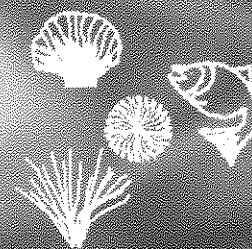


Socio-Economic Evaluation of the Impact of the Aquaculture Industry in Counties Donegal, Galway, Kerry and Cork

MARINE RESOURCE SERIES



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A SOCIO-ECONOMIC EVALUATION OF THE IMPACT OF THE AQUACULTURE INDUSTRY IN COUNTIES DONEGAL, GALWAY, KERRY AND CORK

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SUMMARY OF FINDINGS**Introduction**

As set out in the Terms of Reference of this study the aim at the outset was to put together a clear picture of how the development of the aquaculture industry in Ireland has socially and economically shaped the coastal communities in Counties Donegal, Galway, Kerry and Cork and where this development is likely to lead these communities in the future. Specifically the aquaculture industry was examined in the context of other influencing factors of economic and social wealth in each of the study regions to establish its role within the community. The hinterland of Kilkieran Bay, in southwest Co. Galway, was chosen as a suitable area in which to conduct a detailed case study of the impact of the industry in peripheral coastal areas.

The 3 principal phases of the project comprised;

1. A comprehensive literature review and data collation exercise
2. An extensive consultation process involving representatives of the aquaculture industry, relevant government and semi-state departments, community development bodies, tourism operators, and aquaculture operators in each of the regions.
3. A detailed series of questionnaire surveys in the case study area.

Socio-Economic Imperative

Under the European Community Support Framework Ireland has been classified up to now as an Objective 1 region whose GDP (Gross Domestic Product) has been less than 75% of the EU average. Existing and future classification of Objective 1 regions in Ireland, reflect the areas of the country at the greatest physical and social distance from the centre of our current economic boom. A large proportion of the west coast of Ireland including the study areas for this project lie almost entirely within current and reclassified Objective 1 regions. These coastal areas have limited natural and human resources and typically a harsh landscape with poor quality agricultural land. Educational levels are low and unemployment is high. While not the only deprived areas in the country, it is fair to say that there is a distinct disparity between the eastern and western part of the country in terms of wealth particularly in such coastal areas.

Communities along the west coast are not differentiated from inland or affluent urban communities purely by demographics or higher unemployment levels. Their inherent cultural wealth which is becoming increasingly difficult to identify has grown from centuries of sustaining a traditional life by the sea, using the Irish language, building traditional boats and houses, and having an appreciation of the traditional arts. Recently many coastal communities have entered a dramatic decline and most people make their living from a combination of part time fishing, agriculture and tourism and often have a high dependence on supplementary social welfare.

Case Study Findings

The case study analysis of the community living around Kilkieran Bay in southwest Co. Galway clearly shows the importance of the aquaculture industry in peripheral coastal communities. This area has a well developed salmon farming industry, active inshore fisheries, an operational shellfish co-op, and a strong and developing seaweed harvesting and processing industry and more recently a pilot seaweed cultivation industry. Based on extensive consultation in the locality and the findings of the questionnaire survey the results of the case study were clear.

- In the hinterland of Kilkieran Bay among a population of just over 6000, unemployment ratios are above the national average with a high of **51.9%** in some areas.
- Agriculture in the area is not a viable source of income with up to 100% of farms in some District Electoral Divisions (DED's) having less than 30 acres.
- Salmon farming in Kilkieran Bay started almost 20 years ago there are now 7 companies operating in the bay. In 1997 the industry recorded sales of **IR£6.27m**.
- In the area around Kilkieran Bay 70 jobs are now provided in finfish aquaculture alone realising annual wages of **IR£1.1m** to local people.
- The goods and services provided directly to the aquaculture industry in this area amount to over **IR£6m** almost **IR£1.5m** of which is paid for local goods and services in the Kilkieran Bay area.
- At least 7 local companies depend heavily or totally on finfish aquaculture in this area. These ancillary companies generate an additional **IR£1m** in wages through approximately 120 full time and 30 part-time jobs.
- Of the employees of the industry who were interviewed for the study, the majority had a long term commitment to the job, although more than half had an additional source of income.

A survey of local opinion of the development of the aquaculture industry and its significance to the local community in the hinterland of Kilkieran Bay showed that;

- the majority of people in the locality had a simple recognition that without the industry their community as they knew it would cease to exist.
- Unemployment and emigration levels would be higher, fewer young people would be building houses and starting families in the area.
- The continuation of traditional skills like boat building would also be threatened and the cultural identity of these rural coastal communities would become more fragmented.

Despite these clear indications of the socio-economic benefit of the aquaculture industry in such coastal areas, what is less obvious and more difficult to quantify is the improvement in the social structure of communities in these areas accruing from increased economic stability generated by the aquaculture industry. The development of the industry in Ireland has not been without controversy and conflict has arisen in some regions when development objectives were not supported by the local community. However, many of these issues have been resolved to the mutual benefit of the 'fish farmer' and the 'community neighbour' making the industry more responsible, transparent and better represented in the community and at government level.

Aquaculture in the regions

Comparisons were drawn between the findings of this case study and the variations noted with the development of the industry along the coast of Co. Donegal, Co. Kerry and Co. Cork. A similar reliance on the aquaculture industry in remote coastal areas was noted in the other study areas of the northwest and southwest, particularly in Co. Donegal whose economy faces greater challenges in a national context due to its geographic isolation in the extreme northwest of the country. The economic significance of the aquaculture industry in these peripheral areas is indisputable.

Prospects for the industry

In each of the study regions the successful development of the industry depends heavily on the co-operation of all resources users based on initiatives such as CLAMS while adhering to a sustainability management agenda. The incorporation of the objectives of other industries such as the tourism industry will play an important role in the achievement of development plans for the industry. The changing circumstances in which the industry exists presents a range of challenges which will need the collaboration of all operators involved in the aquaculture industry from farmer to legislator. The formulation of training and funding priorities will also play a key role.

As an indigenous industry using an abundant natural resource on which there is a high level of direct and indirect dependence, the aquaculture industry in the Counties Donegal, Galway, Cork and Kerry presents an opportunity. As a tool to promote the development of local communities along the western seaboard hand in hand with the development of other natural resource industries this industry should be given development priority and investment support from the public and private sectors.

CHAPTER 1 – INTRODUCTION TO THE PROJECT

1.1 Scope of Study

Aqua-Fact International Services Ltd. (Aqua-Fact) undertook a socio-economic evaluation of the impact of aquaculture in Counties Donegal, Galway, Kerry and Cork. This project was funded under the Marine Research Measure of the Operational Programme for Fisheries 1994-1999. The task involved an assessment of the aquaculture industry in Ireland comprising finfish aquaculture, shellfish aquaculture and including the seaweed industry, in Counties Donegal, Galway, Kerry and Cork.

The scope of the study covered a general review of the socio-economic status of the aquaculture and ancillary industries in each of the study regions. This review is elucidated using a detailed and exhaustive case study of a particular area, Kilkieran Bay, Co. Galway. Results of this phase of the project are coupled with accounts of the aquaculture industries in each of the other regions drawing contrasts and comparisons from region to region, where relevant.

The initial task of this study comprised a comprehensive data and literature collation exercise to include the following;

- EU, State and Semi-state publications outlining European regional, national and local policy, training, development and funding priorities and the evolution of the Irish Aquaculture Industry in a European and global context.
- Existing socio-economic studies of Irish and other aquaculture industries.
- Publications from bodies such as An Bórd Fáilte outlining the impact of the aquaculture industry on geographically and economically associated industries such as the tourism industry.
- Demographic data from the Central Statistics Office (CSO) outlining the population structure of each of the geographic areas under study.
- Substantial review of aquaculture associated publications e.g. Aquaculture Ireland, Fishfarming International, etc.
- Conservation publications and priorities such as those provided by NPWS outlining their conservation priorities relevant to proposed future development and expansion of the Irish aquaculture industry.
- Literature and publications relating to Coastal Zone Management theory and practice and the concept and implementation of sustainable Single Bay Management Plans
- Background data on proposed development of CLAMS (Co-ordinated Local Aquaculture Management Systems) by The Department of the Marine and Natural Resources (DoMNR).
- Review of in-house working knowledge of aquaculture industry from individual producer level to national level.

Consultation was established with representative bodies such as the Irish Aquaculture Association, IFA Fishfarming Section comprising the Irish Salmon Growers Association (ISGA) and the Irish Shellfish Association (ISA), Irish Seaweed Industry Organisation, BIM, Dept. of the Marine and Natural Resources, The Central and regional Fisheries Boards, Udarás na Gaeltachta, Taighde Mara Teó, Tourism planners and operators, local community based groups such as Cairde na Mara and Muinteras, and members of the industry in each of the study regions. A detailed list of consultees who participated in this study is provided in Appendix I, while an outline of the various representative and co-ordinating bodies involved in the aquaculture industry is provided in Appendix II. The generous help and co-operation of both of these groups is acknowledged and greatly appreciated in the preparation of this report.

The third phase involved a detailed on the ground interview and questionnaire survey in the Kilkieran Bay area. A detailed survey of opinion of up to 130 local people over a period of several weeks was carried out. These people were randomly chosen in an even distribution over the study area.

1.2 Aquaculture Industry and its development in Ireland

1.2.1 Introduction

The aquaculture industry in Ireland has developed from its humble beginnings in Connemara approximately 140 years ago to an industry with an annual value to the economy of approximately IR£60m, and 1,855 full time job equivalents in 1997 (BIM, 1999). The first commercial attempts at aquaculture in Ireland were in 1854 at a salmon hatchery (Wilkins, 1989), while trials to ongrow Atlantic salmon were undertaken in Dublin and Wicklow shortly afterwards (ESRI, 1992). Aquaculture has experienced significant growth since then particularly in the last 20 years, and a wide range of species are now produced. The vast majority of the operators in the Irish aquaculture industry today are based along the western seaboard taking advantage of the multitude of suitable locations and the exceptionally high quality of unspoiled marine resources available to marine resource users.

As outlined above, for the purpose of this study "aquaculture" refers to the rearing and harvesting of marine foods in artificial circumstances, where stocks are controlled and monitored during their entire life cycle. It will refer to, but not specifically address, stock enhancement methodologies for species such as lobster and some shellfish which would be better described as inshore fisheries. A quantification of the seaweed industry will be included in this study as it is also an increasingly important and emerging source of income in peripheral coastal areas. Seaweed aquaculture techniques are also currently being developed.

1.2.2 Species produced

Today the industry cultivates a range of finfish and shellfish species along with sea urchins, sea worms, and some seaweeds. Stock enhancement and stock management programmes incorporating aquaculture techniques are ongoing for salmon and trout, shellfish (scallops, oysters, clams), and lobster in rivers and bays around the Irish coast.

Shellfish – The principal commercially cultivated shellfish species in terms of employment and income generated in the Irish aquaculture sector are mussels and oysters (Pacific and native oysters). Other species include clams, scallops and to a lesser extent, abalone and sea urchins.

Finfish – Cage aquaculture is primarily devoted to the growing and harvesting of Atlantic Salmon in marine cage aquaculture systems. Sea trout, rainbow trout, turbot, eels and Arctic Charr are also cultivated using various technologies but to a much lesser extent. Significant development of these and new species is likely in the near future.

Seaweed – Currently the Irish seaweed industry is primarily involved in the harvesting and processing of marine foods from their natural environment. In general the anthropogenic influence on cultivation of these foods is minimal to none. Pilot cultivation schemes of some seaweeds and marine plants have been undertaken but the industry is largely focused on the harvesting of available natural resources. This is due in part to the underdevelopment of the Irish seaweed industry relative to other marine food industries in Ireland. It is estimated that the industry is currently worth IR£5.5m per annum.

1.2.3 Production and employment

Currently finfish and shellfish aquaculture form the backbone of the Irish aquaculture industry. Atlantic salmon (*Salmo salar*), mussels (*Mytilus edulis*) and Pacific oysters (*Crassostrea gigas*) are the main species produced. In 1997 the salmon farming industry produced over 15,400T of Atlantic salmon with a market value of almost IR£40m while the mussel farming industry produced almost 17,000T of rope and bottom grown mussels with a market value of IR£6.5m. Over 3,800T of Pacific oysters were produced with a market value of IR£3.8m. Therefore the three species combined account for 86% of total Irish aquaculture by value and 93% by volume. Employment figures for the industry in 1997 also show that these three species combined account for 91% of employment within the sector.

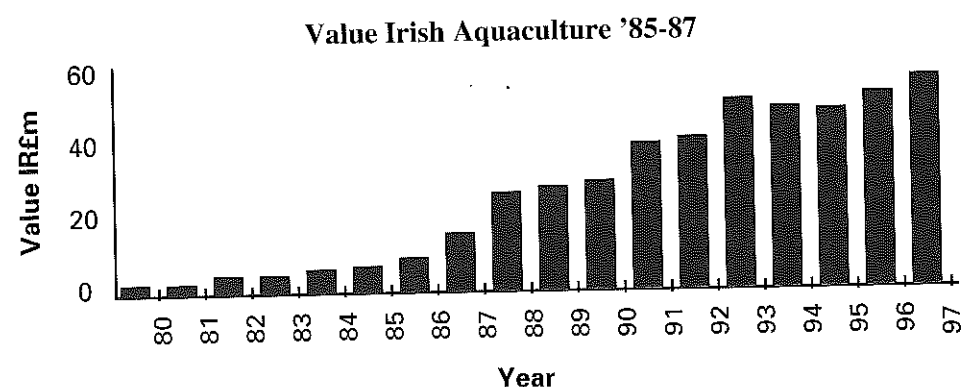


Chart 1.1 Value of Irish Aquaculture 1985-1997 (BIM)

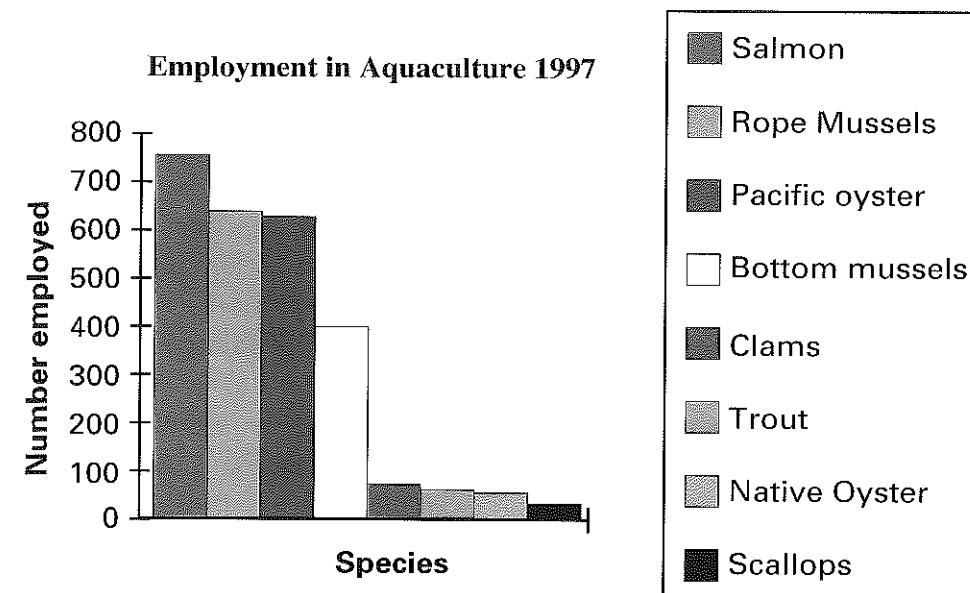


Chart 1.2 Full time equivalent employment in Irish aquaculture, 1997 (BIM)

1.3 **Location of the Industry**

1.3.1 Introduction

The location of the aquaculture industry along the Irish coast, particularly in remote areas on the western seaboard is obviously not coincidental. Proximity to the resource and provision of a labour force with few alternative employment opportunities are the two most important aspects of the marine food industry in Ireland. This has long been recognised by observers of the industry particularly in recent years with the decline in traditional rural income generators like farming. "Aquaculture is a sustainable native industry based in peripheral coastal areas where other employment prospects are negligible and the infrastructure is underdeveloped", (IFA, 1998). BIM recognise that "part-time employment in fishing, including aquaculture, makes an essential contribution to income in regions where alternative earnings may be insufficient on their own". "It also supplements incomes that are seasonal like farming and tourism", for example, (BIM, 1999). They further go on to say "the Irish seafood industry is an important indigenous economic sector in its own right, but its ability to generate wealth and employment in remote and coastal regions is of fundamental importance in sustaining communities in such areas."

Almost half of those employed in the seafood industry live in counties along the west and northwest coast that continue to merit Objective 1 status – The Western Region. Aquaculture output increased from IR£41m in 1993 to IR£59m in 1997, (an increase of 44%). Exports in the seafood sector grew by 22% to IR£228m in 1997.

It can be agreed that the industry has become a significant new source of employment and generator of economic activity in coastal areas, especially in consideration of recent challenges and difficulties in the fishing industry and the following chapters aim to outline and characterise this relationship.

1.3.2 Aquaculture in the Gaeltacht

The Gaeltacht covers extensive parts of coastal counties Donegal, Mayo, Galway, and Kerry as well as parts of Cork, Meath and Waterford. These areas are the only parts of the country where Irish is in daily use as a community language. The preservation of the Gaeltacht areas as Irish speaking communities has been a stated priority of successive governments since the foundation of the State and this has been reflected in preferential investment and allocation of special European funding to these areas. Due primarily to their peripheral location, Gaeltacht areas are among the most socio-economically deprived in the country.

There is considerable overlap between the location of the aquaculture and other marine food industries and the location of the Gaeltacht areas, particularly in Counties Galway and Donegal. This may be symptomatic of the preferential funding and development assistance available for new aquaculture and other enterprises but is also a consequence of the high level of availability of suitable sites in these locations. Údarás na Gaeltachta, the development agency for the Gaeltacht areas and its research subsidiary Taighde Mara Teó. play an important role in this development and assistance.

The link between the aquaculture industry and the survival and promotion of our Gaeltacht regions is an important one which will be dealt with in more detail at later stages of this report.

CHAPTER 2 - AQUACULTURE IN IRELAND

2.1 Shellfish Farming in Ireland - An Introduction

The main shellfish species cultivated in Ireland are mussels and oysters and to lesser extent clams and scallops. The cultivation of scallops is primarily for the purpose of reseeding and stock enhancement to depleted and newly generated beds at selected sites. When shellfish farming started in earnest in this country, and until quite recently, the industry primarily consisted of small scale local operators with other forms of income. These operators often provided their own labour and shellfish farming was well suited to inshore fishermen or part time farmers, (ESRI, 1992). However, this is beginning to change with the mass development of shellfish processing facilities particularly in the southwest. On a national scale there is a considerably greater number of operators involved in shellfish farming than finfish farming, due primarily to the greater capital investment and level of expertise required to start a finfish farming venture. Initiatives such as C.L.A.M.S. (Co-ordinated Local Area Aquaculture Management) promoted by The Marine Institute and BIM, have also helped to facilitate large scale shellfish production with a number of producers collectively producing greater tonnages of shellfish species. It is also true to say that due to the different physical labour requirements and structure of shellfish growing cycles, employment in shellfish aquaculture is more likely part-time and often spasmodic. Larger shellfish enterprises are generally co-operatively owned with one or two notable exceptions. Employment in shellfish farming in 1997 stood at 1,842 full time job equivalents. The main concentrations of shellfish aquaculture in Ireland are Bantry Bay in Co. Cork where the majority of the national mussel industry is based, and Mulroy Bay, Co. Donegal. Diversification into other valuable species such as abalone and sea urchins has occurred in the industry in the last few years.

Mussels (a single species, *Mytilus edulis*) are extensively grown in beds or intensively grown using rafts or longlines. Pacific oysters (*Crassostrea gigas*) are grown on tressles and native oysters (*Ostrea edulis*) are grown extensively, the Pacific oyster being the easier of the two to cultivate and the least susceptible to Bonamia disease. Shellfish production has grown considerably over the past 10 years with shellfish aquaculture valued at approximately IRE12.1m in 1997.

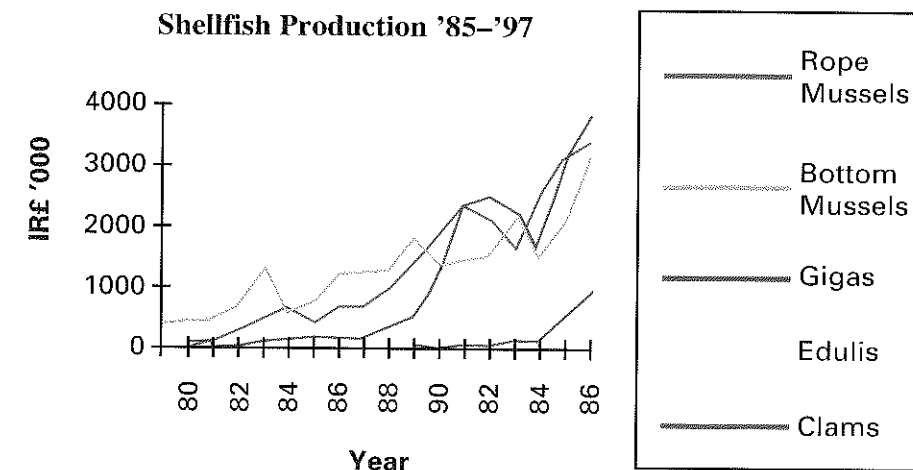


Chart.2.1 Value of Irish Shellfish Aquaculture 1980-97

Greatest developments in shellfish farming has been in the value added and shellfish processing sector. A number of processing plants are located around the country. The new state of the art facility recently opened adjacent to Bantry Bay and owned by Fastnet Mussels is an example of this kind of development. Bantry Bay Mussels on the other side of the bay also have extensive processing facilities. The high level of value added processing in the shellfish industry in this area has helped to combat marketing difficulties associated with incidences of 'red-tide' and temporary closure of fisheries, by maintaining continuity of supply to the market using products with longer shelf lives.

2.2 Finfish Farming in Ireland – An Introduction

In Ireland the main cultivated finfish species are Atlantic salmon, rainbow trout and sea trout. 15,400 tonnes of farmed salmon were produced in 1997 valued at IR£40m. 700 tonnes of rainbow trout and 1,100 of sea trout were also produced with a value of IR£1.5m and IR£2.1m respectively. The rearing of salmon ova, parr and smolts was valued at IR£2.7m in the same year. Thus salmon are by far the more important species of cultivated finfish by tonnage and value.

