

Fisheries management

The paradoxes of quotas

Norway's experience with fisheries quotas reveals the problems peculiar to household economies

Designing proper procedures for regulating the relationship between fish resources and fishers is a major problem for sustainable management and development. Norway introduced individual and maximum quotas following a crisis in the cod fisheries in 1990. For equity reasons, quotas were distributed on the perceived neutral basis of vessel length. However, the fishing pattern of small-scale fishers shows no clear relation between vessel length and annual catches. Small-scale fisher adaptations to this new regime provide an interesting exposure of how quotas work in a household economy.

For centuries, cod (*Gadus morhua*) has been the mainstay for coastal fishers in North Norwegian waters. Vast amounts of North Atlantic cod come from the Barents Sea to the coast of Norway twice a year. The spawning cod give rise to a winter fishery, and the feeding cod give rise to a spring fishery. In addition, coastal cod are present all year around. Both spring and winter fisheries of cod provide small-scale fishers with good income opportunities. The ecological conditions are reflected in the structure of the fishing industry. In 1996, a total of 6,800 boats participated in the cod fishery. Of these, as many as 5,600 vessels, or 82 per cent, were small-scale enterprises, that is less than 13 m in length. Their catches amounted to 20 per cent of the total Norwegian take of cod.

Fishery biologists have regularly measured the size of the cod stock since the mid-1970s. Each year, a Total Allowable Catch (TAC) is set on the basis of their advice. Cod is managed bilaterally, and the TAC is shared between Norway and Russia. The mean annual catch has been around 430,000 tonnes for the last 15 years, but around the turn of the

last decade, Norway and Russia faced what appeared to be a crisis in the Barents sea cod stocks. The TAC for 1990 was as low as 160,000 tonnes of cod. At that time, only trawlers had fixed vessel quotas. Individual maximum vessel quotas, as well as public licences to fish, regulated catch and access of coastal vessels above 13 m in length. Small-scale fishers did not need licences. The maximum vessel quota was also too high to represent a limitation on small-scale catches. They ranged between 250 and 400 tonnes, and this was more than even the most industrious fishers caught. In effect, the small-scale fishery was an open fishery.

Following the fishery crisis, a new and more detailed system for distributing the low quota was required. Within the existing system of maximum vessel quotas as large as 400 tonnes, the larger coastal vessels could take the whole quota within the first months of the year. Fishing authorities decided to share the low quota as best possible, and criteria for distribution were developed. It was decided that small-scale fishers, given their dependency of cod, should be given preferential treatment. More restrictions were put on fishers, with opportunities to switch to species other than cod. Furthermore, the distribution was based on merit. A minimum catch for 1987-1989 was set, and fishers who fulfilled the demands for minimum previous catches for their vessel length-group got fixed vessel quotas. Other fishers were allowed maximum vessel quotas. Both quotas were made dependent on boat size.

Types of rights

In effect, the new regulations implied the establishment of different formal types of fishing rights. Fishers who were allocated individual fixed vessel quotas were labeled Group I; the maximum vessel

quota holders were labeled Group II. Very soon, however, these groups were said to have 'full' and 'reduced' rights, respectively. Group I had guaranteed rights to a fixed quota. Group II, besides having far lower quotas than Group I, had to fish them on a competitive basis; fishing was stopped when the group's TAC was caught. Thus, only those who were first on the scene could fish their maximum quotas.

The effects of these regulations were profound, particularly for small-scale fishers. Fishers were rewarded for their previous fishing effort. Had they caught a certain amount of fish, they were allowed a future 'full rights' position in the industry. Had they fished too little, they were granted only a 'reduced' rights position. Small-scale fishers in the latter category saw their contribution to the depletion of cod stocks as minimal, and argued this was unfair. On the other hand, fishing authorities saw their small catches as evidence they were not as cod-dependent as the other fishers. However, fishing small quantities is an inherent and important trait of the small-scale fishing household economy.

Looking at small-scale fishers' practices in the open fishery of the 1980s, one finds that fishers used their vessels differently. In one and the same village, fishers equipped with the same type of boat and gear, would spend different amount of

work on board their vessels. Some caught large quantities and some only a few tonnes of fish during the year. In fact, the majority of small-scale fishers caught low quantities. In 1984, for example, about 200 fishers with vessels in the size of 9-11 m caught more than 50 tonnes of cod, 900 fishers caught less than 10 tonnes, and around 800 fishers caught between 10 and 50 tonnes of fish.

The different catches can be ascribed to different needs. A debt- and career-dependent fishing pattern characterized small-scale fishing in the 1980s. As newcomers, fishers worked hard to secure their debts, but as debts declined, they reduced their effort. Investments over time in better and more efficient technology were not always used to increase catches. The fishers could use their investments to enjoy the benefits of a long career in fishing a better and comfortable workplace instead of catching more and more fish. As such, one can say that, although being formally open to all in the 1980s, the fishery was restricted by informal regulations. The household's needs was a base for decisions on how much to fish. The new regime changed this situation.

