ITQs and Community: An Essay on Environmental Governance

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Two important new directions in resource and environmental management are increased reliance on market mechanisms on the one hand, and on greater participation by local communities on the other. In fisheries, market-based management is found mainly in the "cap-and-trade" systems known as individual transferable quotas (ITQs). ITQs are effective in achieving certain economic goals but often with undesirable social costs, leading to the view that they are antithetical to community-based management. However, ITQ systems have been adapted to mitigate community losses. In addition, social resistance to ITQs has encouraged the development of innovative programs in community-based fisheries management.

Key Words: Canada, cap-and-trade, community, fisheries management, Iceland, individual transferable quotas, United States

Fisheries governance institutions have experienced changes that reflect the growing significance of the social, economic, and ecological dimensions of marine fisheries. The baseline from which change is assessed in this paper is the now "traditional" practice of natural resource management, which focuses on natural resources as generating commodities, is based in government agencies, and carries the ideal of using science as the basis for policy making. Important changes in recent years include (*a*) increased attention to the conservation of biodiversity and ecological health in marine systems; (*b*) a humbler role for science, given high levels of uncertainty and variability; (*c*) a trend toward reliance on market-based allocation of fishing rights, as in individual transferable quotas (ITQs) and private leaseholds and concessions; and (*d*) recognition of the importance of human communities, in terms of their dependence on marine systems, the impact of their activities on those systems, and their roles in managing and restoring the values of marine systems (McCay, 2000).

The focus of this paper is on market-based allocation of fishing rights, as it intersects with community issues. In fisheries management, ITQs are often seen as diametrically opposed to community-based management. This has an element of disciplinarity: ITQs are typically promoted by economists, i.e., distinctly economic discourses; anthropologists and sociologists favor community-based management and concepts such as co-management. Economists promote monetary values such as profitability and efficiency and consumer surplus; and anthropologists and sociologists argue for the need to pay equal attention to non-monetary values such as job satisfaction, small-town life, family business, and heritage. The disciplinary disagreement is also grounded in concerns that market-based approaches to fisheries problems, such as ITQs, will harm some community interests, and that community-based management works against efficiency goals of market-based approaches. However, as I seek to show here, "community" issues and concerns have influenced the design and implementation of market-based fisheries management systems as well as led to creative explorations of alternatives, suggesting the topic calls for a more *inter*disciplinary approach.

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ITQs and the Birth of the Fish Stocks Market

Individual transferable quotas (ITQs) are fisheries management tools designed to complement other more traditional measures such as restrictions on the total catch, size limits, and closed seasons. ITQ-based fisheries management is analogous to emissions trading in environmental protection "cap-and-trade" systems (Tietenberg, 2002). Briefly, what happens is that some entity—a government agency most likely—decides on an overall total allowable catch (TAC). Permitted users have shares of that quota, and they are assigned individual allowable catches for a particular period of time, for example, a fishing season. How much they are allowed to catch depends on how much quota share they hold as well as the size of the TAC. In a full-blown ITQ system, there are two forms of property: (*a*) the quota share, now typically in the form of a percentage, and (*b*) entitlement to that specific amount for the season. Those engaged in the fishery may be able to buy, sell, and swap either or both quota share and specific allocations.

ITQs make commodities out of the right to catch wild fish and shellfish, and they bring market forces to the allocative task. This method of managing commercial fisheries has been implemented in many countries, starting with New Zealand and Iceland in the early 1980s. But much resistance and controversy exists, exemplified in legal and political action against ITQs in Iceland, Canada, and Latin America (Copes and Pálsson, 2000) as well as the United States. Indeed, in 1996, the U.S. Congress imposed a moratorium on ITQs for American fisheries, and only in 2004 was the moratorium lifted. Controversy remains. Primary concerns are (*a*) the potential effects of ITQs on the socio-economics of fishing fleets, industries, and communities; (*b*) whether ITQs represent an unfair or unwise gift of public resources to private enterprises; and (*c*) whether ITQs work for or against effective fisheries and ecosystem conservation (Marine Fish Conservation Network, 2004; National Research Council, 1999a).

