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***Sustainable Fishing in Irish waters: Assessment of
Current Practices, Policies and Alternative Approaches***

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Sustainable fishing in Irish waters: Assessment of Current Practices, Policies and Alternative Approaches

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Abstract

Irish fishing waters are currently governed as part of the Common Fisheries Policy of the European Union. Under this regime, policies of strict regulation are employed to provide both an ecologically sustainable resource and an economically sustainable industry. These measures, however, have not been sufficiently effective in achieving the desired goals. In this paper we examine the reasons for this deficiency and provide an analysis of the alternatives. In doing so, a critical assessment of current and proposed measures, in terms of ecological and economic sustainability is carried out. It is argued that the current measures of regulation have failed due to both theoretical and practical deficiencies in their application. A proposed policy alternative of a community based rights-based management regime is discussed.

Keywords: Common Fisheries Policy, community based rights-based management regime

JEL: P22, P57

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1. Introduction

The seas around Ireland contain some of Europe's most important fishing grounds. Irish-Atlantic coastal waters, the West of Scotland coast and Rockall, the Celtic Sea and the Irish Sea possess a rich abundance of commercially fished species and the marine habitats which support them. As a contrasting example, the Baltic Sea, due to its estuarine character, exhibits low species diversity in comparison to Irish marine waters. There, only three marine and one anadromous fish species are important for commercial exploitation, namely Baltic cod, sprat, herring, and salmon (Röckmann, 2006). The case is much different for marine waters around Ireland where a diverse set of fish species are harvested from Irish waters¹.

Comprising 16% of total EU waters (Irish Naval Service, 2007), Irish territorial waters are currently governed as part of the European Union's Common Fisheries Policy (CFP). All EU waters are divided into geographical sub-areas determined by the International Council for Exploration of the Sea (ICES). The entire Exclusive Economic Zone (EEZ) of Ireland (12 nautical mile perimeter from the baseline), which only the Irish fishing fleet can exploit, lies within ICES sub-areas VI and VII. Due to the characteristics of Irish marine waters and the fish species therein, the Irish fish catching sector is largely comprised of deep water, demersal, pelagic and shellfish fisheries. Fish and shellfish are landed at the five major fishery harbour centres (Killybegs, Castletownbere, Howth, Rossaveal, and Dunmore East), at 40 secondary ports (each with landings exceeding €1m) and a further 80 piers and landing places where fish landings are recorded (Cawley et al., 2007). According to statistics from the Irish Sea Fisheries Protection Authority, the total value of fish landings in the Irish fisheries sector in 2008 amounted to €214 million (SFPA, 2010).

While the contribution of the fishing sector to Ireland's GDP is quite small when compared with other sectors of the economy, it is of unique significance due to the decentralized and rural characteristics of the industry. By its nature, commercial

¹ Fish caught include small pelagic species such as Mackerel, Horse Mackerel, Herring, Sprat, Sardines; demersal species such as Cod, Saithe, Haddock, Whiting, Hake, Megrin, Monkfish, Ling; shellfish such as Nephrops, Scallops, Mussels, Crabs, Lobsters, Squid, Cuttlefish; deepwater species such as Atlantic redfishes, Black scabbardfish, Blue Ling, Greater forkbeard, Orange roughy, Roundnose grenadier, Tusk and other various species such as Blue whiting, Norway Pout, Sandeel, Various Dogfish, Spurdog, Various Rays and skates, Deepwater sharks, Pelagic sharks are all fished.

fishing activity prevails in mainly remote coastal areas where alternative industries and employment opportunities are scarce. Maintaining a vibrant fisheries sector (and all of the socio-cultural characteristics associated with the communities that depend on it) is something which receives repeated emphasis in fisheries policy and management debates (Macken Walsh, 2010). As Table A.1 shows, a total of 4,987 individuals were employed in the Irish fishing fleet in 2006.

Further economic productivity and employment is created in Irish coastal regions through inshore processing activity, the supply of technical equipment to commercial fishermen and a service industry focused on the needs of the fishing community. Fostering the sustainable growth of this important economic sector in rural Ireland requires the creation of a sustainable policy of fishery management. This in turn involves carefully balancing that which is economically viable, politically acceptable and ecologically sustainable. In order to ensure that all aspects of management are provided for, policy needs to be carefully formulated.

In this paper we review the measures that have been used to date within the framework of the CFP for fisheries management. These measures have been shown to be ineffective in achieving their desired goals. In this paper we examine the reasons for the deficiency of the measures used and provide an analysis of the alternatives. In doing so, a critical assessment of current and proposed measures, in terms of ecological and economic sustainability is carried out. It is argued that the current measures of regulation have failed due to both theoretical and practical deficiencies in their application. A proposed policy alternative of a community based rights-based management regime is discussed.

In what follows we briefly review the concept of the fishery as a common property resource. In sections 3 we then outline the development of the CFP and assess the measures through which the CFP attempts to manage and regulate the fisheries sector. Section 4 analyses each of the current CFP measures from both a practical and theoretical viewpoint. In section 5 we review the current proposals for CFP policy reform. Section 6 discusses alternative rights based management regimes and in section 7 we discuss the issues involved in applying these rights based management

regimes in an Irish fisheries context. Finally, a conclusion and discussion is offered in section 8.

2. The Fishery as a Common Property Resource

Common property resources have been defined as resources whereby exclusion is difficult and joint use involves “subtractability”² (Berkes et al., 1989). Specifically, Ostrom et al. (1999) have defined such resources as those in which (i) exclusion of beneficiaries through physical and institutional means is especially costly, and (ii) exploitation by one user reduces resource availability for others. Coastal fisheries are an example of a biological common property resource; even with prohibitive regulations in place, it is difficult to exclude others from fishing. Along with this, fishing activity is a subtractive activity, where the fishing activity of one depletes the number of fishing opportunities available to others. Additionally, the renewable nature of fish stocks and the sensitivity of that renewability to the level of exploitation mean that a fishery is a primary example of a resource that can either be sustainably managed or permanently damaged through over-intensive exploitation. Consider for example a simple yet typical mathematical function used by fisheries scientists to represent the biomass growth rate of a commercially exploited species.

$$G(B) = r.B(1 - B/k)$$

where G is the biomass growth rate, B is the biomass weight of the species, r is the intrinsic growth rate of the fish in the population and k is the carrying capacity of the ecosystem³.

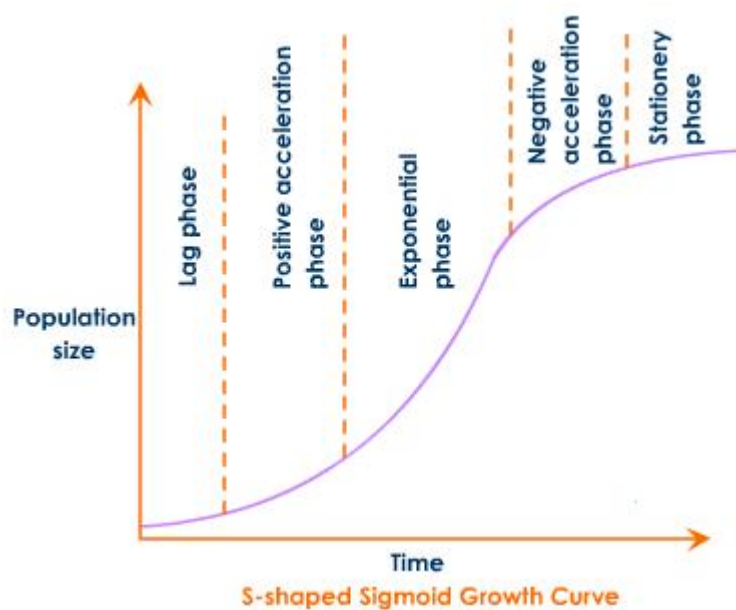
In this equation, the growth rate of the population biomass is a quadratic function of total population biomass. The intuition is based on the logic that at low population levels, growth too is low, since sexually active adults are scarce. Increases in the population lead to more breeding opportunities and thus a large increase in the

² Subtractability refers to the degree to which one person's use of a resource diminishes others' use.

³ The carrying capacity of an ecosystem is the number or biomass of different kinds of organisms that the ecosystem can support while the carrying capacity of a biological species in an environment is the population size of that particular species that the environment can sustain indefinitely, given the food, habitat, water and other necessities available in the environment. The carrying capacity of an ecosystem is usually modelled as a function of a set of features including habitat size and quality as well as predation and availability of prey.

capacity for population growth. However, as the population biomass increases to a high enough level, the carrying capacity of the ecosystem becomes a limiting factor and constrains population growth rates so that again, they become low. This trend can be seen in figure 1 where we see the lag, exponential and stationary phases (please note that figure 1 shows growth with respect to time and therefore is not parabolic as it would be if growth was shown with respect to total population biomass).

