

The End of the Line: Who is Most at Risk from the Crisis in Global Fisheries?

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The crisis of global overfishing has been widely covered in both the scientific literature and the popular media over the last decade. However, with his recent film *The End of the Line* (Murray 2009), Rupert Murray tells the story with unprecedented power. Heralded as the “Inconvenient Truth” for fisheries—a reference to David Guggenheim’s influential film on the perils of climate change—*The End of the Line* provides a rich, well-argued and sobering picture of how people, the oceans’ top predator, have brought many of the world’s fisheries to collapse.

Based on the book of the same name by Clover (2004), the film moves through the value chain from up-market sushi restaurants in London, to global supermarket chains, and down through fish markets to industrial fishing vessels on the seas. Its dominant narrative is one of corporate plunder, governance failure and iniquity. In the words of one reviewer, the film “chronicles the marine Armageddon perpetrated in the name of consumer choice by big businesses over the last half century”. The case is well made by Clover who appears in the film, complemented by superb underwater footage, and ably supported by several scientists who also feature. Drawing on several influential articles from

the past few years (Pauly et al. 1998; Worm et al. 2006; Hilborn et al. 2005), Daniel Pauly, Boris Worm and Ray Hilborn very effectively translate the science behind the story into compelling mental images. There are lessons for all researchers in their performances about how to translate the messages of science in digestible form.

If ever there was a vehicle for coalescing public opinion to influence fisheries policy and consumer choice in the industrialized countries whose fleets have driven these problems, this film is it. Murray and Clover deserve enormous credit for communicating important messages in a balanced and compelling way. However, there are important dimensions to the fisheries story, which the film only touches upon, and yet deserve far more attention. Central among these is the consequence of overfishing for the world’s poor. While it is important to educate affluent consumers and structure management of the world’s large-scale commercial fisheries and trade systems to foster sustainability in our oceans, this needs to be accompanied by efforts to maintain the world’s small-scale fisheries that provide food and income for the vast majority of producers and consumers in the world.

Of the 70% of the world’s total fish catch that comes from developing countries, over a half of this comes from small-scale fisheries (FAO 2008). These fisheries too are collapsing—a major problem for the 22–24 million full- or part-time fishers in developing countries who depend upon them, and the 68–70 million people who work in postharvest (Anonymous 2008). With 90–95% of the catch destined for local domestic markets, the fish supply crisis here will also have far more profound consequences than the omission of bluefin tuna from the sushi bars of Tokyo or Paris, or North Sea cod from supermarket shelves in London or Oslo.

For the affluent consumers of developed countries, eating wild caught fish is a lifestyle choice. If they choose not to eat fish, then there is always lamb, beef, chicken or one of many

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other options available. In contrast, for the poor of developing countries, wild caught fish provide one of the very few options for eating animal protein. In Africa, 200 million people obtain between 22 and 70% of their dietary animal protein from fish, while in developing countries, the average is 13% (Heck et al. 2007). Add to this the vital role of fish in providing the poor with micronutrients and essential fatty acids, and the importance of sustaining fish stocks as a source of food and nutrition for the poor stands out. This contribution to feeding the poor, and the profound humanitarian imperative of sustaining these stocks, does not come across strongly enough in *The End of the Line*.

The poor already face a growing gap between supply and demand, particularly in sub-Saharan Africa (SSA). While average global fish consumption rose from 12 to 16 kg/year between 1973 and 1997, it fell in SSA from 9 to 6.6 kg/year (Heck et al. 2007). Looking forward, demand will increase as population grows. Simply maintaining current per capita consumption requires 1.6 million tonnes more fish every year by 2015, increasing to 4.2 million tonnes by 2030. This calls not only for sustaining the fisheries that these poor consumers depend upon, but also for developing aquaculture that can provide food for poor consumers. This requires moving beyond consideration of highly intensive aquaculture that *The End of the Line* highlights, to develop technologies that can help small and medium enterprises to flourish and do so in ways that are environmentally sustainable.

Failure to solve the fisheries crisis will also add to global security problems. With overfishing, declining incomes and reduced employment opportunities for fishing-dependent people result. In the film, Rashid Sumaila, a fisheries economist, supported by interviews with Adama Mbergaul, a Senegalese fisher, points out how this can lead to increased emigration to Europe—much of it illegal. Overfishing can also make fishing people more vulnerable to involvement in crime, either opportunistic or organized. Fishing boats are frequently implicated in weapons trafficking, people smuggling and drug running. A well-regulated fishing sector in which people are able to earn a decent living is less vulnerable to being used as the instrument of organized crime.

