THE IRISH SEA FISHING INDUSTRY

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THE

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INDUSTRY

R. O'Connor

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INTRODUCTION

In recent years fish has come to be regarded as a health food. The result is an increase in fish consumption throughout the world. In Ireland annual per capita fish consumption increased by 1.2 kg or by 21 per cent between 1980 and 1987. Over the same period per capita consumption of the red meats beef, mutton and lamb declined by 5.9 kg or by about 16 per cent. Pig and poultry meat consumption however increased over those years.

The increased demand for fish has put pressure on fish stocks and a considerable amount of exploratory fishing is being carried out by EC countries in an effort to locate new fishing grounds and new species. Ireland is taking part in these explorations and fishermen are purchasing larger and larger boats to fish for new species like blue whiting and argentines (silver smelt). Most fish are now fetching relatively good prices particularly white fish species which seem to have grown scarce in recent years due no doubt to overfishing in earlier years.

The purpose of this paper is to look at the Irish sea fishing industry in order to describe what has been happening in recent years and to make suggestions for future policies.

The work is divided into seven chapters, with an introduction and an appendix. Chapter 1 gives details of fish landings in recent years, including the development of fish farming (aquaculture). It also shows the labour force employed in different sectors of the industry, discusses the regional importance of sea fishing and describes the structure of the fishing fleet.

Chapter 2 shows the average price per tonne for the more common fish species for the years 1973-1987. Salmon prices are examined in some detail in view of the rapid growth in recent years of farmed salmon. Indices of producer prices for demersal, pelagic and shellfish (constructed for the first time for this paper) are compared with similar indices for fat cattle, sheep, pigs and with consumer prices.

Chapter 3 deals with the utilisation of the catch in recent years showing the quantities sold fresh, frozen, smoked, preserved and made into fishmeal. The disposal of fish in the state as between imports, exports and home consumption is shown in this chapter also.

Chapter 4 describes the market for Irish fish and examines the fish processing sector. The difficulties facing white fish processors at the present time are discussed and suggestions made as to how the processing sector might be strengthened.

The scope for developing the catching sector is discussed in Chapter 5. Since this scope is highly dependent on the EC policies, the Common Fisheries Policy (CFP) is described in some detail. Catch projections for 1991 based on Bord Iascaigh Mhara's latest fishery plan are given and methods of achieving these projections are discussed.

The relationship between value added in sea fishing and State expenditure on this sector is examined in Chapter 6. Similar relationships for agriculture and industry are shown for comparative purposes.

Conclusions and recommendations are given in Chapter 7 where considerable attention is devoted to the processing sector and to the information requirements of the industry. The appendix contains a number of detailed tables.

Though the EC Common Fisheries Policy is described in some detail in Chapter 5, brief reference to certain aspects of this policy have of necessity to be made in earlier chapters. As these references may be confusing for some readers, a short description of some EC policies is given below.

The Quota System

To prevent overfishing, Total Allowable Catches (TACs) are fixed by the EC each year for certain fish species within the different zones of the Community waters. The TACs in the different zones are then allocated between the member states in the form of quotas. The species of interest to Ireland which are under quota are sole, plaice, megrim, cod, haddock, hake, whiting, saithe, pollack, herring, mackerel and Dublin Bay prawns. Some of the more important non-quota species caught by Irish fishermen are: horse mackerel, sprats, blue whiting, argentines, brill, turbot, dabs, ray/skate, dog fish and all the shellfish except Dublin Bay Prawns. There is no limit placed on the amount of these species which may be caught in EC waters. The method of fixing and allocating the quotas is described in Chapter 5.

The Withdrawal System

Since 1982, export refunds are not available for fish exports to third countries. Furthermore, the EC market is relatively unprotected against imports from third countries. Imports of fish raw material enter the market at either zero or very low rates of duty while imports of prepared/ preserved fish products generally command a higher rate of duty. These duty rates are embodied in bilateral agreements with third countries.

The main financial benefits of EC market regulations for Ireland at the present time centres on financial compensation for fish withdrawal arranged through producer organisations (POs). The EC fixes withdrawal prices each year for certain species of fish. Those of interest to Ireland are herring, haddock, whiting, cod, mackerel, saithe and plaice. If the market price for one of these species drops below the withdrawal price, fish may be withdrawn from the market and sold for non-food purposes at the best price available. For such withdrawals compensation payable by the EC through POs varies from 40 per cent to 85 per cent of the withdrawal price depending on the level of withdrawal as a percentage of landings by the PO. A further contribution on withdrawn fish may be made by the PO, funded by a levy on all fish sales.

Grant-Aid for Vessels

In Ireland, EC grant-aid is available for the purchase of vessels between 9 and 33 metres. These boats are eligible for FEOGA grants of 35 per cent of purchase price provided BIM gives a further grant of at least 10 per cent. Since 1987, EC grant-aid is available for boats over 33 metres but as BIM does not grant-aid such boats, the EC grant is not available here.

Modernisation grants are also available from the EC. The rates and conditions are the same as for boat purchase. Ireland does not give modernisation grants for boats over 33 metres.

Explanation of Some Terms Used in Text

Certain terms used in the text may be unfamiliar to some readers:-

Pelagic Fish

These are fish such as herring, mackerel, scad, sprats and blue whiting living in the surface waters or middle depths of the sea which move about from place to place. These form the main bulk of the Irish fish catch and are less valuable than the demersal species described below.

Demersal or Ground Fish

These fish are found on or near the bottom of the sea. The principal demersal species caught by Irish fishermen are: sole, brill, turbot, dabs, plaice, megrim, ray/skate, cod, haddock, hake, whiting, saithe, pollack, dog fish and monkfish. Most of these have white coloured flesh and are often referred to as white fish.

Fish Roe

This is a mass of fish eggs or milt. Herring roe is in strong demand in Japan.It is a type of caviar commanding a very high price. It is available only from female fish in the pre-spawning stage.

Wet Fish

These are ordinary soft fish as distinct from shellfish which are of two kinds, i.e., crustaseans - prawns, lobsters, crabs, etc., and molluscs, i.e., mussels, oysters, etc.

Chapter 1

GENERAL OUTLINE OF THE SEA FISHING INDUSTRY

Landings

Total sea fish landings into Irish ports increased from 25,000 tonnes valued at £1.4 million in 1963 to 217,000 tonnes valued at £70.2 million in 1987. (See Tables A.1 and A.2.) These figures include farmed shellfish but exclude the following fish the quantities and values of which in 1987 were:-

	tonnes	£000
Wild salmon	1,254	4,130
Wild sea trout	23	75
Farmed sea trout	320	690
Farmed salmon	2,232	10,120
Sea fish landed into foreign ports by Irish boats	6,373	6,826
Mackerel transhipped at sea	14,819	1,852
Total	25,021	23,693

Thus the total quantity of wild and farmed fish caught by Irish vessels or reared in Irish waters in 1987 was 242,000 tonnes valued at £93.9 million.

Herring was the most important single species of fishcaught in the early years, accounting for over 40 per cent of the weight and 18 per cent of the value of wet fish landed into Irish ports in 1963. At the present time the most important species is mackerel (see Table A.2) which species accounted for about 33 per cent of the weight and 18 per cent of the value of wet fish landed into Irish ports in 1987.

A species which has shown a large decline in recent years is whiting. The quantity landed dropped from 16,000 tonnes in 1981 to 7,000 tonnes in 1986. There was some increase however in 1987 when the quantity increased to about 9,000 tonnes.

A species which has become important in recent years is blue whiting. This is a non-quota species with landings of 10,227 tonnes in 1986 valued at £307,000. The blue whiting caught in Irish grounds are spent fish (fish which have spawned) and are only suitable for fish meal. Blue whiting in the pre-spawning stage are available at certain times in distant waters. These are suitable for processing into fish fingers and other products and the economics of going after them is currently being investigated by BIM in its exploratory fishing programme. It is hoped that blue whiting can be used to replace the decline in ordinary whiting landings. The fact that it is a non-quota species and in plentiful supply in the North Atlantic means that it could form the basis of an improved white fish processing industry in Ireland.

Another non-quota species, silver smelt, similar to, but somewhat larger than, ordinary whiting has recently been discovered in offshore waters to the West and North of Ireland. It seems to be in plentiful supply but is difficult to catch because of its location and because it shoals at a depth of about 200-300 fathoms. Large boats and very powerful tackle are required. This fish is very suitable for fish fingers and other products and could supply further raw material for an Irish processing industry.

The total value of shell fish landings in 1987 was about 19m. Of these Dublin Bay Prawns accounted for about 25 per cent of the weight and for 45 per cent of the value. Mussels which include farmed mussels accounted for 43 per cent of the weight of shellfish landings in 1987 and for about 10 per cent of the value. Other valuable shellfish are lobsters, crabs and oysters. These three species were valued at nearly £6 million in 1987.

Fish Farming

Production figures for farmed fish in selected years between 1980 and 1987 are given in Table 1. Over the period in question farmed salmon production increased from 20 to 2,200 tonnes and the projected figure for 1989 is 6,200 tonnes. There are 16 on-growing salmon farms in Ireland using conventional cage culture. Many of these farms have their own smolt units and some inland trout farms have also converted to salmon smolt production. Seven hatcheries are currently in operation, the largest of which are owned by the ESB, Fanad Fisheries in Mulroy Bay off Donegal, Carrols Industries and the Salmon Research Trust.

Production of farmed salmon in Ireland is now much greater than the wild catch. The latter averages out at about 1,000 tonnes per annum compared with 2,200 tonnes of farmed salmon in 1987, almost 5,000 tonnes in 1988 and 6,200 tonnes expected in 1989. Irish farmed salmon production is however still relatively small. Norwegian production in 1989 is projected at 130,000 tonnes while that in Scotland is expected to be about 25,000 tonnes.

Ireland's salmon farming production in the past has been limited by the availability of suitable sites but that difficulty is now being overcome by the use of large sized flexible rubber-rimmed cages which have enabled production to be undertaken in more exposed locations.

Table 1: *Farmed Fish Production in Ireland 1980 to 1987*

	Quantity				*Value*			
Species	*1980*	*1984*	*1986*	*1987*	*1980*	*1984*	*1986*	*1987*
	Tonnes				*£'000*			
Salmon	21	385	1,215	2,232	73	1,799	4,540	10,120
Seawater trout	158	130	93	320	317	286	240	690
Mussels (Intensive)	175	1,077	1,043	1,500	72	506	437	670
Mussels (Extensive)	4,557	12,640	9,572	13,393	291	1,351	754	1,180
Oysters (Native Intensive)	13	67	100	160	37	195	330	460
Oysters (Native Extensive)	349	175	175	317	437	450	430	860
Oysters Pacific	60	110	113	104	60	111	177	123
Total	5,333	14,584	12,311	18,016	1,287	4,698	6,908	14,103
Freshwater trout	420	582	470	600	630	1,024	930	1,150

Source: BIM.

Trout

Trout production in ponds and sea cages became widespread before salmon culture was established as a commercial enterprise. However, once salmon farming got underway trout production has remained fairly static and has even declined in some countries. The reason lies mainly with the market. Many farms are no longer viable because of the low prices for trout. A number of Irish trout farmers have gone into the production of salmon smolts.

In more recent years, the trout industry has been given renewed impetus by the setting up of producers' marketing co-operatives in a number of countries. These have improved the price structure considerably. Currently in the UK the industry has become a fairly well established component of the quality fish sector providing as a typical product pan sized (250-500 grm) pink fleshed trout. These are much more popular than the earlier white fleshed production. Down stream processing has also developed to the point where freezer packs are widely available and trout is regularly on the menu in the medium to better class restaurants. There is some movement in this direction in Ireland also.

Mussels

Mussels are grown by two general systems in Ireland.

(1) Culture on bottom and

(2) Rope culture (mussels suspended from long lines or rafts.)

Culture on bottom as is done in Wexford harbour by the Lett Company consists of dredging seed mussels usually from offshore beds and transferring the seed to shallow areas within the harbour. This increases growth and fattening rates and provides acceptable mussels for processing at minimum cost. Over 13,000 tonnes of these mussels were produced in 1987 and prospects for increasing production much further are very good.

In rope culture the seed mussels are collected in settling areas and grown to market size in other areas suspended from long lines or rafts. This form of cultivation is most prevalent in the South West especially in Bantry Bay. It produces a thin shelled mussel with a high meat yield which is especially desirable in the production of high quality fresh and processed mussels for the UK and French markets.

The rope cultured system has high production costs but the mussels produced fetch good prices because they have a high meat content and are free of sand. Two firms, one in Bantry and one in Limerick, are involved in processing rope cultured mussels for stable high quality outlets. The prospects for expanding production are considered to be excellent.

Oysters

The native flat oyster, reproduces naturally in some areas in Ireland (including Tralee, Clarinbridge, Kilkieran, Bertraghbuoy and Aughinish Bay). Total production of these natural oysters was 310 tonnes in 1980, 175 tonnes in 1984 and 317 tonnes in 1987. Artificial production of flat oysters has proved difficult in the past but reliable low cost methods have now been achieved and 160 tonnes were produced by these methods in 1987.

Ireland is seen to be a major source of flat oysters for the foreseeable future due to the devastating effects of disease and pollution on continental beds. Taighe Mara Teo (an Udaras na Gaeltachta Research Company) estimates that there is a potential to produce over 1,000 tonnes in Kilkieran, Blacksod and Gweebara bays off the west coast and it says that the culture of flat oysters warrants a substantial effort on the part of both the government and private industry. There is also scope for oyster production along the South East coast where a very large oyster fishery existed in the past.

The Pacific oyster is much easier to grow under controlled conditions, reaching market size in two growing seasons or less. The species does well in Ireland. Over 200 tonnes were produced in Carlingford Lough in 1988. This is the main producing area. There is a high market for Pacific oysters on the Continent.

Scallops, Clams and Other Species

Scallops and clams are valuable species and are currently in short supply throughout Europe. Research and development work on their production is currently being undertaken by BIM and Taighe Mara Teo. BIM has already grant-aided three hatcheries which are successfully producing clam seed in addition to oysters. There are five further projects which are developing on-growing methods. Research is also underway in the Shellfish Laboratory in Carna on the artificial production of a number of other species such as, abalone, sea urchins, Queen scallops, whelks, periwinkles and lobsters. To date the artificial rearing of these fish has not proved economically viable.

The Labour Force in Fisheries

In 1986 there were an estimated 12,100 people directly employed either in a full-time or part-time capacity in the fish catching, fish farming and fish processing sectors. This represents an increase of almost 50 per cent on the 1975 level and 8 per cent on the 1980 figure. The details of employment are given in Table 2.

Table 2: *Employment in Fisheries, Fish Processing and Aquaculture in 1975, 1980 and 1986*

	1975	*1980*	*1986*
Fishermen full-time	2,274	3,485	3,800
Fishermen part-time	4,356	5,339	3,950
Aquaculture	-	500	1,370
Fish processing	1,500	2,080	2,930
Total	8,130	11,404	12,050

Source: BIM.

