

Grab, cage, fatten, sell

Tuna farming in the Mediterranean raises issues of privatization of common property resources and plundering of a stock

Statistics from the Food and Agriculture Organization of the United Nations (FAO) for 1999 show that, thanks largely to the contribution of aquaculture, the total world fisheries production (177 mn tonnes) is on the increase. Just under a third, or 30.4 mn tonnes, now comes from fish farming, some 40 per cent of which occurs in the sea. While most of this marine production consists of seaweed and shellfish (molluscs), increasing amounts of high-value finfish are also being produced. From a production perspective, aquaculture has undoubtedly achieved some notable successes; but, in many countries, the intensive production of high-value finfish and crustaceans is coming in for increasing criticism. Intensive industrial scale aquaculture has become synonymous with pollution and destruction of the marine environment, conflicts with other resource users, and high levels of toxins in the fish produced. The spread of aquaculture, a cause of increasing concern and growing alarm, has been described as a cancer at the heart of the coastal environment.

Similarly, tuna farming, which combines capture and culture fisheries activities, raises some serious questions about the use of the tuna resource and its sustainability. It also provides an example of a market-driven fishery that generates huge profits for a few, but produces a large ecological footprint on the entire marine ecosystem, undermining the social and economic fabric of coastal communities that are highly dependent on small-scale fisheries and tourism.

Generally, and with the notable exception of some of the more contentious international fisheries, issues arising from fisheries resource management (which is really the management of marine

ecosystems) get scant attention in the mass media and, as a result, are usually absent from the debate on environmental justice. Due to the extremely complex nature of fisheries (only understandable if looked at through the combined perspectives of biology, economics and anthropology), and the tendency for opacity in the fisheries sector, the management of living marine resources is a difficult subject for the uninitiated. This is a shame, because the world of fisheries encapsulates a fascinating mixture of the difficulties and conflicts (both social and environmental) generated by the rational management of a renewable common property natural resource. Its critical study provides an example of the ethereal, yet urgent, quest for sustainable development.

If there is one current example that combines all these elements and which, in addition, merits detailed study, it is without any doubt the Mediterranean tuna fishery, brought to light through the recent phenomenon of tuna fattening (mistakenly referred to by some as tuna aquaculture).

Today, most of the Mediterranean bluefin tuna (*Thunnus thynnus*) are caught by coastal States through tuna purse-seines, made up of large rectangular nets capable of completely surrounding a shoal of fish. The industrial fleets that operate here are mainly French, and, to a lesser extent, Italian, Spanish, Tunisian, Croatian and Turkish. They are amongst the most technologically intensive in the Mediterranean, providing an exception in a sea dominated by small- and medium-scale fleets.

Detection systems

Sophisticated systems for detecting fish shoals are combined with aerial location

systems using light aircraft and helicopters, with which the denominated fishing capacities of these fleets reach huge—and unrecorded—levels.

Tuna caught in this way is transferred—live—to large transport cages, which are towed from the place of capture at low speed (1 knot) towards their destination, often hundreds of kilometres away, where they are again transferred to fixed fattening cages. There the animals are stuffed with fish (fresh or frozen) for several months so that their flesh reaches the optimal fat content demanded by the Japanese *sushi* market. As can be guessed, the final product fetches a high price in Japan, where *sushi* from Mediterranean bluefin tuna is the most highly prized.

In 2001, production of tuna from fattening units located in Spain, Malta and Croatia (countries where, to all intents and purposes, these types of installations are concentrated) was more than 11,000 tonnes.

The region of Murcia in Spain alone exported more than 7,000 tonnes to Japan, worth more than 150 mn Euro. With figures like these, it is not surprising that the Spanish authorities include tuna farms on the agenda of VIPs visiting Murcia as an example of ingenious local enterprise. It is particularly noteworthy that not a single tonne of fattened tuna

was produced in the entire Mediterranean before 1996, when this activity started in Croatia.

But is this profitable activity sustainable? More to the point, does it provide a tangible example of an aquaculture system that will take over from fish catching, an activity obviously in decline and which depends on seas that are already exhausted? The answer to these and other questions highlights the enormous dysfunctions existing in the management mechanisms of our marine resources. It, furthermore, shows how the unstoppable process of the appropriation of public goods by powerful private interests is also extensively at work in marine resources. And all this is happening with hardly a fuss being made.