Figure 1. Trend of population Growth



Source: Tutor Vista Global Pvt. Ltd

The simple intuition has important connotations for how we interpret the economic behaviour of fishers. In the short run, there is profit to be made by entering the fishery and exploiting the resource at the maximum rate possible. In the long run of course, this may drive the population biomass so low that growth rates will tumble and the stocks ability to replenish itself will be threatened. While it may seem counterintuitive for individuals to exploit a resource from which they make their living to the extent that they risk its potential as a going concern, under open access conditions, it may in fact be the economically rational and optimal thing to do. Quite simply, if the “common” nature of the resource prevents the economic benefits of sustainable behaviour accruing to those who act sustainably, the economic incentive to *not* act sustainably exists.

When this problem escalates to a great enough extent, what is known as the ‘Tragedy of the Commons’ can occur. First proposed by Garrett Hardin in 1968, the Tragedy of the Commons is a phrase used to describe the depletion of a common property resource through overexploitation and degradation. Essentially, because the resource is common in nature, users’ perceptions correctly inform them that should they forfeit immediate use of the resource to allow for further potential use in the future, other individuals will also be the beneficiaries of their forward thinking behaviour. It is also clear that the nature of a common property resource may even incentivise individuals to exploit the resource at even more intensive levels to ensure that as much of the benefit as possible accrues only to them: to leave something for another day bears the risk of losing it to somebody else.

In order to get around the Tragedy of the Commons problem and achieve greater sustainability of a common resource, two traditional solutions exist. One is to transfer the resources to private property, thereby overcoming the distortion of incentives just described. The users of the resource then become the *owners*, and since the future benefits of foregone exploitation will only accrue to them, sustainable practice will arise. The second solution is to transfer the resources to government control, allowing for the regulation of destructive human activities (Hardin 1978; Bajema 1991). Each solution carries its own shortcomings and controversies which in turn have led to a third form of governance to receive attention as a possible policy measure, community-focussed, rights-based forms of management.

Despite a protective regime being in place, the territorial waters of Ireland appear to suffer many of the symptoms of the tragedy of the commons. The protective regime in question operates through the Common Fisheries Policy (CFP) of the European Union (EU). Specifically, the CFP aims to develop European fisheries from an environmental, economic and social point of view. However, as already mentioned, it has come under considerable criticism, as it has failed to meet these primary objectives. Given the context outlined, the purpose of this paper to assess the mechanisms of the CFP, consider the alternatives and propose a best course of action, taking this analysis into account.

3. The Common Fisheries Policy and the Instruments used to Conserve Fish Stocks

A Common Fisheries Policy was first alluded to in 1957, when fisheries were mentioned as part of EU agricultural policy in the treaty of Rome. The initial proposals of this legislation were not for conservation, but for the establishment of a common market and the achievement of ‘auto- sufficiency,’ primary goals of its parent policy, the Common Agricultural Policy (Holden, 1994). According to Article 38 of the Treaty of Rome (1957), the Common Market was formed to facilitate and protect agriculture and trade in agricultural products. In this case ‘Agricultural products’ referred to “the product of the soil, of stock farming *and of fisheries* and products of first stage processing related to these products.

The first specific legislation regarding fisheries came into force in 1970, primarily focusing on the right to fish in another State’s waters (the equal access principle⁴), the establishment of a common market, and financial aid to develop the industry. The process of establishing this legislation was fraught with difficulty, as the proposed equal access principle would benefit some member states more than others. This deadlock was overcome with the proposed entry of Ireland, UK, Denmark and Norway. As the initial existing member states had traditionally fished in these waters, a considerable incentive existed for the establishment of a common fisheries policy before these new entrants joined negotiations (Holden, 1994; Song, 1995). By the logic of the equal access principle, the adoption of 200-mile Economic Exclusion Zones (EEZs)⁵ by Member States in 1977 required the development of a common conservation policy to manage a scarce, shared resource (Holden, 1994). The CFP was then first agreed to as a full package in 1983, under EEC Regulation No.170/83, establishing the initial policy configuration of the conservation pillar.

Although problems with the CFP were highlighted from the outset, proposals for reform were only first issued in March 2001 (COM, 2001). This Green Paper resulted in hearings, meetings and consultations, along with submissions from many review groups. Following this, proposals were implemented by the Council of Fisheries

⁴ The ‘equal access principle’ gives equal access to all member states to the territorial waters of all other states, outside what is considered the baseline (12 nautical miles from permanently exposed land).

⁵ Economic Exclusion Zones can be defined as the territorial waters of a nation, extending to 200 nautical miles from the baseline.

Ministers in December 2002 (Council Regulation (EC) No. 2371/02). The reformed CFP augmented its approach in a number of areas. Most notably, it proposed a longer term approach in attaining sustainable fish stocks; a simpler fleet decommissioning policy and phasing out of subsidies to renew or modernise private vessels; a more even application of rules to ensure a level playing field across all regions; and greater stakeholder involvement through newly established Regional Advisory Councils.

Furthermore, the multiple objectives of environmental, economic and social development were provided for by the reformed CFP. In particular, the new policy called for responsible and sustainable fisheries and aquaculture in order to achieve a healthy marine ecosystem; an economically viable and competitive fisheries and aquaculture industry (Frost and Andersen, 2006). By doing so, both the consumer and those dependent on fisheries would benefit. In providing for the conservation of stocks in EU waters, the approach taken by the Common Fisheries Policy has been one of strict regulation through command and control.

Fishing effort is confined to Total Allowable Catch (TAC) limits imposed by the EU, thus attempting to ensure that catch is restricted to that which can be supported by the ecosystem, the Maximum Sustainable Yield (MSY). By limiting extraction to levels outlined in TAC regulations and confining users to those with quota allocations, the CFP attempts to solve both the exclusion and excessive subtractibility problems which can lead to the tragedy of the commons. Not only are these measures enforced to provide ecological sustainability, they play a role in the promotion of sustained economic viability. By attempting to restrict access, regulation attempts to maximize economic rents for the current users of the resource. Theoretically, the fish stocks are thus maintained at an ecologically sustainable level and economic sustainability is ensured for the users of the resource (Blank, 2000).

In order to attain the goals of the CFP in terms of the conservation of the fishing stock, EU policy is based on the division of responsibility between the EU and the Member States, through 3 primary measures; TAC/quota management based on the annual determination of TACs and allocations to Member States⁶, structural policies

⁶ Member states can manage these quotas by use of any measures as long as the national quotas are adhered to.

that specify Member State ceilings (reference levels) for fishing fleet capacity;⁷ and technical measures (closed areas, minimum mesh size, minimum fish size, by-catch rules⁸ (Frost and Andersen, 2006). In order to ensure that the waters of the EU are not overfished, limits (TAC) are placed on each fishing zone. These limits are determined by ecological surveys and analyses, with final catch levels set annually by a meeting of the European Commission of Fisheries Ministers. The allocation of TAC operates under the principle of “relative stability.” First established under the 1983 review of the CFP, this method of allocation was initially adopted to promote political stability, allowing each member state’s fishing effort to remain constant, relative to that of others. It also gives preference to the fishing dependant countries of Northern Europe under the Hague Resolution (Boude, et. al., 2001).

The regulation of stocks and setting of MSY starts with the collection of data and monitoring of stock levels. Each state is responsible for the collection of data in its own waters, with data relating to Irish fisheries being collected by the Marine Institute’s Fisheries Science Services department (FSS). Its mission is to ‘research, assess and advise’ on marine fisheries in order to ensure sustainable exploitation. The Marine Institute carries out examinations aboard commercial vessels along with fisheries surveys by the research vessels the *RV Celtic Explorer* and the *RV Celtic Voyager*. Through data collection, data management, assessment, advice and research, the FSS conduct stock assessments and formulate advice with other international scientists at various international forums. Amongst these bodies are the International Council for the Exploration of the Seas (ICES), North East Atlantic Fisheries Commission (NEAFC) and the EU’s Scientific, Technical and Economic Committee for Fisheries (STECF). (Marine Institute, 2007a)

The findings of the FSS are presented to the Department of Communications, Marine and Natural Resources as advice on the status and management of stocks. The detailed data and information required for stock assessment which is collated by the FSS includes the periodic distribution of landings, a profile of the age structure of landings, discard information, the number of boats fishing in a particular area over

⁷ Member states are free to select structural policy measures to adjust the sizes of their fleets. The EU provides general rules for subsidy rates, and subsidies are released without delay if the Member States co-finance them.