In addition to the numbers engaged in fishing, fish farming and processing there is substantial employment in ancillary industries which service the primary industry such as transport, distribution, net making, boat building, servicing, etc. A study of the fishing industry in Donegal in 1982 (Drudy and Phelan, 1982) found that for every job at sea in the Donegal fishing industry there were two jobs ashore in the fish processing and ancilliary industries. The multiplier in other areas is probably less than this since Donegal has a very well developed on-shore industry.

Regional Importance of Sea Fishing

The greatest concentration of employment in sea fishing is in the West and North West coastal areas which together account for about 60 per cent of the total employment in the industry (O'Connor *et al.*, 1980). The West coast has 25 per cent, the North West coast 35 per cent, the South coast 31 per cent and the East coast 10 per cent of the total fishermen.

Though they form only a small proportion of the total national labour force fishermen form a relatively high proportion of the gainfully occupied in their respective regions. In many areas round the coast fishing is the main source of full or part-time employment while in recent times fish farming has opened up new opportunities for isolated communities. The combination of fishing and fish farming based as they are, on natural resources, provides a source of employment which is compatible with the life styles of the people in those areas.

In 1987 as many as 14 ports situated mainly on the West and South coasts had fish landings in excess of £1.0 million each. Also as indicated above the total gross earnings of fishermen and fish farmers was £94 million in 1987. This sum gives an indication of the flow of income to the coastal regions with incomes to workers in fish processing and services providing additional sources of revenue.

The Fishing Fleet

The Irish fishing fleet consists mainly of inshore and middle distance vessels which rarely stay at sea for more than a few days at a time. In 1985 there were an estimated 1,596 inboard engined vessels in the Irish fishing fleet. This represents a small reduction on the 1980 numbers but is almost three times the 1963 numbers. The number of vessels classified by gross registered tonnes (GRT) in selected years since 1963 is given in Table 3.

Table 3: *Classification of Vessels by GRT in Selected Years 1963 to 1985*

GRT	*1963*	*1970*	*1975*	*1980*	*1983*	*1985*
				No. of boats		
Motor Boats						
0 - 10	328	636	725	1,082	1,051	1,064
11 - 15	39	23	29	115	90	72
16 - 25	46	30	38	40	63	55
26 - 50	149	160	175	154	145	183
51 - 75	19	59	106	110	99	105
75 - 99	-	-	-	47	42	36
100+	3	27	59	68	81	81
Total motorboats	584	935	1,132	1,616	1,571	1,596
Sail boats and outboard engines	1,327	1,075	1,214	1,451	1,449	1,500
Total all boats	1,911	2,010	2,346	3,067	3,020	3,096

Source: Department of the Marine.

There has been a considerable fall off in the number of new vessels entering the fleet in recent years. The figures in Table 4 show that in the period 1980 to 1986 178 new vessels came in with about half this number being introduced in the two years 1980 and 1981. The fall off is most marked in the size classes over 12 metres. Since 1981 only 4 new vessels over 24 metres (100 GRT and over) have come into the fleet of which only 1 qualified for investment grants from BIM or the EC. The fall off in the fleet replacement is due to the severe cost price squeeze which was experienced by fishermen in the early 1980s. Many found themselves in financial difficulties and were unable to meet boat repayments. Others repaired or re-equipped old vessels rather than purchasing new ones. This position has now improved due to better prices for fish in recent years.

Table 4: *New Vessels Entering the Fleet 1980 - 1986*

Length	*GRT*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*
metres								
6-9	5 - 8.5	10	5	5	7	3	2	-
9-12	8.5 - 15	23	10	12	10	10	4	7
12-24	15 - 99	10	14	9	8	7	2	1
24-33	100+	8	2	2	-	1	-	-
33+		4	1	-	-	-	-	1
Total	-	55	32	28	25	21	8	9

Source: BIM.

The re-equipment programme has improved greatly the productivity of the smaller boats, enabling medium sized vessels to fish in waters which heretofore could only be reached by very large boats.

Chapter 2

PRICES OF FISH

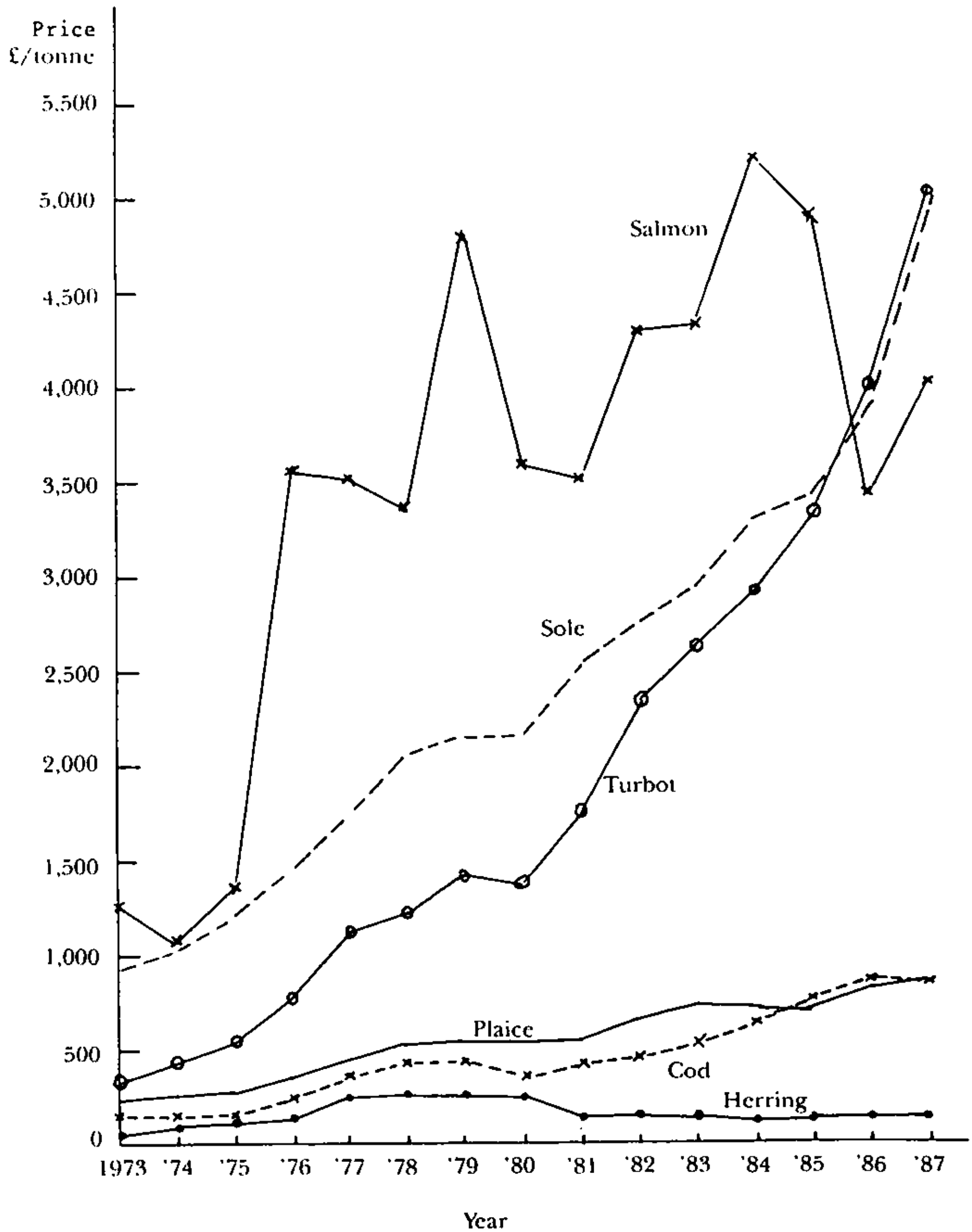
Average prices per tonne for the more common wet fish species in the years 1973 to 1987 are given in Table A.3 of the Appendix. The trends in some of these prices for the same years are given in graphical form in Figure 1. This graph shows that salmon though varying considerably in price from year to year was the most expensive of all the fish shown up to and including 1985.[1] In 1986 there was a severe drop in salmon prices when the Norwegian salmon farmers, to avoid losses due to disease, unloaded large numbers of salmon onto the market. This caused a scarcity of salmon in 1987 when prices rose again although not to their 1985 level. Prices in 1988 (not shown in the graph) averaged about £4,400 per tonne for large salmon over 3.0 kg and about £3,500 for smaller fish. Prices for the larger fish remained at about 1988 levels during the first half of 1989 but those for smaller fish fell to less than £3,000 per tonne as large quantities of Norwegian salmon were unloaded on the French market. Prices for large salmon fell to about £3,700 per tonne in the second half of 1989.

It seems that Norwegian salmon farmers are encountering cash flow difficulties and are forced to sell fish at low weights. There is considerable apprehension in the industry at the present time and it seems that over the coming years there will be a considerable shake out among the less efficient producers with prices settling down close to the cost of efficient production (around £3,000 per tonne). The Irish producers, particularly those using the large new cages, are considered to be very efficient, and those interviewed in connection with this study were optimistic that they can ride out the present difficulties which are viewed as being temporary.

Among the ordinary sea fish, sole and turbot are the most expensive, both species being dearer than salmon in 1986 and 1987. The next most expensive wet fish shown in the diagram are plaice and cod. Brill and hake (not shown) are more expensive than these. Herring is the cheapest of the fish shown in Figure 1. Mackerel and sprats which are not shown in this graph are cheaper than herring. Herring reached its highest price of £295 per tonne in 1978 at a time when the Celtic sea and other grounds were

1. The prices given for salmon are weighted averages of wild and farmed fish prices.

Figure 1: *Prices for Certain Species of Fish, 1973-1987*



closed to herring fishing. With the opening of these grounds in the early 1980s herring prices declined to £136 per tonne in 1985 and have not risen much since then. In 1986 about 15 per cent of the herring catch had to be withdrawn from the market under the EC withdrawal scheme, and made into fish meal. In 1987 almost 17 per cent of the herring catch had to be withdrawn. In those years mackerel withdrawals were less than 4 per cent of the catches.

The herring situation is rather peculiar. There is a two tier price system for this fish. Herring in the pre-spawning stage, suitable for the production of herring roe, are commanding very good prices. On the other hand there is rather poor demand for herring which have spawned and it is from this group that withdrawals take place.

Relationship between Fish Prices and Inflation

Real prices of the more important wet fish species are given in Table A.4 of the Appendix. In preparing this table the figures in Table A.3 have been divided by the consumer price index to base 1973 = 100. Some of the more important fish prices in Table A.3 have been graphed in Figure 2. This figure shows that real prices for all the fish species given tended to increase up to about 1978. Since that time real prices for all species except turbot have declined. The real price of turbot increased by almost 50 per cent between 1978 and 1987 and this despite the fact that the quantity landed more than doubled over the same period.

The graph of salmon prices in Figure 2 is of especial interest because of the current interest throughout the world in salmon farming. This graph shows that real salmon prices increased substantially between 1975 and 1979. This was a period when wild Atlantic salmon were scarce and the output of farmed salmon was as yet fairly small. After 1979, as world output of farmed salmon increased, real salmon prices declined severely from £2,078 per tonne at 1973 prices in 1979 to £689 per tonne in 1986 but rose somewhat to £784 per tonne in 1987 (see Table A.4). The relationship between world Atlantic salmon production (wild catch plus farmed) and real Irish salmon prices (weighted average of wild and farmed salmon prices) for the years 1973-1986 is shown in Figure 3.

What will happen in future years if the current high level of production of farmed salmon is maintained or increases is a matter for speculation. In a fairly recent BIM report on salmon farming (Bord Iascaigh Mhara, 1986) it was predicted that real prices for salmon would decline by about 30 per cent between 1985 and 1995. Most of this decline was projected to occur in 1986 and 1987. Thereafter it was estimated that price falls would be slower because restructuring in the industry in response to lowered prices would

Figure 2: *Real Prices of Certain Species of Fish 1973 - 1987 (current prices divided by consumer price index to base 1973 = 100)*

