	44 587	6 935	5 761	57 283
1975	1 489	13.368	38 013	52.870	9 803	8 139	70 092
1976	1 407	13.182	38 696	53.285	8 871	7 746	69 902
1977	1 089	11.303	33 188	45 580	9 548	7 309	62 437

Source: ISTAT

Appendix 2 - Monthly breakdown of catch in Sicily

	1968		1972		1976		1977	
	Tonnes	%	Tonnes	%	Tonnes	%	Tonnes	%
Jan	1 893.9	4.2	2 893,6	5,6	3 609.0	5.2	3 606.0	5.8
Feb	2 798.2	6.2	2 956.5	5,7	3 297.0	5.7	4 098,0	6.6
Mar	3 396.8	7.5	3 618.7	6,9	4 608.0	6.6	6 138.0	9.8
Apr	3 957.2	8.7	3 778.8	7.2	5 378,0	7,6	4 797,0	7.7
May	4 808.1	10.6	5 804,5	11.1	7 436,0	10.6	7 673.0	12.3
Jun	5 548.2	12.2	6 636.0	12.7	7 750.0	11.1	6 301.0	10.1
Jul	5 138.3	11.3	5 281.9	10.1	6 598.0	9.4	5 832.0	9.3
Aug	5 274.0	11.6	4 970.7	9,6	6 346.0	9.1	6 186,0	9,9
Sep	4 809.5	10.6	5 121.4	9.8	8 259.0	11.8	5 057,0	8.1
Oct	3 218.7	7.1	4 297.5	8.3	6 421.0	9.2	4 911,0	7.9
Nov	2 597.1	5.7	3 601.5	6.9	4 107.0	5.9	3 772,0	6.0
Dec	1 881,8	4.3	3 178.9	6.1	5 456.0	7.8	4 066.0	6.5
Year	45 322.0	100.0	52 140.0	100.0	69 902.0	100.0	62 437.0	100.0

Sources: ISTAT

Appendix 3 - Engine-powered fishing fleet in commission - Sicily

	TRAWLERS			MOTOR BOATS			TOTAL	
	No.	g.r.t.	HP	No.	g.r.t.	HP	g.r.t.	HP
1968	721	33 599	109 781	3 920	11 872	58 191	45 471	167 972
1969	744	37 490	121 302	3 990	12 527	62 641	50 017	183 943
1970	767	38 992	129 248	4 003	12 923	65 236	51 915	194 484
1971	779	39 920	134 261	4 034	13 435	68 817	53 355	203 078
1972	801	42 200	143 838	4 076	13 910	73 256	56 110	217 094
1973	822	43 314	150 125	4 111	14 504	78 232	57 818	228 357
1974	841	44 775	157 853	4 100	14 672	80 715	59 447	238 568
1975	868	46 869	168 853	4 117	15 705	86 201	62 574	255 054
1976	869	47 308	171 882	4 096	15 780	88 242	63 088	260 124
1977	888	48 729	180 082	4 105	15 920	90 720	64 649	270 802

Source: ISTAT

Appendix 4 - Engine-powered fishing fleet in commission - breakdown by maritime district

Maritime district	Trawlers				Motor boats			
	1968	1972	1976	1977	1968	1972	1976	1977
Messina	22	22	25	27	827	877	966	984
Palermo	99	103	108	106	1424	1478	1403	1380
Trapani	266	284	330	159	548	564	557	463
Mazara del V.				176				85
Porto Empedocle	211	236	241	249	298	295	288	284
Siracusa	68	80	85	91	384	270	261	262
Augusta		10	14	14		138	134	140
Catania	55	66	66	66	439	454	487	507
Sicilian coast	721	801	869	880	3920	4076	4096	4105

Source: ISTAT

Appendix 5 - Engine-powered fishing fleet - breakdown by maritime district and gross tonnage

Maritime district	up to 20 t		21-50 t		51-100 t		over 100 t	
	No.	g.r.t	No.	g.r.t.	No.	g.r.t.	No.	g.r.t
				1968				
Messina	899	2 690	14	400	-	-	2	999
Palermo	1 685	5 085	54	1 874	7	544	12	7.703
Trapani	699	1 639	125	4 278	72	5 319	33	4 478
Porto Empedocle	430	2 375	147	4 427	10	702	2	270
Siracusa	498	1 982	44	1 313	16	1 323	8	1 041
Augusta	-	-	-	-	-	-	-	-
Catania	477	2 051	33	974	-	-	-	-
SICILY	4 668	15 822	417	13 266	105	7 788	57	14 491
%	89.0	30.8	7 9	25,8	2.0	15,2	1,1	28,2
				1972				
Messina	951	2 858	17	462	1	65	2	999
Palermo	1 777	5 545	59	2 119	11	710	61	4 610
Trapani	716	2 474	124	4 259	61	4 610	67	9 716
Porto Empedocle	431	2 312	175	5 446	16	1 113	11	1 543
Siracusa	370	1 593	74	2 173	16	1 246	7	952
Augusta	160	679	4	98	-	-	1	158
Catania	485	2 152	50	1 527	2	150	-	-
SICILY	4 890	17 613	503	13 905	107	7 894	149	17 978
%	86.6	30.7	8,9	24.2	1.9	13,8	2.6	31.3
				1976				
Messina	1 045	3 439	26	701	2	135	1	103
Palermo	1 733	5 517	70	2 363	16	1 036	11	6 501
Trapani	750	2 800	133	4 572	69	5 099	107	15 956
Porto Empedocle	443	2 299	188	5 990	19	1 315	7	970
Siracusa	387	1 717	76	2 431	14	1 063	6	818
Augusta	163	661	8	261	-	-	1	158
Catania	507	2 320	53	1 668	5	353	3	415
SICILY	5 028	18 753	554	17 986	125	9 001	136	24 921
%	86.1	26.5	9.5	25.5	2.1	12.7	2.3	35.3

Source: ISTAT

Appendix 6 - Engine-powered fishing fleet - breakdown by maritime district and engine rating

Maritime district	1-109 HP	110-149 HP	150-249 HP	over 250 HP
		1968		
Messina	903	6	4	2
Palermo	1 691	31	23	17
Trapani	720	53	97	61
Porto Empedocle	493	63	27	6
Siracusa	511	21	21	13
Augusta	-	-	-	-
Catania	485	19	6	-
SICILY	4 803	193	178	102
%	91.0	3.7	3.4	1.9
		1972		
Messina	960	4	5	2
Palermo	1 783	32	24	19
Trapani	740	46	84	98
Porto Empedocle	503	68	42	20
Siracusa	397	28	28	14
Augusta	163	-	1	1
Catania	499	18	11	9
SICILY	5 045	196	195	163
%	90.1	3.5	3.5	2.9
		1976		
Messina	1 013	29	26	6
Palermo	1 692	51	45	24
Trapani	760	51	102	146
Porto Empedocle	499	80	71	18
Siracusa	369	38	54	22
Augusta	164	4	2	2
Catania	498	24	29	17
SICILY	4 995	277	329	235
%	85.6	4.8	5.6	4.0

Source: ISTAT

Appendix 7 - Engine-powered fishing fleet - breakdown by maritime district and fishing method