As the film amply demonstrates, it has proved extraordinarily difficult for developed countries to manage high seas and coastal fisheries well. The list of failures outweighs the successes by a considerable margin (Pitcher et al. 2009; Mora et al. 2009). For the coastal waters of developing countries with far fewer resources to devote to the task and a more difficult social context in which to operate, the problem is magnified many fold. This is even truer of inland fisheries, a sector that was not touched at all in the film, but which employs more fishers than marine fisheries do. These fisheries are often even more informal

and dispersed than their marine counterparts and so bring another suite of management challenges. In addition, because these fisheries are dependent on the quantity and quality of freshwater available in rivers and lakes, they are especially vulnerable to the wide range of environmental pressures that these systems face.

The End of the Line offers three prescriptions for viewers to help solve the global fisheries crisis. First, use the power of consumer choice to demand that the fish they eat are caught more sustainably. Second, lobby politicians to strengthen political will to cut the size of fishing fleets and impose fishing quotas based on sound science. Third, join the campaign for “vast marine protected areas, where commercial fishing is banned”.

There is plenty to debate around the relative efficacy of these prescriptions for large-scale fisheries, especially the last of the prescriptions (Hilborn et al. 2004), but each approach has its place. At best, however, these prescriptions are partial. Altering the preferences of affluent consumers will do nothing to change fishing practices for the vast majority of the world fishers—those who supply the local consumers in developing countries. Generating political will to cut fleet sizes and set quotas through centralized policy mechanisms can work in some settings, but it will not work in many others where the social safety net and food security functions that fisheries play are central to people’s survival. We also need to confront the growing gap between fish supply and demand in developing countries—especially in Africa, and examine how sustainable aquaculture can help address this growing need.

If we want to comprehensively tackle the global fisheries’ crisis we would add two further prescriptions to Murray’s list: lobby development agencies to (i) use aid to help secure the productivity of the fish stocks upon which the world’s poor depend, and (ii) invest in developing sustainable aquaculture solutions that meet the food needs of the poor in developing countries. We would also add five principles to guide this investment:

Support the continued operation and development of small-scale fisheries. Unless there is compelling evidence that small-scale fishers cannot operate efficiently (e.g. in offshore marine fisheries), development benefits are more likely to be maintained and widely distributed if the fishery is based on small-scale production units and decentralized marketing networks.

Support livelihood diversification. Diversified livelihoods are already a feature of many fishing communities, particularly inland ones. In these economies, the best investments for fisheries may be those that support complementary household activities. This does not mean encouraging people to leave the fishery altogether, but rather encouraging alternative livelihood sources with potential conservation and economic benefits.

Support technology development in small-scale fisheries. These technologies are needed to help reduce by-catch and environmental destruction, improve vessel safety/seaworthiness, and improve the efficiency of processing and storage of fishery products. Livelihoods analysis can help to target technologies that fit within peoples' constraints, opportunities and investment strategies.

Build on existing strengths and strategies of small-scale fisherfolk to increase their adaptive capacity and build resilience of the fishery system. The key to sustainable fisheries management and development is to facilitate small-scale fisherfolk to find their own routes out of poverty by building on their existing capital and capabilities (Allison and Ellis 2001).

Support the development of small- and medium-scale aquaculture enterprises. This needs to be done where there are both the environmental conditions and the market potential for sustainable aquaculture to succeed and expand. Equally there needs to be investment to identify and manage the environmental impacts so that these systems are both economically and environmentally sustainable.

Moderate investments against these principles can deliver major benefits. Our own analyses of the needs of seven countries in SSA, for example, indicate that an investment of US \$30 million in policy improvement, management, and marketing chains in small-scale fisheries can produce 350,000 tons more fish for low-income consumers in rural and urban areas, improved fish supplies and food security for 35 million people by 2020 and for a further 90 million by 2035. Analysis available on request. Similarly, we estimate that an investment of US \$30 million in technology development, transfer, and capacity building for aquaculture, combined with improvements in policy and markets access, can produce 3 million tonnes of fish by 2020, and generate up to US \$2 billion annually.

These are the kind of benefits that we need to secure if the most vulnerable on our planet are to receive their entitlement to adequate food and nutrition and income security. As Boris Worm, a fisheries ecologist from Dalhousie University notes in the film, our late realization of the just how pervasive overfishing around the world has

become is due largely to the difficulties of counting animals that live underwater. It is easier to count how many poor and hungry people there are in the world, but the reasons for their poverty and the solutions are also largely invisible. As we reflect on the messages in the End of the Line and peruse our sustainable seafood guide when choosing our restaurant meal, we would do well to remember that much of the fisheries story is about small boats, hunger and poverty. This is a story that also needs to be told and acted upon.

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