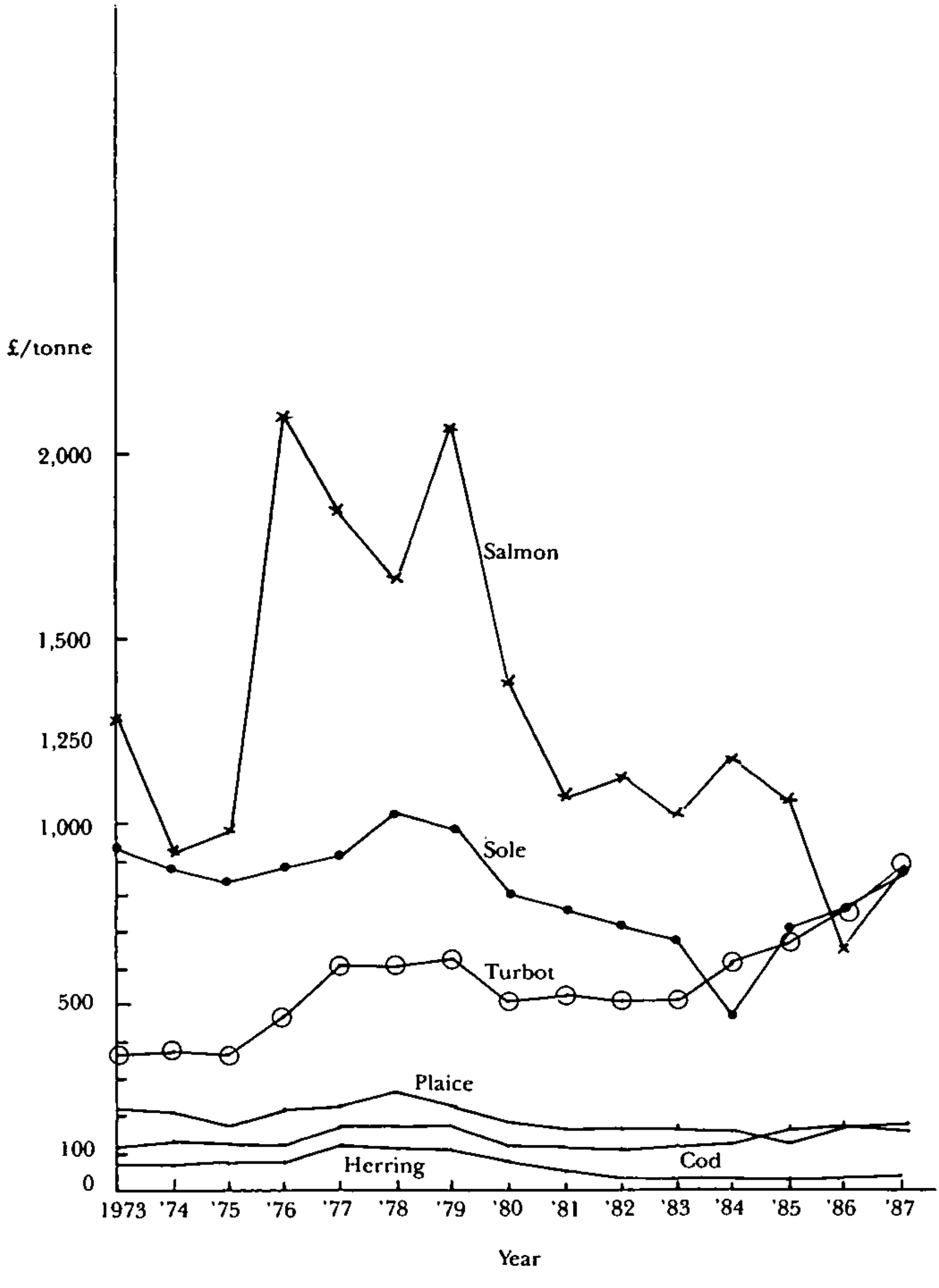
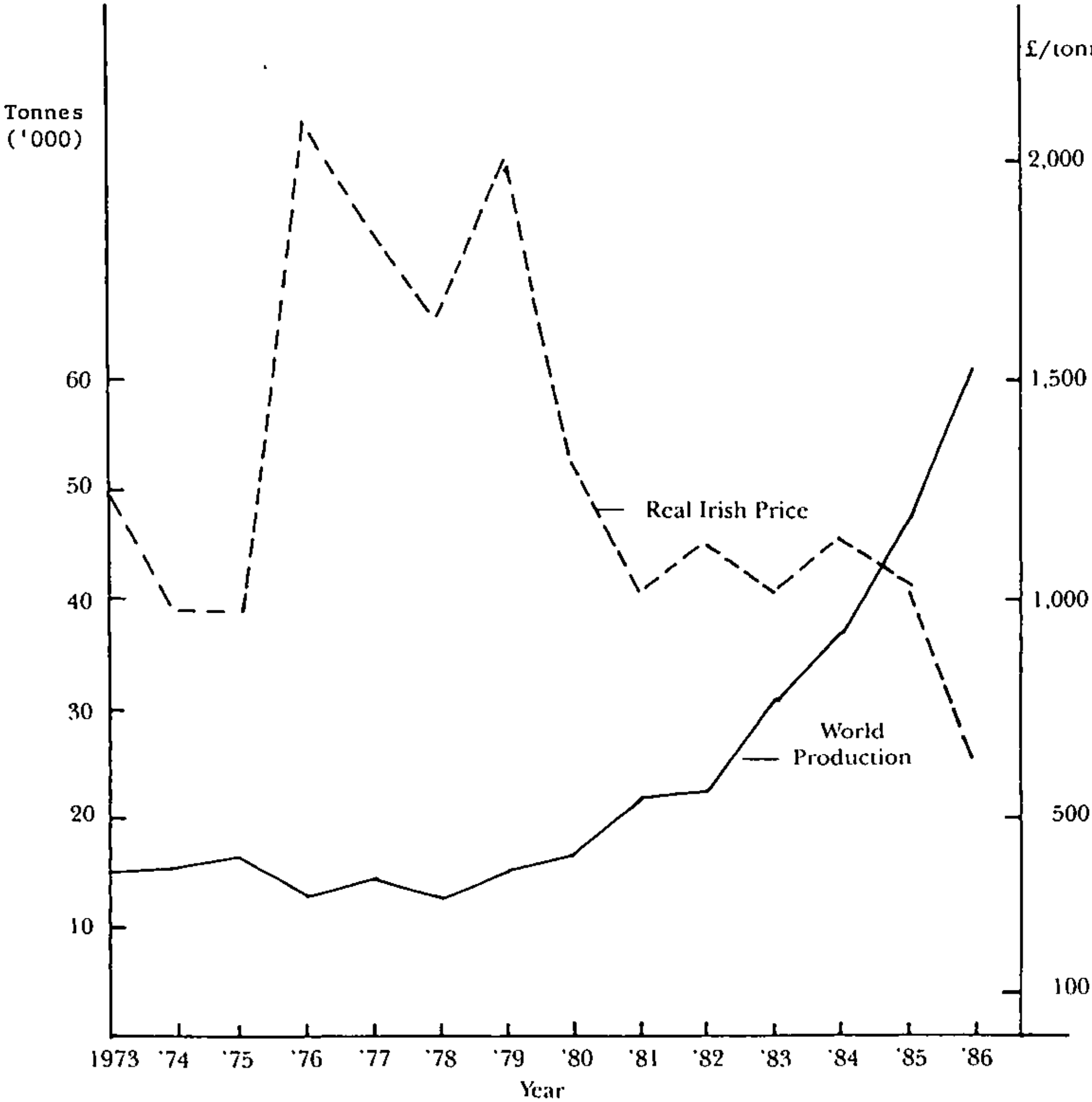


Figure 3: *Relationship between World Atlantic Salmon Production (Wild and Farmed) and Real Prices of Salmon in Ireland 1973-1986*



Source: Prices are unit values from Sea and Inland Fishery Reports (Department of Fisheries). Production is taken from The Atlantic Salmon Fishery Industry, BIM, 1986 force some smaller marginal producers out of business and tend to stabilise production at less ambitious levels than those forecast.

Other analysts (see Bjorndal, 1988) have similar views and there seems to be a general consensus that prices will stabilise at something over the cost of production of the more efficient growers. When this stabilisation takes place, however, is problematic. Disease outbreaks which are a feature of the industry can cause wide price fluctuations, while the human health factor, by increasing demand for all kinds of fish, is bound to have an effect also. With limits on the supply of wild fish of all kinds the demand for farmed fish will grow and this will tend to maintain prices but likely at a much lower level than in the past.

Relationship between Fish Prices and Other Meat Prices

To show the relationship between fish and other meat prices a price index has been constructed for the years 1975 to 1987 for (a) demersal, (b) pelagic, (c) total wet fish and (d) shell fish. These indices are compared with those for beef cattle, sheep and pigs in Table A.5. Some of the data from this table are graphed in Figure 4 which shows that throughout the period (1975-87) shell fish prices rose faster than the consumer price index while pig prices increased at a much slower rate than the CPI. Wet fish prices rose faster than the consumer price index up to 1980 but declined relative to the CPI after that date. Fat cattle prices showed a somewhat similar trend rising faster than the consumer price index up to 1981 and declining relative to this index in recent years. Poultry prices are not available for years prior to 1980 but the figures available for the years since 1980 show that these prices have risen at a much slower rate than the CPI. Between 1980 and 1987 poultry prices rose only by 19.3 per cent whereas consumer prices rose by 91 per cent over the same period.

The trends in certain retail fish and meat prices since 1975 are given in Table A.6 of the Appendix and in Figure 5. Over the period the biggest increase occurred in mutton prices, loin chops going from 68p per lb in 1975 to 304.8p per lb in 1987, a rise of 348 per cent. The smallest increase occurred in the price of pigmeat. The price of uncooked ham went from 65p per lb in 1975 to 131p per lb in 1987, a rise of only 103.5 per cent. An unweighted average of the fish prices given in Table A.6 shows that these prices increased by 275.8 per cent over the period. This compares with an increase of 308 per cent for beef, 348 per cent for mutton and 160.8 per cent for pigmeat. Retail prices are not published for poultry meat but chicken prices are unlikely to have increased at a faster rate than those for the pigmeats.

Figure 4: *Producer Price Indices for Fish, Fat Cattle and Pigs, 1975-1987 (1975=100)*

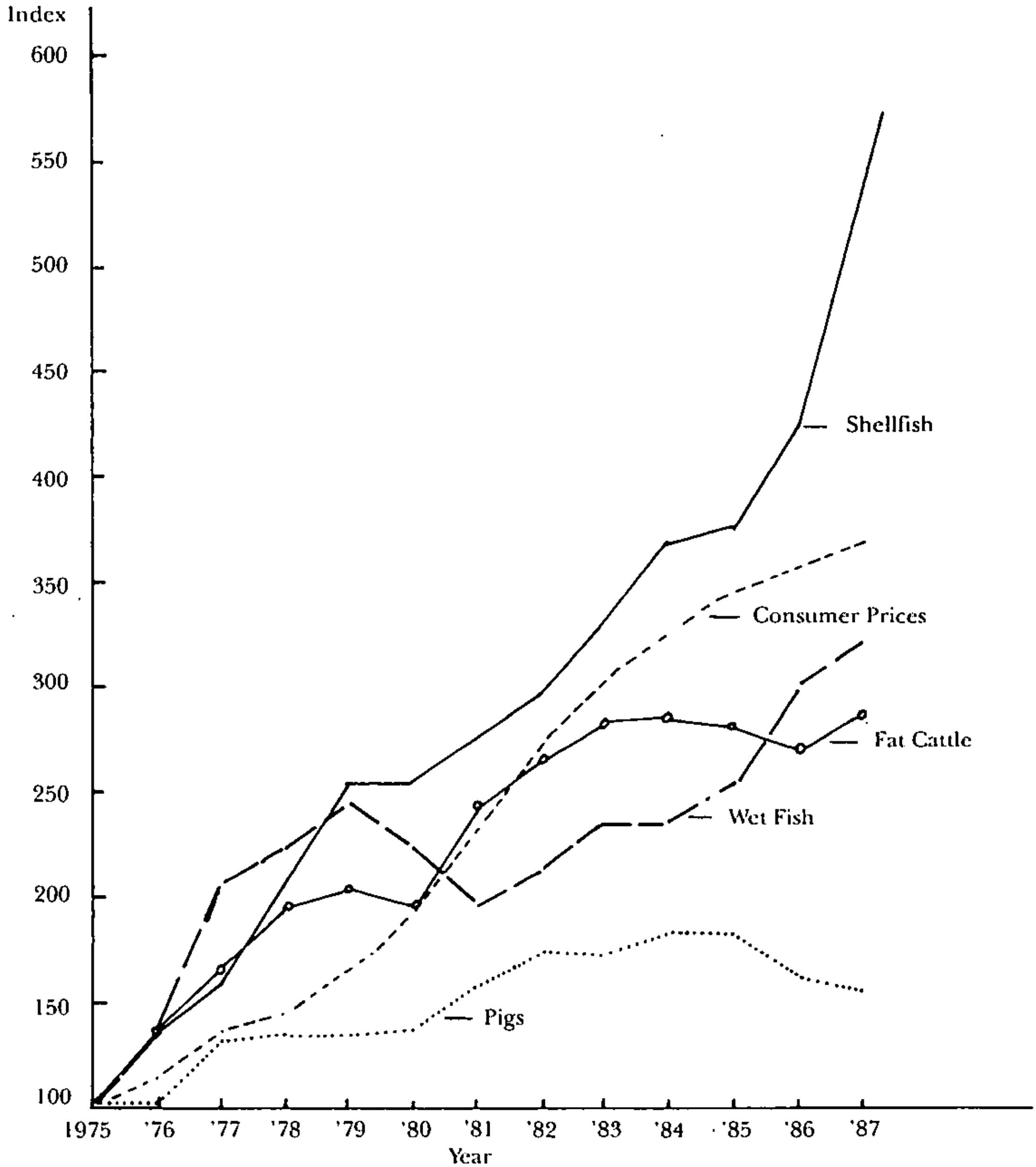
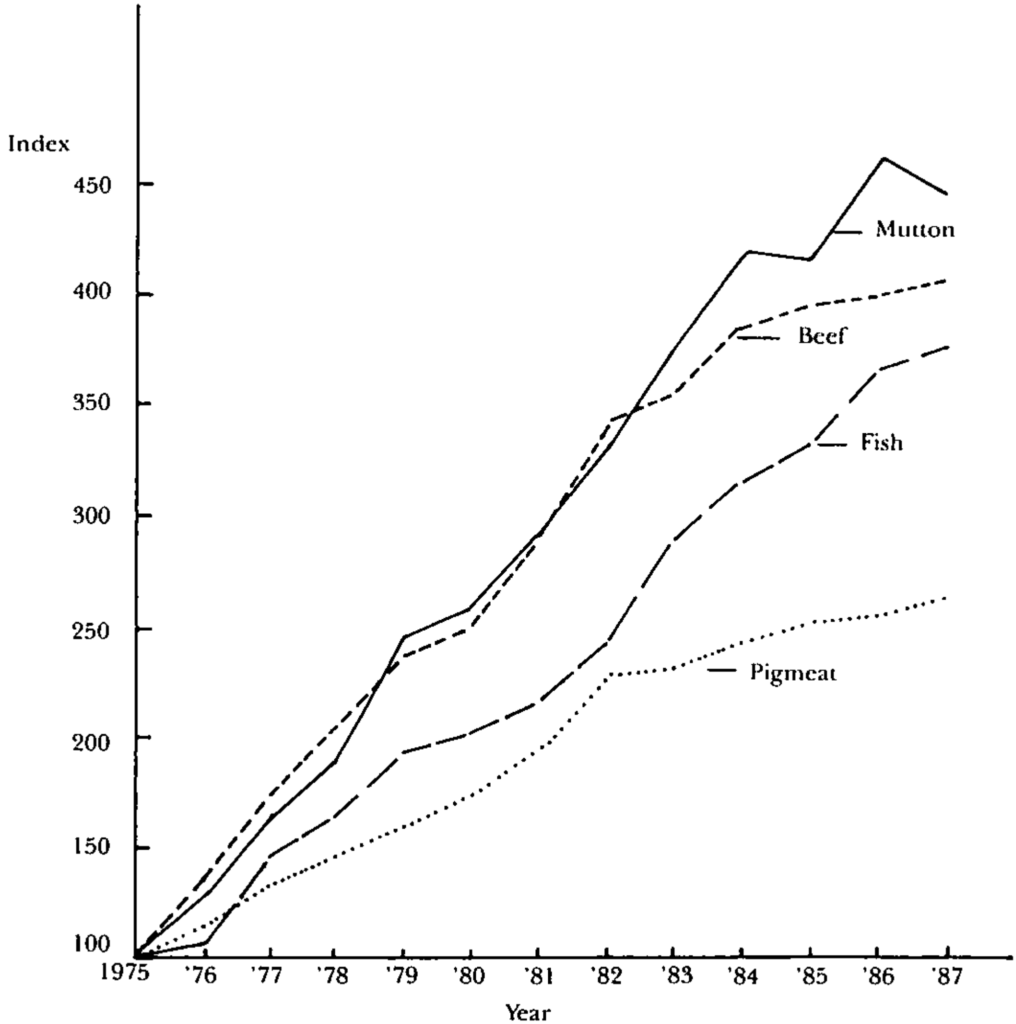


Figure 5: *Indices of Retail Prices for Fish, Beef, Mutton and Pigmeat, 1975-1987 (1975=100)*



Source: Appendix Table A.6.

Chapter 3

UTILISATION OF CATCH

Detailed figures for the utilisation of the fish catch are not prepared on a regular basis. The latest figures available which were prepared by BIM are for 1986. These are given in Table 5 which shows that in that year 66 per cent of the landings into Irish ports other than those going for industrial use went out in the live fresh or frozen form. Though these are classed as low value added they include high value shellfish such as lobsters, crayfish and oysters and high valued finfish such as hake, monkfish, and megrims which are at their maximum value in this form. Some 24 per cent of the 1986 landings were made into medium value added and 10 per cent into high value added products.