Maritime district	Trawling		Encircling		Trammel or long-line		Other methods		Multiple methods	
	No.	g.r.t.	No.	g.r.t.	No.	g.r.t.	No	g.r.t.	No.	g.r.t.
					1968					
Messina	15	1263	58	221	339	898	75	264	428	1443
Palermo	30	1509	107	633	215	384	182	7150	1225	5430
Trapani	195	12595	139	1805	301	1270	202	498	94	384
Porto Empedocle	195	5406	60	830	192	708	33	142	109	688
Siracusa	41	2705	57	740	212	737	99	373	157	1104
Augusta	-	-	-	-	-	-	-	-	-	-
Catania	8	265	17	212	119	714	45	104	321	1730
SICILY	484	23743	438	4441	1378	4711	636	8531	2334	10779
%	9.1	45.4	8.3	8.5	26.2	9.0	12.1	16.3	44.3	20.7
					1972					
Messina	15	1326	53	195	348	995	84	295	471	1573
Palermo	32	1528	105	667	340	450	179	6817	1302	6386
Trapani	215	17215	130	1550	314	1300	199	502	110	492
Porto Empedocle	242	8134	50	714	192	645	33	140	116	781
Siracusa	55	3149	35	568	137	510	97	450	143	1287
Augusta	3	196	17	95	84	357	18	49	43	238
Catania	11	416	18	213	135	1058	52	184	321	1958
SICILY	573	31964	408	4002	1550	5315	662	8437	2506	12715
%	10.1	51.1	7 2	6,4	27.1	8.5	11.6	13.6	44.0	20,4
					1976					
Messina	13	391	50	203	347	1057	110	431	554	2296
Palermo	46	1587	113	982	253	500	177	6045	1241	6903
Trapani	275	24009	117	1480	330	1403	201	576	136	959
Porto Empedocle	248	8259	51	645	193	654	35	144	130	872
Siracusa	64	3108	36	510	145	522	94	376	144	1513
Augusta	4	264	16	106	81	334	25	69	46	307
Catania	19	536	20	287	130	1099	52	253	353	2582
SICILY	663	38154	403	4213	1479	5569	694	7894	2604	14832
%	10,8	54.0	6.6	6,0	24.0	7.8	11.3	11.2	42.3	21.0

Source: ISTAT

Appendix 8 - Engine-powered fishing fleet - breakdown by maritime district and age of hull

Maritime district	Up to 5 years old			6 - 10			11-20			21 and over			Age unknown		
	No.	g.r.t.	HP	No.	g.r.t	HP	No.	g.r.t.	HP	No.	g.r.t	HF	No.	g.r.t.	HP
	1968														
Messina	182	1539	5574	236	801	4180	324	1070	4747	169	669	3158	4	10	136
Palermo	513	7166	2192	194	480	2305	480	3723	10882	554	3675	13763	17	62	290
Trapani	84	3257	11593	148	2586	8763	337	5440	17579	335	5206	17771	27	63	202
Porto Empedocle	61	1178	4941	26	238	848	218	2851	10223	254	3387	13019	30	120	544
Siracusa	98	1033	6036	131	535	2511	188	1617	6074	143	2442	8067	6	32	173
Augusta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Catania	162	1401	7810	120	506	2672	135	583	2347	93	535	3301	-	-	-
SICILY	1100	15574	57046	856	5146	21279	1682	15284	51852	1548	15914	57893	84	287	1445
%	20.9	29.8	30.1	16.2	9.9	11.2	31.9	29.3	27.4	29.4	30.5	30,5	1.6	0.5	0,8

Source: ISTAT

Appendix 8/1 - Engine-powered fishing fleet - breakdown by maritime district and age of hull

Maritime district	Up to 5 years old			6-10			11-20			21 and over			Age unknown		
	No.	g.r.t	HP	No.	g.r.t.	HP	No.	g.r.t	HP	No.	g.r.t.	HP	No.	g.r.t	HP
	1972														
Messina	119	465	3701	205	1668	6166	386	1334	6686	257	877	4123	4	10	136
Palermo	248	6123	15905	477	3612	13931	398	1293	5814	721	4772	17630	14	48	242
Trapani	107	6671	22875	95	3589	12356	318	4324	15272	421	6418	22783	27	57	248
Porto Empedocle	58	2137	8985	68	1449	5639	319	2340	8474	299	4391	16918	27	97	416
Siracusa	54	844	5553	112	1120	7352	149	1214	5081	147	2764	9907	5	22	92
Augusta	34	407	1954	22	135	642	66	254	1223	42	131	563	1	8	96
Catania	92	1175	7871	146	1168	6544	175	703	3190	124	783	3301	-	-	-
SICILY	712	17852	66844	1125	12741	52630	1673	11462	45740	2011	20136	75225	78	242	1230
%	12.7	28.6	27.7	20.1	20.4	21.8	29.9	18.4	18.9	35.9	32.2	31,1	1	0.4	0,5

Source: ISTAT

Apppendix 8/2- Engine-powered fishing fleet - breakdown by maritime district and age of hull

Maritime district	Up to 5 years old			6-10			11-20			21 and over			Age unknown		
	No	g.r.t	HP	No	g.r.t	HP	No	g.r.t	HP	No	g.r.t	HP	No.	g.r.t.	HP
	1976														
Messina	196	1139	10161	194	723	4947	417	1445	8628	262	1054	4879	5	17	211
Palermo	236	3359	12384	451	5948	17913	374	1303	6107	756	4762	18843	13	45	210
Trapani	166	10343	38695	113	4932	17113	311	5435	19057	445	7662	28357	24	55	223
Porto Empedocle	55	1469	6427	88	1873	8067	161	2241	8152	327	4900	19095	26	91	436
Siracusa	70	853	6368	101	1224	8242	161	1291	5824	146	2639	10127	5	22	92
Augusta	33	425	2132	17	115	610	72	334	1492	49	198	787	1	8	96
Catania	133	1896	11609	152	1427	8735	168	688	3513	115	746	2979	-	-	-
SICILY	889	19484	87776	1116	16242	65627	1664	12737	52773	2100	21961	85067	74	233	1268
%	15.2	27.6	30.0	19.1	23.0	22.4	28.5	18.0	18.0	35.9	31.1	29.2	1.3	0,3	0,4

Source: ISTAT

Appendix 9 - Engine-powered fishing fleet equipped for the storage of fish products - breakdown according to maritime district, 1977

Maritime district	Refrigerated hold	Ice-chest	Refrigerated hold and ice-chest	No equipment
Messina	8	40	1	1,046
Palermo	21	273	9	1,517
Trapani	48	124	6	585
Mazara del V.	114	106	15	60
Porto Empedocle	60	140	20	449
Siracusa	44	85	6	361
Augusta	3	15	1	158
Catania	17	81	13	477
Sicilian coast	315	864	71	4,653
g.r.t.	30 410	19 624	4 849	17 633
HP	100 454	89 034	18 800	96 926