The development of marine based salmon farms and particularly their associated tonnage and physical location has lead inevitably to a mixture of management practices especially in relation to some actions such as: fallowing sites, generation separation and therapeutic treatments. In addition to the many single company production sites in areas like Kilkieran Bay, Co. Galway, many of the early salmon farmers were associated with the development of satellite farms in the bay area, i.e. small farms set up adjacent to larger farms with a view to benefit from the larger farms infrastructure and experience. This has lead to concentrations of units in particular areas such as Ardmore in Kilkieran Bay, for example.

In recent years, the change in attitude towards finfish aquaculture in Kilkieran Bay and similar areas, has resulted in a positive and enthusiastic response from the industry. Improvements have been made in developing management techniques, preventative vaccination and medication against disease, increasing research into fish-nutrition and food efficiency, the availability of training courses for personnel and improving predator control systems. Successful improvements such as these are obviously to the mutual benefit of the fish farmer and the local people as the environmental impact is reduced. Through the Operational Programme for Fisheries, funding has been allocated to applied marine research projects in the area of aquaculture. BIM's programme for aquaculture development 1993-1997 entitled "Job Creation in the Aquaculture Sector" has been very successful, placing links between aquaculture and the traditional inshore fishing communities through education and training. With positive recent advancements within the aquaculture industry in the last number of years, fish-farmers are now in a position to consider and implement value-added systems to their stock. Thus, aquaculture provides important employment in marginalised areas, increases the range and accessibility of fish, shellfish and other edible aquatic species to the consumer and helps to reduce the EUs trade deficit on sea products.

Finfish aquaculture, particularly of Atlantic salmon has grown considerably in the past 15 years, so that it now has an estimated value of IR£47m, per annum.

Finfish 1985-1997

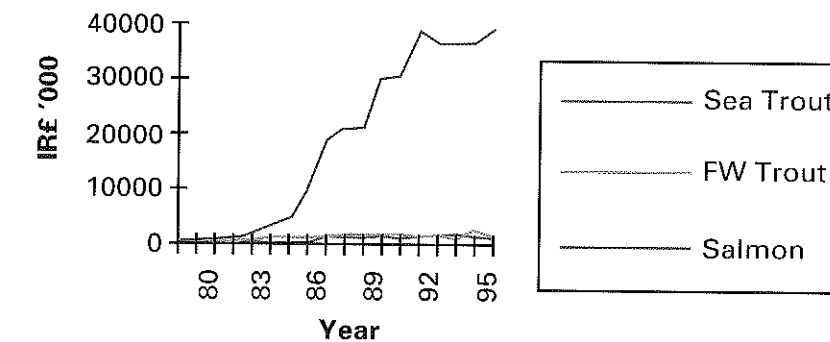


Chart 2.2. Value of Irish Finfish Aquaculture 1980-97

2.3 Seaweed Industry in Ireland – An Introduction

The Irish Seaweed Industry currently contributes in excess of IR£5.5 million annually to the Irish economy. This contribution represents a growth of almost 100% over three years from a IR£2.7m industry in 1994 to IR£5.5m in 1997. The industry currently employs 500 people in full-time and part-time jobs often in marginal coastal areas on the western seaboard.

There are approximately 500 known or recorded species of algae along our 2,700 miles of coastline. The most abundant and commercially viable of these include several species of red and brown algae, but primarily comprises the kelps, wracks and coralline algae known as maërl. The greater proportion of wrack biomass is provided by the intertidal species of *Fucus* sp. (5 sp.) *Pelvetia* sp.(1 sp.), and *Ascophyllum nodosum*. (knotted wrack). This last species is the most economically important of the wracks and is most abundant along the western seaboard. The greater proportion of kelp biomass is provided by three species of *Laminaria* sp. and one of *Sacchorhiza* sp. of which the most important is *Laminaria hyperborea*, the cast stipes of which are processed for alginate production (Guiry, 1996). There is a considerably smaller biomass of red algae than brown algae in Irish waters, and the most important of these are the red coralline maërl deposits which are nationally estimated at 8 million tonnes. Other potentially valuable red algae include *Palmaria palmata* (dulse) and Carrigeen mosses such as *Chondrus crispus*.

The seaweed processing industry in Ireland is dominated by a single company, Arramara Teórantá which is 51% owned by The Minister for the Marine. They operate 2 plants, 1 at Kilkieran, Co. Galway and one at Meenmore, Co. Donegal. Their principal activity concerns the harvesting, washing, drying and milling of *Ascophyllum nodosum*. Processing of seaweed has diversified in the last year however due to the crisis in the Asian economy with the expansion of value added processing. This has meant that Arramara are now involved in the development of products for horticulture and agriculture.

There are also a considerable number of high value sub-tidal kelps such as *Alaria esculenta* (Atlantic Wakame) and *Himanthalia elongata* (Thong weed), which a small number of sea-vegetable processors are beginning to exploit.

2.4 Socio-Economic Imperative

Several reports including Grant Thornton (1995) acknowledge the socio-economic importance of promoting sustainable aquaculture and its role in regional development. Rural areas lacking in economic opportunities and development have experienced emigration and a paucity of investment, leaving remaining communities in an insecure social and economic position. Aquaculture is an industry requiring a high degree of input in the form of local manpower and ancillary services. Being a labour intensive, physically demanding industry, it has gone a long way in stemming emigration and provides greater security for the local community. (Grant Thornton, 1995, Aqua-Fact, 1996). Figures show that over the past fifteen years, the Irish socio-economic imperative for promoting aquaculture has resulted in a six-fold increase in both production and employment coupled with an increase in Revenues from IR£2 million to almost IR£60 million. (BIM, 1999).

The recent report on development of the Irish Seafood Industry into the next millennium (BIM, 1999) shows the highest concentration of fishing employment in 4 counties on the western seaboard: Donegal, Galway, Kerry and Cork. It is broadly accepted and understood that these counties have high levels of economic deprivation as shown in Figure 2.1. and whole communities within these regions rely on the marine food sector. The social structure of each of these regions will be outlined in Chapter 3. Full time jobs undoubtedly provide employment where there would otherwise be none and part-time employment in fishing and aquaculture makes an essential supplement to other sources of income e.g. part time farming, thereby allowing these people to maintain an income and remain in these areas.

East – West Region by County

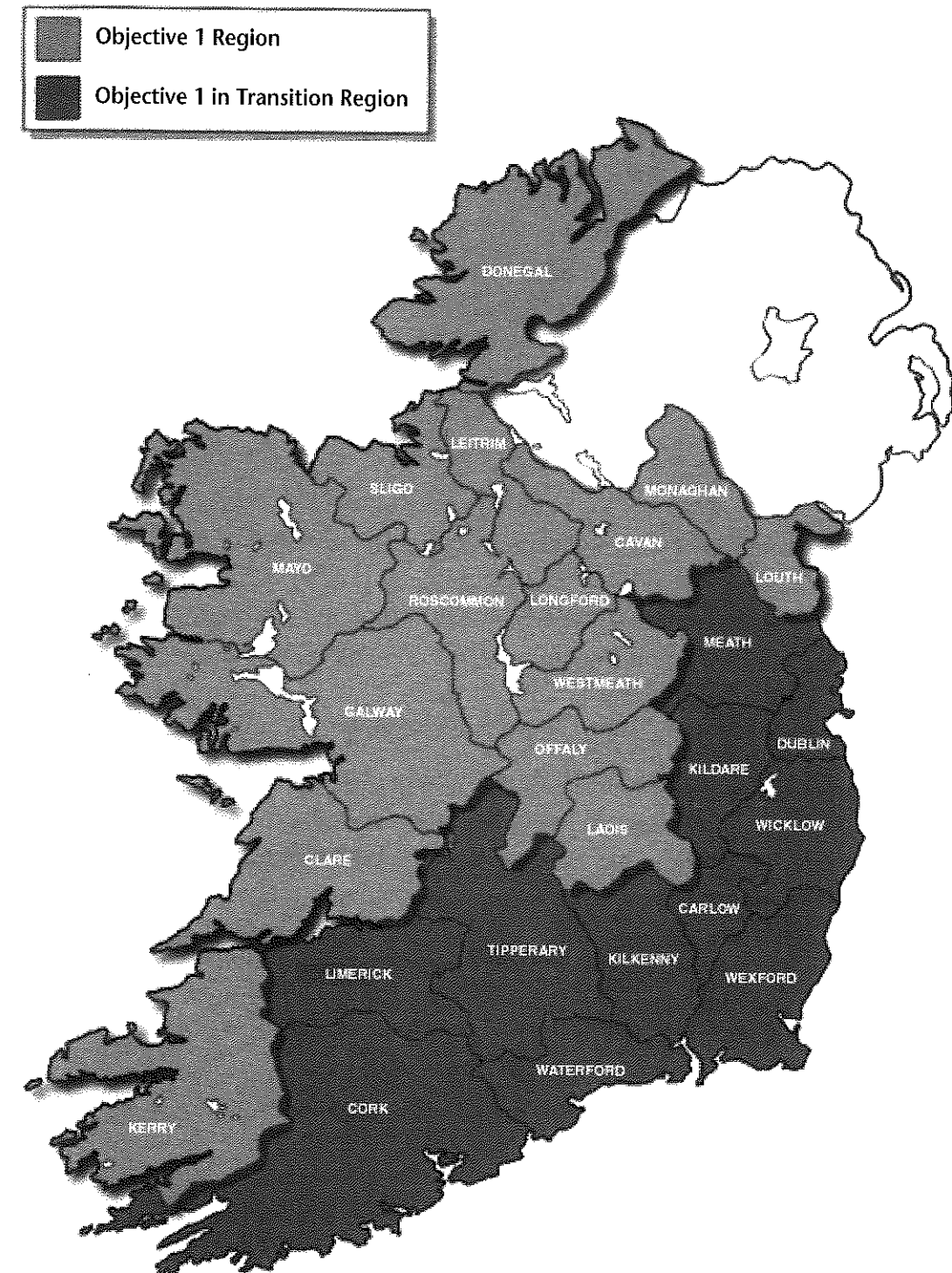


Figure 3.1
Proposed new Objective 1 and Objective 1 in transition regions for the period 2000-2006
(reproduced by permission BIM)

CHAPTER 3 – THE STUDY REGION

3.1 Introduction to the study region and its limits

The Community Support Framework (CSF) 1994-99, is the overall umbrella agreement under which EU structural funding is provided to Ireland. (Fitzpatrick Associates, 1997). While Ireland is currently a single "Objective 1 Region" from an EU perspective, the country has historically been divided into 8 sub-national regions for structural fund purposes. These corresponded to the eight Regional Authority areas as follows; Dublin, Mid-East, South - East, Midlands, South-West, Mid-West, West and Border regions. During the lifetime of the current and previous EU Community Support Frameworks Ireland has benefited from full support as an Objective 1 region whose GDP is less than 75% of the EU average. The core of the CSF is nine individual Operational Programmes (OP's) which are defined by sector, one of these OP's being the Operational Programme for Fisheries. However, the Irish economy has grown phenomenally in the past decade. All growth records since the foundation of the state have been exceeded with falling interest rates, low inflation, falling unemployment and emigration. Thus it is now the case that the government must re-evaluate our economic status in a European context. In its recent application to the EU for continued structural assistance under the next CSF Ireland has been divided into two separate funding regions ; Region 1 retaining Objective 1 Status and Region 2 with Objective 1 in transition status as shown in the diagram (Figure 3.1).

As significant as our economic growth has been, there are parts of this country to which this growth and prosperity have not transferred in comparable terms. This is reflected in the reclassification of Objective 1 regions. These are the areas of the country at the greatest physical and social distance from the centre of this economic boom. These areas have limited natural and human resources and typically a harsh landscape with poor quality agricultural land. Educational levels are low and unemployment is high. This description characterises a large proportion of the west coast of Ireland. While not the only deprived areas in the country, it is fair to say that there is a distinct disparity between the eastern and western part of the country in terms of wealth particularly in coastal areas. Unprecedented growth in multinational companies in the information technology, pharmaceutical and medical devices industries has, by the nature and infrastructural requirements of these industries, been confined to existing urban centres. It is sectors such as these which have made a considerable contribution to our recent economic boom.

These communities along the west coast are not differentiated from inland or affluent urban communities purely by demographics or higher unemployment levels. Their inherent cultural wealth which is becoming increasingly difficult to identify has grown from centuries of living and making a living by the sea. Generations have fished and sailed along our harsh and varied coastline, successfully and sustainably exploiting the vast marine resource adjacent to them. Due to their physical and political isolation over the past few centuries, it was the coastal communities who more often maintained a traditional way of life, using the Irish language, building traditional boats and houses, and having an appreciation of the traditional arts i.e. dancing, traditional music and traditional literature.

However, during this century in particular, many coastal communities entered a dramatic decline; available resources and opportunities were not enough to sustain these people and emigration rose considerably to detrimental levels. Today, many of these communities are in crisis. Most people make their living from a combination of part time sources comprising fishing, agriculture, tourism and a high dependence on supplementary social welfare payments.

Government initiatives and European funding have sought to rectify this decline in marginal communities with some success, but the momentum of the decline in some areas is still such that it is very difficult to arrest. *Údarás na Gaeltachta* aim to facilitate maximum development of natural resources in Gaeltacht areas and yet some areas in south west Co. Galway have an unemployment rate of almost 50%. Undoubtedly the social difficulties in some areas are more complicated than employment creation and preservation of the Irish language. Organisations such as *Plearáca Teó.*, based in Rosmuc, Co. Galway, have made great advancements in addressing the specific needs of such communities. *Plearáca* started up as a community Arts project in 1993. They have targeted a number of groups in the south Connemara Gaeltacht through a series of workshops and Community Employment Schemes using the medium of Irish. *Plearáca* recently won the national AIB Better Ireland Award in recognition of their efforts in the community.

Similarly the establishment of FORUM, a community development project in north Connemara, was an important step in the fostering of new projects and the development of the local community in the north of the county. Their aim has been to improve the situation of the unemployed and under employed by developing the areas natural resource base. This has been achieved by concentrating on agriculture, tourism and aquaculture development in the area. Many other local and community development organisations make continuing efforts to strengthen and enhance community structure throughout the study region.

If opportunities for young people in these communities do not exist, emigration will reach a critical level and the basic social units will disintegrate, leading to the ultimate demise of the community. In simple terms, there needs to be a realistic opportunity for a family to make a living and support their children without difficulty. The most sustainable and obvious way in which to do this is by utilising available natural resources for maximum economic benefit.

The marine resource in Ireland and particularly on the west coast is extensive and of an exceptionally high quality. Due to a lack of concentration of heavy industry or urban dwelling along the west coast, relative pollution levels in a European or global context are minimal to none and the marine resource is largely under exploited. Our greatest exploits to date have been in fisheries but this industry has experienced difficulty in recent generations due to European quota restrictions and overfishing, among other factors. The sea fishing industry is worth an estimated IR£130m in landings and IR£213m in fish processing (based on figures for 1997). Aquaculture, as outlined is worth an estimated IR£60m. The seaweed industry which is undergoing considerable development and growth, is now worth an estimated IR£5.5m. These are the resources which can sustain coastal

Deprivation by Region



Figure 3.2
Combined deprivation scores by regions showing the peripherality of coastal areas
(Haas, 1996, reproduced by permission BIM)

communities into the future. Projections for the development of the marine food sector demonstrate huge growth potential in the industry in the lifetime of the Marine Operational Programme of the next European Support Framework from which much of the funding assistance will come. Table 3.1. outlines these projections as made by BIM.

Table 3.1.
Results of proposed investment and development plan for the marine food sector,
(BIM 1999)

	1997 IR£m	2006 IR£m	Increase	Increase %
Marine catch	130	166	36	28
Aquaculture	59	123	64	108
Processing	213	367	154	72
Exports	228	370	142	62
Employment	10434	12399	1965	19

The principal implementing agency of the Operational Programme for Fisheries is BIM. BIM have 5 regional offices: 2 in Killybegs, 1 in Howth, 1 in Galway and 1 in Skibbereen. BIM liaises with the Sea Fisheries Officers, who are employed by the Department of the Marine. The Marine Institute undertakes the research part of the OP (Marine Research Measure of the OP). Other implementing agencies of the Fisheries OP are Enterprise Ireland, Shannon Development and Údarás na Gaeltachta. In a summary of structural expenditure by region for the current Operational Programme for Fisheries, the Western region, including the coastal counties of Mayo and Galway, achieved the highest percentage of forecasted total expenditure at 22.5%. The border region, including Donegal was forecast to receive 13.3%, while the south-west was forecast to receive a mere 10.6%.

In their submission as part of the mid-term evaluation of the Community Support Framework (CSF), (Fitzpatrick Associates, 1997), the West Regional Authority considered that it was not possible within their limited resources to determine adequately the extent of the impact of the CSF and its inherent Operational Programmes on a range of economic variables including:

- Unemployment and long term unemployment,
- Reduction of social exclusion,
- Arresting of rural de-population,
- Preservation of rural family life,
- Irish language in the Gaeltact areas,
- Promotion of indigenous industry,
- Transport costs for industries such as agriculture, forestry, aquaculture, tourism, etc.

They make it clear that the negative effects of peripherality are a major inhibiting factor to the economic growth of the region and they emphasise the importance of the development of improved transport infrastructure to and within the region.

It is this characterisation of the peripherality and marginal nature of coastal communities on the west coast of Ireland which sets the context of our evaluation of the socio-economic importance of an industry which has the considerable development potential of the aquaculture industry.

3.2 Estimated output of the regions

Gross Domestic Product, or GDP, measures the value of a nation's output of goods and services for a specific period of time, usually a year. It is not solely a measure of output – the CSO (Central Statistics Office) for example publishes a Census of Industrial Production – but GDP has become popular as the most comprehensive of output measures. The calculation of GDP is careful not to double count transactions and therefore only includes the Gross Value Added (GVA) at each stage of production in any economy. In practice there is little difference between GVA and GDP so for some purposes GVA is a better measure of the wealth produced in an area as it gives an indication of the proportion of the final value which has been generated in that area.

Marginal coastal areas in the 4 counties of the study region are among the least affluent in the EU. Figures compiled by the Central Statistics Office, (CSO 1998), show that Co. Donegal had, in 1995, a GVA that was 56% of the EU average; Co. Kerry had 64%, Co. Galway 75% and Co. Cork 108%. Co. Galway includes Galway City so it is more likely that the coastal communities of Co. Galway show values close to those for Co. Donegal and Co. Kerry. The Co. Cork coastal communities are aggregated with the prosperous city of Cork so Castletownbere, Bantry, Schull, Baltimore and Union Hall with their hinterlands are at or below the GVA level for Co. Kerry of 64%.

In 1995, Ireland stood at 92% of EU GDP (Gross Domestic Product). Under previous EU Community Support Frameworks Ireland has benefited from full support as an Objective 1 region whose GDP is less than 75% of the EU average. Recent economic prosperity has led to an increase in GDP in some of the regions which has led to a reassessment of marginal communities as described in Figure 3.1.

3.3 The role of agriculture in the regions

Chief among the socio-economic changes that have affected the world in the latter half of this century is the precipitous drop in agricultural employment in the last 50 years. It must be kept in mind that the rural and coastal communities examined in this study have had two economic bases, agriculture and fisheries. Statistics compiled by the CSO include employment in aquaculture under the heading "Fisheries". There has been an obvious drop

in the number of farmers and other agri-workers in Ireland which is continuing. Ireland had 11.2% of its workforce in agriculture in 1996. This figure is now below 10% and is estimated to be at 5% by 2010. In declining farming numbers, smaller farmers will be most at risk. Thus coastal communities having the greatest proportion of small farmers will suffer the greatest decline.

Table 3.2 shows the proportion of all workers involved in fisheries (including aquaculture) and agriculture (CSO, 1996). The relative dependence of the coastal regions on fisheries will be clear.

Table 3.2
Proportion of Fishers, Farmers and Agri-workers in Selected Areas

Study Region	Fishermen as % of workers	Farmers as % of workers	Agri-and Fishermen as % of workers
Coastal Co. Cork	1.46%	14.49%	20.05%
Co. Kerry	0.60%	15.09%	18.77%
Co. Galway	0.68%	18.76%	22.04%
Co. Donegal	1.70%	9.62%	13.63%
Average for Study Regions	1.09%	14.66%	18.77%
STATE	0.22%	7.62%	10.25%

From these figures it can be seen that all the coastal areas have a higher reliance on farming than does the state as a whole. Donegal has the smallest reliance on farming and the greatest reliance on fisheries. In assessment of farming in these coastal areas the plight of the small farmer is even more precarious. Table 3.3 shows the percentage of farms under 30 acres in these regions.

Table 3.3
Small farmers and agri-workers in study regions.

Study Region	Agri-Worker as % of all at work	Farms <30 acres as % of all farms
Coastal Co. Cork	20.05%	13.38%
Co. Kerry	18.77%	17.60%
Co. Galway	22.04%	21.20%
Co. Donegal	13.63%	31.32%
Average for Study Regions	18.77%	19.92%
STATE	10.25%	16.56%

The national farm household income figure for 1997, according to the Department of Agriculture, was £18, 582 of which farm income was 51% or £10,920. Of this latter figure, 47% came as direct income payment, financed or co-financed by the EU (ITT, 1999). In the study areas there is appreciably less off-farm income as job opportunities are fewer. So the threat to the stability of the community in these areas is greater.

3.4 Assessment of household income for each of the regions

The Census of Industrial Production, 1995 (CSO, 1997) and Household Budget Survey 1994 - 1995 (CSO, 1997), provide the most up to date figures available for approximate household incomes and expenditure. Co. Donegal lags behind the other study regions, having an average industrial wage of £9,915 and an overall employee wage of £10,932. These figures are, respectively, 71.8% and 69.4% of the national averages. The figures for Co. Cork and Co. Galway are obscured by the presence in and near the cities of electronic and pharmaceutical industries. Thus Co. Cork has a net output per person that is 1.64 times that of the State while the output for Co. Donegal is 18% of that for Co. Cork, Co. Galway 54% and Kerry 31% of the output for Co. Cork. Average wages per person in industry for the areas as a percentage of the State's average are, Cork 105%, Kerry 95%, Galway 92% and Donegal 69%.

Total industrial wages as a percentage of the State total are, Cork 12. 5% (11.6%), Galway 4.03% (5.2%), Donegal 3.01% (3.6%) and Kerry 2.02% (3.5%). The figures in parentheses are the percentage of State population in each county. The extent of disadvantage will be obvious with Kerry, for example, earning 63% per person from industry of what it should be earning if industry were spread proportionately to the size of population. Other sources of income must be taken into consideration of course, with Kerry earning proportionately more from tourism. This is underlined by the fact that Kerry has only 2.1% of total State industrial employment.

