

# Can Private Property Rescue Fisheries?

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*The world's press regularly carries warnings that over-fishing is emptying the seas of their most important commercial stocks. Indeed, the economic signals arising from the institutional framework governing fishing encourage fishermen to act apparently logically but in defiance of their own long-term interests – with drastic effects on fish stocks. Radical overhaul appears to be the only solution.<sup>1</sup>*



The 'rush to fish' has resulted in over-capitalised fleets that drain resources from other sectors of the economy.

Any commercial fishing activity, whether undertaken by small scale, inshore vessels or large, sea-faring, factory trawlers, is a complex activity, often involving conflicting biological, social and economic goals. The exploitation of fish stocks provides employment in many areas of the world. Fishery products are furthermore an important food source which, obviously, is threatened when fish stocks decline. Over the past few decades agriculture has responded to increasing populations and growing demand for adequate nutrition with a spectacular increase in productivity.<sup>2</sup> But the fisheries sector has failed to do so.

Within the 200-mile Extended Economic Zones (EEZs) of coastal countries, marine resources are generally the property of 'the people', with the government playing the role of trustee. Under this arrangement, as with the regional agreements covering many high-seas fisheries, many marine fisheries have been left 'open': no single boat or fleet has the right to exclude another from harvesting any part of the resource. Any individual fisher who leaves fish to grow and reproduce – a vital element in any healthy marine ecosystem – thus risks losing them to less considerate rivals. There is therefore little incentive among producers to conserve fish for future use. This absence of private ownership of marine fisheries is the fundamental cause of poor economic performance and biological over-exploitation.

In an attempt to prevent over-fishing, government has therefore intervened with regulation. The management instruments used are of

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three basic kinds. Output controls set annual quotas on harvest volumes; once the quota has been reached, the fishery is closed for the year. Input controls limit the number of vessels that are allowed to fish (by requiring a license, for example) or other factors of production. Third, there are technical measures which protect undersized fish or spawning areas, including the specification of minimum mesh sizes which allow smaller fish to escape and grow to a commercial size. Most fisheries are managed using a combination of all three types. But in spite of the plethora of measures that governments have deployed, most fail to achieve their stated objectives.

First, from a biological perspective, the state of fish stocks has generally not improved following the introduction of such measures; harvest volumes of some species (Atlantic cod and halibut, for example) may, indeed, be reaching a point at which recovery is impossible. The reasons are numerous. Appropriate harvests are difficult to assess. The difficulty of monitoring fish in their natural environment means that scientific information is expensive to collect and difficult to analyse. Fish stocks, moreover, are very sensitive to changing environmental conditions: stocks that are healthy one year may be in a precarious condition the following one because of changes in water currents, temperature

**1. Towards Sustainable Fisheries: Economic Aspects of the Management of Living Marine Resources.** OECD Publications, Paris, forthcoming 1997.

2. At the World Food Summit held in Rome on 13-17 November 1996, the international community reaffirmed its commitment to eradicating hunger and agreed on a plan of action for increasing the year-round availability of food, improving access to supplies, and reducing the number of malnourished people. Scientific and technological progress have played a key role in increasing yields in the agricultural sector. Likewise improvements in the development of aquaculture have contributed to an increased share in the overall supply of fish. See David Blandford and Gérard Viatte, 'Ensuring Global Food Security' and Donald J. Johnston, 'Food Security and Sustainable Agriculture', **The OECD Observer**, No. 203, December 1996/January 1997.

3. FAO, Rome, 1995.

4. In 1988 the FAO estimated that the annual operating costs for the world's fishing fleet was \$92 billion while annual revenue was put at \$70 billion. This left the world fishing fleet facing a deficit of some \$22 billion (without accounting for capital servicing and similar costs).

5. The State of World Fisheries and Agriculture, FAO, Rome, 1995.

gradients, relative salinity or the availability of nutrients.

One solution to this uncertainty might be to adopt the 'precautionary approach' espoused in the *Code of Conduct for Responsible Fisheries* proposed by the Food and Agriculture Organisation of the UN.<sup>3</sup> It requires that, in the absence of sufficient information, harvest volumes be set below those compatible with the natural reproduction rates of the fish stock in question. The implementation of such a decision might nonetheless run into political difficulties: in the short run it would mean a loss of income for the fishermen harvesting the species coming under protection. In the long term, of course, harvests would be expected to increase as the stocks rebuild.