⁸ Member States can use supplementary measures in addition to these, as long as the commonly agreed measures are not violated

time, the catch, time spent fishing, gears used (fleet activity), information on the annual landings into each port and finally data from various research surveys carried out by FSS (Marine Institute, 2007b).

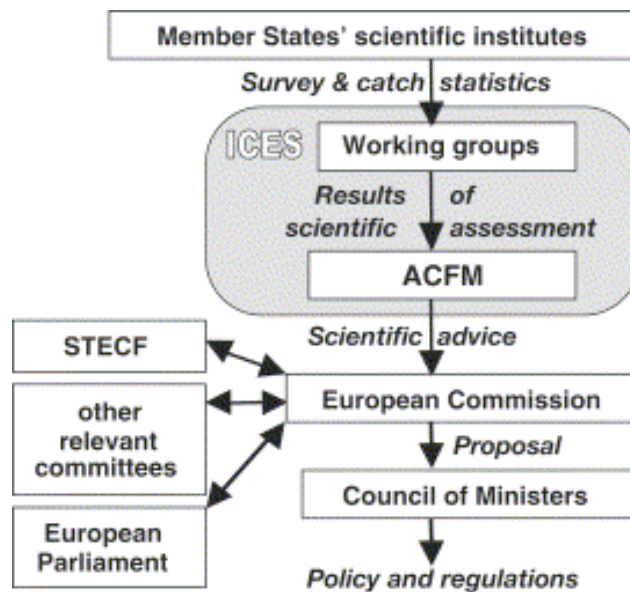
Discards are assessed by a number of Fisheries Assessment Analysts based in the Institute's port facilities at Killybegs, Greencastle, Rossaveal, Castletownbere, Dunmore East and Howth (Marine Institute, 2003). Along with this data, the Sea Fisheries Protection Authority (SFPA) collects the official records of fishing operations and landing statistics recorded in each vessel's logbook, as provided for by Commission Regulation EC 1343/2007. This data is used to calculate catch per unit effort statistics (CPUE) (Marine Institute, 2008). These findings are published annually in "The Stock Book." This is the principle publication of the FSS, summarising the stock assessment findings and is used by the Department of Agriculture, Fisheries and Food (DAFF) to represent Ireland's stock summary. This data is then collated with the data of other member states by the Co-ordinating Working Party on fisheries statistics (CWP). The CWP is "the premier international and inter-organisation forum for agreeing common definitions, classifications and standards for the collection of fishery statistics" (FAO, 1995).

The International Council for the Exploration of the Sea (ICES), using the CWP's complete dataset, provides an ecological assessment of the stock level of each commercial fish species in each of the fishing regions. The Advisory Committee on Fisheries Management (ACFM), consisting of representative members from each EU fishing country, is the ICES department responsible for this report. This advice is used in conjunction with that of the European Commission's own advisory board, the Scientific, Technical and Economic Committee on Fisheries (STECF) to provide the ecological basis for the European Commission's TAC proposals (EC, 2006a). The sequencing of the scientific, political and managerial processes are outlined in Figure 2.

In recent times, a response to this advice from the stakeholders' perspective is provided by the Regional Advisory Councils. Established as part of the 2002 reform of the CFP (Council Decision 004/585/EC), Regional Advisory Councils (RACs)

provide a permanent framework linking stakeholders at the regional and local level and the Commission and the Member States concerned (Holmquist, 2004). The RACs are comprised of all members of the fisheries sector and relevant interest groups. At the head of the organisation is the General Assembly, appointed by general consensus of members, including representatives of EU and national organisations. It is the North Western Waters Regional Advisory Council (NWWRAC) which covers waters relevant to Irish fisheries. Approximately two thirds of the NWWRAC general assembly consists of members of the fisheries sector, with CFP representatives making up one third. Ireland’s representatives come from the Irish Fish Producers’ Organisation, Irish Fishermen’s Organisation, Irish South and East Fish Producers Organisation Ltd, The Irish South and West Fish Producers Organisation, The Killybegs Fishermen's Organisation, Irish Seal Sanctuary and Mna na Mara (NWWRAC, 2008).

Figure 2. Route for the implementation of scientific research into fisheries policy within the European community



The consultation encouraged by this organisation is intended to allow for the building of trust between scientists and fishermen, leading to improved transparency

of ecological advice. A link with other bodies such as the ACFA⁹ is also provided for, attempting to encourage a more embedded approach to fisheries governance and addressing some of the inherent problems of the centralised nature of CFP governance (EC, 2008).

Once these discussions have taken place and the respective advice and responses have been noted, the final step in the process consists of sending these ecological assessments to the Council of Fisheries Ministers, which meets annually each December. Comprised of the national ministers of each member state, this council has final authority in the establishment of the following year's TAC. The Minister for Agriculture, Fisheries and Food (sometimes accompanied by a Junior Minister) represents Ireland on the Council of Fisheries Ministers.

Along with regulating the volume of fish landed, technical conservation measures (TCM) are also implemented to restrict boat catch. These measures include gear regulations, closed seasons, closed areas, and minimum allowable sizes for individual species. A subcategory of these measures is the policy that attempts to limit fishing effort by controlling the capacity of fleets (i.e. structural measures) and limiting time spent at sea. Provided for by Council Regulation 850/98 (and amendments) and Council Regulation 3440/84 (and amendments), minimum net mesh sizes are in place for fishers of demersal fish, pelagic fish and Dublin bay prawns. Additional measures are provided for in Council Regulation No. 3440/84 with restrictions on the minimum net circumference and twine thickness. Finally, limits are also set on the minimum size of fish caught and ecologically sensitive areas of restricted fishing (Bord Iascaigh Mhara, 1999). All of these measures are in place in an attempt to give the fish stocks every chance to re-spawn.

In order to ensure these measures are adhered to, each member state is responsible for enforcement of CFP regulations in their own waters. Established under the Sea Fisheries and Maritime Jurisdiction Act 2006, the Sea Fisheries Protection Authority (SFPA) is responsible for the enforcement of sea-fisheries protection and seafood

⁹ ACFA: The Advisory Committee on Fisheries and Aquaculture is a group comprising of 21 members of many aspects of the industry, through which the opinion of stakeholders is taken into consideration in the implementation of the rules of the CFP.

safety legislation in Ireland and throughout Irish territorial waters. Sea fisheries officers work with other government agencies such as the Naval Service and the Marine Institute, in the implementation of fisheries control. The Irish Naval Service is the active force responsible for the monitoring of vessels in Irish territorial waters. Operating under enforcement policies outlined in European Council Regulation 2847/93, the Irish Naval Service take on the role of national inspectors in Irish waters. Under this regulation, each member state monitors fishing activities within their own jurisdiction and any vessel may be boarded by national inspectors to check fishing gear, logbooks, or catch. EU Inspectors also operate in Irish waters to ensure the correct standard of enforcement is carried out across member states. Along with surveillance vessels and aircraft, a vessel monitoring system (VMS) has been implemented to aid enforcement. These systems provide real time data on the location of every vessel in the Irish fleet.

Before any measures to limit vessel activity can be effectively pursued, however, the challenge of fleet overcapacity must be addressed. In 2005, it was suggested that whitefish stocks would have to be some 30% greater to yield a viable and attractive return for the boats in the Irish demersal sector (White, 2005), with this projection amended to 45% according to 2007 economic conditions (BIM, 2008a). Thus, it has been estimated that the fleet must be reduced by 35%, with a number of fleet decommissioning schemes invoked to address this imbalance. Co-ordination between the NSRG and the Irish fishery producer organisations (FPOs) resulted in the primary advisory publication in this area, “Decommissioning Requirements for Ireland’s Demersal and Shellfish Fleets” (White, 2005). This report suggested a government investment of €38m as part of the National Development Plan (NDP) to remove capacity of the whitefish and scallop fleet. In relation to whitefish, the report suggested that 25% (10,937 GT¹⁰) of the capacity of the entire 43,748 GTs in the polyvalent and beamer segments should be withdrawn. This capacity would be withdrawn from the part of the fleet that is over 18 metres and 15 years of age and represents 30% of all the capacity (36,294 GT) in the over 18-metre fleet in the relevant segments. Following decommissioning 25,397 GT or 70% of the offshore whitefish fleet would remain. Along with this decommissioning, it was also proposed

¹⁰ GT refers to ‘Gross Tonnage.’ This is the measure of the size or cargo capacity of a fishing vessel. It is the volume of all the vessel’s enclosed spaces, measured to the outside of the hull framing.

that a 'ring fencing' of the fleet should take place, preventing entry of further vessels that would undermine the decommissioning process. Contained within this process were mechanisms for dealing with 'cases of hardship' and incentives to encourage young fishermen, with 15% of capacity set aside to accommodate their participation (White, 2005).