In summary, the counties of Donegal and Kerry and the coastal areas of Cork and Galway are disadvantaged in their share of industrial development and in their lower share of wages from industry. An added factor here, undoubtedly, is that the average wage in the fish-processing sector (£9,896) is only 63% of average wages in industry (£15,749). If we look at the strictly 'industrial wage' the fish-processing sector wage at £9,101 is 65% of the State's £13,808.

3.5 Unemployment and dependency ratios in the regions

A glance at the unemployment and dependency ratios for each of the Counties in the study region, as shown in Tables 3.4 and 3.5, shows their relative disadvantage compared with average levels for the State.

Table 3.4
Unemployment Ratios for each of the study regions

Study Region	Total Unemployment Ratio
Coastal Co. Cork	0.12
Co. Kerry	0.16
Co. Galway	0.14
Co. Donegal	0.22
Average for Study Regions	0.16
STATE	0.15

Table 3.5
Dependency Ratios for each of the study regions

Study Region	Dependency Ratio
Coastal Co. Cork	0.59
Co. Kerry	0.60
Co. Galway	0.63
Co. Donegal	0.63
Average for Study Regions	0.61
STATE	0.54

While the degree of peripherality in the study area may not be accurately reflected in these figures it will be more clearly shown in later sections that these ratios are considerably higher when examined on a smaller scale, i.e. by District Electoral Divisions (DED's) in coastal areas instead of amalgamated figures for each county.

CHAPTER 4 – AQUACULTURE IN CO. GALWAY AND THE CASE STUDY AREA

4.1 Introduction

This chapter provides an outline of the aquaculture industry in Co. Galway. Firstly an introduction will be given to the development of the industry and its impact in north Co Galway. More particularly this chapter includes the detailed case study of the industry in Kilkieran Bay in the southwest of the county.

4.2 North Co. Galway and Connemara

Co. Galway is the second largest county in Ireland with an area of 2,350 square miles. The principal employment sectors in the county are Agriculture, Services, Tourism, Technology and Manufacturing. The Connemara region in west Co. Galway, can be broadly divided into North and South Connemara. This is a highly scenic area which despite economic, social, and physical disadvantages has a seasonal but substantial tourism sector. The aquaculture industry extends throughout its coastal boundaries from Killary Harbour in the north to beyond the Connemara area in south Galway Bay near Kinvara as seen in Figure 4.1. The primary shellfish species are oysters and Kilkieran Bay hosts the greatest concentration of salmon aquaculture in the country.

In north Connemara, the area extending westwards from Leenane via Recess and Roundstone covers approximately 800km² and includes a number of pockets of Irish speaking communities. It is quite sparsely populated with a population density of one fifth of the national average. Population decline has been a continual trend since the beginning of the century and community unemployment and underemployment in this area stood at 40% in 1994. (FORUM, 1994). Connemara has traditionally had a diverse economy relying principally on farming and fishing. These sectors have been in continual decline over the past number of decades and in general do not provide an income beyond subsistence level. Farming is not intensive as bad soil and large boggy areas dominate. Farm units are small with 40% of the farms being less than 30 acres (Indrehus, 1994). Some cattle are reared for fattening and sheep are the main livestock held. The EU give ewe-premiums (sheep headage scheme) as this is an Objective 1 region as outlined in Chapter 3. The climate in this area is not suitable for the growth of cereals due to high levels of precipitation, but vegetables such as potatoes, turnips, cabbage and carrots are grown successfully throughout the area.

As mentioned north Connemara has had a significant tourism industry since the turn of the century (Indrehus, 1994), with the main attraction being the unspoiled landscape, and the considerable marine and freshwater resources. This tourist industry is mainly seasonal and boasts one of the most important angling areas in the country. Angling was worth an estimated IR£84m and 3397 full-time job equivalents to the Irish economy in 1996 (Marine Institute, 1998) and is a significant source of income in this area. However, the increase in volume of tourism over the last 15 years and the increasing trend of property purchase by

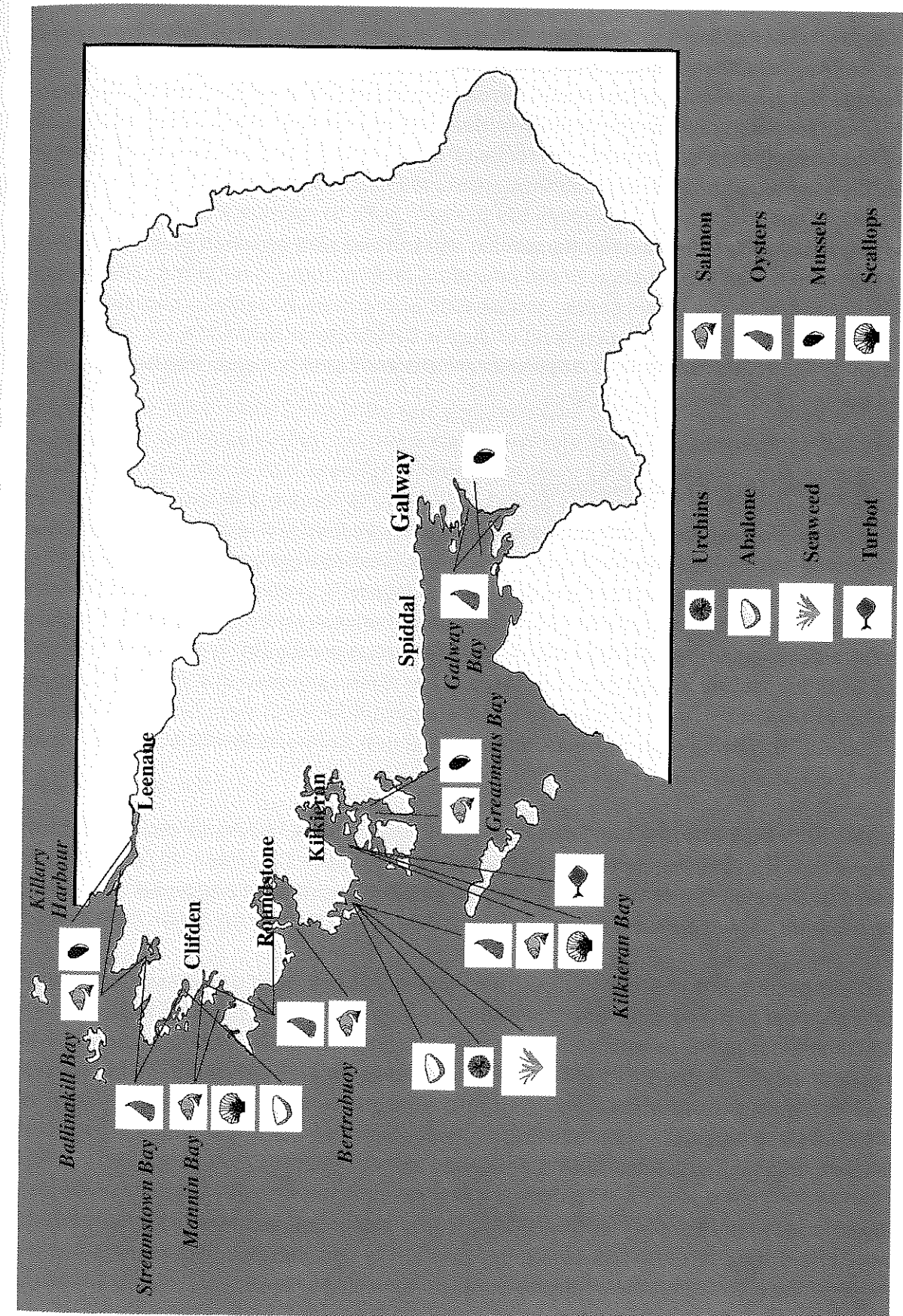


Figure 4.1
Approximate location of principal aquaculture operators in Co. Galway

foreign nationals for use as summer houses has had some negative consequences. Increase in the demand for and consequent value of property in the area is not reflective of the standard of living and economic status of the full time resident population who expect to find employment there. For example, a recent article in the Irish Times suggested that escalating house prices in the Connemara area were a contributory factor in the failure of qualified personnel to take up the position of local GP in a coastal village, thus leaving the area without a full time doctor. After 3 rounds of advertising by the Western Health Board, the position was eventually filled (Irish Times, May 1999).

Some key social indicators identify the specific weaknesses of the human resource base in north Connemara. On examination of the education level of population in the Clifden rural district, according to the 1996 census, almost 60% of the male population and 46% of the female population had an education level of Junior Certificate or below. On the other hand less than 10% of either sex held a degree or professional qualification. This bodes poorly for the human resource base in the area.

4.3 Aquaculture in Co. Galway

Since the mid eighties, aquaculture has become a major industry in Co. Galway offering jobs to these people with few alternative employment options and potentially facing emigration. Salmon farming is carried out at several locations in north and west Co. Galway as seen in Figure 4.1. The 3 salmon farming companies operating in North Connemara generate a turnover of up to IRE15m with a significant expenditure on food going to the nearby fish food factory in Westport, Co. Mayo. It has been estimated that up to 100 people are employed directly in providing services to the aquaculture industry in North Connemara (Indrehus, 1994). The salmon farming industry in South Connemara will be described in detail in the case study later in this chapter.

Trials in turbot cultivation have been carried out in Kilkieran Bay and onshore turbot farming is now moving into a commercial production phase at Leitir Mór. Arctic Charr are cultivated at Corundulla and there are a number of salmon and trout hatcheries associated with the marine based salmonid farms.

Intensive mussel culture is carried out in Killary harbour taking advantage of natural spatting grounds in the harbour and it is also carried out to a lesser extent in Kilkieran Bay. The Shellfish Research Laboratory (SRL) associated to National University of Ireland (NUI) Galway is involved in growth trials and ongoing research and development for several species including lobster, sea urchins, and abalone which are also cultivated in Streamstown Bay. Interest in abalone culture is now greater than ever with a number of producers of this high value species in Co. Galway and Co. Cork.

A project is currently running at the SRL, to study the sustainability of the Irish edible periwinkle (*Littorina littorea*) which is harvested along the coast and is estimated to be worth an estimated IRE7m annually to rural communities. This project also involves research into the potential development of periwinkle aquaculture in the future to relieve pressure on wild stocks.

Oyster culture is prominent in Co. Galway. Pacific and native oysters are grown extensively and intensively at numerous locations along the coast, mainly for the export market. Much of the oysters produced in Co. Galway are extensively grown native flat oysters as there are a shortage of suitable sites for Pacific oyster cultivation. Reseeding and stock enhancement schemes are also ongoing for oysters in Kilkieran Bay as will be described. Galway is host to at least two international Oyster festivals annually: the Galway International Oyster Festival and the Clarinbridge Festival. Each of these festivals generates significant economic benefit. The Clarinbridge Festival for example generates approximately IRE1.5m in the local area in a number of days. While these oysters are from managed stocks rather than intensively cultured stocks the high profile given to the overall oyster market is significant.

4.4 Kilkieran Bay – Introduction to the Case Study location

Kilkieran Bay is almost 12 km long and encompasses approximately 5,800ha. While the main human activities within the bay area are inshore fisheries, seaweed harvesting and aquaculture, the site is also used for recreation, mainly bathing, angling, pleasure boating, SCUBA diving, walking, shooting and horse-riding. Generally the hinterland of Kilkieran Bay, which lies entirely within the south Galway Gaeltacht, is sparsely populated and there is no large centre of population in the area, save the two villages of Kilkieran and Carna on the western shore of the bay. The bay is host to a group of islands known as Ceantar na nOileán. The four main islands which are linked by a series of bridges and causeways are Eanach Mheáin, Leitir Mór, Garumna and Leitir Mealláin, as shown in Figure 4.3.

4.5 Local resources

4.5.1 Introduction

The human, capital and physical/environmental resources of any region largely determine the degree of economic activity occurring there. An absence or a deficiency in any of these areas inevitably creates obstacles to the development of indigenous enterprise and leads to difficulties in attracting outside investment.

Industrial and infrastructural development in the Connemara region have been poor in the last number of decades. It is estimated that the poor quality of the road system, and the time losses associated with this could add 25%-30% to the cost of transporting goods from some remote areas of west Connemara to the rest of Europe. Deficiencies of road networking have greater negative effect on the western Counties than the East/South/Southeastern coastal Counties, with a greater proximity to ports for European Trade. The lack of concentrated economic activity and economies of scale is a principal hindering factor to the development of industry and services in rural areas such as this one. Concentrated demand and the availability of services and capital are essential elements in the location decision of any firm. Rural areas such as Kilkieran are generally not well equipped to fulfill these requirements. Thus industrial development in the area is assisted by Údarás na Gaeltachta, based in Furbo, Co. Galway.

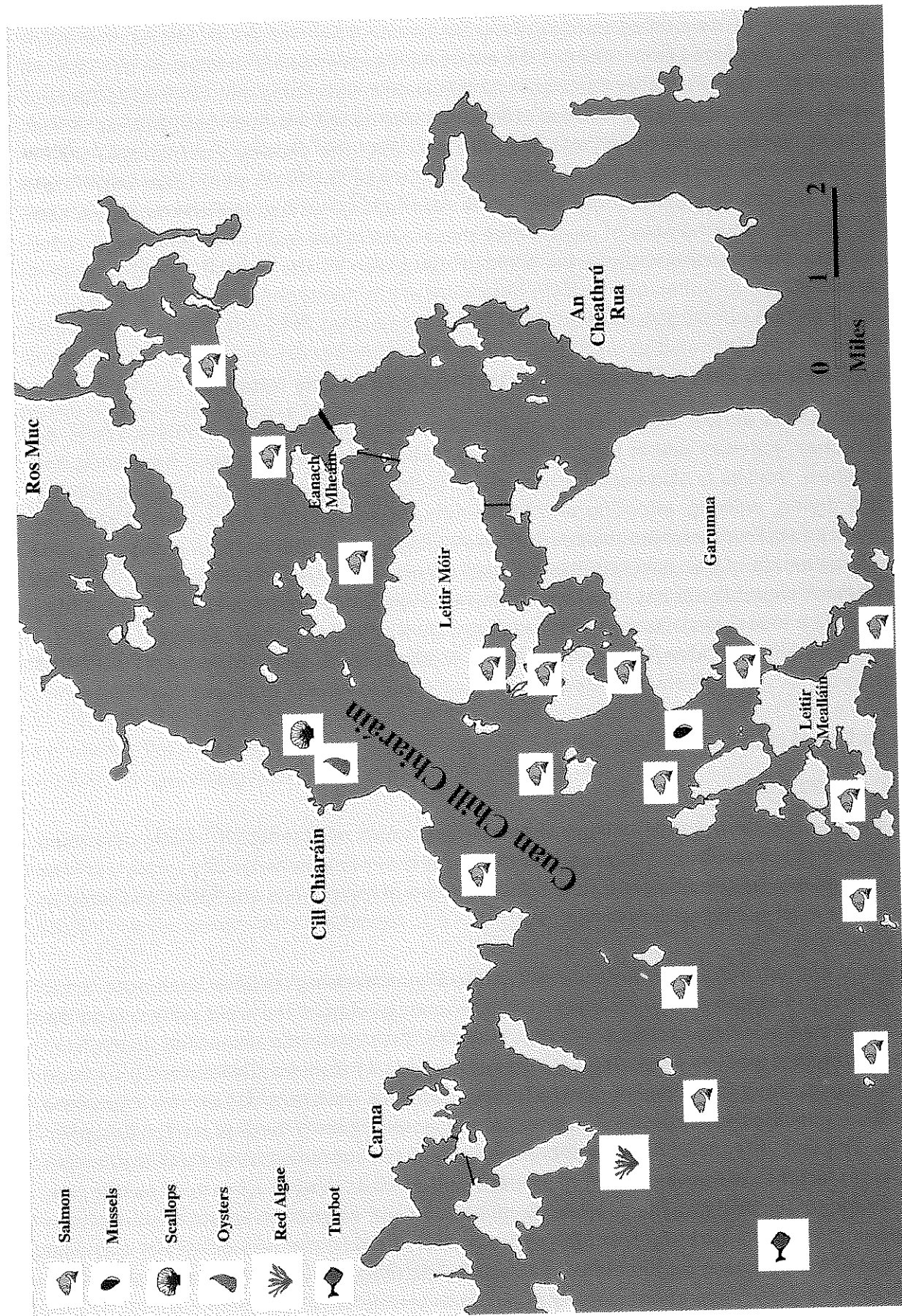


Figure 4.2
Approximate location of principal aquaculture operators in Kilkieran Bay and its hinterland

4.5.2 Human resources and employment

The human resource in the area around Kilkieran Bay is responsible for both the production and consumption of goods and services. It is clear that stable, dynamic populations are necessary for the survival of such rural regions. Since the levels of unemployment are high, there is clearly a large proportion of people seeking work. Unemployed people in these areas, particularly young people, have been forced to emigrate in the past. Emigration of this kind reduces the number of young, dynamic people and, in turn, deprives the area of vital entrepreneurial qualities. The probability of further indigenous employment creation is therefore reduced. According to the 1996 census, the populations of the District Electoral Divisions (DED's) in the area immediately adjacent to Kilkieran Bay are as follows:

Table 4.1
Population in vicinity of Kilkieran Bay.

	Male	Female	1991	Male	Female	1996
Owengowla	171	153	324	181	154	334
Skannive	324	278	602	344	323	667
Camus	219	199	418	206	190	396
Crumpaun	1065	1012	2077	1124	1041	2165
Gorumna	707	627	1334	662	650	1312
Lettermore	416	404	820	416	395	811
Turlough	323	252	575	302	244	546
Total	3225	2925	6150	3235	2997	6232

The surrounding District Electoral Divisions (DED's) make up a population of 6,232 people, an increase of 82 people (1.4%) on the 1991 census.

Table 4.2.
Social structure and labour force in the region

DED	Dependency Ratio	% Households with no one under 65	Unemployment ratio	Proportion farms under 30 acres	% Low education (Junior or below)	% High education (Degree and above)
Owengowla	0.63	16.2%	50.4%	100%	83.1%	0.8%
Skannive	0.70	13.1%	51.9%	66.7%	77.4%	3.9%
Camus	0.64	15.9%	29.5%	92.6%	80%	2.1%
Crumpaun	0.61	15.7%	32.9%	100%	68.1%	8%
Gorumna	0.69	15.7%	46.3%	94.4%	88.6%	1.5%
Lettermore	0.59	13%	47.3%	94.7%	79.5%	5.6%
Turlough	0.65	26.5%	49.5%	93.3%	83.5%	2.7%
Average	0.64	16.6%	44%	91.7%	80%	3.5%

Some of the key social indicators in the area are shown in Table 4.2. It can be seen that unemployment ratios in the area are among the highest in the country, ranging from 29.43% – 51.94%. 91.7% of farms are less than 30 acres and 80% of the population have an education level of Junior Certificate or below.

4.5.4 Capital Resources

Local investment in rural regions normally carries an above average-risk because of a lack of concentrated demand, and poor infrastructure and technology, among other factors. Emigration from areas with few opportunities like the hinterland of Kilkieran Bay leaves behind an ageing, conservative population of low educational attainments and limited skills who are less likely to take risks on the few available business opportunities. However, even when relatively low-risk investment opportunities present themselves, inadequate business expertise in rural areas like this one means that these opportunities may not be taken. The level of business expertise and advice in rural areas is very low relative to the country as a whole and this of course is a major contributory factor to low levels of local investment in these areas. It is important to note that bodies like Údarás na Gaeltachta function through promoting and facilitating entrepreneurship in Gaeltacht areas.

4.5.4 Agriculture

Employment in the primary agricultural sector has continuously declined on a national scale over the past 20 years and it is estimated that this decrease in employment in the sector will continue for the foreseeable future. The number of small farms in Ireland fell from 223,000 in 1980 to 153,000 in 1995 and this loss occurred largely in the border and western regions. Several of these counties have high proportions of small farmers operating less economical holdings from which it is difficult to generate a substantial income. Although social disadvantage in Co. Donegal, for example, is not primarily related to marginal agriculture as described in Chapter 5, small farming in these counties is highly localised and indicative of poverty and social exclusion.

The further major structural weakness of the agriculture sector in the west and border counties is the age structure of farmers on the land. Almost one third of farmers in the western region are over 65 years of age. The cumulative effects of the downturn in agriculture in the west of Ireland has also led to an increase in the number of part-time farmers with a consequent increased reliance on EU and State agricultural financial subsidies. Farming, and the revenue it generates, are critically important to the viability of rural communities. The National Economic and Social Council characterised the counties of Connacht and Co. Donegal as the counties with the highest proportion of small farms in the country. A recent report by the Council for the West also highlighted the need for the identification and development of off farm employment opportunities for part-time farmers who constitute the majority of those farming in disadvantaged areas of the west and North-west.

The overall expected downturn in agriculture and its associated job losses nationally will undoubtedly have a negative effect on what is little more than subsistence farming in southwest Connemara. 95% of holdings in the area around Kilkieran Bay are less than 30 acres. As will be shown in the following sections, all farmers in the area rely on additional income from a variety of sources such as fishing, aquaculture and supplementary social welfare payments.

4.5.5. Tourism

It is somewhat ironic that the characteristics which create obstacles to economic development (like poor rugged land, isolation, etc.) often provide tourists with an attraction which is pleasing to the eye and relaxing to the mind. The benefits of tourism to such areas like Kilkieran Bay are limited. Tourism is very uncertain and seasonal in nature and there is a distinct lack of tourist infrastructure in the area. Further to this a high proportion of tourist bypass the Kilkieran Bay area in favour of better promoted or better equipped areas like Clifden. Tourists visiting Kilkieran Bay and its surrounding area are often just 'passing through' on their way to more popular destinations or lost on their way there! However, Kilkieran Bay is not as geographically accessible as other tourist destinations in the Connemara region. Many of the roads in Ceantar na nOileán come to an abrupt end and it is difficult to arrange a round trip through the area without careful planning.

The most stable form of tourism in the Kilkieran Bay area are the students who come to various Irish colleges during the summer and are provided with accommodation by local families. This tourism is restricted to the summer months and thus seasonal in nature. Although additional spend by individual students may not be significant in context, the additional spin off in the local economy of the area is very important. The seasonal increase in population for these months increases turnover in local grocery shops in particular. Parents visiting students during their stay also avail of local B&B and other accommodation facilities.