Wild population

To start with, as we are dealing with an activity based on catches taken from a wild population (something that many people forget once the fish is stocked in the fattening units), it would seem logical to ask about the conservation status of this natural population. And the answer is far from reassuring. The most important world population (or stock, in fishery science terms) of Northern bluefin tuna is found in the Mediterranean and the adjacent waters of the North Atlantic. If, in the past, tuna was the target of traditional fisheries in the coastal States,

using a wide variety of gear and techniques, the increased demand from Eastern markets—mainly Japan—is driving the development of highly industrialized large-scale fisheries using fleets of longliners and seiners. The absence of exclusive economic zones (EEZs) in the Mediterranean means that international waters begin only 12 nautical miles off the coast, a fact that has favoured the proliferation of pirate industrial and flags-of-convenience fleets that fish the tuna stocks on the high seas with impunity.

Thanks to this, and to the strong economic incentives associated with the fishery, the management recommendations made by the International Commission for the Conservation of Atlantic Tuna (ICCAT) are now not worth the paper they are written on, and annual catch quotas are significantly overshot (as even ICCAT recognizes). The most recent scientific evaluation of the stock was undertaken in 1998. It showed that the levels of the breeding population of the stock had declined alarmingly, in less than 30 years, to only 20 per cent of the 1970 levels. What is more, scientists have also voiced concerns over the increasing fishing mortality of both the adult and juvenile parts of the stock. They are recommending a slight reduction in catches—less than 25,000 tonnes—to avoid a stock collapse, which seems highly possible (90 per cent probability) in the next 5-10 years. Of course, reducing fishing effort by the amount needed for a genuine stock recovery plan, which is absolutely necessary, would be even better. Four years down the line, the total quota is 29,500 tonnes and the pressure on the stock has increased alarmingly. The phenomenon of cage fattening or ‘tuna farming’ has much to do with this.

As noted above, tuna from cages contains optimal fat levels, and is capable of producing high quality *sushi*. This has hugely increased the demand on the Japanese market, as it is a previously unheard-of product. Bluefin tuna *sushi* available up to now has either been top quality (pre-spawning individuals), commanding enormous prices affordable only to a select minority, or of a much lower quality (and price), coming from

post-spawning and juvenile stock. As Northern bluefin tuna *sushi* from tuna farms is of a good quality, with an intermediate price, the demand for Mediterranean tuna on the Japanese market has shot up, especially among the middle class.

While this reference to markets may seem somewhat obscure, given the actual impact, there is clearly increasing pressure on the wild stock. Perhaps Algeria best exemplifies what this implies. As the most recent State to become a member of ICCAT (in February 2001), it lacks any fishing quota for bluefin tuna. This is because ICCAT shares out the total quota amongst the various States according to their historical catch records. Union Pêche, a private financial institution, has, through its subsidiary, heralded the construction of a new fleet of tuna seiners. Although not registered in Algeria, they have been built with the declared intention that the country will profit from the new business of tuna fattening. Given the state of the stocks and the flagrant violation of the ICCAT rules that this new fishery initiative implies, this might seem like a joke in bad taste. However, the fact is that the fleet of 21 industrial vessels (20-30m long, with one, 40m) is already under construction in Spanish and Portuguese shipyards. Once again, it is evident that large-scale short-term profits are not governed by considerations of sustainable resource use (even when this threatens the very source of wealth, which, in this case, is the integrity of the tuna stocks).

The practice of tuna fattening is causing an additional problem, though less obvious, for the sustainability of the resource, which makes the eternal problem of obtaining reliable data on the fishery even more pressing. It is worth remembering that rational fishery resource management needs to have scientific data on the conservation status of the stocks in question.

Lack of data

Significantly, the 2000 ICCAT programme to evaluate the Mediterranean tuna stock has had to be postponed *sine die* due to lack of data. Tuna fattening complicates the situation further, due to transshipments on the high seas (instead of through traditional quayside landings),

which often involve commercial operations between different countries. (Most of the tuna fattened in Spain is caught by French or even Tunisian fleets.)