Of this 10,937GT, only 3,320GT were successfully decommissioned. Thus, a further decommissioning scheme was initiated in 2008 to remove a further 11,140 GTs from the polyvalent and beam trawl segments of the whitefish fleet. The scheme provided a basic payment of €1,000 per GT for successful applicants plus an additional payment of €2,500 per GT for those with tradable or transferable tonnage. Following criticism from the SISRG of lethargy in introduction of the decommissioning program, the scheme had a defined time period, specified as the 10 week period extending from the date of the introduction of the scheme. Financial assistance was provided through the Seafood Development Operational Programme of the National Development Plan. The Department of Agriculture, Fisheries and Food (DAFF) administered the scheme, with implementation being carried out by Bord Iascaigh Mhara (BIM) (White, 2005). Closing in August 2009, a total of 46 vessels were decommissioned at a total cost of €36,605,027, while the capacity decommissioned amounted to 6,913 GT and 19,356 kW respectively (BIM, 2009), representing 62% of the proposed GT target. Once again, decommissioning targets were not achieved.

At an EU level, this problem of fleet overcapacity has been identified as being one of the structural failings of the Common Fisheries Policy. It has been noted that a continuous series of fleet decommissioning support schemes have been ineffective in maintaining appropriate fleet size (EC, 2009). In its 2009 Green Paper (EC, 2009), the European Commission has advocated the use of one-off scrappage schemes or the use of market instruments such as transferable rights to fishing may be more efficient and less expensive. Although Irish schemes to date have been designed to be 'one-off', a continuous failure to meet proposed targets may result in a continuous series of 'one-off' schemes, diminishing effectiveness.

4. Assessment of Current Measures

The conservation measures currently in operation under the CFP have come under considerable criticism. This section analyses each of the current provisions discussed in the previous section from both a practical and theoretical viewpoint.

According to the FAO Code of conduct for responsible management of fisheries, *when considering the adoption of conservation and management measures, the best scientific evidence available should be taken into account in order to evaluate the current state of the fishery resources and the possible impact of the proposed measures on the resources* (Article 7.4.1). Also and as previously discussed, considerable measures are taken to ensure accurate and comprehensive scientific information is collated. However, although advice from scientific sources takes precedence during preliminary stages, the process adopted by the CFP in setting the TACs fails to make full utilisation of this advice. This results in TAC proposals becoming part of a predominantly political process in the final European Committee discussion.

Under the Relative Stability Framework¹¹, political compromise results in a catch allocation, which is far from being scientifically based. Daw and Gray (2005) have pointed out that the political responsibilities of Fisheries Ministers results in a conflict of interest, whereby the welfare of their electorate can take precedence over sustainable exploitation of fish stocks. As a result, national self-interest and undeclared social objectives can sometimes be dominant influences in final TAC negotiations (Symes, 1997). As the Rt. Hon John Gummer MP, former British Agricultural and Fisheries minister put it *"If you are a fisheries minister you sit around the table arguing about fishermen, not about fish. You're there to represent your fishermen. You're there to ensure that if there are ten fish you get your share and if possible a bit more. The arguments aren't about conservation, unless of course you are arguing about another country"* (Fishing News, 1998).

¹¹ The allocation of quotas amongst member states is based on the average catches when the CFP was first implemented, thus ensuring 'relative stability'

This trend has resulted in actual quotas being set in excess of that which has been scientifically advised. A study by A. Karagiannakos (1996) has illustrated the occurrence of this trend throughout the 1980s and 1990s. Evidence also exists for the continuation of this trend past the 2002 reform. Similarly, a study by Daw and Gray (2005) outlined one case in which the ICES expressed concern over the status of North Sea cod, recommending a complete moratorium on all catching of cod, including bycatch. The STECF accepted this advice but the Commission proposed an 80% reduction in the cod TAC. The Council of Ministers eventually agreed on only a 45% reduction in TAC in conjunction with effort limitations. Thus, it can be seen that significant deficiencies in the current system of advice exist. Similar trends were found in the 2007 negotiations, where many of the TAC levels agreed upon contradicted much of the advice offered by scientists. Previously, the Commission had proposed to reduce cod quotas by 25% in most regions. However, it allowed an 11% increase in the North Sea, justifying this by stating that recovery is still possible if discards, bycatch and effort are reduced. (Irish Times, 2007b)

In the interview with Mr. Gerard O’Flynn, IS&WFPO it was noted that considerable under-usage of potential information exists. According to Mr. O’Flynn not only is there a deficiency in using scientific advice in policy formulation but practical experience and knowledge of the fishermen themselves has been underused in the formulation of scientific advice. He also pointed out that fishermen have extensive knowledge on some aspects of the resource and stock levels, which can have a valid contribution in the formulation of scientific data. Mr. O’Flynn stated that he would like to see a more co-ordinated relationship between scientists and the fishing community, more purposeful partnerships and a move towards better incorporation of scientific information in policy formulation. Since that interview a Marine Institute funded project is underway in NUI Galway that is aimed at developing methodologies for accessing the tacit knowledge of fisher communities and the rendering of their insights into a rigorous scientific mode that can be useful for the policy process and more widely in the marine science community¹².

Following on from the above discussion, it is clear that despite a willingness to co-

¹² For further information on this project see http://www.nuigalway.ie/semru/tacit_knowledge.html

operate, the necessary relationships for effective management of fish stocks in EU waters are still not present. Differences in ‘cultural understanding’ between scientists, policy makers and fishermen, along with ‘institutional constraints’ induced by the current arrangements have resulted in the private aims of each individual group being misaligned with the common goal of a sustainable resource (Delaney and Hastie, 2007). Considerable criticism has also been directed at the standard of data collected in formulating scientific advice, further undermining the achievement of an optimum TAC (ICES, 2007). The current method of formulating scientific advice by the ICES is through the usage of complex analytical models of the fishery. Such models require detailed and accurate data to predict the future state of fish stocks (Kelly and Codling, 2006). This data, however, is not always available to a sufficiently high standard for certain stocks (ICES, 2007). The deficiency in engagement with the resource users in data retrieval is seen as a contributory factor to this inaccuracy. As a result, unreliable data leads to unreliable model results and thus unreliable advice (Punt, 1997).

Along with practical deficiencies in the current method of fisheries governance, research has shown that the theory upon which this method of conservation is based is fundamentally flawed. Studies have illustrated that the occurrence of any biological anomalies or variability within the ecosystem when stocks are at MSY levels can lead to a potential collapse (Larkin 1977 and Sissenwine, 1978, Botsford et al., 1997; Pew Oceans Commission, 2003; Pikitch et al., 2004). A study by May et al. (1979) has augmented this argument, illustrating that an MSY level of catch does not take into account the interactions amongst fish. Commenting on reducing fish stocks to the proposed economic optimum of MSY, Larkin (1977) points out that with the reduction in the number of spawning age classes, a failure in egg or larval survival for any reason is potentially far more catastrophic in its effect on long-term abundance. It has also been found that TAC regulations are not suited to mixed species fisheries, as fishers may catch more than one species at a time (Symes, 1997). If the quota for one species has been reached, fishermen have an incentive to continue fishing for other species for which a quota hasn’t been filled yet. Fish for the quota which has been reached may still be caught and as a result may have to be discarded, or landed illegally (Northern Ireland Assembly, 2001). As a result, illegal fishing above the quota amount is likely to occur, thus undermining the ecological

stability of the MSY goal.

The CFP has also failed in a strict and uniform enforcement of its standards, resulting in further deviation of catch from the proposed MSY level. Discarding, Misreporting¹³, Slipping¹⁴, Illegal Landing¹⁵ and High Grading¹⁶ are all common illegitimate fishing practices, many of which have resulted from the altered incentives faced by fishermen as a result of TAC regulations. Discarding has become one of the most prominent problems. Discarded catch is defined as that portion of the total organic material of animal origin, which is thrown away (usually dead) or dumped at sea (Kelleher, 2005). Two main reasons contribute to the problem of discarding. First of all, in a mixed fishery, fishermen may catch fish which they do not have a quota for, and thus must discard. As much of the EU waters are mixed, bycatch is quite a considerable problem. Secondly, with a limit to the quantity of allowable fish landings, it is an economically sound practice to discard small fish in favour of larger fish. A study by Enever et al. (2007) assessed discard levels by Welsh and English fleet in the ICES subarea VII (a substantial part of which is considered Irish coastal waters). Observed discard levels were as much as 63% of total fish numbers landed, equating to 35% in terms of weight.