Management measures have also failed from an economic perspective, since they have not brought excessive fishing intensity under control. The result has been a vicious circle of decreased landings, lower revenues and intensified effort to make up the shortfall. In fisheries where governments have implemented quotas (seasonal or annual), the incentive facing individual operators is to catch as much as they can before the quota is reached. They therefore buy larger, more powerful vessels, fish longer hours, and so on, to outperform their competitors.<sup>4</sup> The over-capitalised fleets which result drain resources away from other sectors of the economy where they could achieve higher returns – and the world's governments already spend some \$54 billion to subsidise an industry that lands only \$70 billion worth of fish.<sup>5</sup>

From a marketing perspective, too, quotas have had undesirable consequences. As fishermen concentrate their effort at the beginning of the season, markets are glutted with fish – which lowers prices (either because of excess supply or because the fish have to be frozen and sold at a lower price later on) and, too, the quality (and price) for fish that is not handled properly. There is also the incentive to limit the fish counted against a quota to the highest-quality specimens (and the biggest ones when they attract a premium). Fish which do not fetch the highest price are then often discarded.

The schemes implemented to try to counter

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### Bottomless By-catch?

'By-catch' – that portion of the catch that is not specifically being targeted – has recently become one of the most important issues in fishery management. It occurs because fishing vessels are not able to limit their catch to a target species. The fate of by-catch is a function of economic, legal or personal considerations. If there is a market for it, and the price justifies landing the fish, it will indeed be landed; otherwise, it is simply discarded at sea. If by-catch is composed of illegal species (undersized fish, for example), they too will be jettisoned. If fishers are allocated a landing quota on a species-by-species basis, they may choose to cull the more valuable fish and discard what remains (a practice referred to as 'highgrading').

The global volume of by-catch is estimated to be in the neighbourhood of 27 million metric tons, a staggering amount when compared to global landings of about 98 million metric tons. In 'clean' fisheries, where the combination of gear and stock composition result in yields limited to the target species, by-catch can be insignificant. But in others the figures can be startling: in the shrimp fishery, for example, by-catch has been estimated to be in excess of 16 million metric tons.

There is no easy solution to this problem. Some countries require that fishers land all the marine life they harvest. This is a potentially costly undertaking when there is no market for the landed products. It is, furthermore, a difficult measure to monitor without an observer on board every vessel. Other countries place no restrictions on the amount of by-catch and its fate, which can lead to considerable wastage. Advances in the selectivity of gear may also reduce the harvest of non-targeted species. But there is no certainty as to the best way forward: research in this area is costly.

such widespread failure – circumscribing access to fisheries by insisting that participating vessels hold a license – cannot control the amount of capital that is invested in a fishery. Licensed participants respond by increasing the fishing power

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### Hope for Halibut?

The commercial Pacific halibut fishery off the western coast of Canada and the United States began in 1888. Until 1990 the fishery was managed by a variety of measures, including limits on the amount of fish that could be harvested on an annual basis, control of the number of licenses issued to participants, restrictions on the types of gear used, and closure of fishing areas to protect immature fish. Stock abundance and harvest volumes fluctuated throughout this period, with the fishing season lasting anywhere from the whole year to 65 days (the season ends when the annual quota is harvested).

In 1990, because of higher prices for halibut, the fishery – which had very recently provided income and employment on a year-round basis – attracted so many vessels that the entire quota was harvested in six days. This ‘race to fish’ resulted in an overcapitalised fleet, loss of gear, increased injuries and market gluts, leading to much lower prices, both for fresh and frozen fish.

Canada therefore introduced individual vessel quotas between 1991 and 1993, whereby boats were allocated a portion of the resource. Because operators were given ownership of a share of the resource, they now had an incentive to harvest it in a manner that maximised the returns on their investment. The result has been an increase in the fishing season from six days to eight months, an increase in fish quality, higher prices, and a reduction in the fleet size. In 1995 the United States introduced individual transferable quotas (ITQs) which can be sold or transferred; the results of the programme are awaited with interest.

of their vessel (‘capital stuffing’) in order to outperform other operators. Measures of this nature, if unsupported by other approaches, also fail to control the amount of fish that is harvested.

Stipulations of minimum mesh sizes which allow smaller fish to escape and grow to a larger commercial size have also failed to bring about the results expected by policy-makers. Enforce-

ment is difficult, as vessels often switch between different fisheries (the same vessel may, for example, fish for cod and for hake during the same fishing trip, thus making it difficult for enforcement officials to ascertain what gear was used to harvest which species). Moreover, the relationship between minimum harvest size and resource viability (so as to judge when a stock is overfished) is not clearly understood.