The tuna fattening process also complicates biological sampling, necessary for understanding the age structure of the population. Generally, today it is more difficult to know, with a minimum of confidence, the quantity and origin of the catch, its biological composition, and the nationality of the fleets involved. ICCAT has recently warned that these uncertainties gravely damage the credibility of future stock evaluations.

It is not only tuna stocks that are affected by the fattening activities but also other species of small- and medium-sized pelagic fish (sardines, anchovies, etc). These species are used in large quantities as feed for the tuna. While some of this fish is imported in frozen form from other seas, the rest comes from Mediterranean fisheries. Thus, in Spain and Croatia, fattening units contract local fleets to supply such local species as sardinella or anchovy, with which tuna is fed.

Again, the fact that the catches destined for the fattening units often do not pass through the local markets (as is apparent, at least in Spain) means that catches are undeclared, and problems are caused for the management of these species. For example, annual consumption figures of 4,500 tonnes of anchovy have been quoted in the case of one fattening unit in Croatia. Catches of these are taken from the Adriatic, a region where the local anchovy stock is under tremendous pressure, and is currently in a state of recovery after experiencing a collapse.

The management of small pelagics is especially difficult in the Mediterranean, where there have been various stock collapses. These species (sardine, anchovy and sardinella) play a central role in the functioning of marine ecosystems, as their populations control both predator and prey species. Increasing pressure on both tuna and small pelagics could cause an increase in the size of the ecological footprint on Mediterranean marine ecosystems, a level of human impact that already

borders on the limits of structural and functional degradation of the ecosystems. In effect, recent studies in the northwest Mediterranean indicate that fishing takes 40 per cent of the total primary production of the ecosystem—one of the largest ecological footprints ever estimated.

Another problem is the social harm caused by the competition with traditional uses of the small pelagics; in Croatia, the increasing demand from some of the tuna fattening units is seriously affecting the availability of sardine and anchovy for the local processing industry.

The tuna installations are also a source of conflict in the use of the coastal zone, already intensively used in the Mediterranean. This includes the conservation requirements of valuable natural spaces. In Murcia, units are found within highly sensitive environmental areas, some categorized in the European Habitats Directive as Areas of Community Interest. The saturation of this area by fattening units has meant that an increasing number of installations are illegal. It is also important to highlight that the technology used only allows the units to be installed a short distance from the shore. In this way, they come into conflict (both directly and indirectly due to all the large-scale activities associated with them) with such coastal activities as navigation, artisanal fishing and tourism. From Murcia to Malta, passing through the Balearics, traditional fishermen are everywhere complaining about the damage being done by the combined activities of tuna fattening and tuna seining.

Low growth rates

As noted above, the emphasis on fattening up the flesh implies that, in addition to increasing the biomass, the tuna stocked must be adults with relatively low or moderate growth rates. This is especially true in the Spanish context, while in the Croatian case, small-sized tuna are used, many of which are below the minimum legal size (6.4 kg). This raises another problem. This emphasis on high production levels results in high levels of waste, as the conversion rates achieved are very low (20:1, in the Murcian case). This large polluting potential provides a

tangible threat to the adjacent ecosystems, which are often such valuable habitats as seagrass beds. Recent studies have confirmed this damaging effect in Spain and Croatia, although it was already well-known in Australia, where this activity was started.

Apart from the biological impact provoked by excess organic material, which is likely to cause outbreaks of eutrophication, the danger of polluting the waters used by tourists for bathing is evident. On the other hand, there are references to the inverse problem, that is, the hypothetical presence of unusually high levels of contaminating toxins in the flesh of tuna coming from Mediterranean fattening units. This effect, known as bioaccumulation, consists of increasing levels of toxic substances throughout the structure of the food web. This means that in the apical predator species, like tuna, maximum levels are found. But why, compared to wild tuna, farm-reared tuna should have a higher level of toxins is, however, still unknown.