From an ecological perspective, one can infer from these findings that quite large amounts of young fish are needlessly removed from the ecosystem. A paper by Ritchie (2003) has also shown that fishermen can have a heavy reliance on illegal landings out of economic necessity. Along with this, Boude et al. (2001) has reported how technical measures to avoid excessive catch of young fish have been frequently resisted and pushed back. This has been due to political and economic considerations taking precedent, as the precarious financial situation of many fishermen would not enable them to support the losses which would result from this in the short run.

¹³ Misreporting involves entering a falsified account of where a particular catch has been caught.

¹⁴ Slipping of fish occurs when a catch contains the wrong mix, size, type or condition of fish. The net is never taken out of the water, it is simply opened to release the fish, the majority of which are already dead.

¹⁵ Illegal landing involves the landing of fish for which a vessel does not have a quota, or fish which may be underdeveloped

¹⁶ Smaller less valuable fish are discarded in favour of larger more valuable fish, in order to stay within the allocated

Frustration has also been experienced by Irish Fishermen due to the slow implementation of the proposed structural changes recommended in the Irish Seafood Industry Strategy Review Group (SISRG)'s "Steering a new course" (FIF, 2008a). This programme of reform is seen as a prerequisite to any further amendments to bring Ireland's fishing fleet to a sustainable level. The slow implementation of fleet restructuring programmes has been a common trend in the restructuring of the European fishing industry in general, across all member states since the 1980s. First introduced in 1983, the CFP's Multi-Annual Guidance Programmes (MAGP) has been ineffective in achieving the necessary reduction in fleet capacity (Symes, 1997). Scientific advice backed by research such as the Gulland report (1990) and the Lassen report (1995) have not been heeded to the full extent, resulting in a compromise between an ecological sustainable fleet and a politically acceptable reduction in fleet. These past failures to implement sufficient action have resulted in the escalated overcapacity problem now being faced in the Irish fishery. The problems of overcapacity in the Irish fishing industry, along with rising fuel prices and uncertain fish prices has led to the current crisis facing the fishing communities of Ireland (O'Cinnéide, 2009). This problem has been escalated as a result of the delayed implementation of the decommissioning scheme.

5. Current Proposals for CFP Reform

The current strategy for the development of a sustainable fishing industry, proposed by the Irish SISRG and Bord Iascaigh Mhara, is outlined in the publication "Steering a new course" (Cawley et al., 2007). Along with these considerations, the National Strategy Review Group (NSRG) on the Common Fisheries Policy has proposed measures to address the current deficiencies. Ultimately though these groups will only contribute to discussions about proposed reforms. Final reforms will be decided at the Community level, though the 2009 CFP green paper indicated that there is scope for Member States to play an autonomous role in *how* overall targets of the reformed CFP are to be achieved.

The issues of discarding, high grading, misreporting and illegal landing are all

contributing factors in the unsuccessful fisheries management according to the Cawley Report. Through discussions raised in formulating the future CFP strategy, many proposals have been heard to tackle these issues, some of which have been cited by the NSRG. Some of the more prominent proposals include more size selective and species selective fishing gears, a higher level of control and enforcement at sea, and the introduction of real-time closures when the proportion of small fish becomes too great.

Many of these proposed measures have met with some criticism. In discussion with Mr Gerard O'Flynn of IS&WFPO, it was found that Irish Fishermen are in favour of the introduction of more selective gear, but express frustration in relation to uneven rules being imposed amongst different fleets. He also stated that it is unfair to impose more restrictive measures on the Irish fleet, without equivalent measures being imposed on other member state fleets that fish Irish waters. Therefore, the introduction of improved TCMs must be seen to be implemented at a European level, in order to ensure that all stakeholders feel that they are operating under similar restrictions.

Aside from the issue of fairness, the effectiveness of TCM in reducing discards has also met with some criticism. A study by Rochet et al. (2002) observed members of the French fleet operating in the Celtic sea. It was found that, although possibly effective for prohibiting the landing of underdeveloped fish of the target species, a considerable amount of fish discarded are fully developed bycatch of another species. Even if the CFP was more focused on an ecosystem based approach to fisheries management, this would still not yield a reduction in the discard rates and since species specific TCM are still not adequately developed to undo this issue, measures other than TCM are required to solve the discard issue. The commission's recent CFP green paper has touched on the potential of transferrable quotas as a possible means to reduce discards but there is no indication to date as to whether this proposal will actually manifest itself as a reform.

In 2007 the EU Court of Auditors highlighted the weakness of fisheries control in the EU (COM, 2009). The Commission agreed with this claim and decided 'it was urgent to move ahead with an immediate in-depth reform of the control and enforcement

system'. In drawing up a proposal to develop the Irish Fishing Industry it was noted that there was a need for the placement of independent observers on fishing vessels (Cawley et al., 2007). These officials would be charged with the duty to monitor potential discarding and high grading activities. This policy has also been suggested by the NSRG in their pre-2002 reform review, citing its effective use in the Falklands Islands and by the Northwest Atlantic Fisheries Organisation (NAFO) (NSRG, 2000). The NSRG recommends that a unit of community funded observers from the Member States be employed. This unit could then be deployed at short notice to particular fisheries in specific areas which are suspected of discarding, high grading, 'slipping' of fish, misreporting or targeting undersized fish. These would operate in a similar fashion to the NAFO observers without having any role in enforcing the eradication of infringements, which they may encounter. The European Commission's decision to 'move ahead' with enforcement control took the form of a communication from the Commission to the European Parliament and the Council. This communication stressed that the legal framework of the CFP would have to be simplified to allow for ease of prosecution of rule breakers and recommended that technological monitoring methods be incorporated into management (COM, 2008).

The closure of biologically sensitive areas is another common practice under current CFP regulations. In past applications, however, it has failed to recover stock levels to that which was anticipated. The closure of spawning grounds, incorporated as part of the Irish Sea cod recovery, resulted in a less than anticipated recovery of stocks. Fishermen were also greatly disadvantaged, and no compensation package was established. The communication from the commission to the European Parliament and the Council highlights the fact that the introduction of the new vessel monitoring system (VMS) may help to combat many of these problems, allowing closed areas to be regulated more closely. From an economic point of view, it has been found that many fishermen prefer regimes such as those that protect spawning areas and those of biological sensitivity. In a study by St. Martin (2001), it was found that fishermen of New England avoided some areas of spawning as they didn't want large amounts of underdeveloped fish. Along with this, it was found that short-term closures, such as those proposed, were preferable to those for long periods. Area closures can also arise independently of fisheries management, for example, through Special Areas of Conservation (SACs) which are enforced by the National Parks and Wildlife Service

of Ireland.

The EU habitats directive, which was brought into Irish Law in 1997 and amended in 1998 and 2005, is the legal basis through which SACs in Ireland can be created. These are zones where prime wildlife is protected from man's activities. It is noteworthy that 47% of the 13,500 square kilometres of SAC designated zones are in Irish coastal waters or large lakes. Consequently, the SACs can have a large impact on Irish fishing activity and Irish fishermen's revenues. Moreover, of the 25 species intended for protection by forming SACs, none are commercial fish species. Indeed, many are predatory sea mammals who compete with fishers for the scarce fishery resource. In an open access system, it is difficult to convince fishers to restrict their effort/catches since future benefits may not accrue to them. It is more difficult to argue in favour of restrictions which may have a benefit for certain species, while at the same time not being of benefit to the fishers themselves. There is no simple solution to this trade off between higher ecosystem functioning and fishermen's revenues but it is an important issue to highlight and worthy of further discussion.