Sailing craft and vessels in the Kilkieran Bay and Greatmans Bay areas are currently estimated to be worth in the region of £500,000. This is considered to be a huge financial and industrial asset to the area. The unique and valuable craft of traditional boat building is still active in the Kilkieran Bay area and some financial assistance is provided by Údarás na Gaeltachta. A range of traditional boat types are currently in use including currachs, hookers, gloteogs and púcans, and sailing and racing festivals take place annually.

Investment in tourist infrastructure in the Kilkieran Bay area has been quite low. Nonetheless there are a number of active tourism groups operating in the area. At least 3 independent tourism groups exist and Údarás na Gaeltachta formed a subsidiary company, Gaelsaoire, in the last year, to develop and promote cultural tourism in the Gaeltacht areas including this region. Gaelsaoire have set up a website to target niche international markets and are involved in a number of co-ordinated initiatives with tourism groups in the Kilkieran Bay area.

Coiste Turasóireacht Cill Chiaráin (CTCC), based in Kilkieran village are involved in a number of tourism initiatives in the bay area. The biggest infrastructural development project underway at present is the improvement of the pier at Kilkieran, a project which is funded by Roinn na Gaeltachta. The improved facilities will be available for use by Arramara Teó and local fishermen including members of the shellfish co-op and CTCC would like to see a marina developed adjacent to the pier to attract sailing vessels to the area. CTCC are also hoping to develop organised fishing trips for visitors to the area in the future. Seafood and Sailing Festivals and Regattas are also being planned. This year a celebration of the Galway Hooker is planned from the 12-20th July. It is hoped that 50-100 traditional sailing vessels will participate, with bases in Kilkieran, Roundstone and Lettermore. There are local plans to set up an activity centre for canoeing, kayaking and wind surfing in this area. A 9 hole golf course has recently been developed along with a number of holiday cottages in Ceantar na nOileán.

SCUBA diving is becoming increasingly popular in the Kilkieran bay area. Atlantic Diving School based in Inverin, Co. Galway, less than 20 miles from the site, are regular users of the bay and it is also a popular destination for seasoned Irish and visiting divers. The economic benefit accruing from this kind of tourism at present is minimal. There is considerable scope for the development of tourism infrastructure (guest houses, hostels, restaurants and shops) associated with this sport and other tourism activity, in order to increase the economic benefit accruing to the area.

The Connemara region has long been noted for its freshwater fisheries. In the Kilkieran Bay catchment area in southwest Connemara, there are the following sea trout fisheries; Furnace, Lettermuckoo, Invermore, Inverbeg, Screebe and Carna.

In the past these systems have been noted for their wild salmon and brown trout fisheries but more particularly for their sea trout fisheries. The sea trout angling season in these systems is 100 days long, and the Western Regional Fisheries Board (WRFB) estimate that these systems could accommodate a total number of 89 rods per day. The Invermore and Screebe Fisheries are the largest of these fisheries providing between 20 and 25 rods each per day during the early 1980's. However, wild sea trout stocks on the west coast of Ireland experienced a serious decline towards the end of the 1980's. This decline showed no signs of reversing until relatively recent years. The Invermore river, for example, recorded rod catches of 1,481 sea trout in 1985, prior to this decline. Catches fell dramatically in the following years until the fishery was closed at the beginning of the 1990's. Similarly, Screebe recorded a catch of 665 which declined until the fishery closed in 1990 until small catches were recorded in 1994.

Based on a cost of £30 per rod per day, if every possible rod were taken up each day for each of these fisheries, £267,000 per annum could potentially accrue to local fishery owners. Additional spend in the economy around Kilkieran Bay from those involved in recreational fisheries during the 1980's and 1990's would be difficult to quantify but it would be fair to say that due to the paucity of local tourist infrastructure (dedicated accommodation, restaurants, craft shops) additional spend would not be significant.

The Western Regional Fisheries Board contend that the decline in sea trout stocks is as a direct consequence of increased parasitic lice infestations on farmed salmonids. This argument is a complicated and litigious one which is as yet unresolved. However, it is outside the scope of this project to reach a presumption on the link or otherwise between sea trout stock decline and the increase in salmon farming in Ireland. Considerable research and development has been spent on researching the cause of this decline from several perspectives. Such projects are still ongoing.

4.5.6 Inshore Fisheries in Kilkieran Bay

Traditional potting for lobsters, crabs and shrimp is carried out at a number of locations in the bay. In the past five years the shrimp fishery has been depleted due to over fishing with the result that shrimp potting is still practised, but with relatively little return. There is some fishing for crawfish with tangle nets which is limited to the outer bay and offshore reefs (NPWS, 1996). A lobster fishery also exists in Kilkieran Bay and most fishermen participate in the Lobster enhancement scheme by "V-notching" berried females and throwing back individuals below the minimum legal size. Periwinkle collection is another small employment generator undertaken by a number of people in the locality. This species is worth up to £1800 per tonne during the year and this value increases at Christmas time.

8-10 years ago, an organisation called Fiontar na nOileáin, an island community co-op., held courses for fishermen and fishfarmers, on subjects such as boat-handling and equipment maintenance, hence increasing the availability of trained personnel in the workplace. These people are now in their mid-30's and still retain these skills. Thus they have the ability to use their skills and training for a number of years to come and will be employable for some time.

4.6 Introduction to the Case Study

In order to present a detailed picture of the nature of the dependence of peripheral Irish coastal communities on the aquaculture industry, a case study was carried out in the area surrounding Kilkieran Bay in southwest Co. Galway. The layout of the bay and hinterland and the location of the various aquaculture activities are shown in Figure 4.2. The three component questionnaire surveys of the Kilkieran Bay case study were as follows:

- 1 - Survey of all Atlantic salmon producers in Kilkieran Bay,
- 2 - Sample survey of fishfarm employees in Kilkieran Bay, and,
- 3 - Survey of local attitudes and opinions regarding the development of the aquaculture industry in Kilkieran Bay.

A copy of each of the questionnaires is provided in Appendix III. An assurance of confidentiality was given to all participants in each of the questionnaire surveys for this study. Numerous interviews were also conducted for the purpose of the study from which further background information was attained. A detailed list of study consultees in the Kilkieran Bay area is provided in Appendix I.

4.7 Survey of aquaculture in Kilkieran Bay

4.7.1 Introduction

The first of the questionnaire surveys, "a survey of salmon farming in Kilkieran Bay", described here provides an account of the extent and immediate value of the salmon farming industry in the bay. It has been collated based on questionnaires distributed to and completed by each of the salmon farming companies in the area. An account of the shellfish co-op, Comharchumman Sliogéisc Chonamara, and the seaweed harvesting and processing industry (through Arramara Teó.) are also provided here, along with an assessment of the ancillary industry directly associated with the aquaculture industry in the area.

4.7.2 Comharchumman Sliogéisc Chonamara Teó.

Comharchumman Sliogéisc Chonamara Teó., the shellfish co-op. operating in Kilkieran Bay, was set up in 1985 to manage the shellfish populations of the bay at a time when drastic overfishing had almost wiped out natural shellfish populations. The shellfish beds were purchased by Údarás na Gaeltachta, on behalf of the co-op, from Gael Linn, who controlled them at that time, at a cost of IR£170,000. The repayment of this money to Údarás na Gaeltachta over a 20 year period, costs the co-op. IR£8,200 per annum. Údarás na Gaeltachta provided a development officer for the co-op. and a 4 year development plan was installed in 1995 to oversee the relaying of the existing beds and the redevelopment of other beds within Kilkieran Bay.

The co-op. currently has 300 full-time and part-time members. There are 140 regular fishermen oyster dredging on an annual basis while 70 of the co-op. members fish for scallops only.

10-15 fishermen dredge for clams a couple of times during the year, harvesting a total of 5-6 tonnes per year.

The majority of co-op. members are farmers on social welfare. Others are local shrimp or lobster fishermen and seaweed harvesters.

The scallop fishery is subject to restrictions due to boat size. The open season during which members of the co-op can dredge for scallops and oysters is strictly limited by the co-op. in order to prevent overfishing. A very small clam fishery also exists and the co-op. is licensed to farm clams. Quotas for oysters are set annually as a result of the oyster survey and fair rights have been established among fishermen for the management of native oyster fisheries. Others fishermen involved in the co-op include full time professionals who come to the west for fisheries.

4.7.3 Seaweed harvesting and processing in Kilkieran Bay

A significant seaweed harvesting and processing industry exists in Kilkieran Bay. All seaweed is harvested by hand, the more abundant and commonly exploited species in this area being *Ascophyllum nodosum* as outlined in Chapter 2.

In a study of seaweed harvesters in the coastal area from Rossaveal to Letterfrack, Co. Galway, it became apparent that there were 3 principal groups of harvesters namely, full-time cutters, part-time cutters and winter cutters (ISIO, 1996).

Of the 130 people in this area involved in seaweed harvesting there were: 26 (steady) full-time, 23 (nearly) full-time, 59 rainy day, and, 22 winter cutters.

It was also noted in this study that the greater proportion of cutters (88%) were over 40 years of age.

Harvesters are currently paid approximately IR£16 per tonne of seaweed.

Most of the seaweed harvesters in Connemara are unemployed and depend on the seaweed industry as a supplement to their social welfare payments.

Many of the harvesters are also part-time or subsistence fishermen or farmers and supplement their income by fishing for lobster, shrimp, salmon, oysters or scallops while saving some turf and hay.

This was perhaps symptomatic of the intensity and difficulty of physical labour required for the practice. Initially this was a cause of concern to those undertaking the study but it was concluded that new trends were developing in seaweed harvesting as the small number of harvesters under 40 years of age were steady full-time cutters.

All the *Ascophyllum sp.* harvested in Kilkieran Bay is processed at Arramara Teó. in Kilkieran village where an additional 16 full-time jobs are provided. The price earned for harvested weed does not seem like a great reward for the physically demanding nature of seaweed harvesting but this further emphasises the importance of this resource as an additional source of income in this area. Notwithstanding the difficulty of the work involved additional income provided from seaweed harvesting is relatively significant in a local context and can range from IR£1,000 to IR£3,000 per harvester per annum. Údarás na Gaeltachta provide a grant subsidy scheme whereby individuals wishing to get involved in seaweed harvesting can avail of a 50% grant towards purchasing an engine and suitable boat. This scheme commenced approximately 9 years ago and almost £50,000 has been invested to date.

Some harvesting of Carrigeen Moss and Dillisk is also carried out in Kilkieran Bay but this is primarily for home consumption and of no commercial value, (Sean O' Loinsigh, pers. com). The seaweed resource in Kilkieran Bay is vast and under exploited and it is considered that there is potential for considerable expansion in the future. The first seaweed cultivation exercises are currently under way for the red alga *Asparagopsis armata*, at Mainis near Carna.

4.7.4 Salmon farming

There are 7 salmon farming companies operating in Kilkieran Bay. Farming started in the bay nearly 20 years ago and has expanded to many licensed sites as shown in Figure 4.2. Production has varied over the past number of years and total licensed tonnage is approximately 3,700 tonnes. This figure amounts to 25% of total Irish farmed salmon

production in 1997 and thus is very significant in a national context. Currently the farmers in Kilkieran Bay are developing a Co-ordinated Local Aquaculture Management System (C.L.A.M.S.) in conjunction with DoMNR which aims to co-ordinate all salmon production in the bay and increase production in a co-ordinated manner towards a production of almost 9,640 tonnes by 2005. The plan is a locally based initiative to develop an integrated approach to the management of salmon farming within the bay and incorporating the recent initiative of the Minister of the Marine in relation to C.L.A.M.S. Its goals are fourfold:

- The control and elimination of disease.
- The optimisation of environmental conditions within the bay.
- More efficient production.
- Co-operation and harmonisation with other users of the bay.

These will be achieved by co-operative ventures including:

- A formal agreement on the exchange of information.
- An agreed code of practice.
- Effective separation of generations.
- Synchronous annual fallowing of all production sites.

The salmon farmers in Kilkieran Bay generate substantial additional economic activity in local and outside areas through day to day running expenditure on each of the farms. This will be outlined in more detail in the following section.

There has been considerable investment in the salmon farming industry in Kilkieran Bay since its inception. The majority of this has come from private investment with significant amounts from Údarás na Gaeltachta and personal bank borrowings by individual aquaculture operators. An estimated total of IR£7.86m has been invested to date from sources as outlined in Chart 4.1.

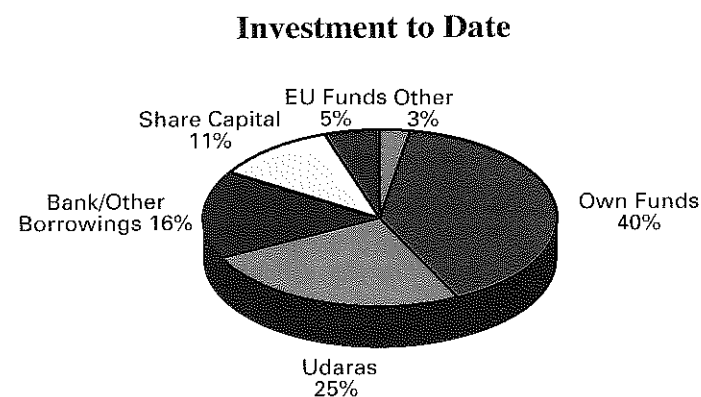


Chart 4.1 Sources of investment to date in Salmon farming in Kilkieran Bay. (Survey of Salmon Farmers in Kilkieran Bay)

4.7.5 Ancillary industry

A number of the larger companies in this area are either heavily or totally reliant on the existence of the aquaculture industry in Kilkieran Bay. More Net Teó., ISPG, Kilkerrin Salmon and Irish Sea Spray provide essential supplier, processing and marketing facilities to the industry. Significant ancillary services are also provided by Transmara Teó., Comharchumman Chonamara Thiar, and companies like Saotharlann Chonamara Teó., for example.

More Net Teó. based in Lettermore supply nets ropes and chandlery to the aquaculture industry in the area, and provide 5 full-time and 2 part-time jobs with an annual wage bill of IR£60,000.

Irish Seafood Producers Group Ltd, (ISPG), to which the Kilkieran salmon farmers pay a total of IR£1.15m annually for ice and marketing facilities, have 10 full-time employees and a number of seasonal employees with an annual wage bill of IR£200,000.

Comharchumman Chonamara Thiar, based in Kilkieran, have an annual turnover of approximately IR£180,000, 20% of which comes from supplying ropes, workwear and heavy tools to local aquaculture operators. They provide 5 full-time and a number of part-time jobs.

Transmara Teó, also based in Kilkieran transport fish from the area to French and domestic suppliers. They have 6 trucks on the road for this purpose and 13 dependent employees on the payroll. They also provide transport services to Arramara Teó.

Saotharlann Chonamara Teó., based in Rosmuc, provide laboratory and analytical services to the aquaculture industry in Kilkieran Bay. They employ 6 full-time employees and have an annual wage bill of IR£92,000.

Irish Seaspray, based in Lettermullen, process salmon primarily for the export market. Approximately 27 full time jobs are provided in processing, administration and quality control. Annual turnover of this company is approximately IR£0.5m and the annual wage bill is approximately IR£180,000. 90% of the processed fish are exported to markets in France and Italy.

Cill Chiaráin Éisc Teó., (CCET) based in Kilkieran, process salmon for export and domestic markets. Most of the processing is primary processing but approximately 10% is devoted to value added processing and this area of processing has considerable potential for development. Approximately 3000 tonnes of fresh salmon are processed annually, the majority of this coming from salmon farms in Kilkieran Bay. Employment in the company this year reached 56 during peak harvesting, with 16-18 of these employees working in value added processing. 18-20 people are employed full-time in off-peak times. The annual turnover is IR£1.2m and the annual wage bill is IR£289,000. A significant number of those working in CCET are same or first generation returned emigrants from the US or the UK who chose to come back to live and work in the area due to improving employment opportunities.

Each of these companies form another vital part of the local economy in the Kilkieran Bay area and without the salmon farming industry and shellfish co-op. they would cease to exist. Based on information provided it is estimated that these companies generate almost **IR£1m** in wages in the locality. An average of **120 full-time jobs** and approximately **30 part-time jobs** are also provided. The significance of this additional income and employment in such a marginal economy cannot be overstated. In many respects there is a high level of dependence on the aquaculture industry in this area by ancillary goods and service providers such as those mentioned above.

Other Services. Other services provided directly to the aquaculture industry in Kilkieran Bay are diving services, aquaculture and environmental consultancy, veterinary services, accountancy and legal services. While these services are provided to other sectors, clients in the aquaculture sector form a significant part of their business.

4.8 Survey of finfish farm employees in Kilkieran Bay

4.8.1 Introduction

The second questionnaire used in the study was a "Survey of finfish farm employees in Kilkieran Bay". For this survey employees on 4 of the 7 salmon farms were interviewed. The aim of this questionnaire survey was to determine more clearly the nature of the employment opportunities provided in the aquaculture industry in Kilkieran Bay from the point of view of those who avail of them. It also aimed to identify less apparent benefits of the reduction in local emigration for which employment opportunities such as these are responsible.

4.8.2. Finfish farm employees

The average length of full-time employment of those interviewed was 8 and a half years and 75% of these employees expected to, or were prepared to, stay in their jobs for the foreseeable future.

However 60% of the employees surveyed had an additional source of income. Many were fishing for lobster, mackerel or shellfish (with the shellfish co-op.) on a part-time basis and interestingly all but one said their primary source of income was from their job on the salmon farm.

80% of the employees had no skills or training outside the aquaculture industry and the average school leaving age was 16, despite a number having attended third level.

50% of those interviewed said that if their job did not exist they would emigrate to the U.K. or the U.S., while only 25% hoped to get another job in the locality. One man who skippered a boat on one of the fishfarms explained that he was the last of his generation on the family farm and would prefer to stay in the area if he could no longer work on the fish farm. However, if he could not make a living from the farm or at a job nearby, he felt he would have to emigrate.

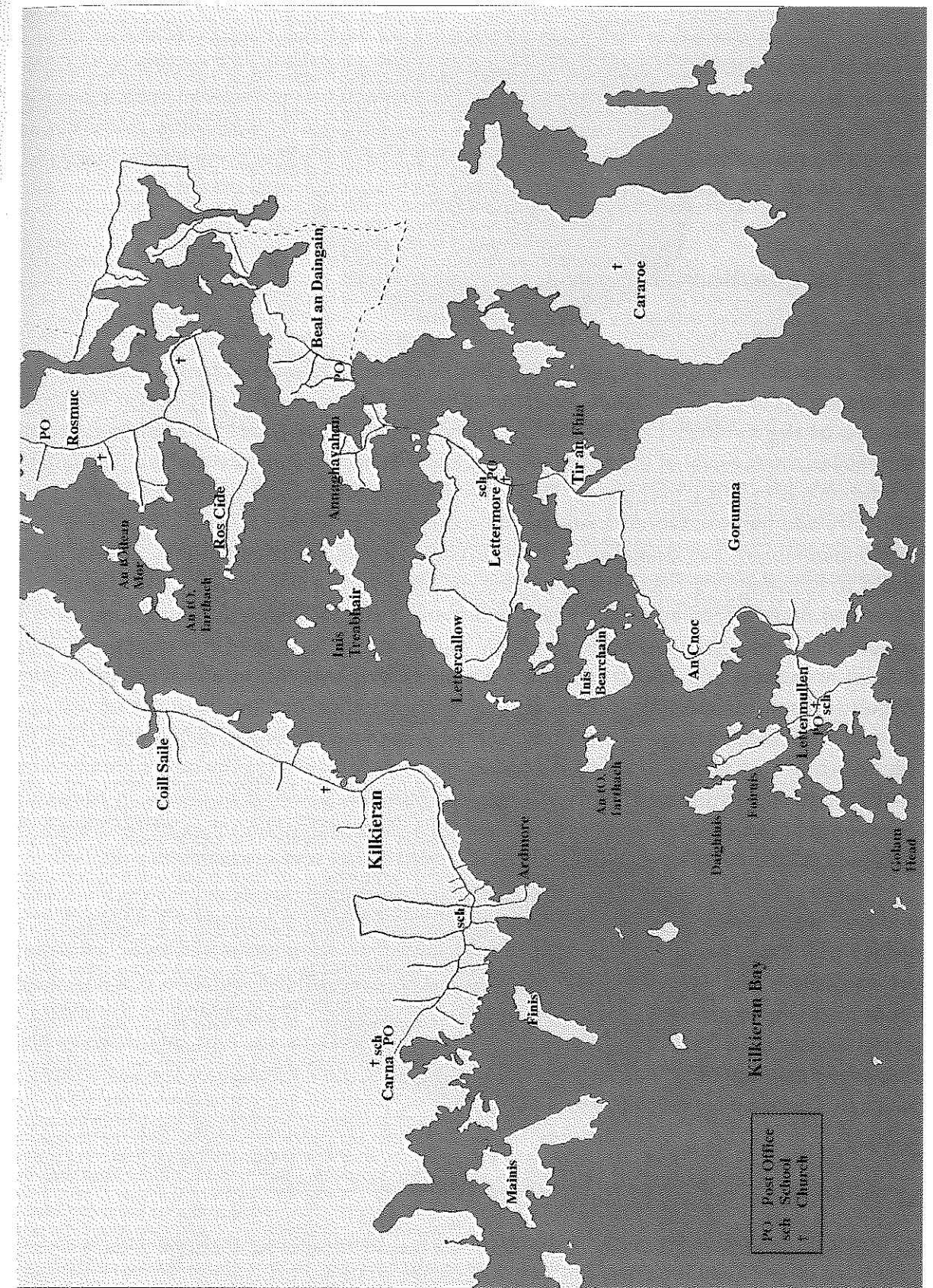


Figure 4.3
Survey Route undertaken around Kilkieran Bay

These figures are quite a significant statistics in a community where long term unemployment and high levels of unemployment are a fact of life. As outlined unemployment ratios in the hinterland of Kilkieran Bay ranges from 41-51%. Few of those questioned had an interest in setting up an aquaculture business because of the perceived risk and financial backing required. A number of the men working on several of the fish farms are involved in traditional boat racing in the area and one is involved in racing in the U.S. The cultural benefit of the continuation of these kinds of traditional activities is enhanced by the increased employment opportunities which allow participants to remain living and working in the area.

