

Fishery Management in the Mediterranean: An Evaluation of French Effort-based Management Systems

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Abstract. The international institutional context for fishery management in the Mediterranean is changing due to the evolution of the General Fisheries Commission for the Mediterranean and the review of the Common Fisheries Policy due in 2002. This changing context offers an ideal opportunity to re-consider the fundamental fishery management strategy. It is widely proposed that only an effort-based management system can succeed in the Mediterranean. Yet in the fishery management literature and in practice in other fisheries around the world, it seems increasingly accepted that effort-based systems suffer significant drawbacks compared to other kinds of system. This paper evaluates the limits and advantages of an effort-based system given the particular nature of Mediterranean fisheries.

Keywords: Mediterranean, fishing effort, management, France

1. INTRODUCTION

This paper seeks to answer the apparently simple question: why is it so widely agreed that fishery management in the Mediterranean must proceed via fishing effort? It turns out that this is a difficult question to answer for a number of reasons. First, although there is widespread agreement that fishing effort control must provide the basis for management, there is far less documentation as to why this should be so. Second, the Mediterranean is a large water body with many coastal states so a wide diversity of situations exist in practice. No attempt is made in this paper to provide a comprehensive review of all Mediterranean fisheries.

The paper seeks therefore to outline the generally held position on fishery management and fishing effort in the Mediterranean, and then to examine the benefits and limits of such management by looking at the case of France.

2. CONSENSUS VIEW ON FISHING EFFORT

“The Council examined the different possible types of management measure and concluded that output controls, such as catch quotas, are not appropriate to the Mediterranean given the importance of artisanal fleets operating along the coasts from numerous landing points and the often multispecific nature of fishing” (FAO 1993, translated from the French by the authors). It is in these terms that the General Fisheries Council for the Mediterranean (GFCM) re-affirmed in 1993 the view of fisheries management in the Mediterranean which has long dominated, looking for example at the

recommendations of the 14th Session of the GFCM held in October 1978 (Pearse, 1980)

A few years later, following its reform, a new era began for what had now become the General Fishery Commission for the Mediterranean. However, the view expressed above has already been reiterated within the framework of the new body (FAO, 1999). It is consistent with the preferences expressed by the various Coastal States in the region, which confirmed, through statements made by some delegations, “the need to control the totality of fishing effort and suggested that an approach based on national shares of the total fishing effort to be inflicted on a common stock may be the most appropriate management method” (ibid).

The first quote cited above emphasises the physical characteristics of the Mediterranean and the nature of the fisheries which have developed as a result. It is certain that these elements have played an important role in determining the nature of the management regime. The continental shelf is generally very narrow so that most fishing is undertaken by small vessels operating close to the shore from numerous landing points and using a wide variety of fishing gear and techniques. The fisheries tend to be multi-species, although exploited zones tend to be fairly well defined and being close inshore, there tends to be less international conflict than is the case, for instance, in the Atlantic. In many fisheries fishing trips are limited to a few hours.

Demand for fishery products both from local populations and tourists is high so that prices are much higher than in Atlantic markets, increasing the economic and social importance of the Mediterranean. A large proportion of

sales are made direct to consumers (hotels, restaurants, private buyers)

In 1987, estimated that there were 124,000 EU fishers (40% of EU total) fishing from 47,000 vessels. Total landings were around 750,000 tonnes, of which Italy represented the greatest share (440,000 tonnes) followed by Spain (130,000 tonnes), Greece (108,000 tonnes) and France (44,000 tonnes). In France 90% of catch is in the Gulf of Lions.

It is generally recognised, however, that because of the large number of landing points, official landings data under-record the true level of landings.

Four main categories of fishing are distinguished in the Mediterranean: small-scale, seining, trawling and high seas. The multi-species, multi-gear nature of fishing means that these categories are somewhat arbitrary being based usually on distance from the coast and main gear used.

About 90% of vessels (by number) are found in the small-scale sector fishing in lagoons or in the coastal area out to the 100 metre isobath. This sector has a very high economic value, targeting high unit-value species such as sea breams, eel, bass, sole, cephalopods, crustaceans and so on. With technical progress, some small-scale vessels are now fishing beyond the 100 metre isobath.

Seine fisheries target small pelagics, principally sardine, anchovy and sardinellas. French sardine landings from 1970 to 1990 fluctuated between 15 and 20,000 tonnes per annum. In the early part of the period lamparo landings were important but this technique has gradually been replaced and most landings are now made by pelagic trawlers. Anchovy also are exploited by pelagic trawling with 1989 an exceptional year with landings of 9,000 tonnes. Generally landings have averaged 4,000 tonnes. (Bertrand et al, 1994, p.108)

Trawling is widespread in the Mediterranean with both pelagic and demersal trawls being used. Pelagic trawls fish the same species of small pelagics as the seiners whilst the demersal trawls target the same demersal species as the small-scale sector. Official landings of demersal species (which mainly reflect trawling) gradually increased from 2,500 tonnes in 1960 to over 10,000 tonnes in the early 1980s. They have since stabilised around 8,000 tonnes per annum. This stability masks however a large amount of variability between species and the way in which fishing effort has been adapted so as to maintain production.