Along with proposals made to BIM, discussions with other stakeholder groups have contributed proposals for amending the current conservation pillar of the CFP. The Federation of Irish Fishermen (FIF)¹⁷ has also been in consultations, on fishermen's behalf, with representatives of the EU presidency during its French tenure.. In relation to fisheries governance, the FIF wish to see the 'Hague Preferences,' mentioned earlier, enhanced and enshrined into EU law. These preferences provide Ireland with certain protection on quotas and reduce the level of cuts that can be imposed on the Irish fleet. Although they have been 'robustly defended' in past European Commission negotiations, any enshrinement into law has yet to be achieved. (FIF, 2008b)

The traditional view of fisheries management follows the theory of aligning the amount of fish caught with the maximum sustainable yield. Research is beginning to show, however, that a broader ecosystem-based fishery management regime is more

¹⁷ The Federation of Irish Fishermen are an umbrella group which represent all the Irish FPOs, providing co-ordination in the governance of Irish fisheries.

appropriate than simply focussing on single species catch statistics. The principle of ecosystem-based management is based on the importance of recognising ecosystem structures and functions and then responding to signals in order to manage anthropogenic activities and uses (Day et al., 2008). It takes into account the ecological interrelationships that may exist within the ecosystem of the fishery, not just that of the fishing activity. Many of these relationships can give rise to intricate dynamics (such as multiple equilibria and bifurcations) which can lead to unreliable analysis (May and Oster, 1976).

Due to this switch towards ecosystem-based fishery management, the Ocean Science Services (OSS) Department of the Irish Marine Institute is becoming increasingly more involved in fisheries governance with traditional management measures beginning to become more linked with ocean management. This incorporates the use of oceanographic and sea bed mapping (e.g. The Marine Institute's INFOMAR¹⁸ program), along with climate change data in the management of fisheries. The establishment of the research initiative entitled "Sea Change," co-ordinated by the Marine Institute, has as one of its central aims in relation to fisheries governance the adoption of an integrated and co-ordinated approach to fisheries management and development planning. With this central aim, it hopes to ensure that the development of the Irish fishing fleet is compatible with the need to protect and improve the marine ecosystem for the benefit of society (Marine Institute, 2006).

As Turrell (2004) has stated, an ecosystem based approach to fisheries management focuses policy on ecosystems rather than single stocks, with oceanography taking a central role in the formulation of such policy. This train of thought has been followed at an EU level with the 2006 publication of "Towards a future Maritime Policy for the Union: A European vision for the oceans and seas," along with its updated 2009 Progress Report. This proposal incorporates the current CFP fisheries governance into a broader maritime agenda, suggesting that fisheries management be considered alongside other sea based policies and activities. This report proposed further

¹⁸ INFOMAR is a mapping project undertaken by the Marine Institute, with the goal of producing mapping products detailing the physical, chemical and biological features of the seabed

stakeholder participation and self regulation as a possible aid to helping current fishery sustainability issues. Acknowledging the introduction of this in the establishment of RACs in the 2002 reform, it states that Corporate Social Responsibility strategies may also be beneficial. As of the 2009 progress report, six priority areas have been outlined for the future direction of the plan, with Integrated Maritime Governance, Economic Growth and Sustainability being notable inclusions.

Finally, the European Association of Fish Producers Organisations (EAPO) has advocated the use of improved stakeholder involvement and grassroots stakeholder groups as a means to solve many of the social and economic deficiencies of the CFP. The difference between quotas and catch has also been addressed, citing property rights based management systems as a possible alternative (EAPO, 2008). Speaking at a conference held in June 2008, CEO of the Killybegs Fish Producers Organisation Sean O'Donoghue proposed reforms leading up to the next CFP review in 2012 (many of which have already been discussed above). The most prominent of these proposals included a new quota management system, the introduction of administrative sanctions for minor fisheries offences, simplified and rationalised fisheries regulations and improved industry-science partnership.

6. Alternative approach: Rights-Based Management Regimes (RBM)

The current reforms being proposed share common goals in achieving the aim of improved sustainability, more responsible fishing practices, a more favourable allocation of catch for the Irish fleet, improved stakeholder involvement and improved industry science partnerships. As has been discussed however, the political and institutional framework has been the underlying cause of many of the CFP's shortcomings. In this section we illustrate how an alternative system of governance, a rights-based management regime, could incorporate all the above characteristics in the establishment of a sustainable fishery, whilst avoiding many of the problems inherent in the current CFP.

Apart from the CFP's command and control based governance of EU fisheries, a typology of regionalised property rights regimes exists. Such systems allow governance of the resource at the local level, devolving many of the responsibilities

to local authorities, interest groups and the resource users themselves. The balance of power between these local groups and central government gives rise to different types of regionalisation. Such a resource becomes what is known as a Common Property Resource (CPR). Traditionally, the coastal waters of Ireland were governed at the local level. When fishing activity first escalated to an extent that threatened stock levels in the 1960s, fishermen's co-operatives were responsible for introducing voluntary measures to restrict catches and effort in order to maintain fisheries. This system of local based governance was gradually eroded, with TAC levels being set by the North East Atlantic Fisheries Commission (NEAFC) prior to Ireland's accession to the EU. This system was further centralised within the current EU CFP system in place today (Molloy, 1995).

Kapoor (2001) points out that we often hear of Western technological innovations (e.g. high-yielding seeds used during the 'green revolution') being transplanted to developing countries; very seldom do we hear about 'traditional' techniques or institutions (e.g. community forestry) from the developing world being promoted by international development agencies for adoption in developed countries. Localised rights based fisheries management regimes is another such 'traditional' institution from the developing world that the European Union could learn from. Rights based management regimes build on the variety of information and knowledge held by the diversity of stakeholders. In theory, at least, participatory management approaches offer a number of advantages. Firstly, they expand the information available to the management process by considering local knowledge and by increasing the representation of the community or stakeholders in the management process. Thus, legitimacy is built into the system. Participatory management approaches such as rights based management regimes can also contribute to conflict resolution and to clarifying and stabilizing the communication between the different groups involved. Furthermore, improving iterative communication processes encourages accountability and compliance among the participants (Alpizar, 2006). Finally a rights based governance of a common property resource can be tailored to suit the needs of each specific fishery.

Although the level of government involvement in the management of the resource

can vary considerably depending on the situation, three primary types of RBM exist:

- Community-based Common Property Resource (CBCPR)
- Co-management
- Community-Based Co-Management (CBCM)

CBCPR involves complete devolution of exclusion and extraction rights to local authorities, interest groups and users. Originating from the operational principle of proximity or subsidiarity, it argues that those who are closest to the operations of a resource are best placed to manage it. It is based on social science and anthropological studies whereby it has been found that user groups are effective in managing a resource through sophisticated systems of self regulation and founded on sound empirical knowledge (Symes, 1997). The key to the success of these regimes is the ability of a community using a common resource to limit the access of outsiders, and to self-regulate its own harvest. Common property management works through the careful control of incentives. Often, if members of a group are assured that future harvests would be theirs by right, and not end up being harvested by another group, they will have the economic incentive to self-regulate (Berkes, 2005). By empowering users and restricting access to a sufficient degree, such incentives can be created. As a result, the 'tragedy of the commons' is avoided.

In addition to devolving power to communities, CBCPR strategies allow for site-specific analysis and management (Basnet, 1992; Brandon, 1995). As a result, these regimes can be more responsive to spatial and temporal variances in fishery characteristics, both ecological and economical. Such improved responsiveness has the potential ability to increase the efficacy, legitimacy, and sustainability of natural resources management (Basnet, 1992). It should be recognised however that CBCPR assumes the existence of a manageable resource system in the first instance. The geographic spread of the functional ecosystem for a particular species may be so wide that a local group would be ineffective in influencing the health of the total system. Of course the management system will differ by species. For example, a lobster management system may involve a smaller geographical area compared to that of a species such as cod.

Co-Management differs from CBCPR as government agencies play a role in governing the resource. Pomeroy (1998) defined Co-Management as a partnership arrangement in which government agencies, the community of local resource users, non-government organizations, and other stakeholders (fish traders, boat owners, business people, etc.) share the responsibility and authority for the management of a fishery. Building on the theoretical foundations of CBCPR, co-management allows for a translation of traditional self regulation to a modern industrialised world, through the involvement of state agencies (Symes, 1997). The extent of governmental involvement can vary, with Sen and Raakjaer-Nielsen (1996) outlining five broad roles. On a descending scale of involvement, the governmental role can be instructive, consultative, co-operative, advisory or informative. The level of involvement employed is chosen in accordance with country-specific and site specific conditions. Some of the considerations taken into account include the level of willingness to participate, along with the perceived ability of local users to adapt (Pomeroy, 1995). As these characteristics are dynamic in nature, the flexibility of this system provides an infrastructure which can be modified as a community becomes more adept.

Along with this, co-management can serve as a mechanism for both fisheries management and for community and economic development by promoting the participation of fishers and the community in actively solving problems and addressing needs (Pomeroy, 1995). As a result, these regimes can be tailored to suit the requirements of the resources and the community, in which it is placed, contributing to the implementation of an optimal system of governance. Establishing a successful co-management regime involves careful formation of formal and/or informal institutional organisations, in order to effectively represent the respective stakeholders. As state interaction is involved, the frameworks established may need to be more formally recognised than that of CBCPR regimes (Pomeroy, 2001). This may result in the requirement of significant investment in resources, especially if the regime is to be effectively tailored and modified to suit the particular situation.