Source: ISTAT

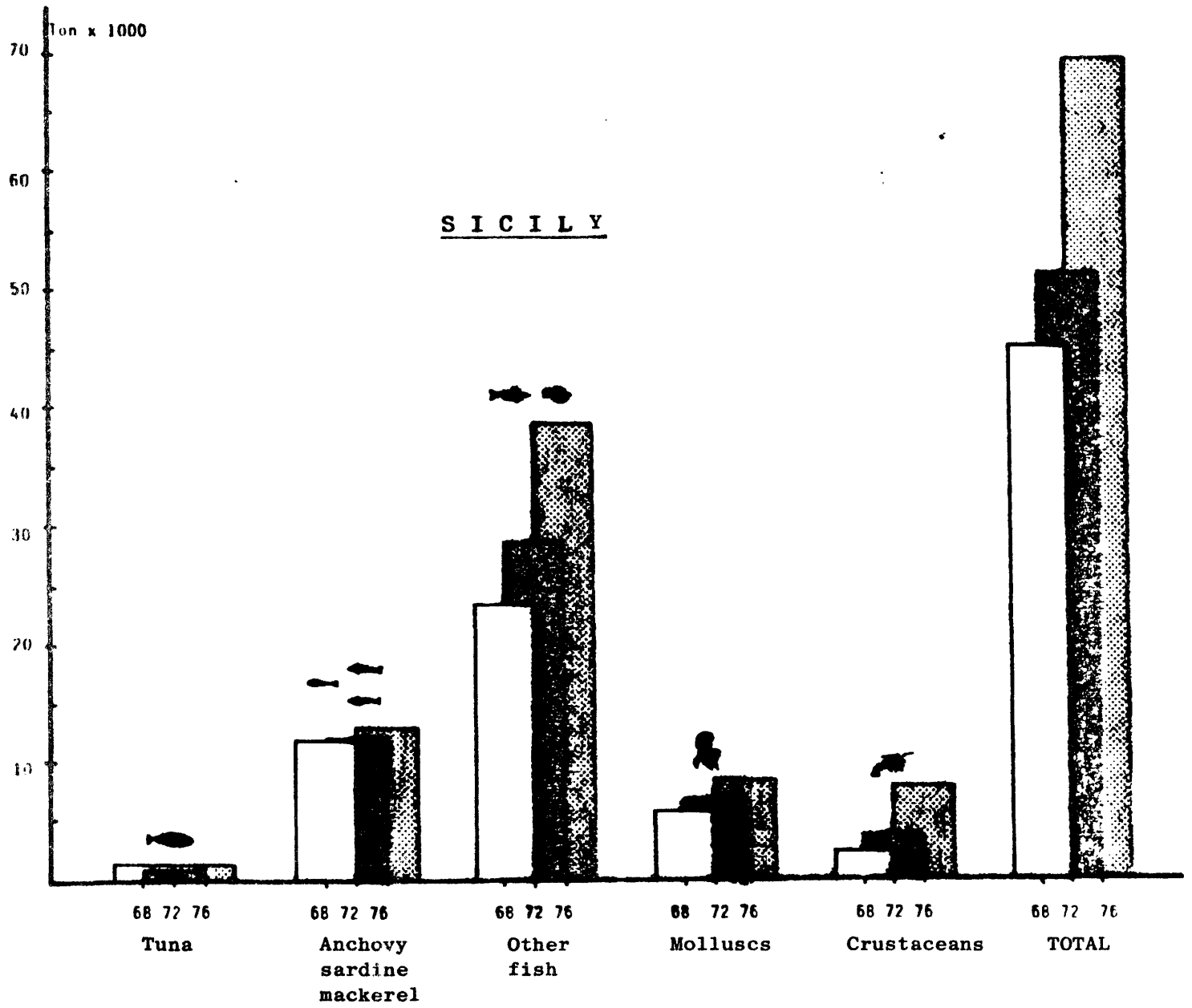
Appendix 10 - Quantity of catch (1977) by maritime district (Harbour Offices data), tonnes

Maritime district	Fish				Molluscs	Crustaceans	Total
	Tuna	Anchovy Sardine Mackerel	Other fish	Total			
Messina	238	1,080	2,340	3,658	492	98	4,248
Palermo	40	2,107	1,413	3,560	967	176	4,703
Trapani	627	6,161	4,677	11,465	1.172	372	13,009
Mazara del V.	-	700	22,800	23,500	8,500	5,000	37.000(1)
Porto Empedocle	10	3,331	3,406	6,747	1,158	1,045	8,950
Siracusa	229	587	850	1,666	211	116	1,993
Augusta	4	40	100	144	12	8	164
Catania (2)	100	600	1.500	2,200	500	20	2,720
Sicilian coast	1,248	14,606	37,086	52,940	13,012	6,835	72,787

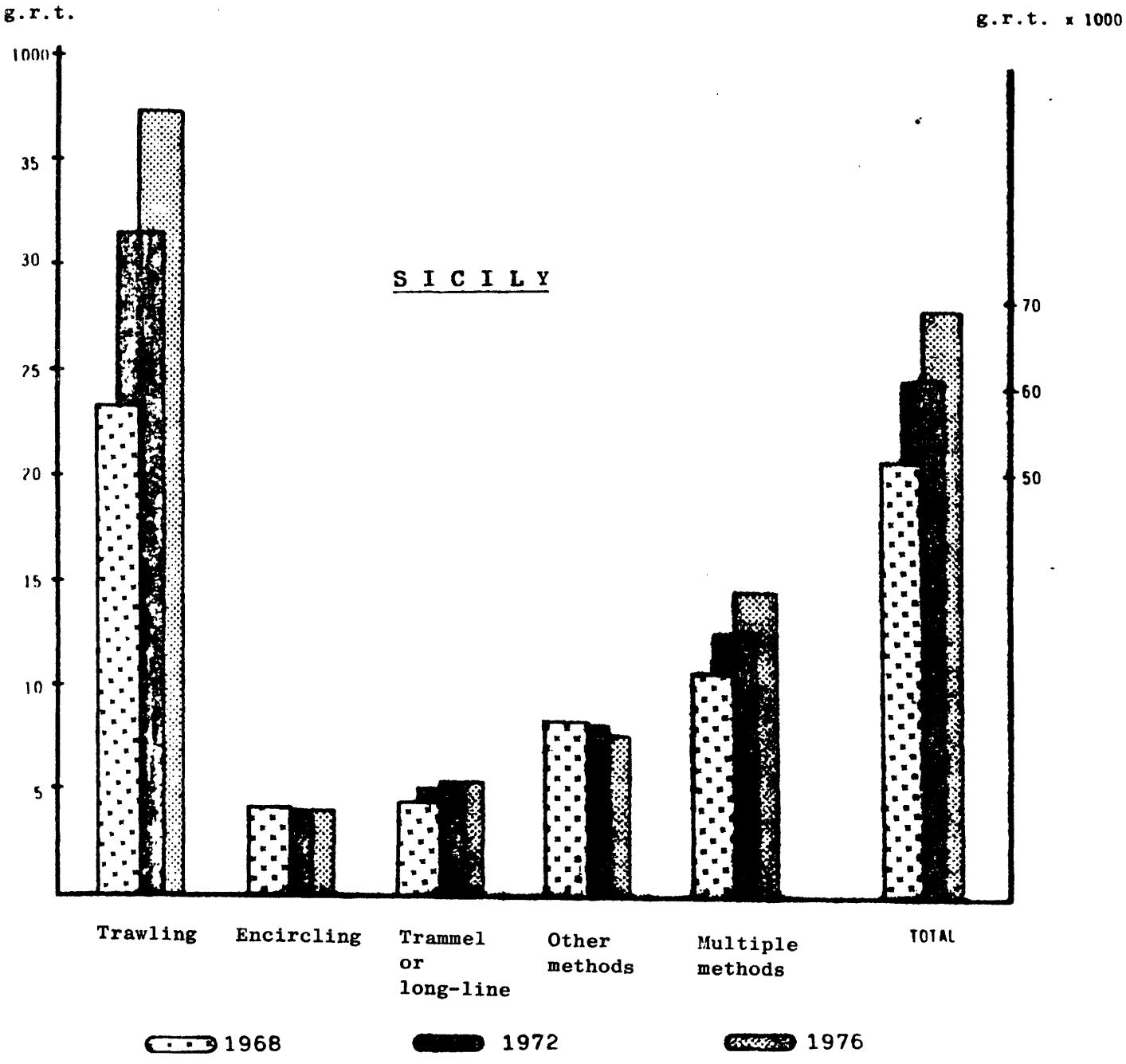
(1) According to other sources, the catch fished from Mazara del Vallo is about 80,000 tonnes, to a value of over Lit.180,000 million.