4.9 Local questionnaire survey

4.9.1. Introduction

The third questionnaire used as part of the case study was "A survey of local attitudes and opinions relating to the aquaculture industry". The local questionnaire survey was the most extensive of the surveys carried out for the purpose of this case study. Of primary importance to the survival of the aquaculture industry at any location are the people living in the communities in which it operates. These are the people whose daily lives are affected by the industry and those to whom a substantial economic benefit can and should accrue. This questionnaire survey was designed to ascertain how people in the community immediately adjacent to Kilkieran Bay really felt about the development of the industry and any effects this has had on their quality of life. Every effort was made to ensure that questions on the questionnaire were not leading in any way and that the format of the questions best facilitated an honest and open response from all participants. An information sheet was provided to each respondent in English and in Irish which outlined and explained the motivation and methodology of the study, and an assurance of confidentiality was given to all participants. This aimed to avoid confusion or suspicion and to provide all participants with the best opportunity to express their opinions clearly and honestly. It must be understood that such efforts do not guarantee open participation and thus all results must be accepted at face value as the best possible response under survey conditions.

The survey was carried on a random door to door basis over a period of 3 weeks in the Summer of 1998. The questionnaires were completed through a series of informal interviews with a total of 126 random respondents from a target population of 2,418 local inhabitants. The target population size was determined as those living in the district electoral divisions (DED's) adjacent to Kilkieran Bay. Participation was high overall and most people when asked were willing to make a contribution. Figure 4.3 outlines the specific area in which this detailed survey was carried out.

4.9.2 . Attitude to the aquaculture industry.

Over one third of respondents had a direct or indirect (family member) involvement in the aquaculture or seaweed industry. Primary sources of income of respondents were derived from a range of activities as outlined in Chart 4.2.

Primary Source of Income

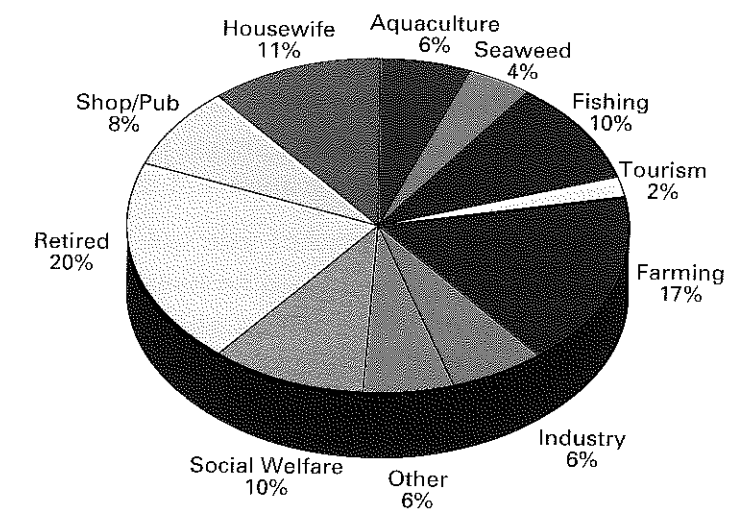


Chart 4.2. Primary sources of income in the locality.

Even a cursory glance at the principal sources of income cited provides a clear picture of the limited employment opportunities within this community. The only real jobs in the area are provided through farming, marine foods (fishing, aquaculture, seaweed), Údarás assisted industry or local shops and pubs. Even more interesting is the secondary or supplementary source of income listed by respondents in this survey, as detailed in Chart 4.3.

Secondary Source of Income

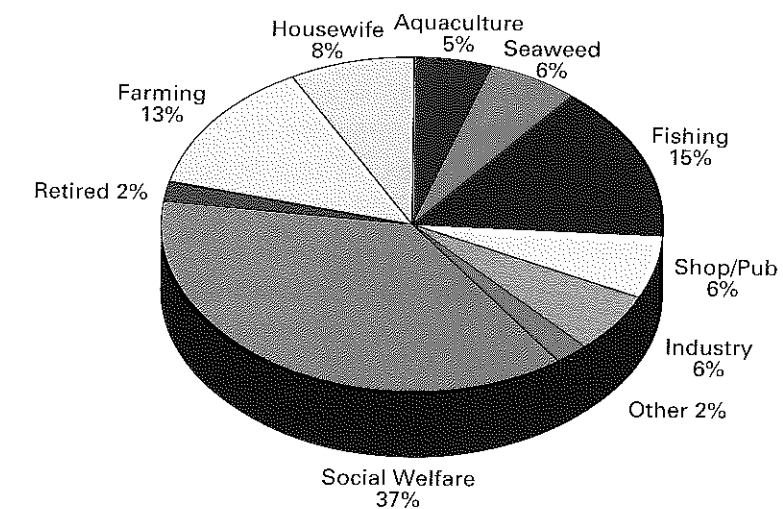


Chart 4.3. Secondary sources of income.

This chart shows the high level of dependence on social welfare payments as a secondary source of income in the area. In this context, anything which poses a threat to these sources of income is considered to be seriously detrimental to the quality of life of this community.

Respondents were then questioned to determine what the negative and positive effects of the development of the aquaculture industry in Kilkieran Bay have been as determined by local people.

85% of respondents confirmed that the single most important positive effect of the development of the industry is the employment it has provided. Other positive effects cited included a decrease in emigration and the utilisation of an indigenous marine resource.

Only 6% of respondents felt that there were no benefits at all to the area from the development of the industry. When asked about the negative effects of the development of the industry 60% of respondents stated that they saw no negative effects in their community or the surrounding area.

18% of respondents felt that the aquaculture industry contributed to the pollution of their immediate environment, though in general they were not specific regarding the source or kind of pollution. However, only 6% of respondents consider that the growth of the aquaculture industry has had a negative effect on wild sea trout stocks despite the controversy surrounding this issue over the past number of years. A greater number of people, 8%, felt that there has been a negative visual impact on the locality by the siting of fish farms in scenic coastal areas, although the number of people who considered this a major impact is still relatively low.

Almost a third of respondents, 32%, felt that there had been no major changes in their locality as a consequence of the growth of the aquaculture industry while a combined 54% felt that there were more jobs, more money or less emigration as shown in Chart 4.4.

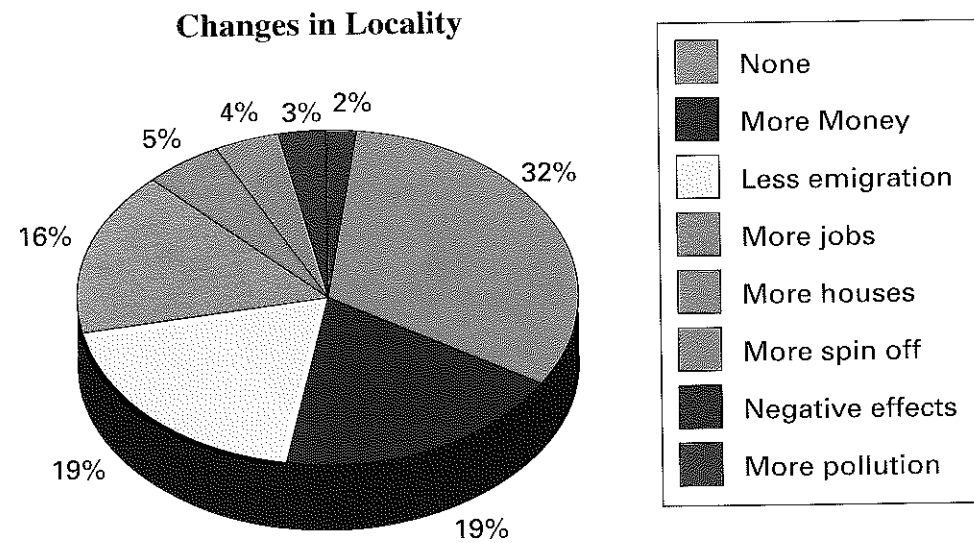


Chart 4.4. Changes in Locality with development of aquaculture.

The response to this question in the survey is of particular importance given past controversies in the Irish salmon farming industry and inaccurate levels of publicity which proposed high levels of local opposition to salmon farming in many areas.

In general respondents in the locality felt that they knew as much as they wanted to know about the industry and how it worked although the overall impression is that this has not always been the case and that there have been difficulties and breakdowns in communication between local people and those involved in the aquaculture industry in the past. Nonetheless some still wanted to know more about various aspects of the industry as shown in Chart 4.5.

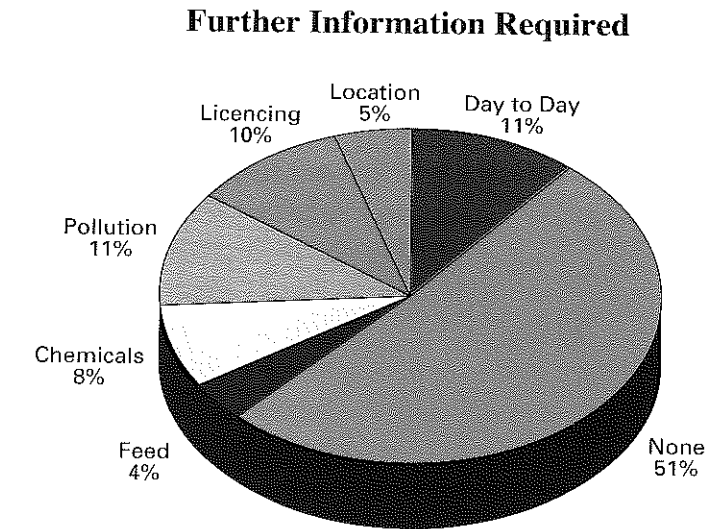


Chart 4.5. Further information required regarding the aquaculture industry.

Most information as expected is provided through family or friends that work in the industry and other kinds of word of mouth. However Radio na Gaeltachta (RnaG) was the most frequently cited source of information with 43% of responses identifying it as their primary source of information of the aquaculture industry and presumably other local issues. This is important to note, not only in consideration of the benefit of RnaG to communities such as this one, but also as an indicator of the peripheral nature of this community and the invaluable link between its members that a facility such as RnaG provides. 38% of those questioned had no interest in visiting a fish farm to see how it operates, while the remainder had either worked on or visited a farm in the past. People were generally unfamiliar with the licensing procedure for finfish or shellfish aquaculture and more importantly 87% were unaware of the amendments in licensing legislation which aimed to make the process more transparent and inclusive of the opinions and concerns of the general public.

Comharchumman Sliogéisc Chonamara as described previously is a prominent operator in the northern area of the bay and opinion of its activities are divided. The general consensus however was an acceptance of the necessary regulation and control of the once profitable and open oyster and scallop fisheries. This was seen as a necessary step in the ultimate survival and gradual improvement of the fishery which had declined drastically though over fishing although it was difficult to accept at first. However, knowledge or concern regarding the activity of the co-op was restricted to those living around the north western part of the bay.

4.9.3. Attitude and awareness regarding tourism in the area.

As the area surrounding Kilkieran Bay is one of high scenic amenity value adjacent to a valuable marine resource, local people were questioned to find out their awareness and appreciation of the tourist resource in the area. The response, as shown in Chart 4.6., was one of the most interesting of the survey.

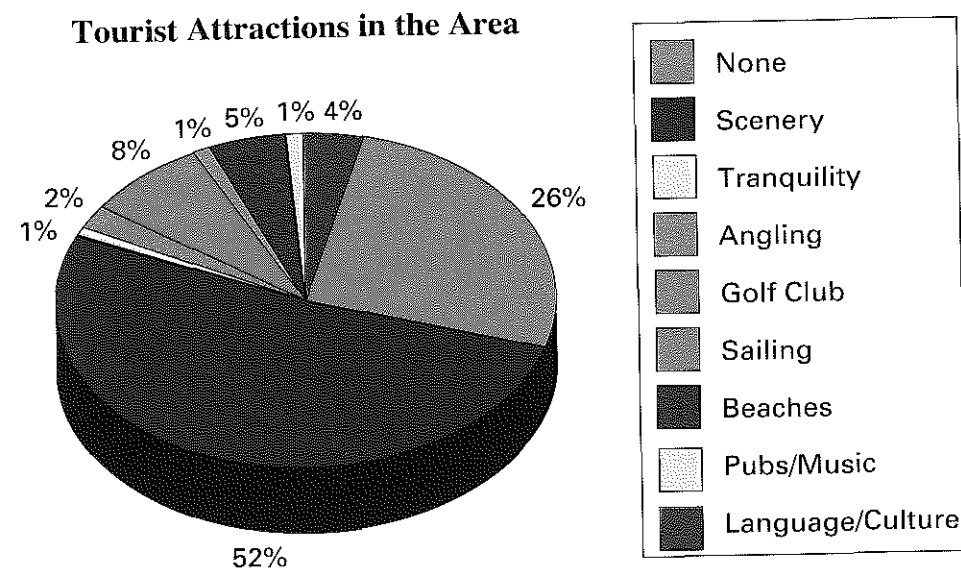


Chart 4.6. Local awareness of tourist attractions in the Kilkieran Bay area

A little more than half of respondents recognised that the scenic value of the area was a major tourist attraction but significantly more than a quarter of the people questioned felt that there were no attractions to attract tourists to visit their area. What is also very interesting to note is that obvious cultural attractions such as traditional music and sailing were not rated highly as tourist attractions by those questioned, both mentioned by less than 1% of respondents as a primary attraction. However it is true to say that the lack of awareness of appreciation of tourist attractions in this area could be symptomatic of the low level of tourism development and the lack of tourism infrastructure in the area.

Local people did not feel that there was any crossover between the tourism and aquaculture industries either as an inhibition of either or regarding the potential for development of tourism associated with the aquaculture industry. While 24% felt that there were no effects whatsoever from the tourism industry, 73% felt that the only effect or benefit was the relatively little additional revenue it brought into the area.

4.10 Overview of results

In general there was a good willingness to participate in the questionnaire survey as part of the study. It must be said that there was an initial suspicion on the part of some

respondents regarding the motivation for the study being carried out. However, participation was more willing when the full scope of the project was outlined and an assurance of confidentiality was given. While responses to the questions asked were not lengthy, it is considered that participants responded simply but frankly. Despite the prominent controversies surrounding the aquaculture industry over the past 10-15 years, people living in this area adjacent to the greatest concentration of salmon aquaculture in the country considered the industry in simple terms. Apart from issues of mis-management and misinformation occurring during the initial development of the industry, it provided badly needed jobs to their neighbours and families and gave them a chance to stay living and working in the area where they had grown up. People even returned to the area to benefit from the increased revenue and activity that the aquaculture industry generated. However, in recognising the value of the industry respondents did not forget their issues of concern relating to pollution and employment stability. Concerns were voiced relating to therapeutants and lice treatments used on the fish farms and their potential effect on the high quality marine environment in Kilkieran Bay. Bodies such as Cairde na Mara brought local people together to voice these concerns and environmental awareness has increased among members of the industry and local observers. Thus local concerns have been satisfied to a large extent. The structure of employment opportunities within the salmon farming industry in particular was also an issue of concern. Some respondents felt that employment was generally of an unskilled nature and thus relatively unstable. Respondents were also concerned about the increasing economies of scale and higher production levels strived for in salmon farming which they felt would eliminate opportunities for local people to get involved in the industry due to the large capital investment required. This is obviously an issue which must be addressed through the structuring of special training and investment initiatives to address the particular employment needs of such local peripheral communities while still satisfying economic objectives in an internationally competitive industry.

The additional stability of employment and income generated by the aquaculture industry in Kilkieran has had additional benefits which are more difficult to quantify and to relate to the growth in the industry. Local people contend that the growth of salmon farming has been responsible for people returning to the area. In Ardmore, on the western shore of the bay, for example there were 2 houses 15-20 years ago and now there are approximately 6 houses (T. Moylan, pers com). Residents work on the salmon farms, in I.S.P.G., Kilkieran Salmon and the processing plant. The additional activity and economic improvement in the area means that services in the area are better provided for, including doctors, nurses, a new teacher in the local primary school, buses and a health centre in Kilkieran village. Some local services are still in need of considerable improvement. For example, no bus runs into Rosmuc village except on a Friday and the nearest pharmacy to the area is in Carraroe, 25-30 miles away.

It was observed during the questionnaire survey that there was a distinct but logical geographic range of opinion throughout the study area which would not be apparent when all questionnaire responses were collated. For instance, people in Ceantar na nOileán were generally well informed and expressed a clear opinion about the working of the salmon farms in the bay while they were unfamiliar with, or indifferent to, the activity of the

shellfish co-op based in Kilkieran at the other side of the bay. The opposite was true for those living adjacent to the northern part of the bay. Most respondents in this area were familiar with the shellfish co-op. and its operation and a number were members but they knew less about the operation of the salmon farms than their counterparts living across the bay. Although the distance between the two areas by sea is quite short (1- 3 miles), the distance by road between Kilkieran and Lettermullen is approximately 35 miles on narrow roads. This further highlights the decreased dependence on sea travel by the people in this area and their increasing alienation from a maritime culture. There was also a noted apathy regarding the industry in one particular area of the study region. The social deprivation was more apparent in this area than in any other within the study region. The area has one of the highest unemployment rates in the country and interestingly also has the highest percentage of Irish speakers per head of population who use the Irish language as their first language on a daily basis. Two of the people living in this area, who participated in the survey, both in their mid 50's, had no English whatsoever. This further highlights the extreme peripherality of this community in a local and a national context.

As in other peripheral coastal communities along the western seaboard, the sustainable development of both the natural and indigenous human resource provides the most realistic option for the survival and continued stability of these communities. Industries such as the aquaculture and marine tourism industries use an abundant and relatively unspoiled local resource. Education of those employed as a consequence of this development is essential if it is to be sustained. More senior or technical positions in such enterprises are often taken by those from outside the local area who may not live there thus breaking the link between the development of the local economy and the development of the human resource base which will sustain it.

CHAPTER 5 – AQUACULTURE IN THE NORTHWEST – CO. DONEGAL

5.1 Economy of Co. Donegal

The marine resources in Co. Donegal are among the most extensive and valuable of any county in the country. It is recognised as our premier sea fishing county as outlined in a similar socio-economic study to this which concentrates on the impact of the fishing industry (ITT, 1999) . It also has a highly developed and very significant fish processing industry with an annual turnover of IR£112m (O'Callaghan & Associates, 1998). The county has an extensive but underdeveloped aquaculture industry. However, Donegal is arguably the most peripheral region in the country due to its location in the extreme northwest of the country being bordered almost entirely by Northern Ireland. This is described in clear terms in the mid term evaluation of the Community Support Framework (Fitzpatrick Associates, 1997). As outlined in Chapter 3 the unemployment ratio in County Donegal stands at 0.22 or 50% greater than the national average of 0.15. Low education levels of Junior Certificate or below, are also the highest in the study region; 63%, compared with a national average of 50.43%. High education levels of a degree, professional qualification or higher are consequently the lowest in the study region; 5.99%, compared with a national average of 10.1%.

5.2 Aquaculture in Co. Donegal

Figure 5.1 outlines the distribution of the main concentrations of aquaculture on the coast of Co. Donegal. The first areas to be designated for aquaculture in the county were Mulroy Bay, Inver Bay and McSwynes Bay. A significant and extensive salmon farming industry has developed in these areas, along with a significant shellfish farming industry in Mulroy Bay. In 1997 the aquaculture industry in Donegal employed 360 people and produced 6,097 tonnes of seafood with a first sale value of IR£14.05m. This aquaculture industry has been developed with considerable financial assistance from the current Marine Operational Programme for Fisheries, benefiting from 14% of its total value to date as outlined earlier. There is little diversification in the industry in this region with Atlantic salmon, pacific oysters, mussels and scallops being the primary species.

Due to the higher than average unemployment levels in Co. Donegal and the vast and under exploited marine resource in the county, a recent government initiative has focused specifically on the marine sector. Considerable co-ordination, expertise and funding have been, and will be, channelled into major development of marine based industries in Co. Donegal. The "Donegal Marine Action Plan" (D.M.A.P.) as devised by the DoMNR and launched earlier this year by Michael Woods T.D. Minister for the Marine and Natural Resources, outlines a proposed investment of over IR£85m in aquaculture, sea fisheries, marine technology and associated developments to bring the marine sector in this area to its full potential in the next millennium. It is considered that there is an immediate potential to create 300 jobs if current impediments to development are resolved.

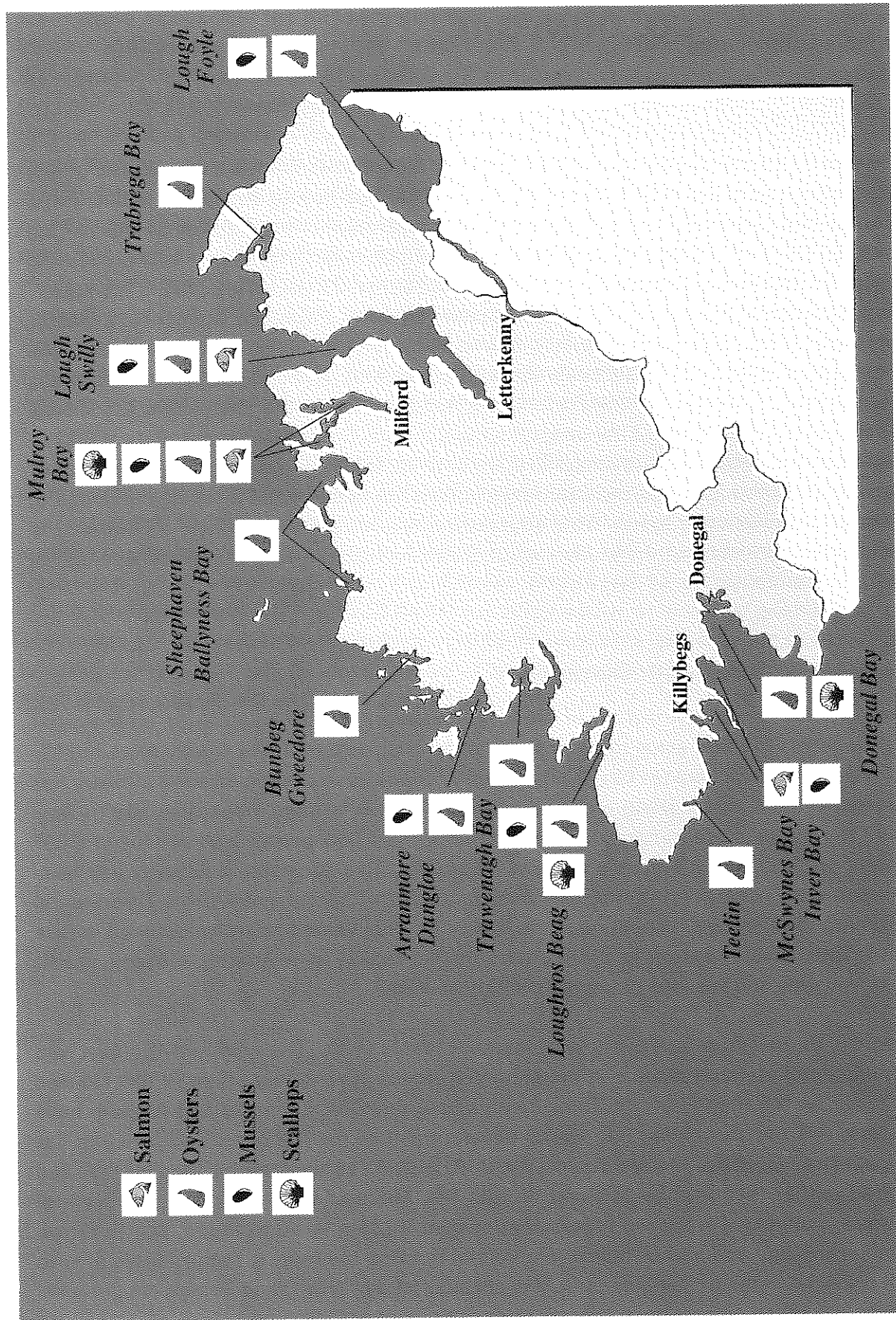


Figure 5.1
Approximate location of primary aquaculture operators in Co. Donegal

5.3 Finfish aquaculture in Donegal

5.3.1 Introduction

The primary finfish producers in Co. Donegal are Hydro Seafood Fanad (Mulroy Bay and Lough Swilly), Ocean Farm (Inver Bay and McSwynes Bay), Eany and Creevin salmon farms (Inver Bay). Based on a micro survey of salmon producers carried out for the purpose of this study, the following is an account of the industry in Co. Donegal.