ITQs in Context

Although ITQs as such are hardly more than two decades old in fisheries management, they are part of a long history of enclosure of the fishery commons, and resistance to them is part of a long history of social resistance to enclosure and other privatizing activities (McCay, 1998). ITQs arise in the context of long histories of conflict over privatizing marine rights and more recent histories of social and legal commitment to freedoms of fishing and navigation (Scheiber and Carr, 1997). Their appearance in fisheries management in the 1980s and 1990s is a product of the historical process of widening and deepening the role of markets in economies, and increased recognition of the importance of economic factors in protecting environments and managing natural resources, including the development of market-based tools for management (Squires, Kirkley, and Tisdell, 1995). ITQ-based fisheries management is analogous to emissions trading in environmental protection "cap-and-trade" systems. The governance questions associated with them are virtually the same, as should be the policy—to be wary of adopting one or another form of governance without carefully examining needs, goals, and potential consequences.

ITQs in fisheries can be seen as the logical approach to problems of open access in the fisheries commons, an inevitable step in a process of civilizing the unruly "frontier" of marine fishing. ITQs are well known in resource economics for what they offer to the challenge of reducing incentives for overcapitalization and, to some extent, overexploitation in otherwise open-access fisheries. The problem of open access, sometimes misleadingly characterized as "the tragedy of the commons" (Hardin, 1968; Ciriacy-Wantrup and Bishop, 1975), was identified in early works of economists such as Jens Warming [Warming (1931), with translation by Andersen (1983)], and then by Canadian economists H. Scott Gordon (Gordon, 1954) and Anthony Scott (Scott, 1955). The practice of restricting access, through limiting the number of licenses or creating other barriers to entry, was adopted in Canada quite early—Pacific salmon in the 1970s (Fraser, 1979) and many other fisheries in the 1980s—and somewhat later and more reluctantly in the United States, such that today most important commercial fisheries in North America (and elsewhere in the developed world) have some form and degree of limits to the number of licensed participants.

Limiting entry does not, however, forestall overexploitation or overcapitalization. It may simply create a smaller "commons" or community of license holders who compete for a limited resource with incentives much the same as those of open-access fishers (within a universe which may or may not include restrictions on gear, minimum sizes of

fish taken, seasons, etc.) (Pearse and Wilen, 1979). A next step was proposed whereby each licensee is granted a quota of sorts, analogous to the "stinting" rules of the English agrarian commons (Moloney and Pearse, 1979). This form of management is fairly widespread now: trip limits, or weekly limits per vessel, or even seasonal quotas per vessel, as in Newfoundland's snow crab fishery, where each vessel is granted a certain amount for the season depending on its size class (McCay, 1999). A variant used in New England and other areas is an assignment of a limited number of "days at sea" (DAS) per vessel. In all of these systems, access to fishing rights is contingent on access to a vessel with such rights.[1]

"Stinting" systems of fisheries management have the virtue of reducing incentives to overinvest in order to compete for limited quotas, but when stocks are in poor shape and/or large numbers of vessels are involved (typically because they were "grandfathered" into the system), they can get into trouble. They often evolve into systems where a large number of vessels have limited catch privileges, and some of those fishing operations—those with few other options or high indebtedness—are struggling to survive. Pressures then arise to allow the combination of vessel-quotas or days-at-sea allocations onto fewer vessels. Sometimes this happens; sometimes instead the system is changed to become an ITQ system, similar to what Francis Christy (Christy, 1973) had in mind: individual harvest rights that could be freely transferred among members of a fishing industry, letting the market promote efficiency. For this to occur, fishing rights must be separated from boat ownership, and people must be able to sell, borrow, lease, and buy fishing rights—whether days-at-sea or specific amounts of allowable catches. In the 1980s, New Zealand, Australia, the Netherlands, Canada, and Iceland instituted fisheries management regimes that included ITQs or very similar practices (Muse and Schelle, 1989).