(2) Our own estimate.

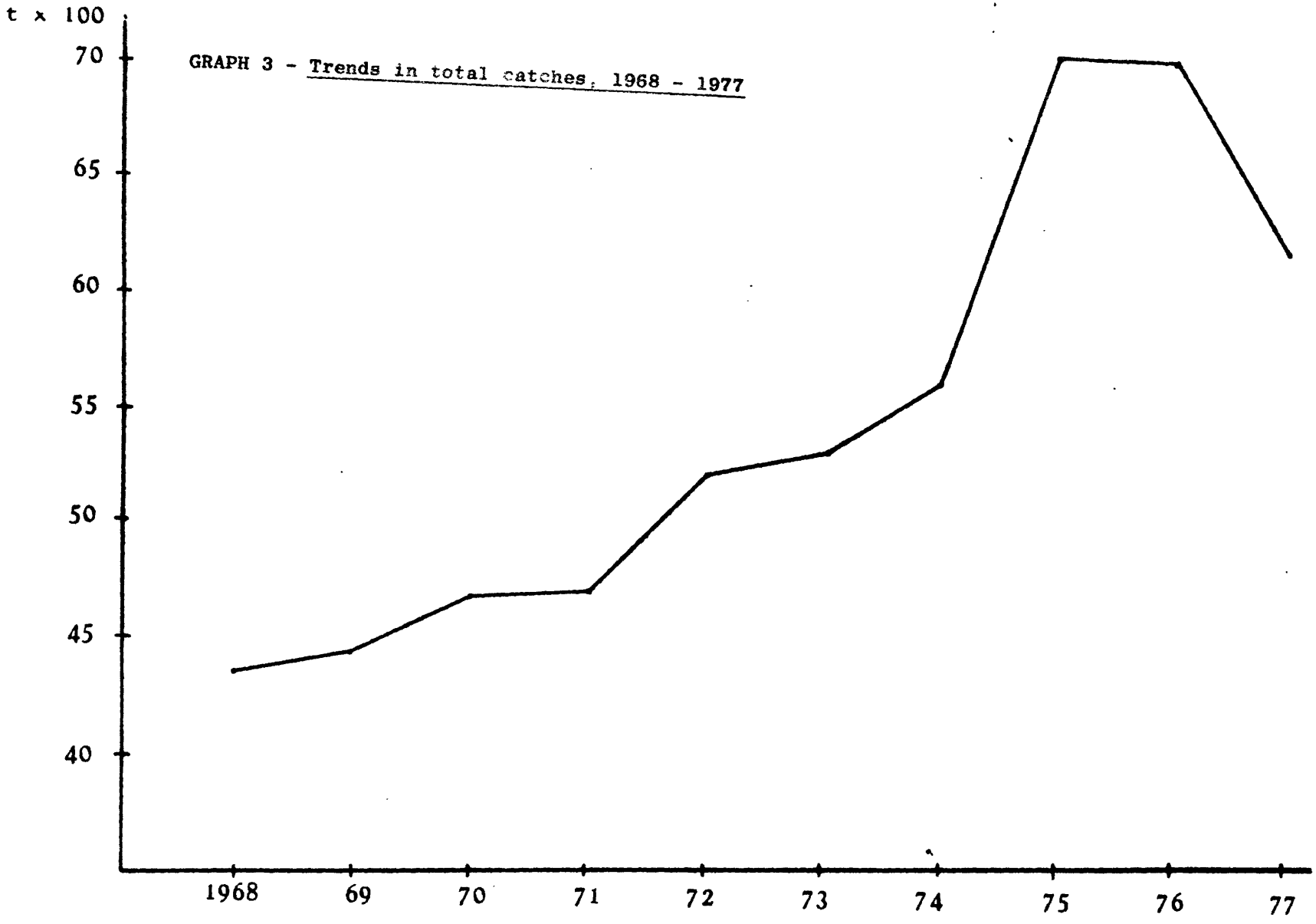
GRAPH 1 -Trends in fishing according to species
in the Sicilian region - 1968, 1972 and 1976



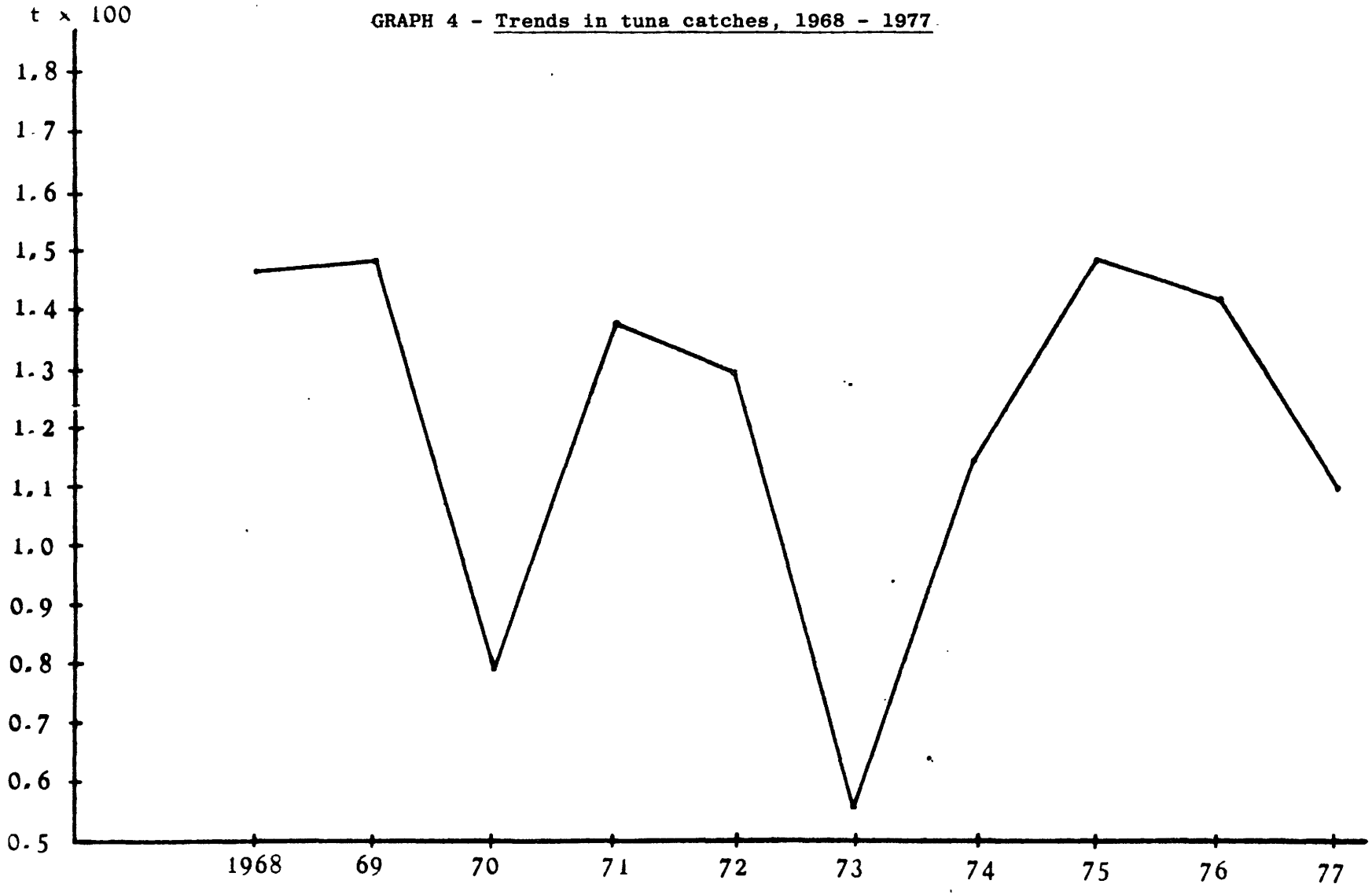
GRAPH 2 - Trends in gross registered tonnage of the fishing fleet in the Sicilian region based on type of fishing gear