The third type of RBM is Community Based Co-Management. This system incorporating elements of both community based management systems and co-management systems. From the above analysis, one can see that the focus of a

CBCPR is that of the people and community, whilst co-management takes these considerations, along with the partnership between the community and state into account. A community based co-management resource on the other hand incorporates the community focus outlined in CBCPR, but acknowledges that “to sustain such action, a horizontal and vertical link is necessary” (Pomeroy, 2001). This involves the incorporation of state agencies and representatives in early stages of policy formulation and implementation, something which can often occur in co-management but less often in CBCPR, where the state is often seen as an outsider to negotiations. Thus, a community based co-management regime can be considered a hybrid regime, incorporating both characteristics of CBCPR and co-management to become people-centered, community-oriented, resource-based and partnership-based (Pomeroy 1998).

In order to accurately assess the suitability of any the above right based regimes in an Irish context, the factors contributing to their success must first be analysed. To start with, a tradition of community managed fishing results in a solid base of practical knowledge formed by the user group, possibly compiled over generations (Berkes, 2005). Many successful RBM regimes have developed over long periods, with traditional methods employed to regulate access and subtractibility (Lobe et al., 2004). In such schemes, established norms have been imperative in the success of the regime, especially in developing countries. Particularly interesting from an Irish point of view is that many such systems in more developed countries have worked without such a foundation. In a study of several Turkish coastal fisheries carried out by Berkes et al. (1992), an established system of self-organisation and self-governance was found to have established itself over a ten year period. In Alanya on the Mediterranean coast of Turkey, local fishers developed a system based on the rotation of fishing sites by drawing lots. This system was used to regulate the fishery and solve the problem of escalating conflicts over prime harvesting areas (Berkes et al., 1992). Similarly, the lobster fishing territories in Maine, USA (Acheson 1988), and the common-property systems in St. Lucia for sea-urchins (Smith and Berkes, 1991) have emerged in relatively recent times. These approaches illustrate ways in which the adoption of such systems may be possible without any previously established tradition.

One of the primary shortcomings of the CFP is the perceived nature of the regulations working against the fishermen, as opposed to with them. As a result, an alternative strategy would require the support of fishermen to ensure compliance and effective operation. This is a trait which is common to many of the RBM regimes which have been implemented. The shellfishery of the Shetland Islands represents a leading example of a coastal resource managed through regionalised governance. A study carried out in 2000, as the formal implementation of the regionalised system was being considered, strong support amongst fishermen and local authorities was observed for such a regime. It was found that there was a desire for greater recognition of users' views and skills in the management process. Along with this, strong support was felt for the devolution of management responsibility and establishment of local controls. Approximately 90% of those surveyed were in favour of hypothetical management options in which local industry would be the dominant partner (Crean and Wisner, 2000).

According to Noble (2003), the evidence tends to show that a desire for this form of management does exist. The barriers to setting up this type of regime are often the skills and resources which are not available to bridge the differences of opinion and the lack of trust and confidence between prospective partners. The key according to Noble in successfully implementing this regime is to firstly work towards building capacity for participation by encouraging a willingness to participate and secondly to build optimism in relation to the willingness of others to participate. The primary barrier to adoption of effective RBM therefore is not unwillingness on part of the users, but rather a defeatist attitude. Zanetell and Knuth (2004) have found that a lack of positive attitude, despite expressing a willingness to participate in an alternative regime, can have a devastating effect on a proposed RBM. In their study, users' perceptions of the current and future state of the fishery correlated with an unwillingness to participate, indicated a defeatist attitude. In an Irish context, the pessimistic attitude of fishermen towards governance and the fishing agencies would have to be addressed in order for any successful adoption of a RBM system.

In order to successfully implement such a regime, proactive characteristics across the stakeholders would need to be fostered and sustained. Along with this, legislative and

institutional changes would have to be made at both the local, national and European level. Thus, the necessary infrastructure must be created to ensure an effective system is in place. In order to encourage active participation and compliance with a new community based regime, certain elements must be introduced. Firstly, 'empowerment measures' must be invoked. As Byers (1996) has stated, these empowerment measures give people the sense that they have the power and skill to act in ways that can resolve environmental issues. User group empowerment provides options, or allows organisations to at least be aware of options that reduce environmentally-damaging fishing practices. These options may be technological or social; for example, the substitution of new fishing techniques or the formation of new policies that enable local users to harvest the resource more sustainably. Zanetell and Knuth (2004) also discuss these empowerment measures and suggest the promotion of improved ecological understanding and increased awareness of sustainable fishing practices. Such education gives the user group competence and confidence, at both an individual and collective level, and equips them with the necessary skill set to take an effective role in the management of the fishery.

Katon et al. (1999) point out that a people-centred and consensus driven approach is integral to the success of a rights-based management regime. In their San Salvador island example, this approach resulted in a sense of ownership, accountability and control which in turn bred an attitude of commitment, compliance and willingness to participate. As Zazueta (1995) state, this greater sense of ownership in turn spurs team-building, joint problem-solving and local management capacity. The most important aspect of this participation is the level and quality of stakeholder input. Involvement by relevant stakeholders is required in all decision-making phases and throughout the programme cycle (i.e. from design to implementation to evaluation) for participation to be meaningful (Kapoor, 2001).

Regardless of the type of governance regime pursued, efforts need to be co-ordinated by the establishment of an administrative group. In some cases, the user groups have to take the initiative themselves and form their own administrative body, before receiving official financial support and recognition, whilst in others the already established infrastructure of fishermen's organisations provides the necessary foundation upon which to build the necessary institutions (Noble, 2003). Pomeroy

(1997) has illustrated the infrastructural requirements needed for the introduction of a Rights Based Management system. In a study focusing on the devolved management of fisheries, upland agriculture, and social forestry in the Phillipines, effective implementation involved institutional strengthening of government agencies, infrastructure, applied communications, research, training, and technical assistance. Along with this, participatory planning and implementation at the smallest administrative division, supported by appropriate government line agencies and local government units were necessary in building a resilient system. Such support took the form of meetings and consultations held with individuals, user groups, and officials. Development of community awareness, local managers and community-based organizations were also instrumental in success.

In devolving governance in the Shetland Shellfishery, a regulating order was issued to a management co-operative with powers to control entry to the fishery and to enforce management measures. This group, entitled the Shetland Shellfish Management Organisation Limited (SSMOL), was established by the Scottish Fisherman's Organisation (SFO) in consultation with stakeholders and the Shetland Islands Council (SIC) (Noble, 2003). The Regulating Order allowed the management of shellfish stocks through effort limitation. The SSMOL's objective was to manage all shellfish stocks within 6 miles of the Shetland coast. Initially, fishermen who traditionally fished in the area were granted a permit, with further permits granted only if the stocks would allow. Along with this, additional restrictions covering vessel size, gear type, closed areas and seasonal closures. Finally, it was proposed to initiate stock enhancement schemes such as lobster restocking. However, it was pointed out that such restocking schemes could only be effective if a proper regulating framework was in place, thus implying that the regulating order was only a first step in the development of the Shetland Shellfishery RBM regime (Goodlad, 2000).

7. Rights Based Management Regimes in an Irish Context

Having discussed the social and institutional prerequisites when implementing a community based resource management system, we must now apply the necessary criteria to an Irish context in order to determine whether such a system is appropriate.

As has been discussed earlier, stakeholder willingness to participate is crucial to the successful implementation of a rights-based regime. A study of the socio-economic characteristics of the Irish fishing industry found sentiments of “quiet despondence, a puzzled desperation and, above all, signs of a pervasive alienation” towards the current fisheries regulations (O Donnchadha et al., 2000). A separate report on the socio-economic profile of Donegal found that the population of fishing communities surrounding Killybegs was in decline (IDG, 2006). This report stated that “the fishing and fish processing sectors have been in decline due to a combination of the dwindling supply of fish, the EU quota system and the fact that the large trawlers do their own processing on board, thereby not requiring on-shore processing facilities”. Findings of the survey indicated that if the prevailing trends continued, there was little hope of a viable fishing industry in the west of Ireland, having potential damaging effects on the coastal communities.