The virtues of ITQ systems are several and well known. Where before, the fishery was managed by a competitive quota, ITQs result in the end of a costly and often dangerous "derby" or race to catch as much as possible before the quota is reached and the fishery is closed. ITQs can also result in higher quality products, especially where "derby fishing" leads to product gluts. The Pacific halibut fisheries of the United States and Canada are familiar examples of both: short-season derby fisheries were transformed into safer ones taking place throughout the year and producing higher quality seafood (i.e., halibut for fresh-fish rather than frozen-fish markets) (Casey et al., 1995). They can also place some of the cost of downsizing a fishing fleet on the industry itself. It must be remembered, though, that ITQs more often are implemented on the heels of other attempts to limit entry and control catches, particularly vessel quotas or time limits. A good example is the surfclam fishery of the U.S. Mid-Atlantic region. ITQs followed a 13-year period of regulation based on a vessel moratorium, overall quotas, and time restrictions—becoming a bureaucratic nightmare and an extremely overcapitalized system where, by the mid-1980s, each vessel was allowed to fish for only six hours every two weeks (McCay and Brandt, 2001).

Once people can trade in stinted fishing rights, i.e., so many pounds of fish or shellfish or so many days at sea, they have incentives to modify their capital investments to maximize profits. Before, ownership of a fishing vessel—the major capital investment involved—was required for access to the right to fish. With ITQs, that right can be obtained separately and applied to whatever vessels are available. Capital and projected returns can be more finely tuned to each other. This is the fundamental rationale for ITQs.

The Evolution of ITQs: Learning and Adaptation

The history of ITQs is shallow, but shows the effects of trial-and-error learning and adaptation. Early experiments such as for herring in Canadian waters of the Bay of Fundy showed the importance of monitoring and enforcement: unreported landings weaken or even destroy a market for quota shares. Monitoring and enforcement of activities that take place in remote, often isolated locations mainly at sea, as well as numerous landing sites, remain major challenges to ITQ systems, which are very hungry for data and vulnerable to cheating (Burke and Macgillivray, 1990).

The ITQs of New Zealand provide many lessons (Boyd and Dewees, 1992; Crothers, 1988). One came about in the aftermath of a dramatic readjustment, downward, of stock assessment for orange roughy: the high costs of allocating specific amounts of fish rather than shares in a periodically adjusted total allowable catch. After an extremely

[1] Note: I am using the term "rights" in its broadest sense, not in the legal sense that would require distinguishing "privileges" from "rights."

costly law suit filed by quota holders, New Zealand's fisheries agency changed the system to one now common elsewhere, where the basic property is in a share of an annual quota; the secondary one, which lasts only for a season or a year, is in whatever that share is computed to be once the annual TAC is set. Using percentages of an annual TAC rather than fixed amounts is a wise step given the uncertainty of ecological systems. It also may provide a stewardship incentive to the quota share holder, in that any action which changes the productivity or size of the fish stock, and hence the TAC, will then automatically change the owner's allowable catch. In contrast, ITQs for fixed amounts do not change, calling for draconian or heroic measures in the face of change in the fish stocks, as shown in the New Zealand case. On the other hand, fixed ITQs might leave open the possibility of allocations to other parties when and if the TAC is increased.

Another cautionary tale concerns the very question of "property rights." Economists point to the need for very secure, exclusive, long-term property rights to provide economizing incentives in an ITQ system (Scott, 1996), but the experience in New Zealand, where holdings of ITQ shares are indeed property rights, shows the risk of having to compensate rights holders if and when the value of the property rights is diminished by natural or regulatory actions. In many other nations with ITQs in fisheries, these are legally defined as privileges, not rights, and in the United States they are further clearly defined as revocable privileges in an attempt to reduce government liability. This, too, is an adjustment to ecological variability and uncertainty, but also to the political and legal expectations of the social system.

A third lesson to be derived from the New Zealand experience is the importance of thinking "up front" about the legitimate claimants when allocating quota shares. In New Zealand, the ITQ system was initially defined only in relation to commercial fishing operations, but very soon the tribal Maori claims under the Treaty of Waitangi, as well as recreational fishing claims, called for major readjustments—indeed, for reparations. In 1992, the government agreed to buy half of Sealord Products Limited, the largest inshore fishing company of the country, for Maori, to settle several fishing rights claims. The Maori became owners of more than 50% of the commercial fishing quota. At the same time, the government incorporated Maori customary fishing rights into the national fisheries act (Guth, 2001). Less dramatic but similar issues have surfaced in other cases, as allocations were made to owners of fishing vessels, ignoring the claims of hired captains and crew members. This is one of the major ways community issues have surfaced in debates about and designs of ITQ systems.