Table 5: *Utilisation of the fish landed into Irish Ports (including aquaculture) in 1986 (tonnes catch weight)*

Description		*Total*	*Low value added*	*Medium value added*	*High value added*
Live/fresh whole [1]		44,702	44,702	-	-
Frozen whole [2]		76,429	73,340	-	3,089
Fresh/frozen fillets, minced blocks		30,581	-	30,581	-
Dried/salted/spiced/marinated		13,208	-	13,208	-
Shellfish meat		4,420	-	-	4,420
Canned		2,258	-	-	2,258
Smoked/preserved		1,589	-	-	1,589
Breaded/fingers/catering packs		250	-	-	250
Recipe dishes		125	-	-	125
Other prepared (roe, etc.)		6,460	-	-	6,460
Total above	Tonnes	180,022	118,042	43,789	18,191
	Percentage	(100)	(65.6)	(24.3)	(10.1)
Industrial use		26,995	-	-	-
Total Catch		207,017	-	-	-

Source: BIM.

Notes: [1] Includes high value shellfish such as lobsters, crayfish, oysters, etc., which are at their maximum value in this form.

[2] Includes whole frozen prawns and crabs in consumer packs.

Imports of Fish

Fish imports have increased substantially in recent years from 11,289 tonnes in 1980 to 40,700 tonnes in 1987 (see Table 6). These figures include imports of herring, mackerel and salmon for processing and re-export. When these latter imports are excluded BIM estimates that total imports for home consumption in product weight were 9,000 tonnes in 1980 and about 13,000 tonnes in 1987. Total home consumption in those years in edible weight is estimated at 19,000 and 24,000 tonnes respectively. When product weights are converted to edible weights it is estimated that imports make up about 50 per cent of home consumption of fish and about 80 per cent of those come from Great Britain and Northern Ireland.

Table 6: *Imports of Fish and Fish Products, 1980 and 1987*

	Quantity 1980	*Quantity* 1987	*Value* 1980	*Value* 1987
	Tonnes (Product weight)		*£'000*	
Whole fish: fresh, chilled, frozen	3,229	28,802	1,796	8,357
Fish fillets: fresh, chilled, frozen	794	842	1,038	1,505
Fish: dried, salted, smoked	1,382	1,099	1,717	1,990
Fish: prepared or preserved NES	5,029	8,681	9,988	19,562
Shell fish: in shell or prepared	808	1,256	2,141	4,571
Fish meal for human consumption	47	21	14	7
Total	11,289	40,701	16,694	35,992

Source: Trade Statistics of Ireland, CSO, Dublin.

Of the fish imported for home consumption in 1987 about 1,000 tonnes were smoked fish, 4,200 tonnes were fish fingers or fillets in batter of various kinds and 2,300 tonnes were canned or bottled fish. The remainder were fresh or frozen whole fish.

Home Consumption of Fish

As stated above about 24,000 tonnes of fish were consumed on the home market in 1987. This worked out at about 6.8 kg (15 lb) per head of the population in that year. The corresponding figure for 1980 has been estimated by BIM at 5.6 kg (12.3 lb) and at 5.2 kg (11.9 lb) in 1975. The 1963 consumption was estimated at 3.4 kg (7.5 lb) per person. Hence per capita fish consumption doubled itself in the period 1963 to 1987. Reliable figures are not available for per capita consumption in other EC countries.

The EC Statistical Office in Luxembourg no longer publishes such figures. Consumption data are produced by the OECD but their comparability as between countries is not reliable. Some countries give edible weights, others landed weights, and so on, but when allowance is made for this, the variation in some of the data from year to year is not credible. The changes in the Irish figures from year to year seem reasonably accurate but their actual level might be understated due to under-reporting of catches by skippers. A household survey would need to be carried out to establish the true level.

Table 7 which gives per capita consumption of fish and different meats in Ireland in selected years since 1963 shows that total meat consumption has increased over the period from 58.2 to 81.0 kg or by 39.2 per cent. Poultry meat consumption more than trebled over the period while mutton and lamb consumption declined by about 40 per cent. Beef consumption increased by 69 per cent between 1963 and 1975 but decreased by 27 per cent since 1975. The per capita consumption of fish as given in the table is now on par with that of mutton and lamb but it is still very much less than that of any of the other meats.[2]

Table 7: *Per Capita Consumption of Fish and Different Meats in Ireland in Selected Years 1963 to 1987*

Year	*Fish (edible weight)*	*Beef and Veal*	*Mutton and Lamb*	*Pigmeat*	*Poultry Meat*	*Total Meat*
			Kg per person			
1963	3.4	17.1	11.3	23.7	6.1	58.2
1966	4.6	16.6	10.8	27.3	8.5	63.2
1970	4.6	19.1	10.8	30.6	10.1	70.6
1975	5.2	28.9	11.1	26.5	10.6	77.1
1980	5.6	25.7	7.8	31.0	14.0	78.5
1985	6.6	22.0	6.8	32.6	17.6	79.0
1987	6.8(est)	21.2	6.8	33.0	20.0	81.0
Percentage Increase 1963-1987	100.0	24.0	-39.8	39.2	227.8	39.2

Source: Irish Statistical Bulletin, CSO and BIM.

2. The fish consumption figures are not official. They are prepared by BIM for its own use and as stated above they may be understated due to under-reporting of catches by skippers.

Exports

The Irish sea fishing industry exported a total of 213,000 tonnes of fish and fish products in 1987 valued at £134 million. These figures include exports of salmon, eels and trout as well as landings by Irish vessels into foreign ports, direct transhipments at sea and re-exports. When allowance is made for re-exports, it is estimated that about 90 per cent of the total Irish catch is exported in one way or another. The remaining 10 per cent is consumed in Ireland by persons or by animals in the form of fish meal.

Details of exports in 1980 and 1987 are given in Table 8 which shows a substantial rise in the overall quantity and value between the two years.

Table 8: *Quantity and Value Exports of Fish, Classified by Form in which Exported, 1980 and 1987*

	Quantity		*Value*	
	1980	*1987*	*1980*	*1987*
	Tonnes (Product weight)		*£'000*	
Fresh or chilled (excluding fillets)	28,231	42,073	7,693	31,003
Frozen (excluding fillets)	21,536	96,737	8,488	42,139
Fillets: fresh or chilled	1,219	1,742	1,123	1,247
Fillets: frozen	8,600	13,422	4,821	8,400
Cod, excluding fillets, dried, salted or not	139	70	149	208
Fish except cod, dried salted or in brine	11,958	8,117	7,128	6,183
Fish, smoked or cooked	288	415	958	3,194
Crustaceans and molluscs in shell	6,705	18,373	8,457	29,648
Crustaceans and molluscs prepared and preserved	120	97	127	259
Fish prepared or preserved NES	1,036	1,298	1,102	1,608
Fish meal, fish oil,etc.	4,788	9,487	881	1,428
Total above	84,620	191,831	40,877	125,317
Irish landings at foreign ports and transhipments at sea	9,397	21,192	6,605	8,678
Total	94,017	213,023	47,482	133,995

Source: Trade Statistics of Ireland, Central Statistics Office, Dublin and Department of the Marine, Dublin.

A breakdown by species of the fresh and frozen exports (excluding fillets) in Table 9 shows that the main increases occurred in the exports of frozen mackerel. Horse mackerel, a non-quota species, is now an important export earner also. Exports of dogfish also increased as well as those of herring, haddock, salmon and sole. Sprat exports declined substantially between the two years. The market for these exports is discussed in Chapter 4.

Table 9: *Exports of Fresh and Frozen Wet Fish Landed (excluding fillets) Into Irish Ports, Classified by Species, 1980 and 1987*

	1980			*1987*		
	Fresh or Chilled	*Frozen*	*Total*	*Fresh or Chilled*	*Frozen*	*Total*
				Tonnes		
Macherel	14,050	13,601	27,651	16,822	66,744	83,566
Horse Mackerel	x	x	x	x	15,206	15,206
Herring	5,041	5,277	10,318	5,174	8,899	14,073
Sprat	4,288	1,765	6,053	205	2,493	2,698
Cod	2,173	x	2,173	1,781	95	1,876
Whiting	719	x	719	1,860	390	2,250
Dogfish	1,400	x	1,400	6,075	299	6,374
Monkfish	x	x	x	834	116	950
Hake	x	x	x	1,286	56	1,342
Salmon	278	360	638	1,734	100	1,834
Sole	91	x	91	863	114	977
Haddock	x	x	x	1,908	22	1,930
Livers and Roes	x	x	x	136	1,673	1,809
Others	191	533	724	3,395	530	3,925
Total	28,231	21,536	49,767	42,073	96,737	138,810

x None or very small amounts.
Source: BIM.

Chapter 4

THE MARKET FOR IRISH FISH AND THE PROCESSING SECTOR

The quantity and value of fish landed into Irish ports and exported to different countries in 1987 is shown in Appendix Table A.7. Total quantity of exports other than fish meal and fish oil in that year was 182,000 tonnes valued at £123.9 million. The UK was the main market - 22.5 per cent of exports going to Great Britain and Northern Ireland for a value of £21 million (17% of the total value). Almost 14 per cent of exports went to Nigeria for a value of £7.9 million which was only 6.3 per cent of the total value. The highest value market was France - 12.4 per cent of exports to that country brought in £31 million or 25 per cent of the total value. Japan was also a high priced market taking 10.8 per cent of the quantity for 14.8 per cent of the total value (£18.3m.). West Germany took 17,000 tonnes (9.4%) for a value of £11.4 million (9.2%) while The Netherlands took 14,600 tonnes (8.0%) for a value of £6.7 million (5.4%). Spain took only 2.9 per cent of the total quantity but the value of these was almost £9 million or 7 per cent of the total value.

The sea food market falls into five main categories:

(1) high priced live fresh and chilled fish and shellfish;

(2) commodity fish products especially pelagic;

(3) semi-processed products for further processing;

(4) prepared sea food products;

(5) fish meal, fish food and fish oil.

The Fresh Fish Market

In the markets of the developed world there is a pronounced swing to the consumption of fresh fish as against preserved products. The increased trade in fresh fish is being aided by advances in air freighting of high value products to markets such as the USA and Japan. France and Spain are the two most important markets for fresh fish in the EC especially for species such as hake, monkfish, and megrims which are caught in waters off Ireland. Our ability to exploit these markets more fully is constrained by the quota regime. The UK is forecast to remain as one of our main markets for traditional white fish species such as cod and whiting, haddock, etc. There is also a growing market for fresh live shellfish on the British and Continental market.

The salmon market which is increasingly being supplied by farmed fish is expected to remain primarily a fresh market with increased sales targeted at the US, France and other smaller markets such as Spain, Switzerland and Japan. The BIM report on farmed salmon (BIM, 1986) forecast that by 1991 about 25 per cent of both fresh and frozen salmon will be sold in fillet and cutlet form, mostly prepacked.

Commodity Fish Products

Nigeria and to a lesser extent Egypt together with some of the French West African countries are major markets for Irish fish volume wise. These markets are exclusively for whole frozen mackerel and frozen horse mackerel and they will not accept any further processing such as heading and filleting. It could be argued therefore that these fish are consumer and not commodity products.

The East European and Dutch over-the-side trade in frozen mackerel is aimed at the same ultimate African market. It is expected that over-the-side mackerel trade will decrease in future years given the capacity of the larger Irish vessels to land here and given the freezing and storage capacity on shore to handle the supplies.

There is also an over-the-side trade with Eastern European freezer vessels for herring. This is mainly for their own domestic markets and is likely to decrease as efforts bear fruit at EC level to stabilise the Community herring market which has suffered because of nematode infections

Semi-processed Products for Further Processing

European processors and packers of herring, mackerel and other pelagic products are major outlets for Irish semi-processed fish. This is part of a traditional industry to industry trade where different manufacturing stages of a product are carried out in different locations and in different countries. Herring is a good example. There has always been a good market for Irish salted, marinated or filleted herring which are further processed into consumer products in Germany. This market is expected to continue and improve as the herring nematode problem is eliminated. There is also a market for semi-processed mackerel in headed/gutted form to French canneries and to Dutch and German smokers.

While it is an objective of policy to expand canning and other added value processing in Ireland the costs of production in large, long-established canneries in Continental countries are usually much lower than in similar smaller plants in Ireland and it is difficult therefore for the Irish plants to be competitive. The feasibility of sprat canning in Ireland is under investigation but the market for frozen sprat to canneries abroad is likely to continue.

Prepared Sea Food Products

Because of supply constraints on the main varieties of white fish, opportunities to expand the production of white fish products in Ireland are limited. There are, however, niches in the market place which can be availed of. The growing market for convenience, pre-packed, ready to eat meals, aimed at two income households represents an opportunity for specialised Irish producers especially in the French and UK markets. Unfortunately these recipe products often have short life cycles and require continuing product innovation and the highest quality standards.

Fish Meal and Oil

There is a strong demand for fish meal for animal feed, with the EC being a net importer but only at low world prices. There are, however, opportunities for higher value products such as salmon feed arising from an expansion of the farmed salmon sector. A new factory to manufacture such feed has now been established in Westport.

New opportunities are also forecast to arise for high grade fish oil given its proven health qualities. The market for oil is increasing both as a food ingredient and in the form of capsules. The extent to which Ireland can become involved in this market has yet to be determined.

The EC Market

The 1986 total EC imports of fish were 1.6 million tonnes while exports were 0.8 million, giving a net deficit of 0.8 million tonnes. The degree of self-sufficiency however varies considerably between species. There is a dearth of whitefish and shellfish and over-supplies of pelagic varieties like mackerel, herring, and scad (horse mackerel). This pattern has severe consequences for Ireland given our high dependence on the pelagic species.

The EC market is relatively unprotected against imports from third countries. The import duties that do exist are determined more by requirements of the Continental processors than by the interests of the Community catching sector. Thus fish raw materials enter the market at either zero or low rates of duty while imports of processed fish generally attract much higher duty rates.

Since 1983 export refunds on mackerel and certain other fish products have been eliminated and all fish exports to third countries are now made at market prices. Ireland has been particularly disadvantaged by the absence of refunds because of our heavy reliance on pelagic species and on third country markets.

Fish Processing

There are 113 fish processing firms in Ireland with estimated sales of close on £100 million (BIM, 1988a). The fish processing sector provides direct employment for 1,700 people on a whole time basis and for 1,230 part-time workers. The location of the fish processing firms are as follows: Donegal 23; Sligo/Mayo 9; Galway 13; Clare/Limerick/Kerry 15; Cork 12; Waterford/ Wexford/Wicklow 19; Dublin/Louth/Other 22. A high proportion of these firms have been established in the last decade or so.

Most of the firms are rather small, 90 of them employ 20 people or less, 17 have between 20 and 100 employees while only 6 firms have over 100 employed. In regard to output, 83 firms had a turnover of less than £1 million in 1986, 22 firms had £1-3 million turnover and 8 firms had turnovers of over £3 million.

During the late 'seventies there was considerable stability in the processing sector. Many existing firms improved their production facilities at that time and some new firms came into operation. Only a few firms ceased operation in those years. Since the beginning of the 1980s, however, there has been a number of fallouts. Some 29 small firms, mainly along the South coast, ceased operations. Many of these relied on a single species or a single sector of the home market. In many cases account was not taken of the continuity of supply of raw materials at economic prices and of the impact of fresh market demand. Another factor was underestimation of the financial marketing resources needed to supply the supermarket trade.