The salmon farming industry in Co. Donegal produced approximately 6,300 tonnes of Atlantic salmon last year along with 3.5million smolts and 7000 litres of ova.

Turnover of the industry exceeded IR£20m (IR£12m in sale value). IR£3m in wages and almost IR£1.5m for goods and services were paid into local economies within the county.

At least 224 full time jobs are provided by the four main salmon producers along with 57 part time positions. PRSI and PAYE to the exchequer amounted to a total of IR£923,770.

Under the Donegal Marine Action Plan it is proposed that the industry will increase in value to IR£27m by 2003 with the creation of almost 300 additional jobs.

One of the more prominent finfish aquaculture companies, Hydro Seafood Fanad, based in north Co. Donegal, have become a keystone employer in a particularly peripheral area of the county providing invaluable jobs where there would otherwise be none. The following is more detailed account of their role in the socio-economic structure of the Fanad Peninsula.

5.3.2 Case example: Hydro Seafood Fanad (HSF)

This company, based at Kindrum on the Fanad Peninsula was set up in 1979 and has expanded since then to become the largest producer of farmed Atlantic salmon in the country. They also produce and have established markets for certified disease free smolts and ova for the domestic and export market. Thus they have a range of freshwater and marine sites in northern Donegal and are hoping to open a new processing plant at Rinmore Point, later this year. All the production and the proposed processing sites are in remote locations so the 165 full time jobs which this company provide are particularly valuable. Staff turnover is quoted to be quite low. HSF have an annual turnover of IR£12m and contribute IR£2.1m in wages to the Donegal economy. PAYE and PRSI paid to the exchequer in the last tax year amounted to a total of IR£598, 614. Apart from the obvious benefit that a company like this contributes through direct employment and wages, the ancillary employment and goods and services it avails of locally and nationwide are significant. HSF paid nearly IR£260,000 for the provision of local services and IR£300,000 for goods bought locally in the last tax year. Other services provided within Ireland amounted to IR£1.2m. Fish food, the greatest expense on a salmon farm cost HSF IR£5m last year and 60% of this went to the Trow factory in Wesport,

Co. Mayo. This is a clear example of the knock on benefit and vital interrelationship between such industries.

Of those employed by HSF only 5 live outside their immediate work area. This is a very important point to consider in the evaluation of community stability accruing from the location of industries like this one in remote parts of the country. The location of employment adjacent to the marine resource is invaluable in the preservation of other socio-cultural links between the local community and traditional way of life which would otherwise be threatened or lost with the decimation of a community resulting from rural unemployment. The benefit of this rural employment is further supported by the fact that 35% of the male workforce of HSF are part-time farmers whose job in salmon farming allows them to use farming as a secondary income. 30% of the women employed in the existing processing operations at Kindrum work a 3-5 day week and some work 4-6 hours per day. This is a mutually beneficial situation as these part-timers and flexi-timers are invaluable to the company while valuable additional income is provided to those women unavailable for full-time work outside the home.

The processing plant at Rinmore which has recently opened has been built to meet strict health and environmental guidelines. Now operational, it will provide 59 additional full time jobs in a particularly remote part of the county at the extreme north of the Fanad peninsula. Licence applications are currently with the Department of the Marine and Natural Resources for the expansion of Hydro Seafood's operations in Lough Swilly which, if successful, will provide additional employment. A previous study examined the attitude of local people to the presence of HSF in their community and the relative value of the employment it created (University of Stirling, 1994). Local businesses were quoted as recognising the economic value of the industry to themselves and others but many concerns were voiced on a range of issues. Local people and visitors to this highly scenic unspoiled area were shown to be very concerned about the integrity of their marine environment and anything which may threaten it. A degree of uncertainty regarding the security and longevity of employment provided by HSF was also identified by this study. These concerns are very real in the long term vision for the salmon farming industry particularly in peripheral areas like northwest Donegal.

5.4 Shellfish aquaculture in Donegal

Almost 40 firms or co-ops are involved in shellfish aquaculture in Donegal. As outlined the species cultivated are mussels, oysters, clams and scallops. Scallop cultivation concentrates on the collection of spat in Mulroy Bay which has been described as one of the best scallop spatting grounds in Europe and operators in Mulroy Bay have been the most important supplier of spat to scallop farmers in this country. Most of the currently designated shellfish aquaculture areas along the Donegal coast are classified as Grade A shellfish waters and thus produce very high quality mussels and oysters which are ready for export without a requirement for depuration. The locations of shellfish growing operations in Donegal area outlined in the Figure 5.1.

The mussel industry in Donegal is valued at IR£340,000 and employs almost 60 people in full time jobs, while Pacific oyster production is valued at IR£606,250 employing 45 people. Approximately 20 people, are also involved in native oyster and scallop cultivation which is worth IR£405,000. This is an area where considerable growth is envisaged under the Donegal Marine Action Plan with the value of these species predicted to be IR£2.5m by 2003. A small number of people are involved in clam culture but this is a relatively minor species in the context of the county's overall shellfish production.

Mulroy Bay, one of the main production sites operated by HSF, also has a significant shellfish aquaculture industry. Mussels and scallops are the most important species and clams are also produced. These industries also provide a valuable source of income in the area and a number of local operators have invested heavily in the industry. All operators are aware that the high level of finfish and shellfish production in the bay would not allow for any significant increases in the future. Thus the aquaculture operators in Mulroy Bay are currently involved in the development of an environmental management plan for the bay. This project is also funded under the Marine Research Measure of the Operational Programme for Fisheries 1994-1999, and is being carried out in conjunction with C-Mar, (Queens University of Belfast) and the Martin Ryan Marine Science Institute (National University of Ireland, Galway). It is hoped that a management plan can be developed for the sustainable continuation of aquaculture operations in the bay for all producers currently involved.

There is a recognised over dependence on textiles in the economy of Co. Donegal. Several large textile companies are based in remote areas of the county where other opportunities are limited and thus dependence on the employment these companies provide is particularly high. The primary resource available to textile companies in Co. Donegal is the labour force and these companies are preferentially located in regions of the county where this is highest. Unfortunately, the availability of a labour force is not sufficient to guarantee the stability and success of a company at any location. The difference between the textile sector and the aquaculture sector in a marginal area like Co. Donegal is the nature of the available resources in the area. The extent and wealth of natural marine resources in the county provide an opportunity for the utilisation of an indigenous resource thus avoiding the risk of relocation of the industry away from dependent communities and local economies. This was the main point made by shellfish operators in Mulroy Bay during consultation for this study, particularly in the context of recent significant job losses at Fruit of the Loom plants in Co. Donegal.

It is not suggested here that aquaculture, in Co. Donegal or elsewhere, should be developed in favour of textile or other industries, rather that in some respects, the security of the resource, if well managed is greater in the aquaculture industry than in the textile industry.

5.5 Seaweed in Donegal

Kelps, wracks, Carrigeen moss and dulse are among the most commonly harvested seaweeds in Co. Donegal. Arramara Teó, as described earlier, have a processing plant near

Dungloe where they process *Ascophyllum nodosum* extracting alginates and manufacturing growth stimulants and feed supplements for use in agriculture and horticulture. As in Connemara, the wrack is harvested by hand. No accurate figures are available for the total number of cutters in the county but it can be estimated that there are approximately 90 full-time and 250 part-time cutters. Many of these cutters are in receipt of full time or part time social welfare payments and work part time in other marine food industries such as inshore fisheries or aquaculture. Other seaweed companies operating in Co. Donegal are Quality Sea Vegetables and Feamnach Thortuil, who are involved in the processing of a range of species for human consumption and horticultural purposes.

CHAPTER 6 – AQUACULTURE IN THE SOUTHWEST – CO. KERRY AND CO. CORK

6.1 Economy of Co. Kerry and Co. Cork

As outlined in Chapter 3 the unemployment ratios in coastal Co. Cork and Co. Kerry stand at 0.12 and 0.16 respectively, compared to a national average of 0.15. Recent national economic growth is reflected in these improved unemployment statistics. Low education levels of Junior Certificate or below, are still higher than the national average of 50.43%, standing at 51.55% in Co. Cork and 53.88% in Kerry. Similarly, high education levels of a degree, professional qualification or higher are consequently lower than the national average of 10.1%; 7.99% in Co. Kerry and 8.76% in coastal Co. Cork. These counties have a considerable and well developed tourism industry and they boast scenery of world renown. Much of the employment in coastal areas of this region of the southwest is in the tourism industry, which is quite significant but distinctly seasonal in nature. Tourism in the southwest was estimated at IR£211m in 1996.

A report by the Aquaculture Development Centre (ADC) (based at National University of Ireland, Cork) for West Cork Leader acknowledged that "the importance of both wild fisheries and aquaculture to coastal communities" in these areas "cannot be underestimated" (ADC, 1996).

6.2 Aquaculture in Co. Kerry and Co. Cork

Figures 6.1 and 6.2 outline the main areas of aquaculture activity in Counties Kerry and Cork, respectively. The southwest (Co. Kerry and Co. Cork), like Co. Galway and Co. Donegal, boasts a vast and valuable unspoiled marine resource. This provides opportunities for development of sources of income in tourism, transport, fishing and aquaculture in these counties. Fisheries and aquaculture are significant. In line with national trends the greater majority of shellfish and finfish aquaculture production in the southwest focuses on the production of intensive mussels and salmon, respectively. The greatest concentration of shellfish aquaculture in the country is located at Bantry Bay, Co. Cork. It has been shown that employment levels tend to be higher in the shellfish sector but most of this is in the form of casual labour. Potential for development of aquaculture with new and existing species is considered to be significant (ADC, 1996), given the 1000km of coastline, numerous deep bays, estuaries and exposed shore, along with substantial freshwater resources. It is further pointed out that the Draft County Development Plan for Cork County Council highlights the importance of integrated management of the coastal zone and on the other hand, warns against insensitive development in areas of high scenic amenity value, i.e. the entire southwest coastline. The County Development Plan for Kerry (KCEB, 1996) is more highly focused on the peripheral location of the county and opportunities for its economic development. Aquaculture is seen as a valuable opportunity to exploit a natural resource in the context of dwindling agriculture and in tandem with a strong and expanding tourism and potential eco-tourism industry. Cork County Council in

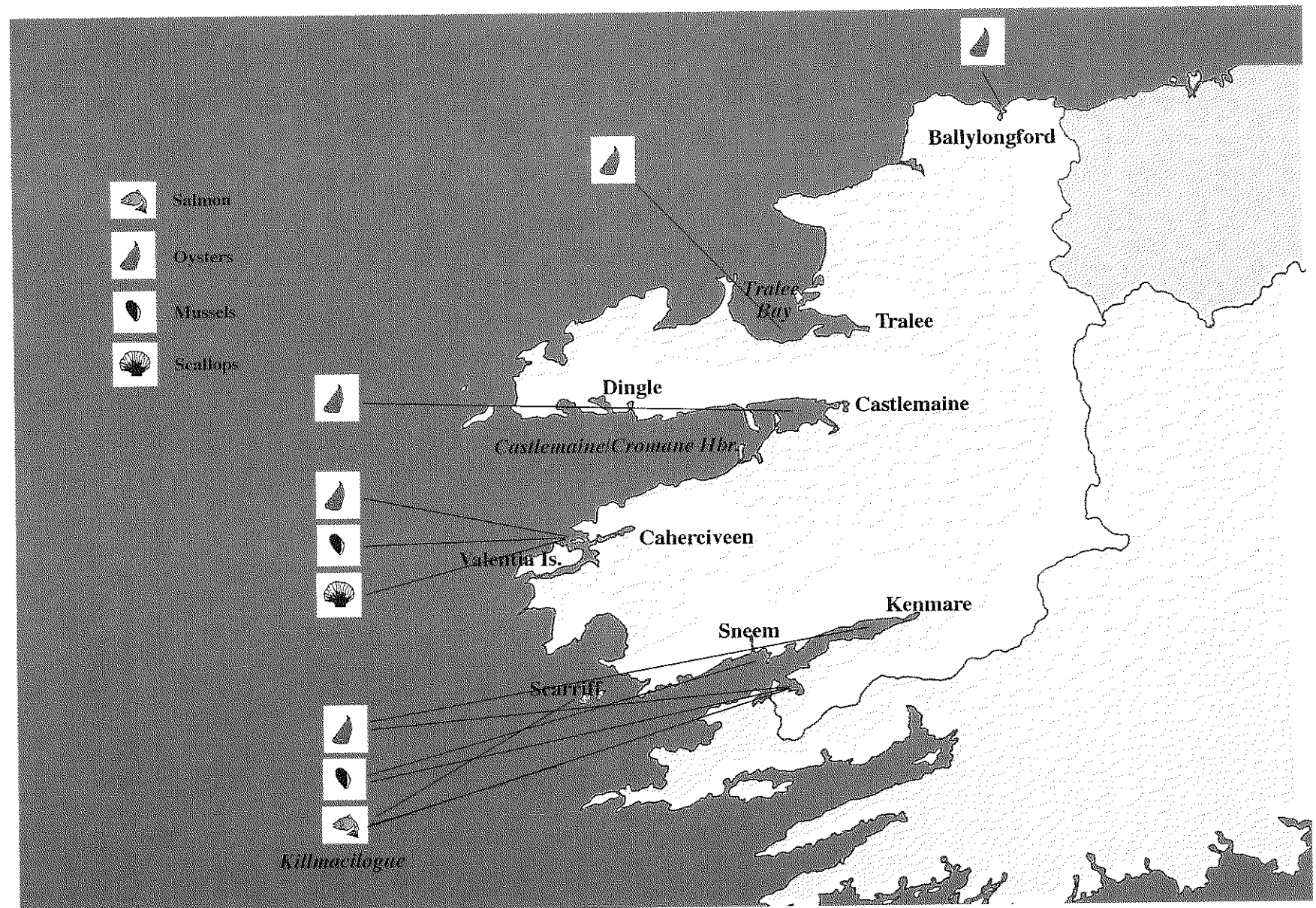


Figure 6.1
Approximate location of principal aquaculture operators in Co. Kerry

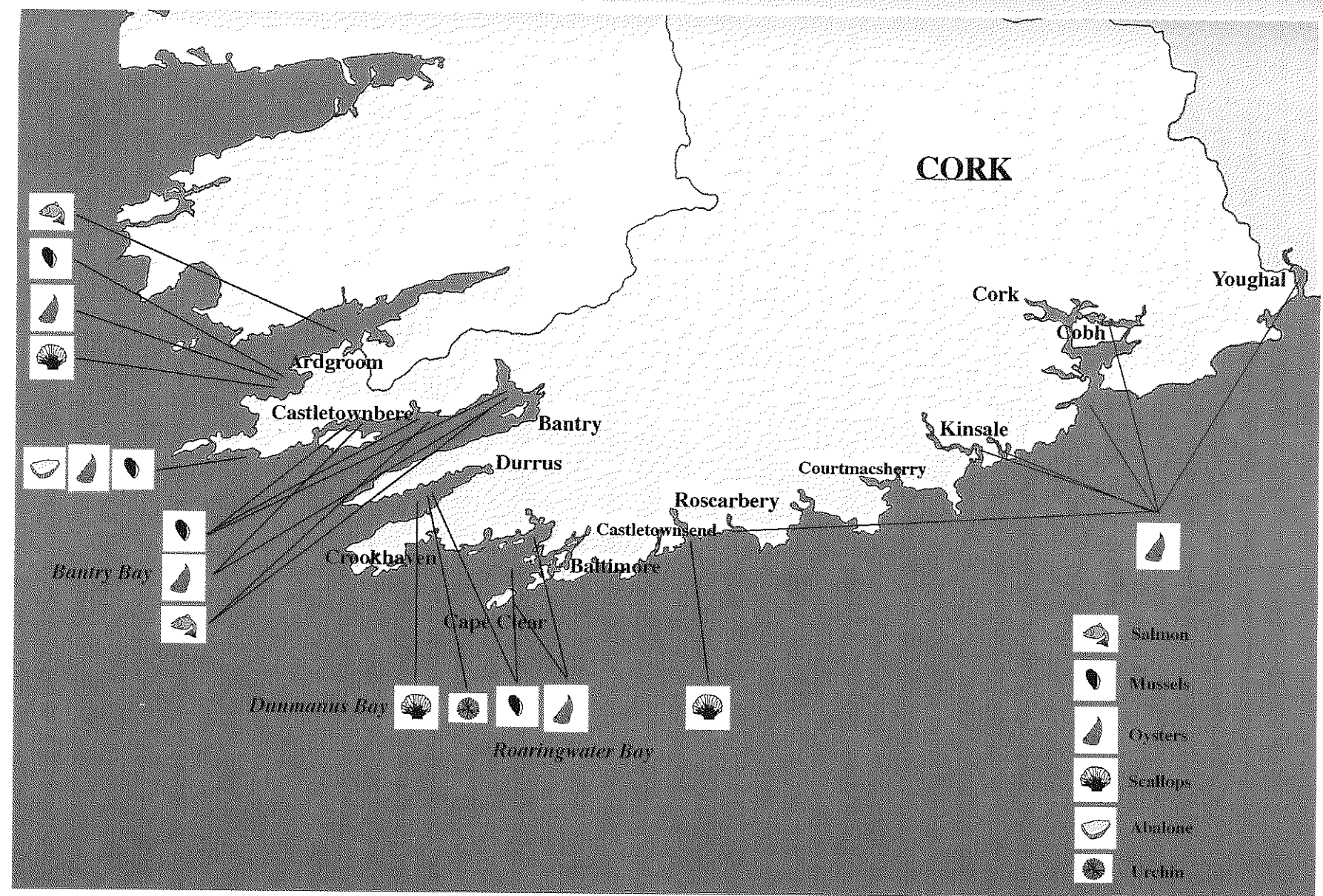


Figure 6.2
Approximate location of principal aquaculture operators in Co. Cork

conjunction with the Coastal Resources Centre (NUI Cork) and the Nautical Enterprise Centre (Cork IT) are currently developing a pilot Integrated Coastal Zone Management (ICZM) study of the Bantry Bay area from Ardgroom to Schull. Its aim is to draw up a 'Stakeholder' charter from which a balanced and inclusive resource management plan for all users of the bay can be developed. To date this has involved roundtable discussions with participating stakeholders and the implementation of a GIS system for use by the public in Bantry and Castletownbere libraries.

6.3 Finfish aquaculture in Co. Kerry and Co. Cork

Finfish aquaculture in Kerry and Cork is focused in Kenmare and Bantry Bays where 2 companies produce Atlantic salmon at a range of sites. Production of adult salmon last year exceeded 4,000 tonnes (over 25% of national production), providing 71 full-time and about 20 or more part-time positions. Based on information received it is estimated that this accounts for approximately IR£1m in wages to the local economies.

One of the primary difficulties facing the salmon farming industry in the southwest is the intense competition for space between marine resource users. This is especially evident in Bantry Bay as will be outlined in the following section. The lack of availability of suitable sites which afford sufficient shelter from extreme sea conditions while still adjacent to ample land based facilities and infrastructure i.e. piers, good roads and suitable processing facilities, is also an issue of concern.

Trials in turbot and halibut cultivation and rag worms by Taighde Mara Teó. (Údarás na Gaeltachta) have also been successful on Cape Clear in Co. Cork.

6.4 Shellfish aquaculture in Co. Kerry and Co. Cork

6.4.1 Introduction

Shellfish aquaculture in the southwest is dominated by the mussel industry, the intensive longline culture in Bantry Bay being the most obvious example. Extensive mussel culture is concentrated in Castlemaine, Cromane and Tralee Bays. Oysters are grown primarily in Castlemaine Harbour in Kerry and in numerous bays along the coast of Cork where they are common.

6.4.2 Case example – Mussel Farming in Bantry Bay

Bantry Bay Fish Farming Co-op.

230 hectares are licensed for mussel culture in the inner Bantry Bay harbour at present. There are about 150 full time employees in the mussel industry in inner Bantry Bay. The throughput of the mussel industry in Bantry Bay, between cultivation and processing, is almost 8,000 tonnes. However, it is considered by some operators, that the inner harbour is reaching its carrying capacity.

Observations from those in the industry, note that mussel lines which would have previously yielded a harvest of 11-12 tonnes, now have only an average yield of 7 or 8 tonnes per line. The co-op is hoping to gain an additional 400 licensed hectares for mussel production outside Whiddy Island, but this rests on the resolution of planning issues inside the island. Planning regulations in the inner bay at present dictate that planning permission must be sought from, and granted by, Cork County Council for developments in the inner harbour.

Bantry Bay Fish Farming Co-op. is a non-trading co-op. and presently functions primarily as a lobbying group. Co-op. membership comprises a number of small scale growers operating in inner Bantry Bay. Most of their sales are to Bantry Bay Mussels. The water quality of inner Bantry Bay is classified as Class B for shellfish cultivation due to the proximity of the urban centre at Bantry town therefore depuration is necessary for all harvested mussels. Most of the mussels grown in Bantry are destined for the French market which has a preference for fresh French mussels and thus is converted to value added produce. This generates significant additional income for the aquaculture industry in Bantry Bay. Over 80% of rope grown mussels produced in the southwest are converted to value added produce.