Several of the ITQ programs are viewed as cautionary tales about the potential for rapid consolidation of ownership, with social and economic consequences for individuals, firms, and communities. While these programs are good at reducing fishing capacity, this comes at social and economic costs: the windfall profits that may go to a select few at the initial allocation; reduced employment opportunities for crew, captains, and shore support workers; effects of ITQs on processors and processing laborers; the increased cost of entry into the fishery, and the various costs of consolidation of ownership in the hands of a select few.

The consolidation issue is often highlighted by reference to the surfclam and ocean quahog ITQ program. It was the first in the United States, started in 1990. This program has clearly shown how rapidly and thoroughly ITQs can foster consolidation. Designed with few restraints on ownership, transfer, and consolidation of quota shares—and implemented in the context of an extremely overcapitalized fishery—the surfclam and ocean quahog ITQ program allowed the industry to divest itself of over half of the licensed vessels within a few years. Rapid consolidation, and re-consolidation, also took place as the industry restructured (Adelaja, Menzo, and McCay, 1998; McCay and Brandt, 2001; National Research Council, 1999a).

Clearly, ITQs are intended to reduce capacity, and the surfclam program demonstrated just how well they can do that. As David Wallace, a consultant to the surfclam and ocean quahog industry, said to a reporter, the ITQ plan was adopted for clamming because "we had too many fishermen. Some had to go away.... It was designed from day one to get rid of fishermen" (Moore, 2003, online). Wallace's choice of the term "fishermen" was unfortunate. The problem was not too many fishermen, but rather too much harvesting capacity, given decisions about how the plan should be managed. But the term was accurate insofar as fishermen were affected. Specifically, the program decreased employment, not unexpectedly, and it also decreased opportunities for young people and hired captains to become vessel owners and for independent vessel owners to find markets for their clams.

Bells, Whistles, and the Reemergence of Community

ITQ programs have been designed to avoid rapid consolidation and loss of opportunity, with provisions that have the potential of protecting community interests, in contrast with the surfclam and ocean quahog ITQ program, which is designed with a minimum of restrictions. Two examples are the mobile gear fishery of Nova Scotia and neighboring New Brunswick, Atlantic Canada—the so-called "under 65' dragger" fleet (Apostle, McCay, and Mikalsen, 2003)—and the halibut and sablefish individual fishery quota (IFQ) program in Alaskan waters (National Research Council, 1999a). Each of these cases included design features ("bells and whistles") intended to protect smaller owner-operator fishing and, by implication, communities engaged in such fisheries, because of lessons learned from other cases. Each of the cases showed how participation declined and consolidation increased regardless of the provisions. And each showed the emergence of counter efforts to restore some measure of community values.

The Nova Scotia under-65' dragger ITQ system began in 1991. Demands for coastal community economic viability and employment conflicted with the need for fleet rationalization. Consequently, the program was designed with limits on transferability, caps on ownership control, and a policy separating ownership of the fishing fleet from ownership of processing firms. These were responses intended to preserve the owner-operator, small-business structure of the industry. Nevertheless, an appropriate qualification is that market-based systems of resource management set up their own very general dynamics and imperatives which may result in very similar consequences.

In support of this point is the rapidity with which members of the under-65' dragger fishery agreed to lift restrictions on transferability of quota shares. There was a particular reason this happened. Because pressures for exchange and transfer of quota were so great, a complex and costly under-the-table system of quota transfers emerged; behind that was a shift in the "community of interest," which in the process of creating ITQs also created a very narrow community of vessel owners who became ITQ owners. Their interests became the weightiest, and there was no explicit representation from fish plant workers, community leaders, or others who might be affected by free transferability of quotas.