The Irish processors can be divided into the following groups with some plants included in more than one group:

Pelagic processors	22
Whitefish processors	40
Smokers	26
Shellfish processors	34

Each of these groups is described briefly below.

Pelagic Processors

Much of the Pelagic processing is low value added preparation of frozen blocks for export. Of the total mackerel exports (including over-the-side landings) in 1987 some 19 per cent went out in the fresh or chilled form and about 74 per cent as frozen whole or headless fish, the bulk of the latter going to Nigeria, The Netherlands and East Germany. Only about 7 per cent were exported as frozen fillets and less than 1 per cent as smoked and prepared products. Herring is processed to a much greater extent than mackerel. Because of the good market for herring roe a considerable amount of fillets are made available. Of the total herring exports in 1987 some 26 per cent went out as fresh or frozen fillets while a further 20 per cent were exported as salted or marinated products.

Landings of horse mackerel are made in increasing volumes and it is hoped that this non-quota species will become an important raw material for both the factory ships and the on-shore processors.

A pleasing feature of the pelagic processing is the increasing activity in the production of herring roe for the Japanese market. In 1987, 1,600 tonnes of herring roe were exported at a value of £9 million. The production of roe is largely based on Celtic Sea stocks but mature roe is only available for a short period (70-100 days per annum). Much of the export volume of bulk salted and marinated pelagic products go to the German market. Very few Irish firms are engaged in the production of marinated products in retail packs.

Whitefish Processors

Static supplies and increased demand from the fresh market both at home and abroad have given rise to very high prices for whitefish. A number of firms have thus been forced out of business in recent years. The trade is now hoping that non-quota argentines and perhaps blue whiting can be used to supply the necessary raw materials for the breaded/battered whitefish products. In 1988 6,000 tonnes of argentines were caught by Irish fishermen and experiments are being conducted in Killybegs to determine the most economic method of marketing these fish, whether in fresh or processed form.

Smokers

Nine large firms and 12 small ones are involved in smoked salmon production for the home as well as for the US and European markets. Very few firms are however solely engaged in smoking; they have other activities as well. The production of smoked salmon appears to be an attractive proposition for new producers but many of these would need to take more account of market demands and of competition from Pacific salmon products.

Shellfish Processors

Processors are finding increasing competition for supplies by buyers of fresh shellfish for the French and Spanish markets. Rope cultured mussels which sell for about £400 per tonne are more expensive than bottom mussels for processing but a few firms are processing these mussels for special supermarket outlets. Bottom cultured mussels, selling for £80-£110 per tonne, are ideally suited for processing but a proportion also go for the fresh market. There is considerable activity in the processing of prawns and crab. The Trade Statistics produced by the CSO show that exports of prepared or preserved shellfish came to only £259,000 in 1987. However, the greater proportion of processed shellfish, e.g., vacuum packed pasteurised crab and frozen mussel meats are classified under the frozen fish category in the Foreign Trade Statistics.

Objective for the Processing Industry

The above discussion shows that the fish processing industry in Ireland is not as highly developed as many commentators would wish and it is very often suggested that the first objective should be to maximise the output of this industry. This, of course, is easier said than done. The market for pelagic fish (which is our main product) is limited to a great extent to third countries which purchase only frozen whole products for direct consumption. Also the arrival in the fleet in recent years of large factory vessels, which have the capacity to carry out primary processing on board, will tend to further depress shore based processing. Furthermore, some fish, such as certain species of white fish and shellfish, are at their most valuable when exported in live, fresh or chilled form.

Having said this, there is still a strong case for investigating the possibilities for upgrading the role of Irish fish processing, particularly of pelagic species. Apart from the employment effects viable processing can play an important part in stabilising the market for landed fish. As stated above, many of the markets for commodity products have been very volatile. For instance Nigerian markets are highly erratic because of a shortage of hard currency and as O Faolain (1988) says:

> Demand for Irish commodity product on European markets has depended heavily on the extent to which German processors have been able to secure their supplies elsewhere. A major advantage therefore of a strategic concentration on secondary processing is that over time it could be expected to result in a more stable industry and one less subject to the whims of intermediate processors in other countries. As the production of consumer products increases so will the degree of control exercised by the industry over the sale of its output through direct contact with consumers. Firms will thus be in a better position to "mould" markets for their products rather than depend passively on the state of demand in commodity markets as they do for the most part at present.

The development of the processing sector has been and will continue to be constrained by the amount and kind of fish available. The main demand by the high value added processors is for white fish species which have a very high value on the fresh fish market. Consequently, the prospects for developing a large white fish processing industry in Ireland are not very promising.

Some commentators have suggested that we could develop a white fish processing industry on the basis of imported fish from non-EC countries such as Iceland and Norway. These countries export considerable quantities of fish to the EC. This suggestion, however, is not very realistic; our peripheral position in Europe and our small domestic market appear to offer a market disadvantage compared with established Continental and UK processors.

Fish imported to Ireland from the North Atlantic would involve double transport costs; first from the producing area to Ireland and then to the consuming markets in Britain and the Continent. By processing the fish in the consuming areas, the main transport costs would be from the producing areas only. Irish processors would have to be very efficient to overcome this extra liability. It would seem, therefore, that a large white fish processing industry will not develop in Ireland, particularly with the quota white fish species.

Niches can, however, be developed for small quantities of high priced white fish products in foreign markets. Some processors are already serving these markets but to expand on the present level a considerable stepping up of our market research is required. BIM has produced a number of first class market reports in recent years and that body has now appointed a market research officer. She should concentrate on finding suitable markets and getting manufacturers interested in supplying them. The IDA and Coras Trachtala should also co-operate in this research. We have a reputation in Europe for having clean, unpolluted waters and we should exploit this to the maximum extent. To do this, very strict emphasis must be placed in our factories on quality control.

Though the pelagic species which account for a very large proportion of the Irish catch are not now in great demand for higher value added processing, this situation could change over the coming years as demand for fish products grows. With the static nature of white fish supplies, consumers are likely to turn to other fish, and herring products in particular may regain their former status. The herring market declined in the mid-1980s because nematodes were discovered in a number of consignments in Germany. As a result of new EC quality regulations, this problem has been largely solved and herring prices are now beginning to rise. We should try and capitalise on these changed attitudes and seek to obtain a niche in the processed herring market in Europe. Joint ventures with established European processors would seem to be the best method of gaining a foothold in this market. Research by the IDA indicates that there are good prospects for such ventures and there are a number of established firms who appear willing to expand their businesses in this direction.

There are prospects also for expanding the mackerel processing industry. Already there are a number of firms involved in smoked mackerel production and it would not be a big step for these firms to expand into other mackerel products if niche markets for such products can be found. Here again joint ventures should be canvassed and the food centre in Dunsinea should be asked to increase its efforts in the development of new mackerel products. Our mackerel and horse mackerel supplies are so large that continuity of raw material supplies is not a problem.

The shellfish processing industry is already well developed, particularly that for bottom cultivated mussels. The expansion of this sector depends very much on increased supplies and if production could be expanded at an economic cost there would appear to be good markets available.

With the increase in farmed salmon production, it is most important to develop a good salmon processing industry so as to maintain prices by selling directly to consumers. Within the last few years, a number of smoked salmon ventures have come into operation and a few firms have gone into the production of salmon steaks and complete dinners for international markets. There may well be scope for accelerating this trend which would help to limit the fluctuations in salmon prices.

The final word on the fish processing industry is that viable opportunities exist for expansion but it will take extensive market research to identify the opportunities and to persuade entrepreneurs to avail of them. The industry cannot progress, however, unless there are adequate supplies of fish. Hence, new firms should not be grant-aided if supplies of raw materials are not sufficient to maintain continuous production. The problem of increasing supplies is discussed in Chapter 5.

Chapter 5

SCOPE FOR DEVELOPING THE CATCHING SECTOR

Fish Resources

The strong demand for seafood on the home and export markets and the reduced catches of whitefish internationally have brought about a recovery in producer prices for fish over the past two years. These increased prices, allied to lower fuel costs, have restored the catching sector to profitability after many years of very difficult operation. The industry is now emerging from a period when fleet replacement was almost at a standstill and many vessels are in urgent need of modernisation.

To overcome the present difficulties BIM has now published a Fleet Development Strategy (BIM, 1988a) aimed at improving the fleet catching capacity, so as to fully exploit the fish resources off our coast where this is feasible from an economic point of view, and taking account of the EC Common Fisheries Policy. The latter is described briefly below.

The Common Fisheries Policy (CFP)

This policy which was agreed by the EC Council of Ministers in January 1983 provides an overall regulatory framework for sea fishing within the Community. It has three principal elements:

(1) Fishing limits;
(2) Total allowable catches, quotas and other conservation measures; and
(3) Structural policy.

(1) *Fishing Limits:* These define rights of access to fish resources. Ireland has exclusive fishing rights in a zone up to 12 miles from the North West and South West coastlines. Along the remaining areas of the coast certain other member states (notably France, UK and the Netherlands) have retained their traditional fishing rights in the 6-12 mile zone, these rights being limited to specific fish varieties.

A major issue concerning access has to do with Spain's entry to the EC. According to the Act of Accession (EEC, 1985) Spain will not be allowed to fish inside the 50 mile Irish zone for a ten year period commencing on 1 January 1986. The regulations state however that there will be orderly opening of the Irish zone to Spanish vessels from

1 January 1996. Fishing in the Irish zone after that date will be restricted to waters outside the 12 mile limit. Rights inside the Irish 12-mile zone have been formally relinquished by Spain but considering the level of illegal fishing in the past this relinquishment is likely to be more hypothetical than real.

Since the introduction of 200 mile fishing zones in the mid-1970s the Spanish fleet has been pushed out of many traditional grounds, yet it failed to adjust fishing capacity to available stocks and as the mismatch grew so did the pressure to find alternative fisheries. According to the French Authorities (O'Connor, 1986; Spense, 1985) there were nearly 3,000 cases of illegal fishing by Spanish vessels between 1980 and 1983 in the Gulf of Gascony. In 1983, 48 vessels were arrested in Irish waters and each fined in the range of IR£25,000 to IR£35,000 plus forfeiture of catch and gear. In September alone of 1984 18 Spanish vessels were arrested in Morocco.

But even with legal fishing Spain's allocation of the existing EC TAC is high and will impinge on the Irish catch, particularly of Dublin Bay Prawns, in the Irish Sea and the Porcupine Bank. This will reduce substantially the availability of prawns to Ireland - a major source of income to Irish fishermen.

(2) *Allowable Catches and Quotas:* Total allowable catch (TAC) is the total catch of a fish species permitted to be taken by all countries fishing in a particular ICES area.[3] The term quota refers to the share of the TAC allocated to a particular State. TACs for each species are decided annually by the Council of Ministers based on scientific advice provided by ICES and the EC Scientific and Technical Committee. The share out of these TACs among the different countries is then made on the basis of catch proportions by these countries in 1982, the base year for the quotas. The figures in Table 10 show that the Irish quota as a proportion of the total Community TAC varies from 1.8 per cent for plaice to 18.6 per cent for mackerel with the overall average being 7.8 per cent. The percentage share of the TAC allocated to each member state for each species remains fixed until 1992. However the Irish share has been affected by the addition of new species to the quota (white pollack and Dublin Bay Prawns) with the accession of Spain and Portugal in 1986. On the other hand, the quotas for hake, monkfish and megrim have increased somewhat in line with higher TACs for these species following Spanish entry. Unfortunately the quotas for the latter are still very small.

3. Areas of sea defined by the International Council for the Exploration of the Sea, Copenhagen.

Table 10: *Irish Quotas as a Percentage of Total Community TAC in All Waters in 1987*

Species	*Irish Quota*	*Total Community TAC*	*Irish Quotas as percentage of Total TAC*
	Tonnes		*Per Cent*
Cod	11,350	332,460	3.4
Haddock	3,850	177,430	2.2
Saithe	3,760	134,800	2.8
White Pollock	910	14,530	6.3
Whiting	17,240	177,270	9.7
Plaice	3,295	185,515	1.8
Sole	625	30,580	2.0
Mackerel	79,350	426,270	18.6
Hake	1,990	88,460	2.2
Monkfish	3,060	58,900	5.2
Megrim	2,960	33,860	8.7
(Dublin Bay Prawns)	9,315	53,540	17.4
Herring	38,920	555,470	7.9
Total	176,625	2,269,085	7.8

Source: BIM.

(3) *Structural Policy*: The broad objective of EC Structural Policy is to adjust fish catching capacity to the available fish resources and to promote the development of aquaculture. The new Policy which was agreed at the end of 1986 will have application for the ten year period commencing 1 January 1987 with a supporting budget of IR£623m for the first five years.

Projects relating to the renewal and modernisation of the fishing fleet, will attract over half the Structural funds. The rationale for EC funding is that new vessels should replace existing ones at an annual rate of 5 per cent of fishing capacity and that 25 per cent of all Community vessels should require modernisation over the duration of the programme.

For the first time, new vessels and improvements to vessels over 33m in length will be eligible for Community aid. FEOGA grants for these vessels will be 25 per cent compared to 35 per cent for vessels between

9 and 33 metres. For both categories of vessel, the enabling National grants must be set at a minimum of 10 per cent of project costs.

EC grants for the development of aquaculture constitute 16 per cent of the total structural fund budget. Ireland is classed as a sensitive region entitling her to preferential rates of grant aid. The threshold investment for aquaculture projects is IR£38,300 and these may be eligible for 40 per cent FEOGA grants provided that minimum grants of 10 per cent are provided by the Member States.

Other innovatory measures in the revised Policy which should be of particular benefit to Ireland, are FEOGA aids for exploratory fishing in Community waters and for the development of port facilities and market promotion.

The aids for exploratory fishing are especially welcome. There are large areas of unexplored fishing grounds in the Atlantic and it is believed that there are substantial quantities of non-quota fish in these grounds. There is some evidence also that lobsters can be found in the deeper waters which cannot be fished by the smaller shellfish boats. BIM, through its exploratory fishing programme, should explore as many new grounds as possible so as to increase landings of non-quota species before they are eventually brought under quota. The level of coastal surveys should also be stepped up in order to locate new suitable sites for shellfish aquaculture.

Irish Catches and Quotas

In recent years Ireland has not been able to fill all of its quota allocations particularly those for whitefish. The figures in Table 11, which give quotas and catches for the different species in 1987, show that out of a total quota of 186,000 tonnes only 163,000 tonnes were landed leaving 23,000 tonnes of unused quotas.

In general pelagic species were fished up to quota levels in 1987. On the other hand catches of Dublin Bay Prawns and of all the demersal species were below quota, whiting, cod and prawns being substantially less. A high proportion of the unused quotas are in the Irish Sea and strong doubts have been expressed as to whether it will ever be possible to fish these species in this area up to quota levels. It is believed that the TACs are far too high - the fish are not there. On the other hand in the Atlantic Ocean where there are little or no unused quotas there are indications that new offshore whitefish grounds can be opened up. If this were to happen the quota restrictions in these areas would not allow us to take those fish - at least not until the TACs for the areas were increased substantially.