High seas fishing mostly targets highly migratory species such as tuna and swordfish. In the case of bluefin tuna, French landings have increased from a few hundred

tonnes in the 1960s to 4,000 tonnes in 1990; an increase from 11% to 30% of total Mediterranean landings according to ICCAT data (Bertrand et al, 1994, p.107).

There are also some specialised fisheries for sponges (Greece), sea urchins (France) and coral (Italy and Spain).

Given the physical nature of the Mediterranean, and the small-scale multi-species multi-gear fisheries that have developed, the view has arisen that effort-based management is required. The following sections consider in more detail the emergence of such a system in France, with a consideration of the advantages and limits of the system and some suggestion as to how it may be expected to evolve in the future.

3. FRENCH LICENSING SYSTEM

3.1 Emergence of the system

Licences were first introduced in the trawl fishery in 1975. Their introduction came at the end of a long process beginning at the start of the 1960s. At that time, two major developments occurred. First, the introduction of the "lamparo" fishing technique for small pelagics and second, the repatriation of a significant of French trawlers at the end of the Franco-Algerian war in 1962. The repatriated vessels tended to be newer, larger and better equipped than the existing fleet. The two developments led to a significant increase in landings and a subsequent collapse in markets. As a result, existing fishers began to call for the introduction of licences (Meuriot and Dremière 1987).

The call for licences on the part of the industry was driven by two main factors. First, the 1960s experience had demonstrated the way in which fishing could become less profitable in the context of a cycle increased investment led to falling catch rates and increased threats to already heavily-exploited stocks. Second, and perhaps more important, there was a desire to construct barriers to entry to the industry to prevent the kind of fleet development that was observed on the Atlantic seaboard in the early 1970s.

Towards the end of the 1960s lamparo fishing became much less profitable with the result that a number of vessels switched to demersal trawling. Because the vessels were small, they tended to fish close inshore and entered into competition with the small-scale sector. From this competition came support for the idea of restricting trawling licences to vessels at least 18 metres in length so that they would be able, and could be required, to fish beyond the 3-mile limit. (Over time of course it is the scope of the small-sector which has increased leading to

fishing by some “small-scale” vessels far beyond the 3-mile limit.)

In 1993, a similar set of arguments was used to extend the system to the small-scale sector. The main factors taken into account were the needs: to protect existing fishers from newcomers, to define segments (within the context of the multi-annual guidance programmes of the EU Common Fisheries Policy), to implement spatial control of effort, to control capacity, to regulate conflicts and to allocate what were to become the equivalent of use rights. Due to the multi-gear nature of the fishery, multiple licences had to be defined and fishers were given the right to combine up to 3 licences so as to be able to continue with their fishing strategy.

Other systems for managing the small-scale sector are currently being tested. For instance, a co-management system is being used to manage clam fisheries in the Etang de Thau (Anon, 1999).

The remainder of this section deals with the trawl fishery.

3.2 Characteristics of licences

Licences are issued on an annual basis. After some debate about the desirability of transferable licences, it was decided that licences should be free and non-transferable. Partly the idea was to ensure that young fishers could still afford to enter the profession. New licences are issued on the basis of the opinion of the fisheries committee for the fishery concerned. Such committees tend to show a preference for social stability, favouring, for instance, sons of fishers in the allocation of new licences.

3.3 Accompanying measures

Fishery management does not depend only on licences. A whole raft of accompanying measures also exist. These tend to make it difficult to be precise about the impact of individual measures.

Trawler licences for instance are accompanied by the following measures.

Vessels are limited to an engine power of 316kW (430 HP). The installation of more powerful engines (up to 588 kW (800 HP)) is allowed provided that they are blocked so as to deliver only 316kW. Engine power is tested and the motor sealed, but in practice the seals often seem to be missing.

Limits are also placed on fishing time. Fishing is not allowed during weekends or on bank holidays. On days when it is allowed, vessels are restricted to a few hours at sea.

Area limitations also exist with trawlers not being authorised to trawl within the 3-mile zone.

Finally, the standard set of technical conservation measures is in place, including mesh size limits, fish size limits and so on.