Now that we have an overall picture, especially concerning the issue of sustainable exploitation of tuna stocks and the possible ecosystem effects, and on the human use of the coastal fringe, it seems appropriate to look in greater depth at the socioeconomic aspects of this 'new industry'. For this, two fundamental questions arise: whom does the resource

belong to, and who benefits from it? The reply to the first question is clear: the resource is a common property, and its exploitation should, therefore, benefit society at large. However, marine species know no boundaries; and even less so, large pelagic species like the bluefin tuna, which undertakes great migrations. As noted above, the lack of the well-known 200-mile EEZs in the Mediterranean means that the Mediterranean tuna stock is mainly caught in international waters, where this species is known to breed. While this may complicate things, it does not mean that the coastal States have not taken up political responsibility to protect and manage the resource rationally. The very existence of ICCAT is an indicator of this, where recommendations produced for management are directed to the contracting parties, including the European Union (EU).

Resource conservation

On the other hand, the United Nations Convention on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks clearly establishes the fishing States' responsibilities for the conservation of resources, although these may be found in international waters. The responsibility of coastal States (including the EU) for the management of the tuna fishery also has implications for economic investment in scientific research (geared towards better stock management), as well as public

infrastructure, subsidies for the sector—such as aids for vessel construction—inspection and monitoring activities, etc. All this, it is clear, must come from public funds.

In the opposing camp, in parallel to this public intervention in management (although obviously inadequate), we are witnessing, *de facto*, a whirlwind privatization of resource use, and, as a result, of the benefits obtained. This has led most of the benefits to get concentrated in the hands of the tuna fattening units and the associated large-scale tuna seiners. The live tuna required by the fattening units can only be supplied by the seiners, which means that this gear is monopolizing the fishery. This is to the detriment of the other traditional fleets, such as longliners and other hook-and-line techniques. These could not dream of competing for the resource against technologically advanced industrial fleets, with large catching capacities, capable of searching large areas of the sea with acoustic and aerial surveillance methods. These even use real-time satellite information on levels of oceanic primary production.

The real tuna bosses, however, are the owners of the fattening units. A new economic power, in most cases of local origin—true self-made men—has burst forcefully onto the social and economic scene in the Mediterranean. Significantly, it is an open secret that some of their fortunes have been made in the trade of illegally caught tuna by the famous flags-of-convenience fleets, which work with impunity in the Mediterranean.

It all began in Croatia, after independence from Yugoslavia, where former Australian emigrants successfully transplanted the technique that they had learned there, of fattening Southern bluefin tuna for the Japanese market. Almost immediately, the first units appeared in Murcia (Spain). Today, apart from Spain, Croatia and Malta, there exist imminent prospects for establishing new units in Morocco, Turkey and Italy, with less advanced plans in Tunisia, France and Algeria. The largest Croatian producer of fattened tuna, Kali Tuna, is a joint venture arrangement with Croatian, Australian and Japanese investment. In

Spain, the principal companies are linked to the Fuentes, Abaladejo and Gines Mendez families. Fuentes have established joint ventures with powerful Japanese companies like the multinationals Mitsui and Co. Ltd., Mitsubishi Corporation and the processing and distribution company, Kanetomo Co. Ltd.

While the danger of the imminent collapse of the wild tuna population may be quite apparent, no less worrying is the implication of the unplanned development of the combined industrial tuna seining fishery/fattening units for the socioeconomic fabric of the Mediterranean fishing communities. Faced with the chronic crisis in the traditional fishery, the local and national authorities have been seduced by the apparent attractiveness of a new activity that promises enormous benefits, and, aided by 'new technologies', it has an air of modernity that the traditional sector lacks. This perception is encouraged by a vast coalition of interests within the industry and a wide group of international scientists who, with no qualms, sell the impossible idea of tuna as the 'veal of the future'. They legitimize the validity of the current fattening practices as the first step towards the domestication of the tuna, while, at the same time, obtaining generous financial aid from the EU for their research, which they claim to be of enormous social importance. It has even been claimed, by one of the promoters of the project in a popular French daily, that this is nothing less than a way of "alleviating the world's hunger". Nothing is said about the enormous technical difficulties faced. These are related as much to the process of reproduction (with massive larval mortality) as to the poor progress achieved in the manufacture of alternative feeds to fresh or frozen fish.

Real problem

And what about the lack of environmental sustainability (in terms of using ecosystem dynamics) intrinsic in the hypothetical large-scale production of a large predatory species? And, what is more important, concerning the real problem facing us: what is happening to the Mediterranean tuna in the meantime? The very scientists engaged in the task of

domesticating tuna recognize that it will take at least 10 to 20 years to achieve this.