The TACs off the South West and North West Irish coast are based on historic catches rather than on scientific stock assessment. There is a pressing need therefore for a comprehensive programme of scientific stock assessment for demersal species in deeper offshore Atlantic grounds off the Irish coast.

Table 11: *Irish Fish Quotas and Landings in 1987*

Species	*Quota*	*Landings*	*Unused Quotas*
		Tonnes	
Demersal			
Whiting	17,240	9,288	7,952
Cod	11,350	7,238	4,112
Haddock	3,850	2,827	1,023
Saithe	3,760	2,353	1,407
Plaice	3,295	2,878	417
Megrim	2,960	1,830	1,130
Monkfish	3,060	1,328	1,732
Hake	1,990	1,367	623
Sole	680	371	309
White Pollack	910	786	124
Total Demersal	49,095	30,266	18,829
Mackerel *	89,350	89,490	-140
Herring	38,920	39,395	-475
Dublin Bay Prawns	9,315	4,131	5,184
Total all quota species	186,680	163,282	23,398

Source: BIM.

Note: *The official EC mackerel quota was increased during 1987 by the acquisition of some unused British, German and other country quotas.

Non-Quota Species

In 1987 these species accounted 32 per cent of total landings by volume of sea fish excluding aquaculture. Eighty three per cent of the shellfish, 25 per cent of the pelagic and 28 per cent of the demersal landings were not subject to quotas.

Many of the non-quota species are likely to be brought into the quota net after 1992 when the present CFP comes up for revision. As this quota share out will be based on historic catches, Ireland must urgently increase her catches of these species over the coming three years if it is believed that that long-term expansion of fishing will be viable.

Catch Projections

BIM in its most recent projections (BIM, 1988a) think it is possible to increase horse mackerel catches to 60,000 tonnes per annum by 1991 from the present level of about 30,000 tonnes. The 1991 catch predicted for blue whiting is 70,000 tonnes compared with a 1987 catch of about 3,000 tonnes. At the present time all the blue whiting catch goes at a low prices for reduction to fish meal but it is hoped that over time better quality fish will be found which will go for fillet/minced block manufacture with the spent fish only going for fish meal.

Recent surveys show that mackerel stocks are more abundant than hitherto thought and in view of this the mackerel TAC is predicted to increase. The official 1991 Irish quota is projected at 90,000 tonnes compared with 80,000 tonnes in 1987.

In regard to demersal fish the main scope is to avail of the present 19,000 tonnes below quota shortfall in the catch of traditional species mainly whiting and cod. As stated above this shortfall occurs in the Irish sea where it is believed the fish do not exist. If these quotas could be transferred to the Atlantic Ocean the full quotas could be taken.

Unfortunately this transfer will not occur automatically. Evidence will have to be presented to the EC Commission that the TACs in the Atlantic should be increased and this evidence must be forthcoming from scientific studies. The Department of the Marine must endeavour, therefore, to have these investigations carried out immediately.

Ireland has a very low hake quota and it is hoped that this can be increased as well as those of associated species like monkfish and megrim. Experience with these fisheries leads to the belief that the stocks are more abundant than heretofore thought and that TACs can be increased without danger.

BIM also think it is possible to increase the annual landings of non-quota whitefish by 9,000 tonnes, the main species being ray/skate, ling, and to a lesser extent turbot, brill, tusk and bream. It is considered that a significant amount of the projected expanded landings of both quota and non-quota whitefish must derive from offshore grounds of 100 fathoms and more. A transfer of fishing to these new areas will have the additional benefit of relieving pressure on the inshore grounds.

Our shellfish industry has a greater diversity of species than most other European countries and there is considerable scope for further development of all species except perhaps crayfish. There is probably scope also for increasing landings of less well known species such as spider, velvet, green crab, whelk, brown shrimp and clam. BIM thinks it is possible to increase shellfish landings by a further 11,000 tonnes over the next few years. No increase in the wild Atlantic salmon catch is predicted over the planned period.

The projected landings for the different groups in 1991 are compared with actual 1986 landings in Table 12. Total landings are projected to increase from 218,000 tonnes in 1986 to 405,000 tonnes in 1991 or by 187,000 tonnes. The big bulk of this increase is projected to come from pelagic landings. This looks like a very optimistic projection but because of the entry into the fleet of some very large boats it should be possible to attain the projections for the non-quota species. The increase in the landings of quota species is a different matter. For this to take place, quotas will have to be transferred or increased and, as stated above, this will not happen automatically.

How Projections May be Achieved

The whitefish and prawn fleet is still very dependent on inshore grounds despite the fact that a number of Irish vessels have begun to successfully fish the Porcupine, Rockall and other offshore grounds in recent years. One reason why offshore grounds are not fully exploited is that fishermen wish to minimise steaming distances, and other things being equal, will always fish grounds close to home in preference to distant ones. Another reason is that most of our present fleet is extremely weather dependent. Vessels under 27m are able to fish on the Porcupine bank only in good weather. In bad weather these vessels must run to port for shelter – a 10-14 hour steam. The large French and Spanish vessels, on the other hand, can

Table 12: *Fish Landings in 1986 Compared with Projected Landings* [a] *in 1991.*

	1986		*1991*		*Volume Increase*	
	Tonnes	*£'000*	*Tonnes*	*£'000*[b]	*Tonnes*	*%*
Quota Demersal	30,324	24,100	47,900	34,370	17,600	58
Non-Quota Demersal	9,824	5,164	17,800	11,450	7,900	81
Total Demersal	40,148	29,264	65,700	45,820	25,500	64
Quota Pelagic	112,531	14,466	135,000	17,000	22,500	20
Non-Quata Pelagic	49,800	3,328	177,000	10,900	127,200	255
Total Pelagic	162,331	17,794	312,000	27,900	149,700	92
Quota Shellfish	6,150	7,360	9,300	11,100	3,150	51
Non-Quota Shellfish	7,550	7,893	15,800	17,340	8,250	109
Total Shellfish	13,706	15,253	25,100	28,440	11,400	83
Salmon and Sea Trout	1,827	5,924	1,830	5,936	-	-
Total	218,012	67,860	404,630	108,096	186,600	86

Source: BIM (1988a).

Notes: (a) Landing figures include landings into foreign ports and transhipments at sea.

(b) 1991 values are at 1986 prices.

remain on the grounds and begin fishing again when gales moderate. They thus have a great competitive advantage over the Irish boats.

In general Irish fishing vessels working offshore for whitefish and prawns are undersized, underpowered and usually more poorly equipped than those of competitor nations on the same grounds. The trouble is that we have too many small boats for the stocks available where these boats can fish safely, while we have a shortage of large whitefish boats capable of fishing the valuable offshore grounds.

Fleet Development Strategy

To achieve the projected increase in landings it will be necessary to increase the offshore whitefish/prawn fleet that will be capable of safely exploiting the more distant and deeper grounds that are currently being worked by Irish vessels.

Apart from quotas the main constraint affecting the scope for fleet development is the requirement (under EC structural policy) that total fleet capacity must be reduced by 3 per cent of its 1984 gross registered tonnage (GRT) and must not show any increases in this level over the period 1987-1991. Hence the GRT of new vessels entering the fleet and expecting EC grants must be balanced by the withdrawal of older vessels to an equivalent GRT. In the period 1988-1991 a total of 70 inboard engined vessels amounting to about 10,000 GRT are targeted to enter the fleet with 130 vessels constituting the same GRT due to be withdrawn from the Register. If this level of withdrawals is not obtained by natural wastage it may be necessary for Ireland to avail of the EC decommissioning grant scheme. This scheme, which applies to vessels under 100 GRT provides for a maximum cessation premium of IR£21,000 per vessel plus IR£1,700 per tonne GRT. Thus a 15m vessel of 50 GRT would qualify for a premium of IR£106,000, half of which would be funded by the EC and half by the state.

A summary of BIM's fleet development programme 1988-1991 is given in Table 13. Total investment in new vessels over the period is estimated at IR£52.2 million. A further IR£17.3 million is to be invested in fleet modernisation making for a total investment of IR£69.5 million over the period. The grant aid on the new vessels is projected at IR£3.6 million from BIM and IR£12.1 million from the EC. In addition IR£6.7 million is expected to be paid in modernisation grants of which IR£1.6 million will come from BIM and IR£5.1 million from the EC.

Thus £22.4 million is scheduled to be spent by the EC and the Irish exchequer on new vessels and modernisation. At the same time there could be an open-ended commitment possibly amounting to a further £7 million for decommissioning existing boats. The main aim of this policy is to improve the ability of the Irish fishing fleet to fish more distant and more difficult waters, thus permitting a substantial increase in the total catch within the constraints of a constant or declining tonnage of fishing vessels.

Table 13: *BIM's Fishing Fleet Programme, 1988-1991*

	No. of new vessels entering fleet	*Total Investment*	*BIM Grant*	*EC Grant*	*No. of Vessels on Register December 1991*
			IR£m.		
Inshore Vessels (up to 18m)	49	4.1	0.4	1.5	1,669
Near Water Vessels (18-27m)	10	8.9	1.1	3.2	211
Offshore Vessels (27-40m)	9	21.2	2.1	7.4	30
Distant Water Vessels (over 40m)	2[a]	18.0	-	-	7
Total	70	52.2	3.6	12.1	1,917
Modernisation Work	-	17.3	1.6	5.1	-

[a] These vessels entered the fleet in the latter part of 1987 but did not contribute significantly to landings until 1988.

Source: BIM, 1988a.

Whether grant aid of this magnitude represents the most appropriate use of Irish exchequer and EC funding needs careful consideration. However if the resultant increase in catches can form the basis for a viable expansion of the processing industry it would improve the likelihood that such expenditure is justified. The benefit/cost effect in the recent past of grant aiding boats and other state expenditure on sea fisheries is examined in the next chapter.

Chapter 6

RELATIONSHIP BETWEEN VALUE ADDED IN SEA FISHING AND STATE EXPENDITURE ON THIS SECTOR[4]

In this chapter a comparison is made between the value added in sea fishing and state expenditure on the sector. For this exercise sea fishing is taken as the catching sector up to the point of first sale. Processing, marketing and aquaculture are not included.

For the purpose of the exercise it is necessary to define an appropriate measure of economic activity in the catching sector. Since the primary purpose of state expenditure in relation to economic activity is to improve the growth performance and contribution which the sector can make to national output, a measure of the gross value added of the sector would appear to be the most appropriate indicator. Gross value added is the difference between gross output and non-factor costs, i.e., costs other than those paid for labour and capital items.

There are no systematic estimates available of the value added of the sea fisheries sector and so it has been necessary to make such estimates for this exercise. In doing this, output of the sector is defined as the value of landings by Irish registered vessels into Irish and foreign ports plus transhipments at sea from Irish to foreign vessels. The value of farmed fish has been omitted as well as the state expenditure on this activity. No account is taken either of the value added as a result of processing and marketing of fish after being landed. Nor is the state expenditure on these activities included in the calculations. The estimates do however include the value of salmon caught at sea in both draft and drift nets since netting for salmon represents a significant proportion of the value of landings of vessels under 15 meters in length.

In estimating non-factor costs, data supplied by BIM indicated that these costs were about 34 per cent of the value of output and this figure has been used to estimate the gross value added of the industry each year.

In assessing the level of public expenditure in relation to sea fisheries (see Table A.8) only expenditure which could influence the output

4. In preparing this chapter I have drawn on unpublished work by Dr Peter Bacon (formerly of the ESRI) who examined this question in 1985.

defined above is included. There is little ambiguity about the bulk of the expenditure. In the case of the Department of the Marine (formerly Department of Fisheries) the items included are direct Expenditure on Sea Fisheries development and Fishery harbours and the overheads attributable to these items and to the salmon sector. For BIM the figures included are the direct expenditure on the catching sector which include current development costs capital grants for boats, ice plants, etc., and the administration costs allocated to these items. Direct costs on aquaculture marketing and processing have been omitted as well as the estimated administration of these items. In addition to these expenditures there are relatively minor works undertaken by Roinn na Gaeltachta the main beneficiaries of which are probably fishermen.

A less clearcut item is state expenditure on inland fisheries. Since catches of salmon at sea, which now account for over 90 per cent of the salmon catch, are included in the output it seems appropriate that state expenditure to maintain and improve salmon stocks should be included. The Central Fisheries Board (CFB) which deals with inland fisheries estimates that about 50 per cent of its expenditure is related to salmon and accordingly this fraction of the CFB budget is included. The Salmon Research Trust expenditure is included also.

A more contentious item for inclusion in the state expenditure table is the cost of enforcing the Common Fisheries Policy of the EC. This involves the Irish authorities in patrolling a section of the vast areas of sea covered by the community's 200 mile zone. However as most commercial sea fishing in Ireland takes place within 20 miles of the shore much of the activity probably has little effect on the catches made by the Irish Fishery Fleet. Accordingly it seems inappropriate to include all of the protection expenses in evaluating state expenditure in relation to Fisheries. Having said this it is clear that some costs associated with fisheries protection must be included.

Two considerations lead to the conclusion that perhaps 15-20 per cent of the protection costs should be attributed to the Irish sea fisheries sector. First, the vast bulk of the Irish sea fishing takes place in an area equivalent to 15 per cent of the waters within the Irish 200 mile zone. Hence in the absence of a Common Fisheries Policy we would be unlikely to protect the areas in which we do not fish. Second, Ireland catches only about 5 per cent of the total community catch despite having 25 per cent of community waters within its 200 mile zone. Accordingly about 20 per cent of the total protection cost (5.0 divided by 0.25) might be appropriately attributed to the Irish catching sector. The remainder might be deemed an overhead cost which we pay for the many benefits of community membership. Hence 20 per cent of the protection costs are included in the state expenditure in this evaluation.

The estimates for the different items of expenditure are given in Table A.8 of the Appendix for the years 1982 to 1987 and for 1991. The figures for 1991 are projections made by BIM and the author. The totals of these items together with the figures for output and gross value added are brought together in Table 14. The figures in the top section of this table show that in the years 1982 to 1987 the gross value added (GVA) of the sea fisheries as a percentage of state expenditure rose from 192 to 309. This represents a considerable improvement over the period. The projection for 1991 is 401 per cent, representing a further improvement over the coming years.

Table 14: *Output and Gross Value Added of Fisheries and Agriculture Compared with State and State plus EC Expenditure on These Items 1982-1987 and Projections for 1991*

	1982	*1983*	*1984*	*1985*	*1986*	*1987*	*1991* [b]
Fisheries				*£'000*			
Total Value of Landings [a]	50,690	58,371	55,517	65,522	67,500	79,596	132,000
Gross Value Added (GVA)	33,743	38,748	36,730	43,245	44,550	52,533	87,120
State Expenditure	17,578	15,649	14,263	15,857	15,836	17,015	21,717
State plus EC Expenditure	24,079	19,301	20,563	19,539	20,714	22,293	25,717
				%			
GVA as percentage of State Expenditure	192	248	258	273	288	309	401
GVA as percentage of Ssate plus EC Expenditure	140	201	179	221	215	236	239
Agriculture				*£ million*			
Gross Agricultural Product at Market Prices (GAP)	1,268.7	1,413.0	1,613.5	1,467.9	1,413.1	1,653.4	-
State Expenditure on Agriculture	328.9	342.0	346.5	336.2	363	370[b]	-
State plus EC Expenditure	731.2	841.9	1,041.3	1,222.2	1,294	1,347	-
				%			
GAP as percentage of State Expenditure	386	413	466	437	389	447	-
GAP as percentage of State plus EC Expenditure	174	168	155	120	109	123	-

Notes: [a] Includes landings into foreign ports, transhipments at sea as well as salmon and sea trout caught at sea in draft and drift nets.