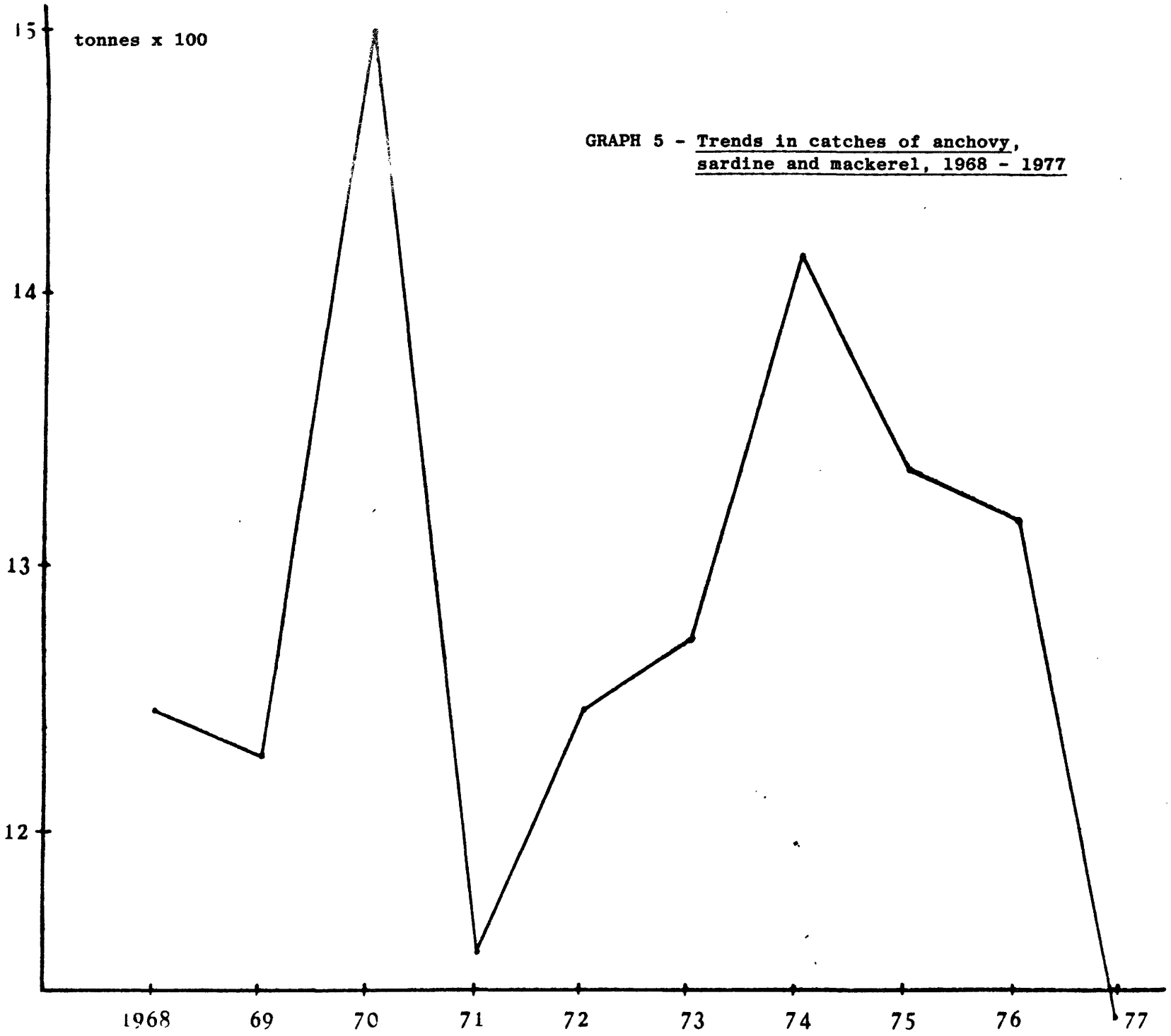


GRAPH 3 - Trends in total catches, 1968 - 1977



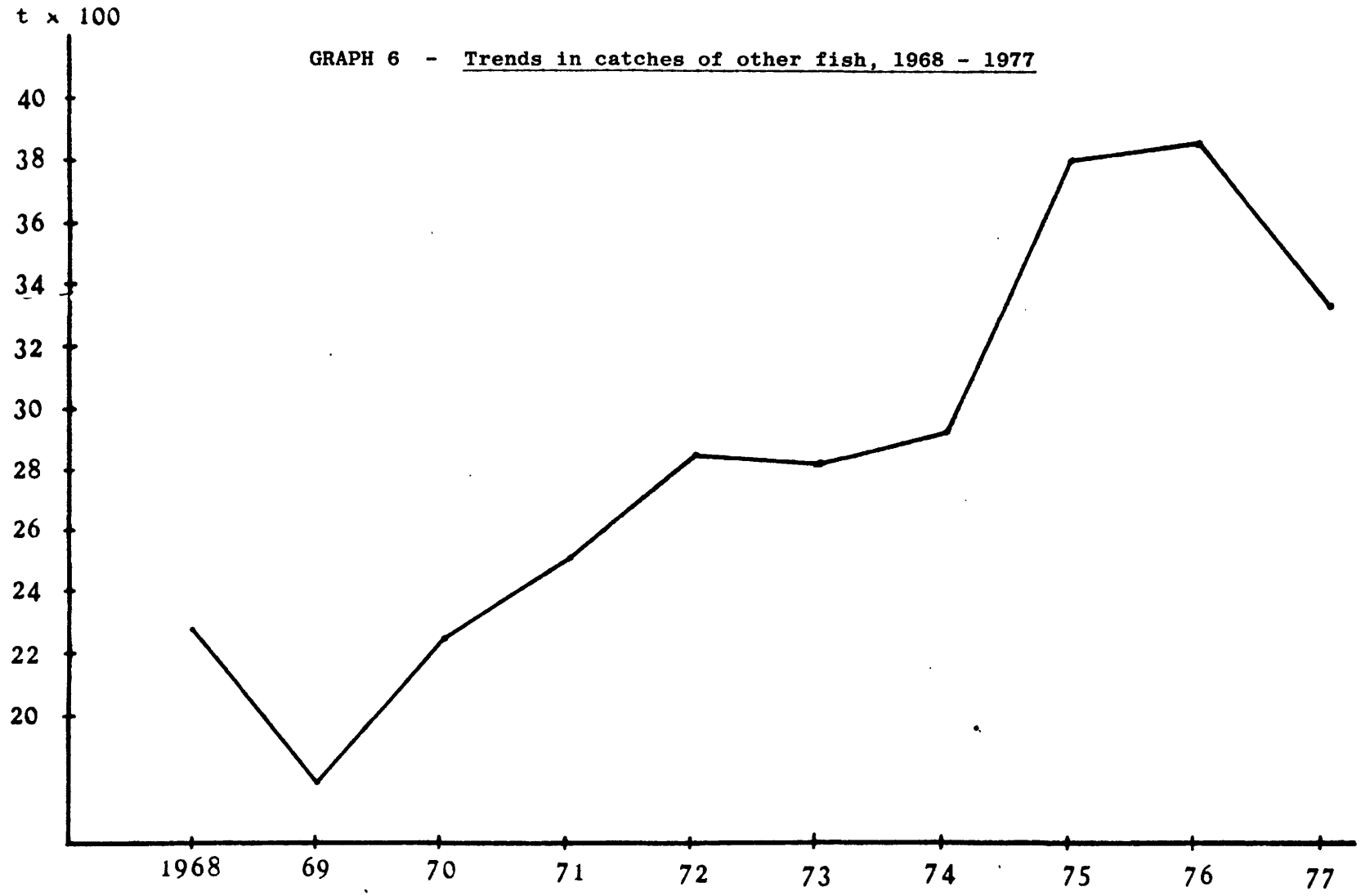
GRAPH 4 - Trends in tuna catches, 1968 - 1977