3.4 Benefits of licences

The licensing system has had a number of benefits. First, it has placed a control on the number of vessels in the fishery. At the very least, this has prevented the unnecessary build-up of vessel numbers during periods when the fishery is particularly profitable. Second, licences have helped the industry to structure itself and this has increased, to some extent, its negotiating power with other users of coastal resources. Third, the management costs associated with the system are relatively low compared to alternative systems that might be envisaged (particularly quotas where the enforcement costs appear likely to be very high). Fourth, licences have the advantage of being firmly within the management tradition of the Mediterranean and for this reason they are accepted by (indeed were proposed by) the fishers themselves. On the other hand, there is widespread hostility to the idea of quotas.

3.5 Problems with licences

In accordance with economic theory, licences have given rise to a large amount of input stuffing. It has sometimes been suggested that although non-transferable licences of limited duration will not prevent input stuffing, they may reduce its extent and make it easier to deal with. It is argued that fishers with non-transferable licences will benefit from input stuffing only in respect of any rents they may thereby capture during their remaining years in the fishery, unless the management authority agrees to compensate them for their investment in stuffing at the time of their retirement. There is little evidence to support this optimistic assessment in the case of the French Mediterranean trawl fisheries.

First, almost all trawlers have increased their engine size up to the allowed limit of 430 HP. As mentioned above, engines up to 800 HP are allowed provided that their power is blocked at 430 HP but enforcing this rule appears to be difficult. Second, within the power constraint, various technical improvements have been made so as to increase traction. The main innovations are the use of Kort nozzles, variable pitch propellers and super-charged engines. The increase in traction power can be substantial (perhaps as much as 70%) if all three are used. As a result vessels are able to tow larger nets and trawl technology has evolved away from traditional bottom trawls to high-opening bottom trawls and mid-water trawls. Third, vessels have made use of the great

diversity of electronic fishing aids now available, including colour sounders, sonar, GPS and net sensors.

It is difficult to establish the precise impact of these different changes but it seems clear from the larger trawls being used that fishing power has increased significantly. Total catch from demersal species has remained stable during the 1990s at around 8,000 tonnes. If, as is implied by the input stuffing, real fishing effort has expanded within the licence constraint, then true CPUE must have fallen over the period. Since stocks were broadly considered fully exploited at the beginning of the period, this would indicate that they are beginning to become biologically overexploited. In discussing the apparent stability of landings, Bertrand et al (1994, p.108) summarise the situation as follows: "this synthetic result masks in fact a strong inter-annual variability in the different species making up the group as well as the many adaptations in fishing effort which have been developed so as to maintain production".

An alternative explanation is that some of the input-stuffing may arise for non-economic reasons and may therefore have less impact on true fishing effort than at first appears to be the case.

One theory is that a lot of the investment has in fact been a kind of conspicuous consumption by the fishers. The desire to have the biggest and best equipped vessel. The desire to demonstrate to his peers that he is able to afford the best electronic navigation and fishing aids, even if the fisher does not know how to use them or particularly need them. The impact of fishing effort may be far less than would be implied by a situation where well trained fishers make full use of the various onboard investments that they have made.

This particular theory conflicts with generally-accepted view that resource rent in the fishery must be removed from the fishery, either by its capitalisation into use right prices, or by taxing it away somehow. Otherwise high incomes will attract increased effort, either from within or from without. Experience generally indicates that this theory is quite robust so alternatives must be treated with some scepticism.

However, the alternative model would run something like this. The current group of fishers have a lot of political power and have effective control over the number of licences. Only someone acceptable to the group is likely to be granted a licence (or at least be able to operate it effectively). Fish catch rates are stable (partly it seems because of onshore pollution providing nutrients for the Mediterranean, partly because fishers switch from species to species according to inter-annual variability) and fish prices are high, so incomes are high and significant rents are earned. The members of the group are interested

primarily in maintaining their incomes at the going rate (hypothesis of satisfactory incomes rather than profit maximisation). At the same time, an important concern is to be able to demonstrate a certain level of wealth and expertise to the other members of the group. Hence, expenditure on items of conspicuous consumption such as Mercedes Benz motor vehicles and all kinds of electronic and other equipment for their vessels. The fishery management system itself bites sufficiently hard to be able to sustain this situation, at least over a reasonably significant period of time. It bites because of rules concerning the number of vessels in the fishery and rules concerning the number of days at sea authorised per vessel.

In this model, expenditure on, say, electronic equipment is not looked at as an investment giving rise to concerns for future levels of effective fishing effort, but rather as consumption of (some) rents generated by the fishery. One might argue that such expenditure is not particularly efficient in investment terms but in terms of consumption, it reveals that individual utility is increased more than if rents had been spent on, for instance, second, third and fourth motor vehicles.