Moreover, very soon after the program began, actual control over quota share became directly or indirectly vested in a few large processors. Within five years, the number of participating vessels had declined by at least half. In addition, the trading of quota share resulted in regional shifts in the landings of groundfish, whereby some ports emerged as major centers and others declined, reducing the processing sector employment available in them (Apostle, McCay, and Mikalsen, 2003; McCay, Apostle, and Creed, 1998; McCay et al., 1995).

This problem of regional shifts in ITQ ownership with often devastating economic impacts on small coastal communities has been identified in Iceland as well (National Research Council, 1999a; Pálsson and Helgason, 1995), and it became an issue in Alaska as will be discussed below. In Canada, one consequence was the development of community-based alternatives or adjuncts to ITQs. Largely in response to threats that the ITQ system would be imposed upon the smaller and fixed-gear vessels used by fishers in the region, numerous acts of civil disobedience as well as more peaceful negotiations led to the creation of community-based quota management. This process began in 1995 with an agreement to allocate part of the TAC for a particular area to the fishers of the community of Sambro, Nova Scotia, who would decide among themselves how to allocate it rather than have it assigned as ITQs to qualifying individuals (Apostle et al., 1998).

Subsequent grassroots efforts and civil disobedience saw the expansion of this principle of community-based management to the "fixed-gear" sector in the Bay of Fundy region (Kearney et al., 1998). The Canadian fisheries agency agreed to allocate TAC to "community management boards," based on the collective catch history of the fishers they represented. The boards then developed management plans, using a participatory, consensus-based process. They used contract law to enforce the plans, lacking legislated capacity. Fishers who wish to participate sign a contract agreeing to follow the plan, and accept designated penalties for violation. If they decline, they may participate in a government-run competitive fishery. The boards also became vehicles for fishermen's participation in scientific research.

Two cooperatives created in the late 1990s in Alaska, the Whiting Conservation Cooperative and the Pollock Conservation Cooperative, are similar, involving voluntary contractual agreements on the part of members of a group to apportion shares of

the catch among themselves (U.S. General Accounting Office, 2004). However, participants are industrialized offshore fishers with no links to particular communities. Although one might refer to them as members of "virtual communities" (National Research Council, 1999b), they mainly represent particular sectors of an industry, defined in terms of species sought and technology employed.

A stronger sense of community is found in the most recent variant of this system which was adopted in August 2004 in the New England region of the United States, when hook-and-line ("fixed-gear") fishers from Cape Cod communities received a legally binding contract from the National Marine Fisheries Service (NMFS) to manage a portion of the TAC for cod (Plante, 2004). The fishers, who belong to an organization that has already been active in collaborative research and other matters, are seen as a "sector" within the fishery. However, because of their long-standing involvement in shared endeavors through their association and their use of the same ports and, in many cases, residence in the same small communities, this sector may be interpreted as a community defined not only by shared interest and occupation but also in relation to place.

The Alaskan halibut and sablefish IFQ program, developed by the North Pacific Fishery Management Council in 1995, similarly includes provisions intended to maintain the existing owner-operator structure of parts of the industry. The many bells and whistles built into this ITQ program include "caps" on the quota share that can be held by any one person per species and area, constraints on the transfer of quota share from smaller to larger operations, a loan program to help crew get financing to own quota share, and a rule that the holder of the quota share used on a particular fishing voyage must be on the boat for that voyage (National Research Council, 1999a). Nonetheless, participation has declined markedly. For halibut, the number of vessels declined by 53% between 1992, the reference date, and 1999 (NMFS, 2000). In 1995, when the IFQ program began, there were 4,828 persons holding IFQs; by 1999, four years later, there was a decline of 24%, to 3,649.

As in Iceland and Canada, the loss of access to quota share by many coastal communities, as individuals sell their IFQ effect of ITQs, has emerged as an issue in Alaska, and an institutional innovation has emerged in the direction of community-based management. The Pacific sablefish and halibut IFQ program included a provision that the holder of quota share had to be on board the vessel. This is one of the measures intended to help preserve the owner-operator nature of the fishing fleet and reduce corporate control, because it also meant that the owner of quota share has to be a person. An unintended consequence of this provision was that cooperatives and communities, as well as businesses, are not allowed to hold quota share, making it harder for groups of fishers and communities to forestall the movement of quota share—and hence fishing opportunities—out of coastal fishery-dependent communities. This has emerged as a problem for many isolated communities of Alaska, despite the many social "bells and whistles" of the IFQ system.