[b] Estimated.

In order to have some standard of reference similar percentages were prepared for the agricultural sector for the same years (see bottom section of Table 14). These ratios averaged 442 per cent for the six years varying from 386 per cent in 1982 to 466 per cent in 1984. By comparison with agriculture, therefore, the return on state expenditure in sea fisheries has been low over the past years but is becoming more favourable.

This comparison is, however, not entirely valid. In addition to state expenditure the agricultural sector benefits substantially from the common agricultural policy of the EC. The common fishery policy does not confer benefits of the same relative magnitudes on the fisheries sector. If EC transfers to agriculture and fisheries are added to state expenditure on these activities a more favourable result for fisheries relative to agriculture emerges. Reference to Table 14 shows that for 1982 the fishery ratio is less than that for agriculture but for the years 1983 to 1987 the fishery ratio is higher than the other though both series are still relatively low.

This exercise goes to show that industries like agriculture and fisheries which are primary food producers, require considerable public expenditure to make them viable at current levels of output. O'Connor, *et al.*, (1983) have shown that special policies have been introduced for agriculture in almost all developed countries and these policies are very expensive.

On the basis of the above analysis, both sea fisheries and agriculture would appear to compare very unfavourably with manufacturing industry in regard to return on state spending. The estimated value added by the latter is currently over 27 times total IDA expenditure on industrial grants plus administration. This ratio would be reduced to about 22/1 if profit repatriations by the multinational firms were deducted from GVA; but even when this is done the difference is still quite substantial.

Comparison of value added/state expenditure ratios for different sectors is, however, an exercise which must be taken with a considerable amount of caution. The results depend on three factors.

(1) the capital intensity of the sectors

(2) the amount of private investment which goes with the state grants, and

(3) the size of the sectors involved measured in output or value added.

As is well known, both agriculture and sea fisheries are very capital intensive industries. Consequently, the value added per £1 invested is much lower in these sectors than in manufacturing industry.

In regard to the second point, state investment in manufacturing industry is only about 15 per cent of total investment in any year. Hence when the GVA of the sector is related to the state investment, the ratio is high. In sea fisheries, direct state and EC investment in boats (not including administration) is about 50 per cent of total investment in any year. Accordingly, when related to total fishery GVA, the return on this investment is lower than the corresponding industrial figure.

The biggest problem with sea fisheries, however, is the small size of the sector as compared with manufacturing industry. The cost of administering the IDA industrial grant scheme is only about 14 per cent of total IDA expenditure. On the other hand, the cost of administering sea fishing grants by BIM is about 33 per cent of total BIM expenditure on sea fishing. In addition, there are Department of Marine, Central Fisheries Board and Department of Defence protection costs. When all these are taken into account, it is found that administration and protection account for about 80 per cent of total state expenditure on sea fishing, with only about 20 per cent of the costs going for capital and current development and repayment of bad debts (see Table A.8).

Even if no development work were done on sea fisheries, the cost of protecting and regulating the existing industry would have to go on so that overall costs would not be reduced greatly. It would seem expedient, therefore, to continue the development work. As the sector grows the relative deadweight of the administration and protection costs will decrease and with increased supplies it may be possible to develop the processing industry further.

Probably the most telling reason for a continuation of support for sea fishery development is the regional argument. The 1980 ESRI Fishery Report (O'Connor, *et al.*, 1980) said that many areas within Donegal, Mayo, Galway, Kerry, and West Cork are now thriving regions due almost entirely to income from fishing. Without such incomes they would be deprived, under-populated areas. Because of their location there are few other sources of income available to them. This statement is still true.

Chapter 7

CONCLUSIONS AND RECOMMENDATIONS

The figures presented in this report show that there has been a very large increase in fish landings since 1963. The volume of landings into Irish and foreign ports has increased over the period from 25,000 tonnes to over 240,000 tonnes. In addition there has been a considerable increase in aquaculture production. Farmed salmon output in 1987 at about 2,200 tonnes was about twice as high as the wild salmon catch while there has been a large increase also in farmed shell fish. Farmed salmon output in 1988 was 4,700 tonnes and the projection for 1989 is 6,200 tonnes.

Constraints on Future Supplies

Unfortunately a high proportion of the more valuable fish species are under quota and these quotas are not likely to increase to any significant extent in future years. Irish fishermen have thus been increasing catches of lower priced non-quota species like horse mackerel and blue whiting. It is important that we increase the catch of these species for two reasons. First, because of technology or other reasons fish prices can change dramatically in a short time. For example, on some markets in 1989 cod is dearer than salmon whereas a few years ago cod was a rather low-priced fish. The second reason is related to the quota system. The present non-quota species will inevitably be put under quota in the coming years and since quotas are always based on catches in a base year, it is very important that we continue to increase catches of these fish. At the time Ireland joined the Common Market, our catch of the present quota species was so small that we succeeded only in getting less than 5 per cent of the EC TAC, even though we had 25 per cent of Community waters. We must ensure that when new quotas are introduced, we obtain a more equitable share.

A further problem relating to catches is that the EC, in order to reduce pressure on stocks, has directed national governments to reduce the GRT of vessels in their fleets by 3 per cent on the 1984 level. This directive may be particularly severe for Ireland as it is believed that we have increased the GRT of our fleet considerably since that date. At the moment the actual GRT level of the active boats in the Irish fleet is in dispute and the Department of the Marine is in the course of drawing up a comprehensive fleet register to determine the exact situation. Until this review is completed the question will remain unsettled but if it turns out that a large reduction in the GRT of the fleet has to be undertaken, it could have serious consequences for the BIM fishery programme.

There are difficulties also with some of the quotas we already have. In the Irish sea there are quotas which cannot be filled because the fish are not there, whereas in the Atlantic it is thought that the TACs and hence the quotas are understated. The aim for policy makers would appear to be to have some of the Irish sea quotas transferred to the Atlantic. This will not occur automatically and the Department of the Marine must have studies carried out immediately to show what the exact position is regarding stocks in different areas. If we must have quotas they should be based on sound scientific assessments.

Aquaculture

Because of the increasing demand for fish and of the static nature of supplies, countries are turning more and more to fish farming in recent years. Atlantic salmon production in particular has become very popular in Northern European countries and until recently was a very profitable undertaking. This industry is now under some threat because of rapidly increasing production and falling prices. It is expected that about 200,000 tonnes of farmed Atlantic salmon will come on the market in 1989 compared with a total world "wild" catch of 10,000 tonnes. The market is having difficulty absorbing all these supplies and prices for small fish dropped below cost of production in recent months. There is bound, therefore, to be a shake out among the less efficient producers especially in Norway. A levelling out of the steep upward trend in Norwegian production is inevitable in the medium term. Irish producers are considered to be very efficient and expansion of production, mainly from existing producers, is still going on despite the fall in prices. New producers, however, will be reluctant to enter the industry until prices return to a more economic level.

The prospects for shellfish farming, on the other hand, appear to be bright and good markets are available on the Continent, particularly, for oysters and mussels. These fish can be produced profitably in many areas around the coast.

Nor should other fish species be ruled out. Experiments should be undertaken with species like sole, brill and turbot as well as with a number of shellfish species to see if they can be farmed profitably. The enhancement of the eel population should also receive attention. The ESB, which has pioneered salmon farming in this country, should be encouraged to examine the economic viability of growing eels in the warm waters around its power stations, particularly around the Moneypoint station which is in constant use, and from which a regular supply of waste heat is available.

The regional distribution of fish farms needs investigation also. Except for the Wexford Harbour mussel operation and the major development in oysters in Carlingford Lough, there is little aquaculture activity along the East coast. The conclusions from a conference held in Wexford in December 1986 was that the prospects for salmon farming in this area were limited due to the lack of suitably sheltered deep water sites but there was general agreement among the experts present that a major potential existed for shellfish cultivation in the area. It was considered that the Wexford/Waterford coastal areas were very suitable for the growing of mussels, oysters, clams, escallops and possibly abalone. Reference was made at the Conference to regenerating part of the large oyster fishery which extended from Wicklow Head to Hook Head in the 17th and 18th centuries and which was the largest oyster fishery in Europe. Ways and means of developing shellfish aquaculture along the Wexford/Waterford coast are now being examined by the South East Regional Technical Committee (SERTEC) and the Wexford County Development Officer (Ringwood, 1989). The possibility of appointing a marine biologist in the area is being examined. This officer, if appointed, will carry out surveys to locate suitable sites, stimulate interest in aquaculture in the area and give technical and commercial advisory information on projects. A marine biologist in the Dingle area is doing similar work for Taidghe Mara Teo. The appointment of similar officers in other areas, funded to some extent by existing industry, should be investigated by BIM and Udaras na Gaeltachta.

Aquaculture and the Environment

Considerable unease has arisen in many quarters concerning the effects of salmon aquaculture on the marine environment. Some of the drugs used to control disease and pests have lethal effects on other aquatic animals. Research in this area is urgently needed to develop less environmentally damaging treatments. The Irish Salmon Growers' Association in liaison with An Taisce and other environmental groups has now produced a general code of practice on the safe use of drugs. It has also launched a programme into the cause and treatment of fish diseases together with Bio Research Ireland and Hamburg University. Other projects planned, in conjunction with the Department of the Marine, include determining the effect of escaped fish on wild stocks and the correlation of environmental data.

Fish Processing

In Ireland, over the years, the concentration has been on increasing the fish catch. Up to 1963 when BIM was established in its present form there was little worthwhile sea fishing in the state. Over the years our waters had been fished by all the great nations of Europe while the Irish industry languished. We have now overcome the early difficulties regarding supplies of fish but unfortunately the processing sector has not developed to anything like the same extent as the catching sector. There were various reasons for this in the early years. The Irish market was small and we were very dependent on exports. Because of the inshore nature of the fleet, supplies of raw materials were irregular - the small boats could not go to sea in bad weather. Also profit margins on processing were low with the result that temporary difficulties with markets or supplies could have serious effects. But even now when supplies have increased and become more regular the high value added sector of the white fish processing industry has difficulty in expanding. In recent years a higher price can be obtained for these fish on the fresh market than most Irish processors can pay. Consequently, it is difficult to survive in the industry, and many who established in former years have now been forced out of production. The shellfish processing sector has, however, expanded and there are good prospects for further developments in this area if supplies of raw materials can be increased.

In other EC states the white fish processing industry has remained viable through the import of raw materials from third countries, but because of our location, it is unlikely that we could be competitive using such supplies. Transport costs from the fishing grounds to Ireland and from Ireland to the consuming market would be very high. The situation, however, is not without some promise. Niches can be established for small quantities of high priced white fish products on foreign markets and a number of processors are already serving such markets.

To expand on the present level, a considerable stepping up of our market research is required. BIM is already involved in this work and has produced a number of very valuable market research reports (see, for example, BIM, 1988b). It should continue this work. IDA, Coras Trachtala and Udaras na Gaeltachta should also become involved. Trial shipments should be arranged and we should try and cash in on our reputation in Europe for having clear, unpolluted waters. To do this, emphasis must be placed on hygiene and quality control in our factories.

Because pelagic species form a very high proportion of the Irish catch and because prices for these fish are relatively low, it should be possible to develop the pelagic processing industry, for both traditional and new varieties. Due to nematode infection the demand for herring declined in the mid to late 1980s and prices were severely affected. As a result of new EC regulations, the market has now recovered and the demand for herring is beginning to pick up again. We should try and capitalise on this changed attitude and seek to obtain a niche in the processed herring market in Europe. This is probably best done by establishing joint ventures with established European processors.

To expand the processing industry, however, will require intensive efforts by all concerned. If the state is to continue spending money on catching fish it should endeavour to have these catches generate as much income and employment as possible. The ESRI 1980 Fishery Study (O'Connor, *et al.*, 1980) quoted IDA survey data which showed that for every 200 tonnes of raw herring, primary processing created an average 1.25 jobs. If the same amount of herring were further processed into consumer products an additional 5.8 jobs could be created. In a country with our high rates of unemployment this factor should carry a great deal of weight.

A second major advantage of a concentration on secondary processing is that over time it could be expected to result in a more stable industry, one less subject to the whims of processors in other countries or the availability of hard currenty in Nigeria (O Faolain, 1988, op. cit., p. 75). In the short term profitability in the commodity markets may be high because such markets require little investment in marketing expenditure. In the long term, however, once the initial entry costs have been borne, retail markets tend to be more profitable.

The Information Requirements of the Industry

In its report to the Sectoral Development Committee (The Development of the Fishing Industry, 1984) the Sectoral Consultative Committee (SCC) said: "There is a general agreement that the information dealing with the economic and social aspects of the industry is totally inadequate." It went on to say that the statistics which were collected on fish landings, yield extremely limited information. In many areas around the coast, and particularly in the smaller fishery harbours the frequency of collecting data is dependent largely on the availability of the fishery staff who are required to undertake other duties. The SCC report concluded that the accuracy of the data was questionable.

Statistical problems are not confined to Ireland alone. Because the data supplied to it by the member states are so variable from year to year the EC Statistical Office in Luxembourg has ceased publishing country consumption figures. Such data, based on disappearance calculations, are still produced by the OECD but the results are not comparable as between countries and indeed the variations in "within" country figures from year to year are so great that little reliance can be placed on them.

A further difficulty will arise in 1992 when intra- community foreign trade statistics in their present form cease to be collected. Research workers have always considered that the quantities entered on export/import documents were reasonably accurate and have used these entries to check the landing figures. Post-1992 when these documents are no longer being completed there will be no good checks available. Schemes are now being devised to deal with this problem but the data obtained are unlikely to be as accurate as the current trade statistics. Consumption figures in particular will have to be based on household surveys and it is suggested that in Ireland these surveys be carried out by the Central Statistics Office which has vast experience in this area. The CSO should also be charged with the collection of the basic catch data. These should be obtained from portal and other primary sales dockets and *not* from ship log book entries. Where quotas are in operation the catch entries in the latter are very often understated and species of fish are misnamed.