### Market Mechanisms to the Rescue?

Yet the story is not entirely bleak. Fisheries which have introduced market mechanisms have generally fared well. Under such schemes individual fishers acquire a share (quota) of the resource and harvest it in the most desirable

manner, generally attempting to maximise returns on their investment, subject to whatever legal constraints the government has implemented. Since the fishers own (or lease) the quota, each share owner has an incentive to ensure that the stocks are harvested in a manner that will guarantee their future sustainability. In cases where these stocks are transferable (that is, they can be sold), the system also promotes the participation of the most efficient fishermen.<sup>6</sup>

As a rule these types of mechanisms have worked well in ‘directed’ fisheries which only harvest one species of fish (thus avoiding the necessity of purchasing quota which is exactly proportionate to the composition of the landed species) and in fisheries where landings are fairly stable from year to year (investors must be confident that they will be able to land the quota they purchased).



Sardine fisheries are among the many hundreds around the world where harvests have dropped dramatically.

L. Beche/Sea and See

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## Towards Sustainable Fisheries

The selection of effective management instruments is complex since the effect of each type of instrument depends on a number of factors. The OECD Committee for Fisheries has examined the management instruments used in more than a hundred fisheries in OECD countries to discover their economic, biological, social and administrative consequences. The study does not aim to specify which management instruments should be used or to rank their effectiveness but to assess the economic consequences of different management approaches.

A management regime which does not adequately limit fishing capacity can lead to over-exploitation and poor economic performance. The introduction of rights-based management systems – such as transferable individual licenses, individual quotas or the right to exclusive fishing in a given area – has been proven to alleviate many of the problems involved. But a problem with the introduction of such systems is that they might cause problems of structural adjustment, including lower employment opportunities and distributional conflicts. Another successful approach has proven to be co-management, including community-based management systems and partnering arrangements. These systems increase fishermen's participation in the management process, not least by devolving management responsibilities.

The OECD will continue to work to promote responsible and sustainable fisheries but from an integrated approach, examining both the supply-side and demand-side effects resulting from a move towards these ends.

But in the high seas, where no individual country has the exclusive jurisdiction of the resource, access cannot be limited, and without the introduction of proper management regimes, the future of these fisheries is in jeopardy.<sup>7</sup> That calls for the establishment of regional fisheries organisations or agreements whose mandate is to ensure the effective conservation and man-

6. Carl-Christian Schmidt, 'The Net Effects of Over-fishing', *The OECD Observer*, No. 184, October/November 1993.

7. William Emerson, 'Hitting the High Seas', *The OECD Observer*, No. 195, August/September 1995.

8. More recently, these include the United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks and the 1993 Agreement to Promote Compliance with International Conservation and Management by Fishing Vessels on the High Seas.



The one that got away? Minimum net sizes have not been effective in protecting fish stocks.

agement of international resources. The international community has already agreed on a number of measures whose aim is to ensure that exploitation is compatible with the productivity of the resources.<sup>8</sup>

An essential element in an effective regime is the co-operation and support of the industry itself. Policy-making under co-management regimes benefits from practical knowledge of the resource (fishers are often very sceptical of 'scientific' advice) and, once fishers feel they have more of a stake in the success of the policy measures, the result is often improved compliance.

■ ■

There are no universal solutions to the problems of fisheries management. The most fitting remedies will vary from country to country and from period to period. They will also depend on the unique combination of the economic, biological, technological and social characteristics making up each fishery. Management decisions will have to aim at long-term responsibility and not be driven by short-term profits. The correct

solutions for responsible fisheries require astute judgement in blending a complex range of policy instruments to suit the circumstances of individual fisheries – and bold political decisions that are often unpopular in the short term, since eliminating over-capacity will deprive people of jobs. ■

## OECD BIBLIOGRAPHY



- Towards Sustainable Fisheries: Economic Aspects of the Management of Living Marine Resources, forthcoming 1997
- Donald J. Johnston, 'Food Security and Sustainable Agriculture', *The OECD Observer*, No. 203, December 1996/January 1997
- David Blandford and Gérard Viatte, 'Ensuring Global Food Security', *The OECD Observer*, No. 203, December 1996/January 1997
- Review of Fisheries in OECD Member Countries, 1996
- William Emerson, 'Hitting the High Seas', *The OECD Observer*, No. 195, August/September 1995
- The Use of Individual Quotas in Fisheries Management, 1993
- Carl-Christian Schmidt, 'The Net Effects of Over-fishing', *The OECD Observer*, No. 184, October/November 1993.