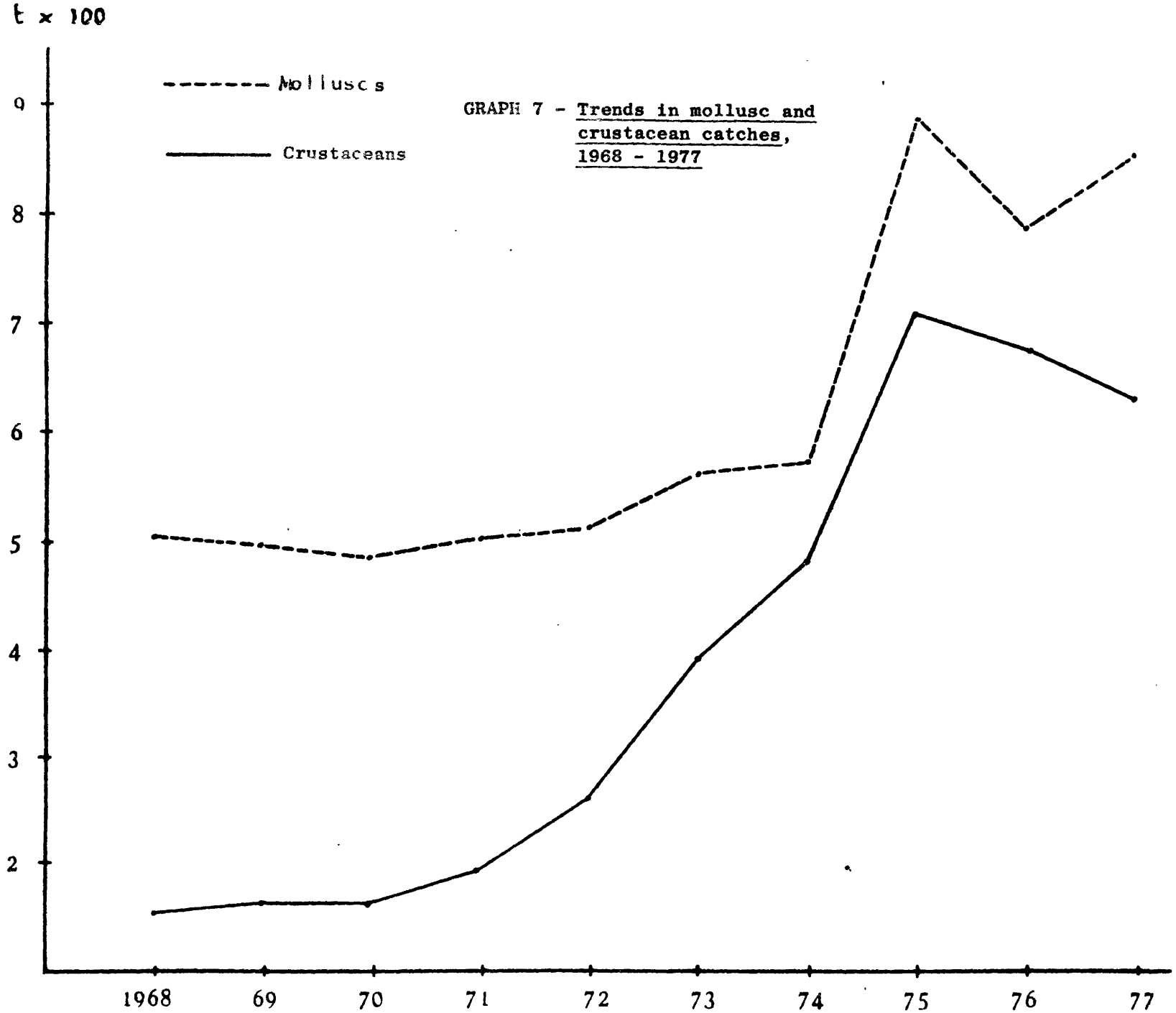




GRAPH 5 - Trends in catches of anchovy, sardine and mackerel, 1968 - 1977

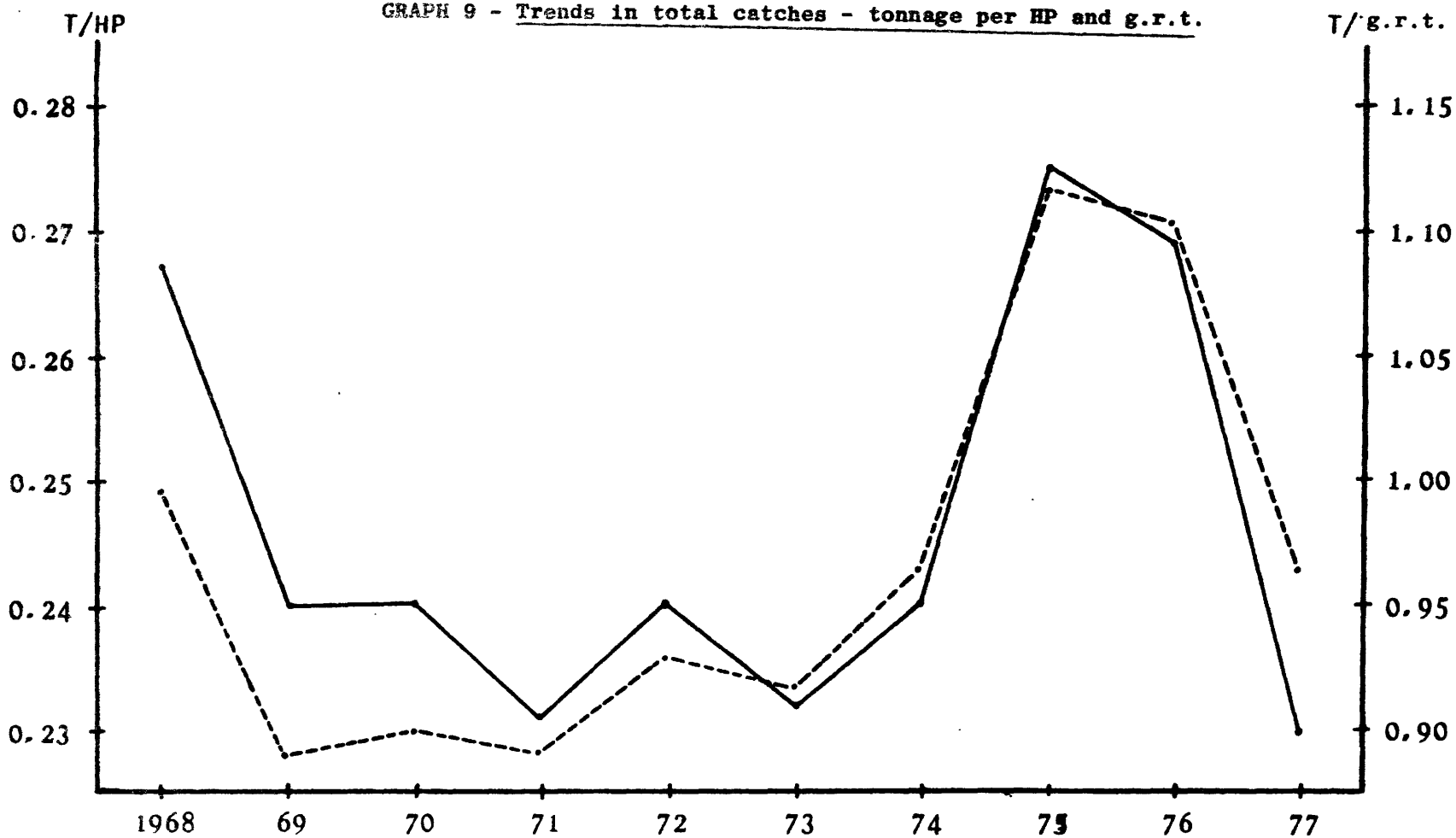
GRAPH 6 - Trends in catches of other fish, 1968 - 1977