Summary of Recommendations

1. Carry out investigations immediately to have misplaced white fish quotas transferred from Irish Sea to Atlantic Ocean.
2. Step up level of exploratory fishing with EC grants in an endeavour to locate new fishing grounds for non-quota species and possibly new species.
3. Step up the level of coastal surveys in order to locate suitable sites for shellfish aquaculture.
4. Continue research work on new species suitable for fish farming.
5. Carry out development work to determine the economics of farming species like sole, brill, turbot, cod, abalone, clams, etc.
6. Carry out experiments on eel growing in the waste hot water at Moneypoint Power Station in Clare.
7. Improve the advisory services so as to stimulate interest in shellfish farming and give technical advice to those involved.
8. Carry out studies to determine the effect of escaped farmed salmon on wild stocks and to develop environmentally friendly methods for the control of salmon diseases and pests.
9. Step up the level of market research abroad to locate profitable niches for processed fish.
10. Negotiate joint ventures with established foreign processors for the manufacture in Ireland of processed products.
11. Ensure that there are adequate supplies of fish available for grant

aided firms. If catching and processing development plans are not co-ordinated surplus processing capacity could be created.

12. Concentrate on quality and hygiene standards in the processing industry so as to give Irish products a good name on home and export markets.
13. Have the Central Statistics Office be made responsible for compiling the data on fish catches and household consumption of fish.
14. Ensure that catch data are obtained from portal and other primary sales dockets and not from log book entries.

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APPENDIX

Table A.1: *Quantity and Value of Different Classes of Fish Landed into Irish Ports* by Irish Fishermen in Selected Years, 1963 to 1987*

Year	*Quantity*					*Value*				
	Demersal	*Pelagic* *Herring*	*Pelagic* *Other*	*Shellfish*	*Total*	*Demersal*	*Pelagic* *Herring*	*Pelagic* *Other*	*Shellfish*	*Total*
	Tonnes					*£'000*				
1963	10,688	8,420	1,182	2,886+	25,176	829	193	37	354	1,413
1965	14,340	10,700	3,554	4,180+	32,774	959	251	58	431	1,699
1967	15,928	23,660	2,775	4,962+	47,325	1,080	499	57	517	2,153
1970	15,345	45,464	6,529	10,058+	77,396	1,428	1,275	105	1,102	3,910
1973	20,378	38,866	15,976	10,505+	85,725	2,374	2,802	514	1,773	7,463
1975	20,415	28,808	17,051	9,988	76,262	2,881	3,232	648	2,374	9,135
1977	18,887	23,129	28,750	11,722	82,488	5,708	6,033	1,947	5,001	18,689
1980	27,230	36,800	60,141	10,715	134,886	8,398	9,395	4,931	6,143	28,866
1982	34,917	29,734	114,472	15,719	194,842	13,908	5,233	12,758	11,909	43,808
1983	36,011	32,025	86,134	16,063	170,233	17,069	5,229	10,905	12,229	45,432
1984	37,596	31,622	71,786	23,909	164,914	18,985	4,497	7,953	13,406	44,843
1985	41,800	31,716	91,235	22,998	187,749	23,685	4,315	9,471	14,294	51,765
1986	32,776	38,020	98,427	24,450	193,673	23,281	5,872	9,625	16,965	55,743
1987	41,806	39,395	110,294	25,544	217,039	32,284	5,680	13,300	18,936	70,200

Source: *Sea and Inland Fisheries Reports* for various years. Dublin: Stationery Office.

Notes: * Landings into foreign ports by Irish fishermen excluded. These landings were valued at £6.8 million in 1987. In addition mackerel to the value of £1.9 million were transhipped at sea in that year.

+ Volume figures estimated from data on numbers landed.

Table A.2: *Quantity and Value of Different Species of Wet Fish and Shellfish Landed into Irish Ports 1983-1987*

Species	*1983*	*1984*	*1985*	*1986*	*1987*	*1983*	*1984*	*1985*	*1986*	*1987*
	Quantity (Tonnes)					*Value £'000*				
Sole*	411	313	348	328	371	1204	1035	1197	1308	1857
Brill	91	110	121	98	105	151	196	248	246	337
Turbot	216	208	178	187	270	570	608	598	755	1384
Plaice*	2223	2420	3043	2494	2878	1644	1756	2190	2051	2514
Dabs	426	442	483	461	363	94	101	122	142	113
Megrim*	1596	1310	1377	1367	1830	623	647	877	1091	1598
Other flat fish	323	441	508	461	579	185	270	396	401	507
Ray/Skate	1852	2112	2553	1978	2370	933	1033	1442	1225	1531
Cod*	6781	5464	6523	5806	7238	3922	3585	5162	4967	6305
Haddock*	3838	3766	3472	2055	2827	1471	1806	2276	1493	2094
Hake*	986	1066	1050	1026	1367	922	1010	1284	1487	1891
Whiting*	8313	8813	9111	6927	9288	2087	2503	2543	2630	3976
Saithe/ Pollock*	2500	2351	2220	2935	2353	868	1004	1012	1531	1358
Dogfish	4234	6235	7987	4509	7940	842	1297	2090	1563	3646
Other round fish	2222	2545	2285	2144	2027	1554	2135	2231	2391	3172
Herring*	32025	31622	31716	38020	39395	5229	4497	4315	5872	5680
Mackerel*	65537	53211	60699	55189	74671	8542	6139	7848	6575	9359
Horse Macherel	65086	43920	26571	28828	30093	1874	1377	1250	2333	3587
Sprats	5511	4655	3964	4184	2230	489	437	374	410	249
Blue Whiting	-	-	543	10226	3300	-	-	16	307	106
Total wet fish	154171	141004	164752	169223	191495	33204	31436	37471	38777	51264
					Shellfish					
Shrimps	69	75	104	93	29	241	265	438	439	131
Lobsters	400	398	300	292	281	2532	3025	2811	2513	2456
Crawfish	111	85	73	66	68	877	743	796	685	812
Crabs	1686	3704	4108	3670	3330	569	1145	1376	1311	2031
Escallops	418	321	389	533	227	448	446	451	626	411
Oysters [(a)]	316	371	317	388	581	579	732	615	937	1450
Dublin Bay Prawns*	5545	3987	4703	5937	4131	5496	4354	5000	7022	8584
Mussels [(a)]	5739	12640	10358	10615	14893	659	1351	1240	1191	1863
Periwinkles	1512	1902	2150	1810	1572	526	716	903	761	709
Squid	192	263	247	689	152	201	437	455	1242	282
Other	75	163	249	357	281	101	193	209	238	206
Total Shellfish	16063	23909	22998	24450	25544	12229	13407	14294	16965	18936
Total all fish	170234	164913	187749	193673	217039	45433	44843	51765	55742	70200

[(a)] Includes intensively farmed oysters and mussels.

* Quota species

Note: In addition to the landings shown there were 14,819 tonnes of mackerel valued at £1.852 million transhipped at sea in 1987. Landings into foreign ports in 1987 were valued at £6.8m.

Table A.3: *Current Producer Prices for the More Important Species of Wet Fish Landed into Irish Ports 1973-1987*

Species	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
								£/tonne							
Sole	931	1006	1200	1485	1732	2093	2184	2192	2565	2759	2932	3304	3437	3992	4999
Brill	354	411	477	515	680	740	826	866	1145	1423	1661	1785	2052	2511	3222
Turbot	358	444	510	799	1145	1231	1444	1389	1781	2314	2643	2929	3362	4050	5136
Plaice	217	247	276	364	457	519	557	514	575	690	740	726	720	823	874
Dabs	93	81	114	143	176	195	215	193	166	173	221	230	253	308	313
Megrim	95	94	114	149	230	206	260	229	322	269	390	494	637	798	873
Ray/Skate	161	191	200	228	262	306	375	372	428	466	504	489	565	620	646
Cod	139	176	173	242	375	406	448	375	411	482	578	656	791	855	871
Haddock	96	111	181	188	327	365	373	291	258	296	383	480	656	727	741
Hake	141	150	176	288	456	428	571	499	674	764	936	947	1223	1449	1384
Whiting	68	70	90	109	205	217	228	167	177	182	251	284	279	380	428
Saithe	82	97	118	142	255	301	312	297	293	335	347	427	456	406	484
Dogfish	na	na	na	na	na	120	109	103	151	201	199	208	262	347	459
Herring	72	100	112	142	261	295	287	255	170	176	163	142	136	154	144
Mackerel	46	43	44	61	77	63	74	83	105	113	130	115	129	119	125
Sprats	17	19	17	25	33	38	67	75	63	74	89	94	94	98	112
Salmon*	1268	1074	1377	3554	3510	3381	4803	3616	3527	4309	4357	5238	4964	3485	4090

Source: Sea and Inland Fisheries Reports of Department of Marine and BIM.

* The salmon price is the weighted average of wild and farmed salmon prices.

Table A.4: *Real* Producer Prices for Certain Species of Fish 1973-1987*

	1973	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
							IR£/tonne								
Species															
Sole	931	860	849	890	913	1026	945	802	780	716	689	498	705	789	860
Turbot	358	379	361	479	604	603	625	508	541	501	521	634	690	800	887
Plaice	217	211	195	218	241	254	241	188	175	179	174	157	148	163	168
Ray/Skate	161	163	141	137	138	150	162	136	130	121	118	106	116	123	124
Cod	139	150	122	145	198	199	194	137	125	125	136	142	162	169	167
Haddock	96	95	128	113	172	179	161	107	78	77	90	104	135	144	142
Whiting	68	60	64	65	108	106	99	61	54	47	59	61	57	75	82
Herring	72	85	79	85	138	143	124	93	52	46	38	31	28	30	28
Mackerel	46	37	31	37	41	31	32	30	32	29	31	25	26	24	24
Salmon	1268	918	974	2129	1850	1657	2078	1324	1072	1119	1024	1134	1019	689	784

* Current prices deflated by consumer price index (1973 = 100).

Table A.5: *Indices* of Producer Prices for Meat and Fish 1975-1987 (1975 = 100)*

	1975	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
						Fish							
Demersal	100	125.3	196.7	215.4	233.3	198.0	216.9	244.6	293.6	330.6	381.9	443.9	471.4
Pelagic	100	132.3	207.0	210.0	219.5	213.6	193.1	204.9	216.8	192.0	203.0	202.2	223.2
All Wet Fish	100	129.7	202.4	212.2	225.7	206.6	203.7	225.6	251.0	253.7	282.7	293.9	320.4
Shellfish	100	135.2	160.3	218.0	275.1	275.6	296.4	376.3	346.6	392.9	392.8	426.1	575.1
						Agriculture							
Fat Cattle	100	135.7	165.7	197.1	203.5	197.5	243.6	267.5	280.1	288.7	281.0	269.8	288.9
Sheep	100	142.0	151.1	221.4	254.1	229.7	289.7	287.1	301.4	303.2	294.9	297.5	311.6
Pigs	100	109.0	130.2	135.9	135.0	138.4	158.2	173.7	171.7	184.4	180.6	160.9	157.1
						Consumer Prices							
Consumer Prices	100	118.0	134.1	144.3	163.4	193.2	232.6	272.5	301.0	326.9	344.7	357.8	369.0

* In constructing the fish price indices, prices for the different fish species were weighted by the 1982 landings. Cattle, sheep and pig price indices were taken from different issues of the *Statistical Bulletin* of the CSO.

Table A.6: *Comparison of Retail Prices for Certain Fish and Meat Cuts Mid May 1975 - 1987.*

	1975	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
						£/lb							
Fish													
Whiting fillets	0.384	0.395	0.578	0.663	0.754	0.774	0.834	0.908	1.067	1.198	1.190	1.339	1.333
Cod cutlets	0.462	0.506	0.685	0.774	0.916	0.958	1.055	1.203	1.476	1.568	1.675	1.858	1.918
Plaice fillets	0.604	0.664	0.816	0.955	1.113	1.178	1.290	1.438	1.740	1.846	1.969	2.152	2.198
Beef													
Round steak	0.651	0.874	1.129	1.315	1.553	1.618	1.864	2.178	2.258	2.456	2.531	2.513	2.552
Sirloin steak	0.769	1.005	1.312	1.538	1.815	1.911	2.230	2.641	2.736	2.995	3.077	3.133	3.212
Mutton													
Loin chops	0.680	0.884	1.093	1.283	1.687	1.747	1.979	2.332	2.552	2.858	2.849	3.150	3.048
Pork													
Loin chops	0.719	0.849	0.983	1.125	1.227	1.320	1.525	1.805	1.868	1.934	1.999	2.084	2.150
Bacon and ham													
Back rashers	0.764	0.892	0.986	1.108	1.204	1.306	1.511	1.773	1.813	1.941	2.072	2.058	2.098
Ham uncooked	0.649	0.742	0.844	0.892	0.991	1.039	1.164	1.325	1.270	1.313	1.296	1.281	1.312
						*Price Indices 1975 = 100**							
Fish	100	107.9	143.4	165.0	191.9	200.7	219.2	244.8	295.4	318.1	333.3	368.9	375.8
Beef	100	133.3	173.1	202.3	238.9	250.3	290.3	341.8	354.1	386.6	397.7	400.4	408.8
Mutton	100	130.0	160.7	188.7	248.1	256.9	291.0	342.9	375.3	420.3	419.0	463.2	448.2
Pigmeat	100	116.5	131.9	146.6	160.5	171.9	197.0	230.0	232.2	243.3	251.7	254.4	260.8

Source: Irish Statistical Bulletin various issues.

* These indicates are unweighted averages of the prices shown in the upper section of the table.

Table A.7: *Principal Markets for Irish Fish Exports,* 1987*

	Quantity ⁺ (tonnes)	Value (£m)
France	22,657	31.043
Japan	19,727	18.343
Great Britain	24,834	13.966
West Germany	17,232	11.404
Spain	5,359	8.993
Nigeria	25,233	7.856
Northern Ireland	16,283	7.271
Netherlands	14,638	6.704
Other	36,571	18.361
Total	182,534	123.941*

Source: Central Statistics Office, Dublin.

* Excluding direct exports into foreign ports and exports of fishmeal, oil, etc.

⁺ Product weight.

Table A.8: *State Expenditure on Sea Fisheries, 1982-1991*

Expenditure by:	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1991*[(a)]
Department of Marine on:				*£'000*			
Sea Fisheries Development	322	281	296	307	386	371	400
Fishery Harbours	3,931	2,384	1,223	1,351	1,190	1,697	4,000
Overheads to Sea Fisheries	1,681	2,001	2,254	2,503	2,511	3,518	3,800
Inland Fisheries [(b)]	2,571	2,551	2,386	2,740	2,841	2,809	3,000
Bord Iascaigh Mhara:							
Current development [(c)]	2,078	1,666	1,384	1,519	1,247	797	815
Capital Development	2,022	1,578	1,176	1,089	1,083	1,294	2,711
Repayments Written Of	800	500	680	1,000	1,250	1,250	1,250
Administration of Current and Capital Development	807	911	965	971	996	936	796
Overheads	896	919	703	854	787	693	685
Roinn na Gaeltachta:							
Marine Works	116	217	319	273	175	199	200
Salmon Research Trust	54	60	57	70	70	50	60
Fishery Protection [(d)]	2,300	2,580	2,820	3,180	3,300	3,400	4,000
Total	17,578	15,649	14,263	15,857	15,836	17,015	21,717

Notes: [(a)] Projected.

[(b)] 50 per cent of inland fisheries attributable to salmon.

[(c)] Mainly exploratory fishing.

[(d)] 20 per cent of total protection costs; data obtained from Department of Defence.

Source: BIM, Department of Marine and Department of Defence.

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