This IDG (2006) survey also found that fishermen felt a sense of powerlessness under the current regime. This lack of confidence may, however, indicate that fishermen would be receptive towards an alternative. While they may be slow to change, Irish fishermen are experienced businessmen and according to the CEO of IS&WFPO, Mr. O’Flynn (personal interview) their “ability and drive should not be underestimated.” These statements would indicate that an attitude amongst Irish fishermen in favour of change does exist. In relation to the imposition of possible empowerment measures in the form of educational measures on ecological or fishing practices, the many fishing representative bodies in Ireland already offer advice to their members on matters such as sustainable and efficient fishing practices, so any required measures needed to endow fishermen with the necessary skill set are likely to be met with much co-operation, as it would represent little change from the current status quo.

In the implementation of various community based fisheries governance systems, the provision of the appropriate institutional framework was a necessary prerequisite to success. When studying the Irish scenario, both positive and negative aspects become apparent. First of all, little change may be required in introducing a localised system of governance. The current system of fishery producer organisations provide ideal foundations upon which to build localised administrative institutions to manage and

control fisheries. Much of the social and legislative infrastructure required for effective management is already in place. As a result, preliminary meetings and organisations to establish the new infrastructure would not be as significant as has been seen in the establishment of such regimes elsewhere. Despite this, the necessary investment to strengthen the communications, research, training, technical assistance and government agencies in order to deliver such a system is less certain. There exists uncertainty in relation to the financing of these proposals under the current economic climate. This, along with the lethargy experienced in the implementation of the Fleet Decommissioning scheme, would indicate that such a regime could face problems in the early stages of implementation.

An alternative approach to implementing a rights based management scheme in Ireland that might be suitable is a transferable vessel quota scheme. According to Cawley et al., (2007) a fishing sector, supporting and operating under a Fisheries Management Regime, comprising both a quota management system and a fleet management and licensing policy, that is equitable and transparent, incorporating effective control and enforcement mechanisms, delivering biologically sustainable stocks, promoting economic viability and stability for vessel owners, and generating a greater focus on market needs, could become a reality in Ireland under the correct circumstances.

This vision for the Irish fishing sector could be achieved through devolved quota management, namely a Transferable Vessel Quota (TVQ) system. Under this regime quotas have equal applicability to all vessels, including inshore vessels and those not represented by the local FPO. Each FPO would take responsibility for administering quota allocations amongst the fleet of the local fishery. Quota allocation under this scheme would be decided by an Industry Quota Management Committee, comprising FPOs, inshore representatives, non-aligned fishermen and processors/marketers. This proposed management system shares many similarities in structure to that introduced in the Shetland Island shellfishery, discussed earlier.

Following research into the stock levels of lobster in Irish waters (BIM, 2008b), BIM put forward an information paper, outlining a co-management plan. Entitled,

“Managing Access to the Irish Lobster Fishery”, it outlines a regionalised management plan between the state and fishermen. Only fishermen with official authorisation to fish in the specified region will be granted access. Along with this, members of the lobster industry themselves will be delegated responsibility of managing the implementation of the plan as part of the local lobster management units. These arrangements are being tailored to suit each specific region. Compiled in consultation with lobster fishermen, this document has been circulated to the rest of the industry for consultation. These proposals are very encouraging, and could form the basis for the introduction of similar devolved management in relation to other fish stocks.

8. Discussion and Conclusions

Creating a sustainable policy of fishery management involves carefully balancing economic viability, political acceptability and ecological sustainability. In order to ensure that all aspects of management are provided for, policy needs to be carefully formulated. Through the preceding analysis, however, it has become apparent that the current measures being implemented under the CFP are irreconcilably flawed. Based on unsuitable theoretical foundations, it is apparent that the measures of TAC regulation are inappropriate for ensuring a sustainable fishing industry in the long run, both ecologically and economically. Such command and control policies have been shown to be unsuitable for a mixed fishery, providing user incentives with the potential to cause more problems than they create. Along with this, poor enforcement of Technical Conservation Measures, in an effort to limit these negative consequences, has exacerbated the fishing resource sustainability.

Many flaws also exist in relation to implementation. In attempting to achieve sustainable fisheries management, the conflicting political interests at play, along with the many economic challenges being faced by the industry, have resulted in the CFP contributing to the inadvertent neglect of ecological sustainability. As a result, an alternative management regime must be considered. Before any effective devolved management plan can be implemented, the Fleet Management Scheme must be completed. The excess capacity of Ireland’s fleet means an ecologically and economically sustainable allocation of quota in any rights based regime may fail to

meet one or both of these targets. These failures have compounded the struggles already facing the industry (increasing fuel costs and decreasing fish prices), and delayed any possible restructuring of the management framework.

The adoption of an ecosystem-based management regime could also overcome many of the theoretical discrepancies associated with the current scheme. Suitable scheme adoption requires correct identification of the vital relationships in marine ecosystems in order to determine the range of policy options that protect this infrastructure of relationships and thus the resource as a whole. The current research being undertaken in this area highlights the relationships, which must be considered. By applying this research a more appropriate method for determining catch and managing the fisheries may be formulated which, if applied in conjunction with the EU's Marine Strategy Framework Directive, may result in a more sustainable Irish fishery.

The strategic position of the Irish FPOs is one of great importance when considering the most suitable form of governance under any reform of the CFP. A full devolution of governance may not be the most efficient course of action, given the infrastructural requirements for co-management or the proposed TVQ system. A significant transformation of the current approach must be achieved, whereby the dissatisfaction and frustration experienced by Irish fishermen with the current regime is replaced by their empowerment to effectively control and manage a community rights based management regime. However, judging from discussions at the Mini Conference on Irish Fisheries Management held in the Irish Marine Institute in June 2010 there is a willingness to participate in a substantial reform of the CFP across stakeholders and an attitude of reasonable compliance by Irish fishermen. The governance of fisheries is not a simple issue, but having assessed the many considerations which must be taken into account, the formulation of a rights based management policy similar to that outlined may provide the most economically and ecologically prudent approach.

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List of Abbreviations Used:

ACFA:	Advisory Committee on Fisheries and Aquaculture
ACFM:	The Advisory Committee on Fisheries Management
BIM:	Bord Iascaigh Mhara
CBCPR:	Community Based Common Property Resource
CFP:	Common Fisheries Policy
CPR:	Common Property Resource
CWP:	Co-ordinating Working Party on fisheries statistics
DAFF:	Department of Agriculture, Fisheries and Food.
DCMNR:	Department of Communications, Marine and Natural Resources
EAPO:	European Association of Fish Producers Organisations
EEC:	European Economic Community
EEZ:	Economic Exclusion Zone
EFF:	European Fisheries Fund
EU:	European Union
FAO:	Food and Agriculture Organisation
FIF:	Federation of Irish Fishermen
FPO:	Fish Producers' Organisation
FSS:	Fisheries Science Services
GT:	Gross Tonnage
ICES:	International Council for the Exploration of the Seas
IFPO:	Irish Fish Producers Organisation
INFOMAR:	Integrated mapping for the Sustainable Development of Ireland's Marine Resource
IS&WFPO:	Irish South and West Fish Producers Organisation
KFO:	Killybegs Fishermen's Organisation
MAGP:	Multi-Annual Guidance Programs
MI:	The Marine Institute
MSY:	Maximum Sustainable Yield
NAFO:	Northwest Atlantic Fisheries Organisation
NDP:	National Development Plan

NEAFC:	North East Atlantic Fisheries Commission
NSRG:	National Strategy Review Group on the Common Fisheries Policy
NWWRAC:	North Western Waters Regional Advisory Council
OSS:	Ocean Science Services Division of the Marine Institute
RAC:	Regional Advisory Council
RBM:	Rights Based Management
RO:	Regulating Order
SFO:	Scottish Fisherman's Organisation
SFPA:	Sea Fisheries Protection Authority
SIC:	Shetland Islands Council
SISRG:	Seafood Industry Strategy Review Group
SSMOL:	Shetland Shellfish Management Organisation Limited
STECF:	Scientific, Technical and Economic Committee for Fisheries
TAC:	Total Allowable Catch
TCM:	Technical Conservation Measure
TVQ:	Transferrable Vessel Quota
VMS:	Vessel Monitoring System

Table A.1 Breakdown of the Irish Fishing Fleet 2004

Segment	No. of Vessels	Percentage of Overall Fleet	Percentage Capacity of Fleet	Full-time Employment	Part-time Employment	Total Employment
Pelagic	23	1%	40%	276	-	276
Polyvalent	1,650	85	48%	3,320	872	4192
Beam trawl	13	1%	2%	73		73
Specific	158	9%	10%	255	191	446
Total	1,844	96%	100%	3924	1063	4,987

Source: Cawley et al., 2007