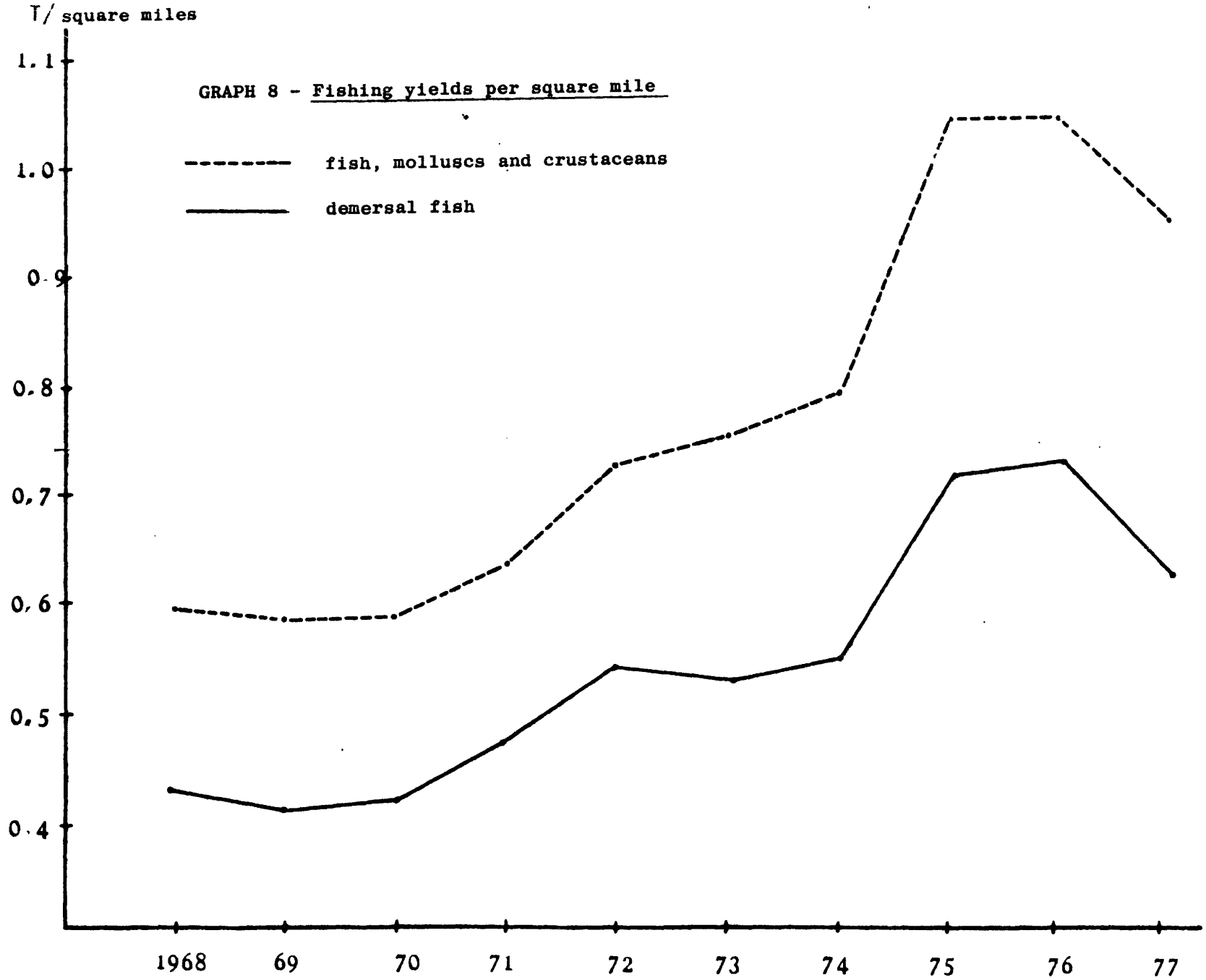




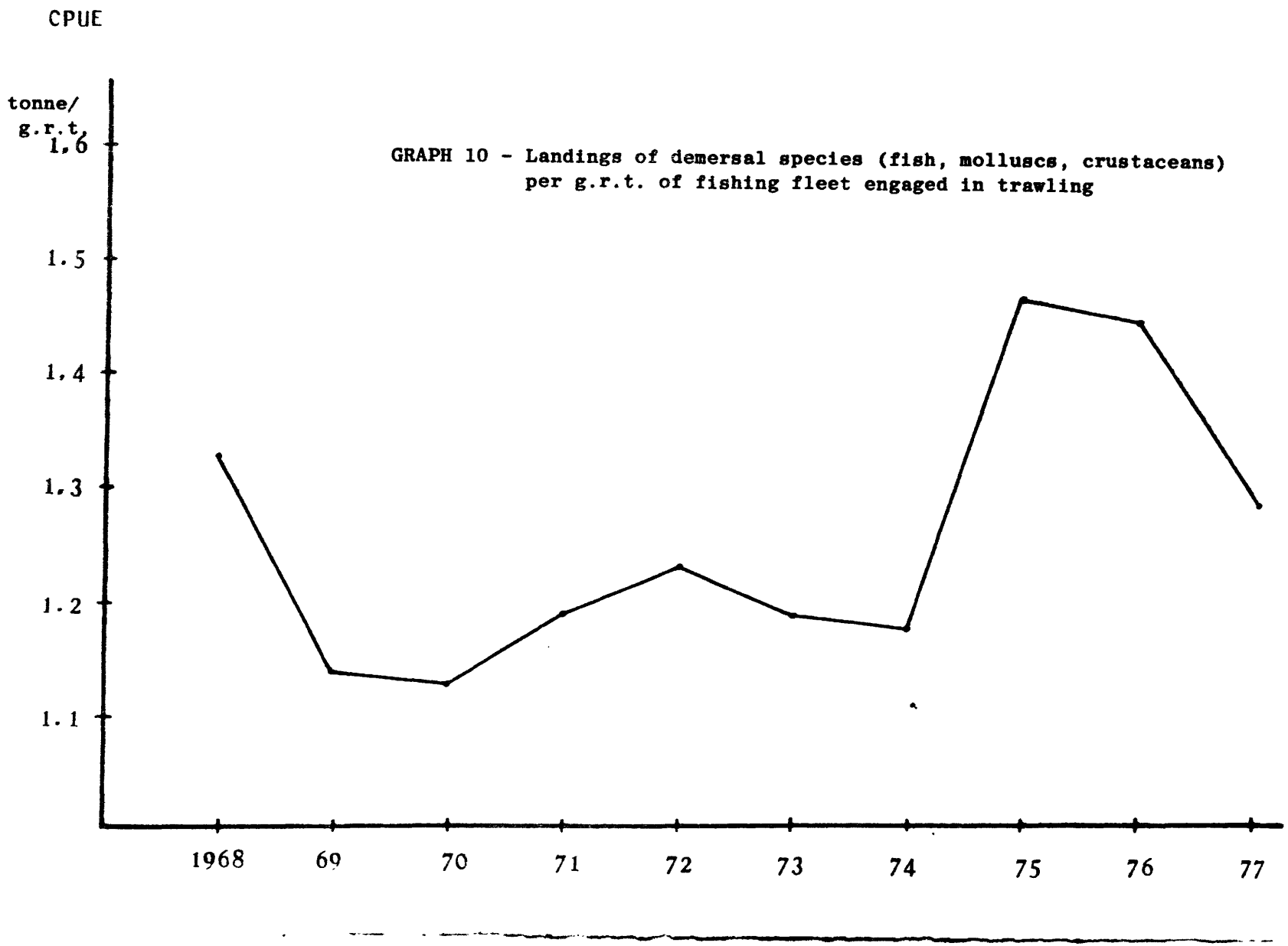
GRAPH 7 - Trends in mollusc and crustacean catches, 1968 - 1977

GRAPH 9 - Trends in total catches - tonnage per HP and g.r.t.



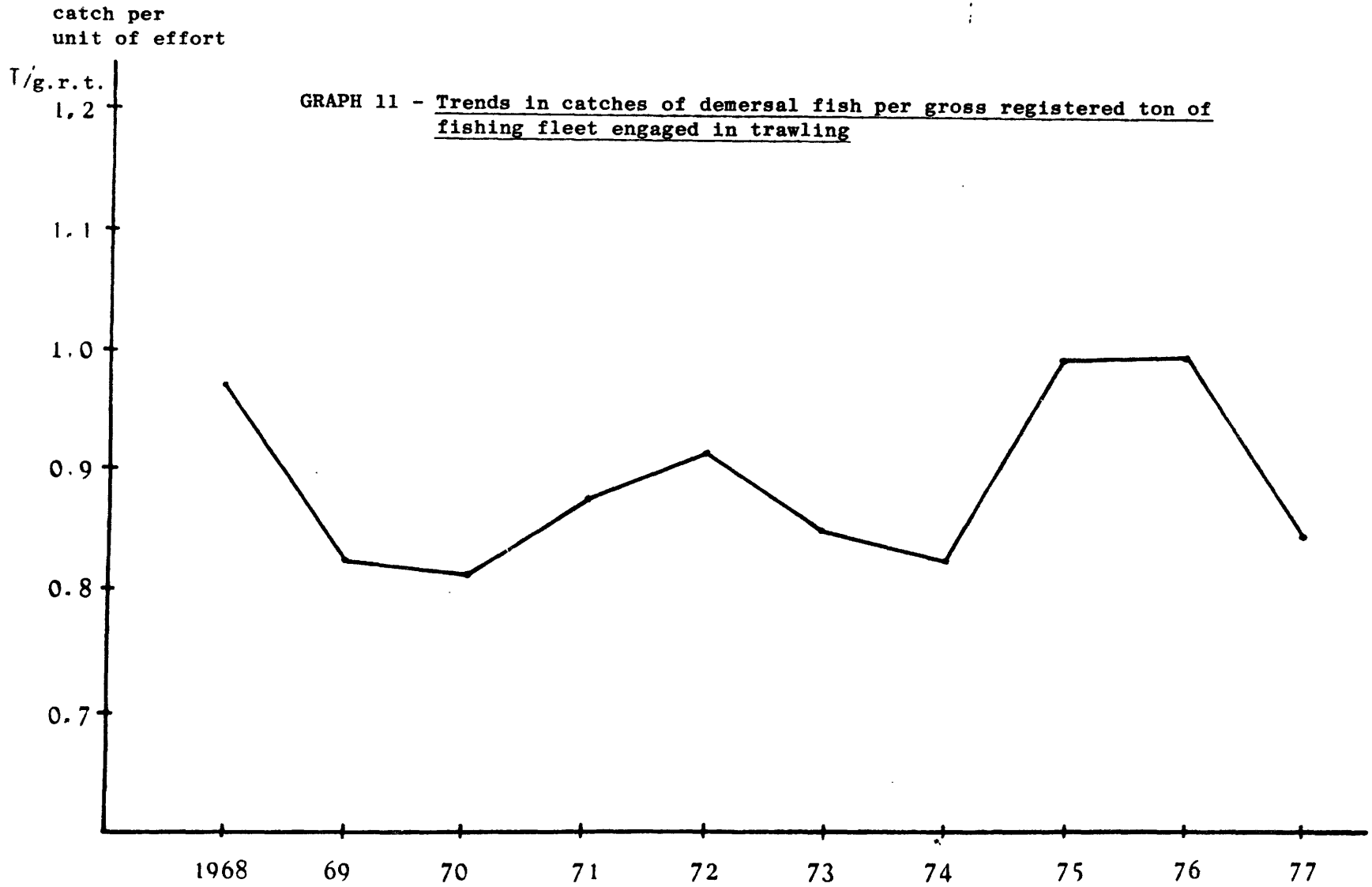


GRAPH 8 - Fishing yields per square mile



GRAPH 10 - Landings of demersal species (fish, molluscs, crustaceans) per g.r.t. of fishing fleet engaged in trawling

GRAPH 11 - Trends in catches of demersal fish per gross registered ton of fishing fleet engaged in trawling



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PART III - OBJECTIVES TO BE PURSUED AND NECESSARY MEASURES

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