The mussel farming industry in Bantry has invested heavily in public relations exercises such as the Bantry Mussel Festival which is held each May. The festival costs about IR£60,000 which is provided by local individual and business sponsors. Up to IR£20,000 is spent on media promotion including T.V. advertising but the economic benefit accruing to Bantry and the surrounding area has been estimated at IR£1.5m over a number of days and 5 tonnes of mussels are consumed.

Members of the co-op. feel that there is some potential for the development of aqua-tourism associated with the aquaculture industry in Bantry Bay. Scenic areas like Garinish Island which has several mussel lines in close proximity to it have been suggested as potential sites. Some visitors to the Bantry Bay area have expressed an interest in the working of the aquaculture industry in the bay but to date no resources have been devoted to develop aqua-tourism to meet this demand. However, BIM installed special interpretative signs for tourists during 1999 at strategic viewing points around the bay in order to promote the aqua-tourism potential of the area.

Bantry Bay Mussels

Bantry Bay Mussels (BBM) produce 1000 tonnes of fresh mussels annually in Bantry Bay and buy an additional 3000 tonnes for value added processing from growers in a number of bays in the southwest including Bantry, Kenmare and Roaringwater Bays. They also buy 4-500 tonnes from growers in Clew Bay, Co. Mayo and occasionally buy mussels from growers in Donegal. However, 70% of their fresh mussels are sourced in Bantry Bay.

Bantry Bay Mussels had an approximate turnover of IR£6.5m in 1997 and on average 70 people are employed at the BBM processing plant. This comprises 65 full-time

staff in the off season and up to 95 full-time and part-time staff during the summertime. 5 people are employed year round at sea on a full time basis and up to 12 staff are employed at sea during the summer.

The value of the mussels sold through Bantry Bay Mussels is considerably increased by converting the entire stock to value added produce thus increasing the economic benefit to the company and to the area. Production grew by 15% in 1997 and a growth in production of 16% was predicted for 1998. In order to meet this increase production and the associated demand on processing facilities a new processing facility for BBM is currently under construction on the southern shore of Bantry Bay.

99% of the finished products from BBM are destined for the export market and a range of products have been designed to meet market demands in different destinations. All but two of the products used in the value added processing of the mussels at the plant are sourced in Ireland, the exceptions being the wine used in marinating and the plastic used to wrap the finished product.

With such a high turnover each year, this company is an example of the growing trend in shellfish aquaculture in Ireland. The development of a high level of value added processing in order to generate maximum economic benefit demonstrates the potential for growth in the industry at other locations in the country. The employment provided and the ancillary services of which BBM avail in the Bantry area are significant even in the winter time when other industries such as the tourism industry are in a seasonal downturn. When the new processing plant becomes operational additional employment and economic activity will also be generated.

The expansion and development of Bantry Bay Mussels has encountered some opposition in the locality due to licensing issues and the visual impact of some of the company's operations. However, the value of the employment provided by this company has outweighed most negative feeling in the community and local people are in general supportive of the company.

Fastnet Mussels

Fastnet Mussels (FM) operate a mussel harvesting and processing plant at Ghearies on the south shore of Bantry Bay. Fastnet Mussels produce 500 tonnes of mussels in Bantry Bay and process up to 1,100 tonnes annually sourcing the additional several hundred tonnes from Roaringwater Bay in Co. Cork and Killmacillogue and Kenmare Bays in Co. Kerry. All stock is converted to value added produce to maximise market value. FM have an approximate turnover of IR£750,000. 28 jobs are provided by the company at their processing plant comprising 19 full-time and 9 part-time positions. The ratio of skilled to unskilled labour in this number is approximately 40:60, and the average age of employees is 29 years and 90% of those employed at FM are from the local area.

Fastnet Mussels recently opened a new processing plant, providing the company with the capability to become one of the biggest shellfish producers and processors

in the country. As part of their ongoing research and development and in conjunction with NUI Cork, the company have an on-site testing station where turbot farming trials are ongoing. Trials are also ongoing for cultivation of other shellfish species including abalone and scallops.

Companies like Fastnet Mussels and Bantry Bay Mussels are facilitating the way forward for shellfish farming and processing in the southwest and nationally.

All in a Shell Ltd.

"All in a Shell" Ltd. were established in 1991 to trade in farmed shellfish and supply equipment for shellfish farming. They are based at Lissarda in Co. Cork and currently employ 4 people. The annual turnover of the company is almost £500,000. This is an example of a company which has been set up to provide services directly to the aquaculture industry. 70% of the company's business relates to equipment supply to the shellfish aquaculture industry particularly in the southwest. The remaining 30% deals with the export of farmed shellfish species from the southwest. The company also operate a small clam farm but this has been inactive for the past number of years due to difficulties with disease. "All in a Shell" Ltd. have been involved in BIM sponsored R&D in recent years and are also involved in the sponsorship of local events.

6.5 Seaweed in Co. Kerry and Co. Cork

Several species of seaweed are harvested in the southwest, perhaps the most prominent of which being at Castletownbere in Co. Cork. Celtic Sea Minerals Ltd., currently harvest live maerl, the red coralline deposits which are nationally estimated at 8 million tonnes.

CHAPTER 7 – SIGNIFICANCE OF THE INDUSTRY

7.1. Overview of the significance of aquaculture in Co. Donegal, Co. Galway, Co. Kerry and Co Cork.

The role of the industry in each of the study regions has been outlined in previous chapters and elucidated using an exhaustive case study of the industry in Kilkieran Bay in Co. Galway. Comparisons can be drawn with the relative deprivation, wealth and dependence in each of the regions, but each also contrasts with the others.

In Co. Donegal for example, the aquaculture industry has an important role to play as an extension of the prominent seafishing and processing industry in the county. Co. Donegal has also been shown to have a greater overall peripherality even in the context of this study. A greater proportion of the county lies within the most disadvantaged 20% of Ireland than any of the other 3 counties in the study region. Recent work by development organisations within the county (Donegal County Enterprise Board, IBEC, Donegal VEC, Donegal Co. Co) aims to promote a policy of investment and self-sufficiency (Irish Times, October 1998) utilising available indigenous resources. Current initiatives, for example, are looking towards offshore industries in order to generate maximum economic benefit from the marine infrastructural resources in the county and develop them further. The aquaculture industry in Co. Donegal thus plays an important role in this vision. The responsible management and harvesting of an indigenous natural resource to further advance the secure development of such a peripheral region has the potential to provide long term and far reaching benefits.

The aquaculture industry in Co. Galway exists in a slightly different regional context. Although coastal areas of the county are also marginal by any standard and by comparison with other regions in the study area, much of the county lies entirely within the Gaeltacht and thus comes under the development priority of Údarás na Gaeltachta. Unemployment and deprivation indices are high as in other regions but the cultural effects of economic stability or instability in Gaeltacht communities are more keenly felt with national and international consequences. The Gaeltacht regions in Ireland host populations which are among a falling number of only 71,000 people who are estimated to use the Irish language on a daily basis, (Ó hÉallaithe, 1999). Thus the maintenance of a sound community structure is essential to the survival and continuing evolution of the language and its associated cultural aspects. For coastal communities living on the margins of a European mass culture which is becoming increasingly homogenous, the importance of cultural diversity in areas like this in the west of Ireland, cannot be overstated.

Údarás na Gaeltachta recognise the potential of the marine resource in Gaeltacht areas around the country, particularly in Co. Galway, and have invested considerable money and resources in the development of the aquaculture industry, as has been shown. In some cases, as is apparent in this study, no other prominent viable option for employment exists which can use local resources and the local available work force in a sustainable way. In areas like Kilkieran Bay, the stability of the whole community is completely reliant on the

aquaculture industry in one way or another. Such a high degree of reliance on any industry also raises the issue of environmental responsibility. In order to ensure that the industry and local communities do not come under threat, the onus is on operators and researchers to develop and run the industry with a long-term environmental consciousness for maximum sustainable benefit to these communities and all resource users. For this reason the proposed Single Bay Management Plan under the C.L.A.M.S. Scheme in Kilkieran Bay will be an important step in the future development of Irish aquaculture. Co-operative involvement of all marine resource users in the area and the cognisance of effects on local people will be essential to the long term success of the industry under this kind of sustainability management. Large scale plans currently being formulated by Údarás na Gaeltachta for the development of shore based facilities in this area, will further strengthen the infrastructural and socio-economic base of the industry.

Although there is some overlap of the aquaculture industry with Gaeltacht areas in Co. Kerry and Co. Cork this is not as extensive as in Co. Galway. No official coastal Gaeltacht exists in Co. Cork except at Cape Clear (Oilean Chléire) and in Co. Kerry the Gaeltacht is largely restricted to the western areas of the Dingle and Iveragh Peninsulas. Much of the marine resource development in these areas concentrates on stock enhancement schemes for species such as scallops and lobster although turbot, halibut and marine worms have been grown on Cape Clear. Aquaculture in tandem with stock enhancement schemes has been a beneficial form of diversification for inshore fishermen suffering from the negative effects of stock depletion in areas like Valentia Harbour for example where there has been an historic traditional scallop fishery but where stock management is now essential.

In a broader context the most prominent industry in the southwest, particularly in coastal areas is the continually expanding tourism industry. The same is true for coastal areas of Counties Donegal and Galway. Large scale intensive shellfish aquaculture has developed in scenic areas like Bantry Bay as described, with varying degrees of support from the local community. It must be agreed that industries such as these make valuable use of the available marine resource adjacent to them. As mentioned the sustainability of these industries has a high degree of reliance on the environmental responsibility with which they are developed. The development of suitable offshore and submerged shellfish and finfish culture techniques are currently under investigation and if successful and feasible would mitigate against any visual impact of the location of these industries close to popular tourist destinations.

It can be broadly stated that support for the aquaculture industry at any location within or outside the study region in Ireland is high among employees of the industry and their families and among those benefiting directly from, or with a high dependence on the industry. The more marginal the community, the higher the level of reliance on the aquaculture and similar industries. More important perhaps is the recognition by local communities of the importance of the employment and socio-economic benefits accruing to them from these industries and the unwillingness of local community members to criticise any aspect of the industry or jeopardise its stability. In light of this it can also be broadly stated that some of the opposition to the development of the aquaculture industry in the past has emanated from other socio-economic groups with no direct reliance on the

industry, for example well educated and affluent European and North American immigrants. There exists in Ireland a recognised "Insider" and "Outsider" mentality, as referred to by Phyne (1999), among members of tightly knit Irish communities and those joining the community from different geographic, social or economic backgrounds. Groups such as these often have a greater awareness of the global evolution of environmental policy and practice. Immigrants are sometimes excluded from a full understanding of the socio-economic role of these industries across the community as a consequence of these social divisions. Indrehus (1994), in his assessment of conflicts associated with the salmon farming industry in North Connemara contended that "the various green groups managed to present themselves as locals, and these locals are the voices heard at central level." He went on to "question the legitimacy of these groups to speak as representatives of the local community". He argues that "opposition to fish farming is an expression of identity and belonging to the community, as well as an environmental issue." Aside from the arguments put forward by angling and aquaculture interests in North Connemara as part of an ongoing and difficult dispute, divisions between these groups extend much further than current difficulties and more likely have their roots in a post colonial prejudice, with both sides having conflicting rights to a common property resource. This is also described in Phyne (1999). Successful rural development is highly dependent on the support and commitment of rural communities. For this reason there needs to be a greater integration of development priorities among all members of such communities in recognition of the fact that full time, stable, indigenous employment is the key to sustaining local communities, particularly in coastal areas.

The aquaculture industries in Counties Donegal, Galway, Kerry and Cork thus exist in changing circumstances and face a range of challenges in each of these regions. Based on the availability of the marine resource and demands of many resource users, the development and expansion of the aquaculture industry in the west of Ireland must logically follow a coastal resource management agenda. Such an agenda requires the committed participation and co-operation at all levels of

DoMNR,
BIM,
The Marine Institute,
Local and Regional Authorities,
Aquaculture operators and representative bodies,
Inshore fishermen,
Tourism operators,
Community groups, and,
any other stakeholders in a marine resource in a given area.

Phyne (1999), in an analysis of the principal issues affecting the salmon farming industry over the past 12 years, recognises and elaborates on the importance of resource management for example. He cites the development by the DoM, over a 2 year period (1995-97), of a **Strategic Management Initiative (SMI)**, to protect the marine environment and to regulate and develop fishing sectors (presumably including aquaculture), marine transport sectors and the coastal zone for economic and recreational purposes. In

consideration of the issues and conflicts between angling and aquaculture interests for example, he points out that the development of initiatives such as the SMI outlined by DoM are what is required to co-ordinate the activities of the various aquatic resource users governed by them, with the Marine Institute playing a key role in facilitating this initiative. The activity of the Marine Institute further enhances the success of initiatives such as these by encouraging the sustainable development of all marine resources available along the Irish coast.

CHAPTER 8 – PROSPECTS FOR INDUSTRY IN THE REGIONS

8.1 The aquaculture industry into the next millennium

The Irish seafood industry is a vital indigenous sector which contributes exports and employment, but more importantly, regional and local development in coastal, island and other rural areas. This industry strives for the sustainable long term exploitation of our natural marine resources and the development of a self sufficient and profitable sector.

Today aquaculture accounts for an increasing proportion of world fish production. Within the European Union, it has traditionally been seen as a means of complementing internal EU fish supplies and alleviating its dependence on imports from third countries. Consumers benefit from the variety of aquaculture products which complement those available from fishing. The past 10 years have witnessed rapid expansion on world aquaculture – fish farming has become the fastest growing sector in world food production and by 1995 production amounted to almost one fifth in volume and one third in value of world production of fish and shellfish. On the other hand the negative effects of overfishing and necessary worldwide restrictions on catching effort have been keenly felt by Irish fishermen. Growth in Irish farmed seafood is led by market demand and thus is not adversely affected by catch restrictions. Reduced and restricted catches are increasingly common at the same time that the aquaculture industry has become a more viable and prominent source of income in many coastal areas with few other opportunities for industrial development. However, it is important to note that this should not be seen as a trade off by regulating authorities for the consequences of overfishing and reduced employment in the fishing industry.

The 1991 review of the European Common Fisheries Policy recommended that "aquaculture should be developed in its own right for the income and employment it generates in remote coastal regions and not just in compensation for restrictions on fishing. Furthermore, it should be undertaken with due regard to environmental requirements and the needs of these local communities". Consideration of these and other resource management priorities is essential if the industry is to achieve high levels of sustainable development.

The Irish seafood sector is now at a crossroads in its development with few emergent enterprises of scale. Substantial investment support from the public and private sectors is necessary for essential development of the industry to proceed. The period 2000-2006 represents, possibly, a last chance for the seafood industry to achieve large scale European structural assistance. This assistance is vital if the industry is to continue to grow, and deliver the necessary added-value that will help secure real jobs in some of the most deprived parts of the country.

8.2 BIM Seafood Industry Agenda Development Plans for the Industry 2000-2006

The development of the Irish Seafood sector up to 2006 has been projected and outlined by BIM in their Seafood Industry Agenda (BIM, 1999). The key strategic objectives of BIM in realising their vision for the Irish Seafood and Aquaculture Industry relate more directly to this apparent gap in skills as they aim "To address the skills deficit in the seafood industry by developing and delivering flexible, modular training programmes conducive to structured career path development."

One of the 9 specific development programmes outlined under the Development Programme for 2000-2006 is devoted to aquaculture development. It aims to "provide financial, technical and advisory support to promote the sustainable expansion of the aquaculture sector resulting in additional jobs, growth in output and best practice in environmental and quality management." Their recently published document clearly recognises the socio-economic importance of the development of marine food industries in marginal coastal areas.

The 6 year plan has specific regional targets with the greater proportion of its investment and expansion priority focusing on the Western Region in consideration of its continued Objective 1 status. It is proposed to increase turnover by 109% in the Western region from IR£47m in 1997 to IR£98m in 2006 with a 22% increase in employment from 6,260 in 1997 to 7,627 in 2007. Hand in hand with this will be significant investment in the processing sector leading to an expected 88% increase in its value. The argument for balanced socio-economic and regional development is made very strongly in the outline of this development agenda. The realisation of the component objectives relies on key factors including:

- Addressing training priorities
- Provision of support from the industry, government and development agencies
- Funding commitment from government and EU
- Retention of Objective 1 and Objective 1 in transition status in the regions.

8.3 Funding for the development of the industry

Under the current Operational Programme for Fisheries the seafood industry will have received about IR£75m (1% of structural funding). This has been used to stimulate and support vital investment in the fishing and aquaculture industries including harbours, primary and secondary processing, market development, marine research and human resource development.

The continued provision of community support for aquaculture from funds separate to those for fishing was recommended as an important step in the separation of the two industries from a funding and development perspective. The European aquaculture industry should still fully benefit from the enlargement of the structural funds to eligible member states, including Ireland. The continued deployment of EU structural funding to

promote the effective integration of fishing and aquaculture would be a logical approach to avoid a perception of trade-off or betrayal among members of a fishing industry in difficulty in order to maximise the socio-economic benefit from these EU funds in the 2000-2006 period.

Due to the recognised peripheral nature of the aquaculture industry in Ireland its continued support through investment must be recognised as fundamental to balanced socio-economic and regional development. As outlined previously, there is a clear geographic concentration of the industry in peripheral areas along the western seaboard, in the Gaeltacht regions and in areas where farming is poor and offers little potential for income generation. If the continuation and development of this and other rural industries is not assured the fatal trend of rural depopulation and deprivation will accelerate with drastic effects. Remote communities will fall below critical levels and there will be a consequent disintegration in infrastructure (schools, social services, roads, piers and telecommunications) in these areas. The development of value added aquaculture products in Ireland has significant potential for development which to date has been largely unrealised. When the new licensing legislation introduced in 1998 is working efficiently and without difficulty there should be few barriers to the expansion of the industry as projected by BIM within the lifetime of the next Operational Programme. The buoyant nature of seafood markets and the increase in consumption levels should facilitate this increase. Inherent in the realisation of this ambition is the need for development to be as an orderly, sustainable and environmentally acceptable process.

8.4 Comment on ESRI Report

The recent ESRI "National Investment Priorities for the period 2000-2006" Report is highly dismissive of significant further investment in fisheries in this period. In regard to Aquaculture the report questioned the extent of public and EU investment in the aquaculture sector as follows; "The negative externalities associated with finfish aquaculture in terms of its detrimental visual impact and the suspected damage to wild fish stocks suggest a lower level of funding for such activities".

This view is considered in very critical terms by the Common Fisheries Policy (CFP) review group in their recent report. The comment is considered by them to be of an insubstantive and anecdotal nature. It is concurred here that this analysis by the ESRI gives no consideration to the essential socio-economic benefit accruing from aquaculture in marginal coastal communities as outlined in this report. Our report further shows, especially through the Case Study, that the extent of any visual impact from the siting of finfish farms is not enough to significantly effect their operation either through lack of local support or licencing difficulties.

The 'suspected damage to wild fish stocks' as mentioned by ESRI is cited by the CFP Review Group to be just that, 'suspected'. Large sums of money spent by the DoMNR and Marine Institute have as yet failed to provide evidence of a link between sea trout decline and the siting of salmonid fish farms, a point of frustration for fisheries and aquaculture

interests alike. Be that as it may, continued improvement in fish husbandry to improve production efficiency and tighter environmental restrictions as outlined in the Fisheries Amendment Act 1997 are bringing salmonid aquaculture towards a more environmentally responsible and sustainable kind of production in all respects. This must be enforced and maintained if the industry is to survive and expand as predicted. Similarly the successful development and implementation of Catchment Management Plans and Single Bay Management Plans for Freshwater and Marine Systems with a multi-user base are likely to provide the only realistic option for sustainable management of these resources for all concerned.

8.5 Conclusions and Summary Comment

This study has evaluated the relative socio-economic importance of the aquaculture industry in each of the study regions using on the ground analysis and socio-demographic data. The unique and specific resources in remote and marginal regions of the Irish west coast are well exploited by the aquaculture industry with a vital economic and social benefit to local communities in these regions. The identification of the most valuable local resources in these areas and their sustainable exploitation is the key to the survival of these communities.

The evaluation of the socio-economic impact of the aquaculture industry in specific regions of the west coast of Ireland within the scope of this project identified a number of key features which characterised this relationship between the industry and its location in physical, economic and social terms.

- The degree of dependence in remote coastal communities was clearly shown through the study in areas where other opportunities and entrepreneurial enterprise are limited
- The extent of the ancillary dependence or effect from the industry is also significant and extends outside the marine sector. The extension of this effect reaches other industries and services providers including the building industry for example.
- The opinion among communities adjacent to concentrations of aquaculture activity and associated services has evolved in recent years so that for the most part there is a high level of support for the industry and the jobs that it creates. However, it is also true to say that the relationship between the average local community member and aquaculture operator has become more transparent. While difficulties still exist in some instances, improvements in licencing legislation and levels of awareness among community members has removed a lot of the suspicion which previously existed.

- There is perception of greater longevity of employment among those currently working in the salmon farming industry in more remote areas as shown in the case study analysis. This may be symptomatic of the limited opportunities for alternative employment in this area but the opportunity also exists to capitalise on this perception by investing in the long-term employability of the employees. If the industry is to expand as planned a large and committed workforce will be one of the most important factors in its success.
- The deficiencies in training and the need for incentive schemes to attract lesser qualified employees of the aquaculture industry into more highly skilled positions was highlighted in the case study of the salmon farming industry in Kilkieran Bay. The concern of smaller producers that they would be "swallowed up" in the attempt to dramatically increase national production was also highlighted. The stated RTDI policy of the Marine Institute outlines the need to "utilise new and existing training resources, to promote manpower development and training, particularly in smaller firms, with support from BIM, FÁS and other local development agencies". If well managed and inclusive of the concerns and specific needs of smaller producers and their employees, this objective will further strengthen the human resource base of the Irish aquaculture industry in the most peripheral regions of its distribution.
- The primary socio-economic benefit from the location and success of the industries is the community cohesion to which they contribute. This cohesion is brought about through a number of factors including greater employment levels, falling emigration and improvements in infrastructure. These changes and improvements may be slow to become apparent and they are highly reliant on the sustainability of the industry. However if sustainable development is achieved using such a valuable and renewable indigenous resource, the long term outlook for these communities is very positive.

