

Where and how to prioritize fishery reform?

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Fishery reform in North America and Europe has substantially improved the prospects for recovery of ecosystems affected by overfishing. Costello et al. (1) draw from lessons learnt and suggest, in their view, commonsense approaches for improved resource management, including fishing to maximize long-term catch and rights-based fishery management approaches that optimize economic values. They identify global prospects by 2050 and highlight 10 countries that constitute "the most compelling and urgent cases for fishery reform." This important study has value to both scientists and decision makers, but its long-term and global perspective raises several questions in relation to where and how to prioritize future reform.

We argue that the global scale has inherent dynamics that are not captured by simply aggregating national statistics. While international agreements are emerging to advance compliance and conservation (2, 3), globalization is also rapidly changing fisheries by concentrating production toward large and vertically integrated transnational corporations. In 2012, a handful of companies controlled 11-16% of global reported wild marine catch, and up to 40% of some of the largest and most valuable stocks (4). These corporations operate through global networks of subsidiaries (4), including in the countries prioritized for reform by Costello et al. (1). Mergers and acquisitions will further consolidate the sector and increasingly integrate catches and economic benefits from these countries into value chains controlled by transnational corporations.

Consequently, fisheries reform targeting countries where raw materials are sourced should be complemented with efforts addressing the activities and incentives of transnational corporations. Limited corporate transparency is currently hampering the ability to understand who catches what, how much, and from where. However, increasing public availability of vessel monitoring data (5), seafood certifi-

cation schemes (6), and industry transparency initiatives (https://www.sustainablefish.org/global-programs/ocean-disclosure-project) incentivize corporations to act responsibly while also drawing attention to where and how to prioritize reform.

Of the world's 100 largest seafood companies (combining wild-capture fisheries and aquaculture), 46 are headquartered in Japan, the United States, or Norway (7). We also identified ownership for 83 of them using the Orbis database (https://orbis.bvdinfo.com) and found that 20% of all shareholders are based in Japan and 18% in the United States, followed by Norway (13%), Great Britain (7%), and Canada (4%). How these shareholders prioritize between short-term profits and social and environmental goals influences corporate engagement in sustainable fisheries around the world. Targeted investments, performance standards, green bonds, or futures contracts are examples of how private and public banks or pension funds, philanthropy organizations, insurance companies, and other financial institutions can substantially redirect capital toward more sustainable practices (8).

Transnational seafood corporations and financial actors likely respond to different management approaches than those approaches suggested by Costello et al. (1), and are also based in a number of countries not among the ones they prioritize for reform. Although we agree that reform is important in the countries identified by the authors, our findings suggest that governments in nations hosting corporate headquarters of transnational actors could play a central role in designing incentives and enforcing rules that accelerate fishery reform.

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