There is one final piece of evidence that may be revealing. In the Mediterranean, fish prices are high and the fishery is the most profitable of the French fisheries. On the face of it, conditions would seem to be in place for an expansion of effort. Yet in the trawl fisheries, some licences are currently unused.

With current data it is impossible to choose between the two theories. It is possible that both contain elements of truth, but experience elsewhere leads us to think that most probably the fisheries are subject to a fairly standard input-stuffing situation which is gradually leading to overexploitation. The one positive aspect is that the licensing system is preventing increases in effort through new vessels joining the fleet.

Another difficulty with the current licensing system is that it does not establish clear use rights for the fishing industry. Fishers have tended to perceive the main threat to them to be other fishers from outside the current group. A system of non-transferable licences gives the group of fishers use rights compared to other fishers, but appears less satisfactory when conflicts arise with other users. The lack of a market in licences makes it difficult to evaluate their worth, and means that other users have no direct mechanism to compensate fishers if their rights are to be expropriated. Fishers are left therefore in the political arena. Over time it seems unlikely that they can resist the march of tourism and urbanism.

Finally, there is some threat from unlicensed fishing from two main sources. First, associated with tourism, there is

an important and growing amount of recreational fishing. Experience elsewhere has demonstrated that where commercial and recreational fishing come into conflict it is rarely the former that wins. And second, a significant number of small scale vessels operate outside of the system.

4. THE FUTURE

A tentative answer to the question posed at the beginning of the paper is that there is no particular reason why only effort systems need be used in the Mediterranean. Fishery management is a process and the process in the Mediterranean happens to have reached that point. It seems clear from the French experience that the process is not at an end. The challenge over the next few years is to design management systems that can move the process forward.

A number of developments are occurring which give reason to hope that the process can move forward. First, the General Fishery Council for the Mediterranean has recently become the General Fishery Committee for the Mediterranean. Second, the Common Fisheries Policy of the European Union is likely to be an increasingly important element of Mediterranean fishery management following the review of 2002.

Third, in addition to developments specific to the Mediterranean, fishers may also be affected by changes in the general regulatory framework of French fisheries. A new fishing law was adopted in 1997 (Law Number 97-1051). The law develops and clarifies the legal underpinning of licensing. In particular, Article 4 of the Second Title of the Law specifies that:

- the administrative authority will issue, or oversee the issuance, of fishing permits, which have for object to allow fishing by a given company and vessel, during particular periods, in particular zones and for particular species or groups of species. The authorisation may also specify the type of gear which may be used and the quantities that may be caught. Granted for one year, these authorisations are not transferable and are granted jointly to a company and a vessel
- in the same way, the administrative authority will allocate catch quotas implemented in accordance with Community or National regulations, using sub-quotas allocated either to Producer Organisations or to management unions, or to vessels or groups of vessels (sub-quotas valid 12 months and not transferable)
- Producer Organisations are required to achieve results in the context of management plans

The idea of non-transferability is to limit the number of resource users in activity. It is also intended to continue to allow the entry of young people into the industry. However, as has already been seen in the case of the Mediterranean, where licences are free and non-transferable, some allocation mechanism needs to be implemented. These may be queuing systems of some kind, the favouring of particular kinds of applicant (sons of fishers). The development of a black market in rights is also a possibility, particularly if the intrinsic value of rights is high.

The current system is clearly part of a process. Over the past couple of decades, the various players, industry, administration, research, have found the management system to their liking for different reasons. Some limits to the system have begun to appear. The interesting question is to try to forecast how the system will evolve.

In common with other fisheries around the world, the most likely way forward seems to be towards better defined use rights. Quite what form these will take is difficult to predict.

Two broad approaches are possible. One is to seek to develop the current licensing system. Notwithstanding the current legal situation, there are appear to be four main ways in which the system of licences might be made more effective economically. They are:

- To extend the duration of licences
- To make them transferable
- To define them by area
- To define them by species

The other broad alternative would be to develop new management systems. Two main alternatives suggest themselves, which are:

- Given the dominance of small-scale fisheries, to consider the use of territorial use rights
- To move towards quota-based management, although great care would be required in the design of the system to take into account the particular nature of Mediterranean fisheries.

Another interesting question is to speculate on where the main impetus will come from for development of the management system. So far, fishers themselves have been instrumental and they are likely to remain important. They are likely to gradually perceive two new threats. First, the threat posed by the expansion of fishing capacity from within the community and second, the threat posed by other coastal users competing either for resources or space.

However, the factors that seem most likely to incite change in the system are outside of the fishery sector, in particular the development of tourism and urbanism. The fishing industry is likely to have to fight to preserve its rights and in so doing will be forced to negotiate to define more precisely what the rights are.

Perhaps the most probable development therefore is the development of integrated coastal area management plans, including the fishing industry.

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