Statistics compared

If we compare catch statistics for 1994, when the regulations had worked for four years, with the figures of the non-regulated situation of the 1980s,

interesting shifts in harvest patterns appear. The overall reduction in the Norwegian small-scale fleet was 20 per cent from 1984 to 1994.

As the table shows, there were 1,703 fewer fishers in the industry in 1994. It also shows that there were 115 fewer fishers catching more than 50 tonnes of cod and as many as 2,226 fewer fishers catching less than 10 tonnes. For a net reduction of 'only' 1,703, some fishers must have increased their effort. Table I shows that there were 638 more fishers fishing between 10 and 50 tonnes of fish in 1994, as compared to 1984. Paradoxically, the new regime, instituted in the context of a severe fish crisis, did not provide incentives for reduced fishing effort, and safeguarding of cod stocks. Instead, regulations were rewarding increased fishing effort and larger catches.

In terms of workload, fishers now spend more time on board their vessels. Public fishery statistics show that the effort of full-time fishers has increased from 175 fishing days a year in 1984 to 217 in 1994, roughly a 25 per cent increase. Prior to the new regulations, some fished for cod only in the winter, others only in the spring. With the regulations, most fishers now participate in both seasons, as well as fish cod out of season, in the autumn.

The increased work effort also stems from an increased mobility. In most places, local fish resources can not sustain the increased demand for fish. Moving to other places to locate fish takes time. Fishing where one's knowledge is poorly developed also increases the workload. Fishing throughout the year and in new places also increases capital costs. Using

the vessels an extra day at home is costly; using them away from home costs even more.

Since size of the quota is attached to vessel length, there is also an incentive to buy bigger boats. Bigger boats allow fishers to be more mobile and to use more efficient gear. Thus, investment patterns are in the process of changing. Formerly, fishers tried to keep debts low. Low debts allowed for flexibility and security in years where natural availability of cod was scarce. Low debts still serve this function, but it has become more difficult to keep them low.

The price of entry also includes buying a quota. Quotas are legally not transferable per se, but attached to boats. To attain rights for the 'full' rights positions, one must buy a boat with a quota. A finite number of vessels with these rights exists and the prices of boats have increased to reflect an informal market for quotas.

Fishing authorities now have a stronger tool for controlling and distributing fishing opportunities than in the 1980s. Formal limits to expansion in the small-scale fleet have been established. Controlling expansion is regarded as crucial for successful fisheries management.

A success?

As such, the new regime is a success. But its success has a flip side. The new formal regulations have penetrated a system of production where the needs of the individual fisher and his or her household were crucial for fishing effort. Furthermore, the formal regulations seem to undermine the informal management

Changes in the fishing patterns of Norwegian small-scale fishers (1984-1994)

No. of vessels fishing	1984	1994	Change (No)	Change (%)
- less than 10 tons of cod	6 215	3 989	-2 226	-36
- between 10 and 50 tons of cod	1 659	2 297	+638	+38
- more than 50 tons of cod	359	244	-115	-32
Total	8 233	6 530	-1 703	-21

among fishers. The new regulations provide incentives for expansive strategies, whereas the former inherent restrictions are discontinued. One can no longer enjoy the benefits of a long career and perhaps enjoy family life while a neighbor fisher is at sea. It could mean becoming disqualified for fishing the following year.

Fishers' increased endeavors to fish their quota represent an increased pressure on the cod resource. This increased pressure is to be controlled by the new regulations. But there are loopholes in the formal control system, and clear incentives to use them. Changed harvest patterns may also have ramifications for stock composition.

From fishing heavily in the winter, fishing pressure is now shifting toward other times of the year. The impacts on stock composition might be positive or negative the point is that we do not know how changed fishing patterns are affecting the cod stock. Neither do we know how they are affecting species other than cod.

Restrictions in the cod fishery led to a shift towards fishing other species. With low cod quotas, many of those who experienced cuts turned to other resources to obtain sufficient incomes. Fishers also came to see this as a warranty for eventual future rights potentials. Fishers had learned a lesson and fear the same

regulations may be introduced for other species.

In conclusion, the effect of the new regulations is a transformation of small-scale fisheries. Small-scale fishing is an occupation for people in rural communities, where alternative job opportunities are scarce. The stated goals of Norwegian fishery policy are occupation and settlement in remote regions, as well as economic efficiency and sustainability of resources. From the viewpoints of these goals, the results of the new regulations are highly debatable.

Postscript: Shortly after 1990, cod stocks were seen as recovering, allowing for quotas corresponding to those before 1990. The last years' positive prognoses are now being reversed, however. Fishery biologists have again found the spawning stock to be below critical levels, and a large quota cut is expected to follow for the year 2000. Apparently, controlling the small-scale fishers has not been effective in controlling the cod stocks

This article is by Anita Maurstad, Associate Professor at the Norwegian College of Fishery Science, Troms, Norway