Coming back to the social impacts of tuna fattening, the most evident one is the danger of the collapse of the sector, a process that can already be observed in Spain. Only with great difficulty can a traditional sector in crisis resist the overwhelming force of a large-scale agroindustrial activity that is covered up by the administration and blessed, through ignorance, by public opinion. A flight of human capital which seems irreversible is happening, with traditional fishermen selling their vessels to become salaried workers in the fattening units.

In one form or another, directly and indirectly (working under contract to supply the fattening units with low-cost fish), the traditional sector is becoming co-opted by the large industrial/tuna fattening fishery—not to mention the loss of influence with the administration of the fishermen's associations due to the tuna fattening industry, whose large concentration of economic power means that it has become the privileged representative with public servants.

The model, then, is clear: appropriation of a common property resource (tuna) and the use of the public marine domain by a few unscrupulous businessmen who are a powerful lobby with the public

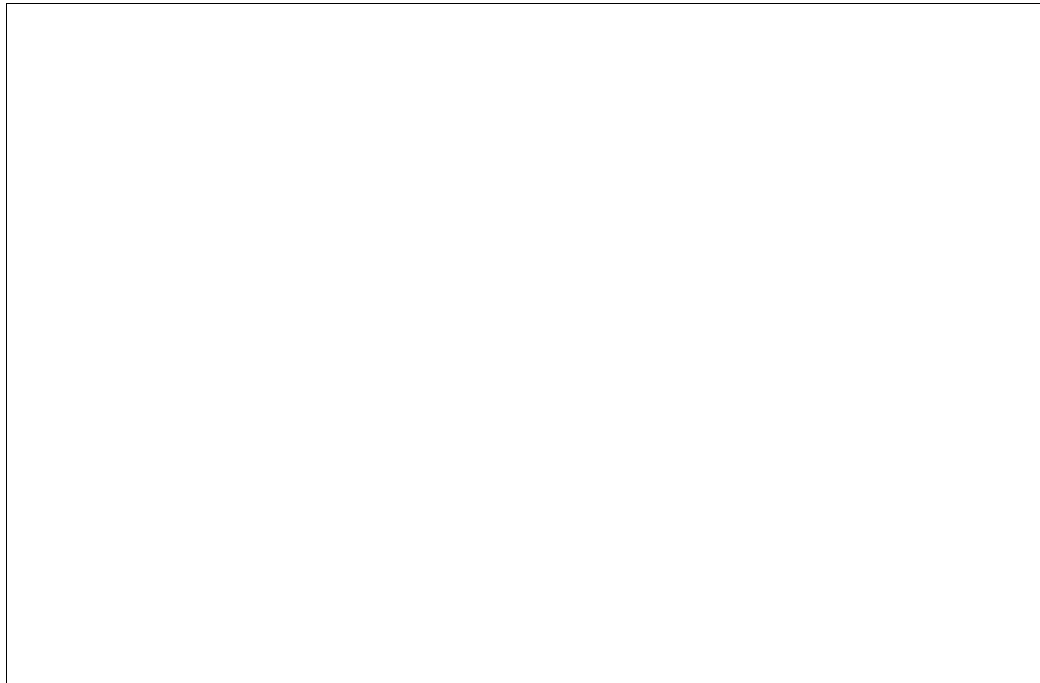
administration. This is resulting in the tuna population being exploited to its limits following the paradigm of maximum immediate benefits. In this context, it is seen as naïve to raise questions about the sustainability of the resource when we are caught up in a race for the last fish—a race that is bringing about the probable commercial extinction of the fishery in the short- to medium-term (thus jeopardizing the principle of intergenerational equity).

In fact, the industry admits, in private, that the reason some of the new vessels being constructed for the Mediterranean are of such a huge size is because they may soon be operating in distant waters, such as the Indian or Pacific Oceans, to where they will be exported once the Mediterranean tuna population has collapsed.

All this is happening with the connivance of the administration, who, knowing that this new activity lacks any specific regulatory framework, prefers to steer its way through a comfortable legal lagoon where anything can be legitimized.