APPENDIX 1: CONSULTEES / INDUSTRY CONTACTS

Co. Galway

Seasamh O' Laoi
 Denis Harding
 Donal Mac an Iomaire
 Mark Kilroy
 Dara Beag O' Flatharta
 John O' Carroll
 Damien O' Ceallachain
 Tom Moylan
 Eamonn O' hÉanaigh
 Eithne McDonagh
 Richard McDonagh
 Séamus Breathnach
 Joe O' Shea
 Michael Diver
 Greg Forde
 Pete Tyndall
 Evelyn Moylan
 Mark Norman
 Charles Jacob
 Tadhg O' Conghaile
 Mícheál Corduff
 Lorna Kelly,
 Áine Collins
 Brian Flynn
 James Ryan
 Gerard O' Donohue
 Maureen Browne
 Meta O' Màille

Muirachmhainni Teó.
 Iascaigh Inisbarra Teó.
 DMCI Teó.
 Eisc Iathglas Teó.
 Eisc Uí Flathatra Teó.
 TBA Teó.
 Muir Gheal Teó.
 Comharchumman Sliogeisc Chonemara.
 Comhlachas na gComharchumman Gaeltachta.
 Coiste Turasóireacht Chill Chiaráin.
 Transmara Teó.
 Cumas Teó.
 Irish Salmon Producers Group.
 Arramara Teó.
 Western Regional Fisheries Board.
 An Bord Iascaigh Mhara.
 Taighde Mara Teó.
 Taighde Mara Teó.
 Taighde Mara Teó.
 Údarás na Gaeltachta.
 Údarás na Gaeltachta.
 Irish Seaweed Industry Organisation.
 Cairde na Mara.
 Ireland West Tourism.
 Killary Salmon Company.
 Mannin Bay Salmon Company Ltd.
 Cill Chiaráin Éisc Teó.
 Pléaráca Teó.

Co Kerry and Co. Cork

Vincent Roantree
 Paul Casburn
 Ian Dempsey
 Richie Fitzgerald
 Mick Mulcahy
 David O' Leary
 Eddie O' Leary
 John Murphy
 Mike Keohane
 Paddy Minehane

Taighde Mara Teó, Dingle
 Taighde Mara Teó, Cape Clear.
 LEADER, South West Services Co-op.
 Aquaculture Development Centre, NUIC.
 Dissemination Manager, Bantry LIFE Proj. Cork Co.Co.
 Coastal Resources Centre, NUIC
 Coastal Resources Centre, NUIC.
 Fastnet Mussels.
 Bantry Bay Mussels.
 Bantry Bay Fish Farming Co-op

John O' Riordan
 Patricia Murphy
 Cpt. Jerry Desmond
 John Harrington
 Angela Daly
 Declan Nee
 Bob Cooke,
 Frances Birmingham
 Con O' Conaill
 John Leonard
 Mary Hannan

Bantry Bay Users Forum
 Bantry Bay Harbour Commission
 Bantry Bay Harbour Master
 Kush Seafarms, Ardroom, Chairman IAA
 Killmacillogue.
 Beara Atlantic Salmon, Castletownbere.
 BIM, Castletownbere.
 BIM, Bastletownbere.
 Cork and Kerry Tourism.
 Shannon Development.
 South West Kerry Development Partnership.

Co. Donegal

Hugh Wilhare
 Jerry Gallagher
 Hector McIlwaine
 Martin Coll
 John Slater
 Patrick Sweeney
 Patrick Gallagher
 Willie Ward
 Joe Rose
 Kevin O' Connor
 Conor Reed
 John Greene

Chairman, MBAPG, Mulroy Bay.
 Chairman Irish Shellfish Association.
 Mulroy Bay.
 Mulroy Bay.
 Mulroy Bay.
 Hydro Seafood Fanad.
 Ocean Farm, Killybegs.
 Eany Fish Products.
 Creevin Salmon Farm.
 Northern Regional Fisheries Board
 Taighde Mara Teó, Donegal
 Ireland Northwest Tourism

NATIONAL/OTHER CONSULTEES

Tony Lowes
 Karen Dubsky
 Liz Sides
 James Ryan
 Niamh Farrell
 Rose Minehan
 Breda Smith
 John Joyce
 Chris Doonican
 Aidan O' Connell
 Anne Burril
 Richie Flynn
 Diarmuid Mulcahy
 Pete Tyndall
 Sean Myers
 Éamonn O' Cuiv

An Taisce
 Coastwatch Ireland.
 Dúchas, The Heritage Service.
 Chairman, Irish Salmon Growers Association.
 BIM, Dublin.
 Aquaculture Ireland.
 Aqua Culture, BIM Newsletter
 Marine Institute
 Irish Skipper
 Marine Times
 DGXI ICZM Demonstration Programme, Brussels.
 Executive Secretary, IFA Fishfarming Section
 Irish Aquaculture Association
 Department of the Marine
 Irish Lobster Association
 T.D.

Hugh Byrne
 Frank O' Brien
 Joe McCartin M.E.P.
 Clr. Bernard McGuinness
 Fionn O' Grada
 Chris Doonican
 Aiden O' Connell
 Brian Geraghty
 Fidelma Mullane
 Paddy Gargan
 Nathalie Stiens
 Steve Ó Cúláin

T.D., CIRCA Group
 Galway Aqua Consulting

 Council for Peripheral Maritime Regions, DCC.
 Dept. of Tourism Sport and Recreation
 Irish Skipper
 Marine Times
 Bord Failte
 Heritage Board, UCC
 Central Fisheries Board
 University of Portsmouth (formerly)
 Gaelsaoire, subsidiary of Údarás na Gaeltachta

APPENDIX II

1. Representative Groups

The aquaculture industry in Ireland is co-ordinated, funded and represented by various organisations with a range of agendas and priorities.

2. Department of the Marine and Natural Resources (DOMNR)

The Department of the Marine and Natural Resources is the government department with principal responsibility for the regulation of the aquaculture industry. All aquaculture licences are granted by them and they have responsibility for the implementation of Aquaculture Legislation as outlined in the Aquaculture Acts (1980, 1997). There are 2 primary divisions within the DoMNR which are devoted to aquaculture namely, the Coastal Zone Administration Division and The Aquaculture Policy Division.

3. Bord Iascaigh Mhara (BIM)

An Bord Iascaigh Mhara, (the Irish Sea Fisheries Board) was established in 1952 as the State agency with responsibility for developing the seafishing and aquaculture industry. BIM's mission is "to promote the sustainable development of the Irish seafish and aquaculture industry both at sea and ashore and the diversification of the coastal economy so as to enhance the employment, income and welfare of people in coastal regions and their contribution to the national economy". This work is carried out in a divisional manner under the following headings:

Aquaculture Development
Fisheries Development
Marine Services, and,
Market Development.

The Aquaculture Development Division promotes the development of the aquaculture industry by promoting and expanding new and existing enterprises. They are also involved in the introduction of new species for cultivation and implementing the most up to date and cost efficient production techniques with particular emphasis on minimal environmental impact to the marine environment. Under these objectives they are responsible for the administration of BIM and EU grant aid to the aquaculture industry.

As part of their approach to industry development BIM provide a facility to Irish exporters to identify, develop and strengthen market opportunities for Irish seafood abroad.

3.1 BIM and PESCA

The PESCA Initiative was introduced by the European Commission in 1994 to address problems relating to fisheries management and conservation policy in the context of the Common Fisheries Policy which impact on coastal communities dependent on the fishing

industry for livelihood. BIM has responsibility for implementing the PESCA Programme in Ireland. PESCA will be in operation until 1999 and is expected to realise in excess of IR£11m investment in alternative marine related activities.

The aim of PESCA is to assist communities dependent on fishing to diversify from traditional activities into alternative means of income generation, job creation and development of new economic activity thereby protecting the social fabric of coastal communities. PESCA is aimed at groups of fishermen, co-operatives and other companies or individuals who can contribute to such development in fishing dependent areas. PESCA provides assistance for viable alternatives to traditional inshore fishing such as stock management and enhancement programmes, aquaculture, marine tourism and for certain projects which are not eligible for assistance under the mainstream Operational Programme for Fisheries 1994-99. Total Investment under the PESCA programme in each of the study regions in the period 1995-1997 has been as shown in Table 1.

Table 1
PESCA Investment in Study Regions 1995-97

REGION	Total Investment IR£	EU Aid IR£	Exchequer Aid IR£
Galway	1,151,421	586,864	94,521
Cork	777,111	407,556	65,380
Kerry	1,202,049	620,251	84,861
Donegal	1,046,375	525,388	82,059

4. Marine Institute

The Marine Institute was established in 1991 to:

- support and promote the sustainable development of Ireland's marine resource,
- define the contribution it can make to the Irish economy, and,
- propose, and where appropriate, implement the necessary programmes and measures to ensure that this development potential is realised.

The structure of the Marine Institute incorporates the following recently restructured divisions;

- Corporate Services
- Marine Fisheries Management Services
- Marine Environment and Health
- Salmon Management Services
- Marine Science Technology Development and Innovation

5. IFA (Fishfarming Section), ISGA, ISA

The Irish Farmers Association (IFA) Fish Farming Section, comprising the Irish Salmon Growers Association (ISGA) and the Irish Shellfish Association (ISA), is the primary representative body for all Irish finfish and shellfish aquaculture producers. Its role is to lobby for, organise and represent the aquaculture industry at local, national and EU level. Nationally the IFA represents industry on several committees including the Aquaculture Industry Forum, the National Biotoxin Review Group, The Operational Programme Monitoring Committee, the National Salmon Commission and the Common Fisheries Policy Review Group. Internationally its is represented on EU Fisheries Advisory Committee and the International Salmon Farmers Association among others. As part of the negotiation of the next Operational Programme for fisheries 2000-2006 the IFA have made the following proposal for the development of the aquaculture industry:

"To develop and consolidate the position of the Irish Aquaculture Sector as a vital income and employment generating industry in peripheral areas through a IR£100m investment programme in private and public projects between 2000 and 2006".

6. Irish Aquaculture Association

The Irish Aquaculture Association (IAA) is an umbrella body for representatives, researchers and state bodies involved in the Irish aquaculture industry. Industry is represented on the IAA by the ISGA, the ISA and the ITGA (Irish Trout Growers Association) while researchers are represented by the Aquaculture Development Group and the State are represented by BIM, Údarás na Gaeltachta and the Marine Institute. The most significant role of the IAA is the provision of a direct industry link with the Marine Institute's research programme.

7. Aquaculture Development Group

The Aquaculture Development Group (ADG) has been a constituent member of the IAA for some time. It was initially set up to give a structure and a voice to the ancillary service providers to the industry. These service providers include those involved in training and education, consultancies, equipment manufacture and direct service suppliers. The current objectives of the ADG are to provide information through a series of workshops.

8. Aquaculture Forum

Under the chairmanship of the Aquaculture Policy Section of DoMNR, the Aquaculture Forum brings together the state service providers to the aquaculture industry, namely the Coastal Zone Administration and the Aquaculture Policy Divisions of DoMNR, BIM, Údarás na Gaeltachta, and the Marine Institute, and different sections of the aquaculture industry, through ISGA, ISA, ITGA, New species (Shellfish) and New species (finfish). The primary focus of the aquaculture forum is to evaluate current obstacles to the industries development.

9. Údarás na Gaeltachta

The population of the Gaeltacht, the official Irish speaking parts Ireland, is a little in excess of 86,000 according to the 1996 census of population and the total labour force is 28,500. There are 7,854 people employed full-time and a further 4,000 part-time in Údarás supported industries such as textiles, engineering, electronics, aquaculture, other natural resources, audio-visual activities and telecommunications. Other important economic activities within the Gaeltacht are farming, fishing and tourism.

The task of Údarás na Gaeltachta as a regional government agency, is to develop the economy of the Gaeltacht areas in order to facilitate the preservation and extension of the Irish language as the principal language of the Gaeltacht community, (Údarás na Gaeltachta, 1997). To achieve this objective, An tÚdarás promotes productive schemes of employment through the development of local natural resources, skills and entrepreneurial abilities and the attraction of mobile investment to the Gaeltacht. An tÚdarás also promotes and supports community development and pursues a range of language and cultural activities involving community groups and industries throughout the Gaeltacht.

In the marine sector, the objective of Údarás na Gaeltachta is to promote a marine resource development imperative in order that the marine resources and mariculture potential of the Gaeltacht regions are exploited to the full. This aims to ensure the greatest possible economic return in a national context from the natural resources in these regions. This also hopes to ensure the preservation of the indigenous communities in these regions which are largely located in remote coastal areas where it has proven difficult to attract conventional industrial development.

10. Third Level Institutes

Several of the third level colleges and institutes in Ireland have an important part to play in the development of the aquaculture industry. Among the more prominent of these are N.U.I. Cork, N.U.I. Galway and Galway/Mayo Institute of Technology (GMIT). The Coastal Zone Institute (CZI) at N.U.I. Cork comprises the Aquaculture Development Centre (ADC), Coastal Resources Centre (CRC) and the Hydraulics and Maritime Research Centre (HMRC).

The Martin Ryan Marine Science Institute at N.U.I Galway is involved in a range of research and development projects in the aquaculture and seaweed sectors. The Shellfish Research Laboratory (SRL) at Carna, in southwest Co. Galway, is part of N.U.I. Galway and has been prominent in the research and development of aquaculture and stock enhancement techniques for many important and new marine species particularly Crustacea and Bivalves. Several major crustacean projects are currently ongoing at SRL.

11. Irish Seaweed Industry Organisation

In the context of the expanding potential of the seaweed industry in Ireland, the Irish Seaweed Industry Organisation was set up in 1994 as a joint initiative between the seaweed industry in Ireland (now at 18 members) and the Phycology Department within the Martin

Ryan Marine Science Institute, National University of Ireland, Galway. The aims of the ISIO are:

- to represent the seaweed industry at local, national and international level,
- to promote and disseminate information on the use of seaweed in all appropriate applications,
- to promote internal co-operation within the seaweed industry,
- to initiate and undertake applied seaweed research,
- to participate in the development of rural maritime areas based on the naturally occurring seaweed resource

Since its inception, the ISIO has undertaken a major programme of research and development with the seaweed industry and has overseen an investment of over IR£500,000 in various projects to date, (ISIO, 1998).

The future aspirations of the Irish seaweed industry, and consequently the Irish Seaweed Industry Organisation are therefore focused on the improvement of the industry to make it more efficient and profitable and short term priorities have been identified. The industry is only seen to operate at 50-60% of its sustainable potential. There is a need for legislative change to address the current harvesting and licensing problems. Other priorities include the development of the value added sector.

Last year, the ISIO, under the Operational Programme for Fisheries undertook a project to identify the impact of hand and mechanical harvesting plant regeneration and biodiversity.

The Seaweed Forum, recently established by the DoMNR aims to examine and report on the potential for development of the Irish seaweed resource, with particular focus on the 'value added' sector. The remit of the forum includes the evaluation of the current state of knowledge of the seaweed resource and its economic contribution to the Irish economy. For this to be achieved wide consultation with the relevant participants and industry players is essential. The forum brings together all relevant interests and expertise in the seaweed sector to evaluate and advise on development of the resource.

APPENDIX III

Survey. No: _____ Date: _____

Aquaculture and Seaweed Industry Opinion

1. Are you directly involved in the aquaculture/seaweed industry? _____

2. In what capacity? _____

3. Employment Sector

Aquaculture	Type _____	Season of Work _____
Seaweed Industry	Type _____	Season of Work _____
Fishing	Type _____	Season of Work _____
Tourism	Type _____	Season of Work _____
Farming	Type _____	Season of Work _____
Industry	Type _____	Season of Work _____
Other	Please Specify _____	Season of Work _____

4. How has aquaculture contributed positively to your locality? _____

5. Can you identify any negative contribution from this industry to your locality?

6. Do you feel adequately informed about the aquaculture/ seaweed industry in your area?

7. Can you see any significant changes in your locality as a result of the growth of aquaculture or the development of the seaweed industry?

- 8. Do you feel you are informed about the working of these industries? _____

- 9. What is the source of your information? _____

- 10. Is there an area of the industry which you would like to know more about and who do you feel should provide any additional information? _____

- 11. Would you be interested in visiting fishfarms in order to learn more about aquaculture? _____

- 12. What is your opinion of the role of the shellfish co-op in the development of shellfish farming in the bay. _____

- 13. Is the co-op activity constructive or does it hinder other activity _____

- 14. What is your opinion of the current procedure for aquaculture licence application process and the control of the siting of aquaculture licences? _____

- 15. Are you aware of the proposed amendments to the current aquaculture licence legislation? _____

- 16. Do you think that the proposed amendments to the licensing laws will (a) improve, (b) disimprove, or, (c) not change the situation? _____

Tourism

- 17. What tourist facilities are available in the area around Kilkieran Bay? _____

- 18. What accommodation facilities are available? _____

- 19. How many tourists do you estimate travel to the area around Kilkieran Bay each year and for what reason? _____

- 20. What are the positive and negative effects of tourism? _____

- 21. Do you see any crossover between aquaculture and tourism in the Kilkieran Bay area? _____

- 22. What are the organised community groups in your area? _____

Optional Information

23. Name _____ Gender _____

24. Address _____

25. Age 20-30 31-40 41-50 51-60 61-70 70+

26. Marital Status _____

27. District Electoral Division _____

28. No in household _____

29. No. of dependants _____

30. Employment Status FT PT NOT

31. Principal Source of Income(Sector) _____

32. Car Owner Y/N _____ Model _____ Year _____

33. Irish Speaker _____

34. Age Formal Education Ceased _____

Additional Information

EMPLOYEE QUESTIONNAIRE

Name of Farm _____

Job Description _____

Employment Status _____

Length of time employed in this position _____

How long do you expect to stay in this job? _____

Other Employment Sector %

Agriculture _____

Seaweed Cutter _____

Fishing _____

Industry _____

Tourism _____

Other (name) _____

Principal Source of Income _____

Have you ever emigrated? _____

If so, why did you come back? _____

If you didn't have this job where would you/could you, work instead? _____

What training courses have you done for this job? _____

What other skills or training do you have? _____

Where do you shop locally? _____

Do you have a car? _____

Did you buy it locally? _____

Are you involved in any of the following (List trad. skills)e.g. Boatbuilding, other trad. skills unique to peripheral coastal areas. _____

Would you like to get involved in aquaculture yourself? _____

Why/why not? _____

INDIVIDUAL DETAILS

Marital Status _____ Gender _____

Age 20-30 31-40 41-50 51-60 61-70 70+

No in household _____

No of dependants _____

Are you a native Irish Speaker? _____

How often do you use the language? All Most <50%

Where do you live? _____

Have you always lived here? _____

Age Formal Education Ceased _____

FARM QUESTIONNAIRE Shellfish and Finfish

Farm Name _____

Farm Owner _____

Location _____

Species reared _____

Date farm commenced operation _____

Total No. of Sites _____ Production _____ Fallow _____

Production Tonnage 95/96 96/97 97/98

Proposed production 98/99 99/00 00/01

Total Investment to Date in Farm _____
 Source of capital BIM _____
 Udarás _____
 Other Govt. funding _____
 EU _____
 Share capital _____
 Bank and other borrowings _____
 Own Funds _____
 Other _____

What have been your annual sales over the past 5 years? _____
 Tonnes 93 94 95 96 97
 Value 93 94 95 96 97

How much of this was value added produce _____

What is the current value of stock on your farm? _____

What is the current value of equipment on your farm? _____

Cages/Ropes and Lines _____
 Nets _____
 Anchors/Moorings _____
 Boats _____
 Transport _____
 Stores _____
 Other buildings _____
 Other (specify) _____

Expenditure Details

Non-Staff Costs in 1997 and source of supply _____

Items	Cost	Source
Smolts/Spat	_____	_____
Feed	_____	_____
Energy (ESB etc.)	_____	_____
Theraputents/chemicals	_____	_____
Veterinary	_____	_____
Diving	_____	_____
Environmental Monitoring	_____	_____
Running costs of transport	_____	_____
Ice and Packaging	_____	_____

Marketing _____
 Licensing _____
 Insurance _____
 Local Authority Payments _____
 Administration _____
 Accountancy/Legal _____
 Other (specify) _____

Employee Details

Annual Wage Bill _____
 No of Employees Male _____ Female _____
 Managers _____ FF/T _____ FP/T _____ MF/T _____ MP/T
 Technical _____ FF/T _____ FP/T _____ MF/T _____ MP/T
 Clerical _____ FF/T _____ FP/T _____ MF/T _____ MP/T
 Operatives _____ FF/T _____ FP/T _____ MF/T _____ MP/T
 TOTAL _____ FF/T _____ FP/T _____ MF/T _____ MP/T
 Projected employment in _____ 2000 _____ 2002

What have been the greatest problems encountered by you on the farm in the last five years? (please give details) _____

Have you encountered conflict in the locality with regard to your farming activities? _____

What is the source of this conflict and has there been any resolution? _____

Sales and Marketing

Who markets your produce? _____

What percentage of your produce is destined for the domestic export market? _____

What producers groups representative bodies do you belong to? _____

Do you advertise individually in aquaculture publications? _____

Aquatourism

Are you involved in the tourism industry? _____

Do you sponsor any local events? _____

How much do you sponsor? _____

Do tourists ever express an interest in visiting your farm? _____

Would you and do you allow tours of the farm? _____

What is the response? _____

Do you think the public should be more informed about the operation aquaculture operations, and if so, who do you feel should or could provide this information?

Further comments and recommendations _____

GENERAL INDUSTRY QUESTIONNAIRE

Company Name _____

Location _____

Manager/respondent _____

Nature of Business _____

No of employees ___ FF/T ___ FP/T ___ MF/T ___ MP/T

Management ___ FF/T ___ FP/T ___ MF/T ___ MP/T

Administration ___ FF/T ___ FP/T ___ MF/T ___ MP/T

Operatives ___ FF/T ___ FP/T ___ MF/T ___ MP/T

Annual Wage Bill _____

GENERAL INFORMATION

Year company/business established _____

Full/Part Irish Owned _____

Manufacturing/Processing/Service/Other Sector _____

Do you export goods or services? _____

How much of your business arises from the aquaculture sector or those directly involved in this sector? _____

Is your business in a tax-relief grant aided area? _____

What grants/funding are you eligible for or do you receive on an annual basis? _____

Source of aid _____

Where is the source of your supplies/raw materials?

% Domestic _____

% Foreign _____

Is your company/business involved in any tourist-based activities in the locality?

Do you see any interaction with these activities and any aquaculture activities in the area.?

Do you sponsor local events, and if so how often and to what approximate value?

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