After a long struggle, and several false starts, the Alaska region of the NMFS began to implement a special "community quota program" as of June 1st, 2004, for 42 Gulf of Alaska communities. Details of the program are briefly outlined below (NMFS, 2004, online):

- "Eligible communities have fewer than 1,500 people, are located on the coast of the Gulf of Alaska (and not a road system), have a history of halibut or sablefish fishing, and have been identified by the Council as eligible—there are 42 eligible communities.

- An eligible community will form a non-profit corporation to act on its behalf; the non-profit will apply to NMFS for recognition as a Community Quota Entity (CQE) and may buy and sell Quota for the community.

- Each year, the CQE will transfer (lease) its IFQ to one or more permanent residents of the community who will do the actual fishing.

- The CQE will continue to act on behalf of the community by purchasing more Quota and helping more local fishermen to fish.

- The program does not allocate fish and it does not allocate money—instead, it allocates 'opportunity' for community residents to improve their local economies."

There are also extensive reporting requirements and caps or limits on the amount of quota share any one community may hold, as well as on the amount of quota share that can be held by all communities. Many of the features of this program were changed

to reduce its size and potential for competing with the existing IFQ system: narrowing its range to the very smallest and most isolated communities, creating very small caps on holdings (Deep Sea Fishermen's Union, 2002). Nonetheless, like the sector management initiative of the Scotia-Fundy region and the Cape Cod region, the Community Quota program of Alaska is realizing the potentials of community-based fisheries management in response to perceived and realized problems that accompany the use of ITQs for fleet rationalization.

Conclusion

ITQ systems of fisheries management are effective in countering perverse incentives toward overcapitalization that plague fisheries and other common pool resource activities. These systems have evolved over the past three decades, to improve their performance in relation to economic efficiency and social equity as well as administrative resilience (Young and McCay, 1995). Concerns related to consolidation of quota and other matters can be addressed through individual program design. Reaction to some of the social costs that come along with ITQs has led to the creation of stronger measures within ITQ systems to protect community values (U.S. General Accounting Office, 2004). Some concerns call for bolder measures. These include important innovations in community-based fisheries management, exemplified by the community management boards of the Scotia-Fundy district of Atlantic Canada and the new sector allocation of Cape Cod in New England and the Community Quota program for Gulf of Alaska communities, among others.

Additional concerns about ITQs, more difficult to alleviate, relate to the quasi-privatization of a public trust resource and to whether ITQs contribute to conservation. ITQs are sometimes referred to as "rights-based" tools for fisheries management (Neher, Arnason, and Mollett, 1989). This language signifies the idea that more exclusive and enduring rights—private property rights—are keys to stewardship. It is much clearer that ITQs are excellent ways to reduce overcapitalization in fisheries than that they improve incentives for personal or collective stewardship. The incentives embedded in ITQs have led to practices such as "highgrading," whereby less marketable species or sizes of fish that are caught are discarded in favor of the more valuable ones, thus assuring the market returns of a given quota share are optimized. This is one example of many demonstrating how rational economic behavior can be potentially damaging to the sustainability of a natural resource-based system of extraction even when, as in the case of ITQs, access is no longer open. Colin Clark showed this long ago in his essay illustrating the effect of the discount rate on decisions which could lead to the overexploitation of whales (Clark, 1973). There are "tragedies of the privatized commons" just as there are "tragedies of the open-access commons."

In addition, when most people recognize the need for ecosystem-based management and the challenges of complex and dynamic socio-ecological systems, ITQs are difficult to justify, given their basis in species-specific, deterministic, and production-oriented bio-economic modeling and their reliance on market signals. Clearly, ITQs must be embedded in systems of governance which include both the state and communities, to link market forces with the social and ecological dimensions required for ecosystem-based management. And that calls for a truly interdisciplinary effort: among biologists, economists, and anthropologists.

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