Conservationism

It is not in vain that some Murcian businessmen have already threatened to set themselves up in North African countries should conservationists' demands for developing a specific regulatory framework for the fattening of tuna be taken seriously.



Meanwhile, the administrators continue to make obscene boasts, of supporting this new initiative, proving the ingenuity of the private sector, which is capable of transforming something as economically deprived as Mediterranean fisheries into a huge earner of foreign exchange. With loud fanfare, the inauguration of what has been described as “the largest of the Spanish Mediterranean fleet” has just taken place in Catalonia. This tuna seiner, fitted with the latest state-of-the-art detection systems was launched in the presence of the highest fisheries authorities of the Government of Catalonia. It is well known that around one-third of the 2.05 mn Euro costs of its construction have been subsidized with grants from the EU, thanks to a favourable report from the Spanish authorities. The immediate construction of another three vessels has been announced.

Thus, the construction of large-scale fishing vessels, destined to increase fishing pressure on a population of a severely overexploited species for which a theoretical catch quota has been set, has been subsidized by taxpayers’ monies. It seems an absurdity, but the motive is clear: everyone wants a slice of the cake, but the cake is not big enough to go round. The fattening industry needs supplier seiner fleets and tuna in Spain has traditionally been caught by other techniques (handlines, *currican* or bait

fishing, *almadraba* or traps, longlines, etc.). If we want to compete with the French tuna seiner fleet, we must promote the development of a large capacity Spanish tuna seiner fleet. The victims (apart from the bluefin tuna) will be the rest of the traditional fleets, which are technologically much less advanced, and clearly incapable of supplying live tuna for the fattening units. We are faced with a clear case of social injustice in the use of (and benefit from) a common property natural resource.

In September 2001, the Maltese delegation presented a formal proposal to the 26th Full Session of the General Fisheries Council of the Mediterranean. This aimed to establish a fishing zone in international waters to the South of the island, where fishing for tuna with seines and the other associated activities of tuna fattening (clearing the cages, etc.) would be excluded. This initiative was justified by the damage being caused to the local longline fishery, due to competition for the resource and the destruction caused to fishing gear.

Strong opposition

While this proposal was thrown out due to the strong opposition of the EU (in looking after the interests of its tuna fleets), the case exemplified the serious tensions that are being produced throughout the Mediterranean between traditional fishing activities and the

growing tuna catching and fattening industry. Along the entire Spanish Mediterranean coast there is also a fierce opposition from the local fishermen's *confradías* to new projects underway for installing tuna farms. Some of these are almost being imposed by the autonomous authorities, despite the open opposition of the local fishermen.

In sum, all the usual ingredients are there in the case of tuna fattening farms: privatization of a common good (in this case, with the added risk of its probable destruction in the short- to medium-term), concentration of the benefits into a few hands, public aid provided to pillage a natural resource, dispossession of the traditional resource users, social and economic deconstruction of the traditional fishing sector, complete lack of a regulatory framework, connivance of the administration, ineffectiveness of international supra-Statal organizations, and growing demand for the product from a powerful market.

Faced with such a situation, a wide social movement is growing in the Mediterranean region that is urging for an urgent reflection on the extent of this phenomenon, and that is pushing for the establishment of a regulatory framework to ensure the social and environmental sustainability of this activity. This front—although hardly structured—includes the traditional fishing sector, groups of local environmentalists, scientists employed by public research organizations and international conservation organizations.

In this context, the World Wide Fund for Nature (WWF) is actively working to raise awareness about the issue and to propose solutions, and maintain direct contact with the affected parties. WWF thinks that, as a precautionary measure, an immediate moratorium on the establishment of new fattening units in the region is indispensable, and a step towards developing a regulatory framework valid for the entire Mediterranean. Recently, in May 2002, WWF received unanimous support for a proposal presented to the discussion in the Subcommittee for Stock Evaluation of the Scientific Advisory Committee to the General Fisheries

Council of the Mediterranean. This aimed to create a working group to develop a Code of Conduct to establish the basis of this Pan-Mediterranean regulatory framework. While this implies that the problem is explicitly recognized by the highest scientific authorities of the region, almost everything else remains to be done. And tomorrow may already be too late...

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