



Rebuilding fish stocks and changing fisheries management, a major challenge for the Common Fisheries Policy reform in Europe

Sebastian Villasante^{a,b,c,d,*}, Didier Gascuel^e, Rainer Froese^f

^a Department of Applied Economics, Faculty of Economics and Business Administration, University of Santiago de Compostela, Av. Burgo das Nacións s/n, 15782 Santiago de Compostela, Spain

^b Centro Nacional Patagónico, CONICET, 9120 Puerto Madryn, Chubut, Argentina

^c Karl-Göran Mäler Fellow, The Beijer Institute of Ecological Economics, The Royal Swedish Academy of Sciences, P.O. Box 50005, SE-104 05 Stockholm, Sweden

^d Campus do Mar – International Campus of Excellence, Spain

^e Université Européenne de Bretagne, Pôle halieutique AGROCAMPUS OUEST, UMR Ecologie et Santé des Ecosystèmes, Rennes, France

^f Helmholtz-Centre for Ocean Research (GEOMAR), Duesternbrooker Weg 20, Germany

ARTICLE INFO

Article history:

Available online 4 August 2012

ABSTRACT

In the European Union (EU), subsidies to the fishing industry and lack of compliance and enforcement of fishing regulations have led to a chronic overcapacity and a general decline of commercial fish stocks. The entire fisheries sector (extractive fishing, fish canning and commercialization subsectors) is still affected, with all directly and indirectly employed people being impacted by the overfishing problem. However, fish populations could strongly increase and generate more economic output if they were left for only a few years under less fishing pressure. The papers published in this Special Issue are the products of recent research conducted by European fisheries scientists, economists, and lawyers. A window of opportunity for change is currently open under the current Common Fisheries Policy (CFP) reform. This Special Issue is an attempt to stimulate the debate by providing new findings and formulating new proposals to rebuild stocks, strengthen ecosystems resilience and better manage EU fisheries. The Special Issue consists of eight papers dealing with relevant biological and economic aspects of the management of European fisheries. Together these papers show that the EU fish stocks are under high fishing pressure and that their recovery will generate not only environmental or ecosystem benefits but also greater profitability for the fisheries sector.

© 2012 Elsevier Ltd. All rights reserved.

In the European Union (EU), subsidies to the fishing industry (Khan et al., 2006) and lack of compliance and enforcement of fishing regulations have led to a chronic overcapacity and a general decline of commercial fish stocks (Froese and Proelß, 2011; European Commission, 2009, 2011; ICES, 2011). The so called “precautionary approach” formally adopted by EU and International Council for the Exploration of the Sea (ICES) in 1998 contributed at maintaining stock abundance at low level. Only recently the objective to reach the fishing mortality that produce the maximum sustainable yield (F_{msy}) in 2015 was adopted and several stocks have improved as a result. But half of the European stocks for which an assessment is available are still overexploited in Atlantic waters and 80% in the Mediterranean Sea (European

Commission, 2012). The entire fisheries sector (extractive fishing, fish canning and commercialization subsectors) is still affected, with all directly and indirectly employed people being impacted by the overfishing problem (Gascuel et al., 2011).

Fish populations could strongly increase and generate more economic output if they were left for only a few years under less fishing pressure (World Bank, 2009; European Commission, 2012; Srinivasan et al., 2012). For example, European fisheries have profit margins of about 3–6%, whereas in New Zealand, which has successfully reformed its fisheries, the margins are closer to 40% (Froese, 2011). Indeed, Froese et al. (2011) suggested that long-term catches in Europe could be 63% higher on average under the harvest control rules proposed by the authors, and profits could increase 3-fold within 5 years. Rather than demanding the highest possible catches immediately, fishers would be well advised to demand low increases in catches and a fixed upper catch below the theoretical maximum once the stock is fully recovered (Froese and Quaas, 2011).

* Corresponding author. University of Santiago de Compostela – Campus do Mar – International Campus of Excellence, Av. Burgo das Nacións s/n, A Coruña, 15782 Santiago de Compostela, Spain. Tel.: +34 981563100x11649; fax: +34 981559965.
E-mail address: sebastian.villasante@usc.es (S. Villasante).

The papers published in this Special Issue are the products of recent research conducted by European fisheries scientists, economists, and lawyers. A window of opportunity for change is currently open under the current Common Fisheries Policy (CFP) reform (Gascuel et al., 2011).

This Special Issue is an attempt to stimulate the debate by providing new findings and formulating new proposals to rebuild stocks, strengthen ecosystems resilience and better manage EU fisheries. The Special Issue consists of eight papers dealing with relevant biological and economic aspects of the management of European fisheries. Together these papers show that the EU fish stocks are under high fishing pressure and that their recovery will generate not only environmental or ecosystem benefits but also greater profitability for the fisheries sector.

In the first paper, Arnason analyses the impacts of climate change on fish stocks and suggests that, if they occur, the consequences for the size, location, range, and productivity of many European fisheries will be significant. Arnason shows that in migratory stocks, the effectiveness of the total allowable catch rules will be limited.

In the second paper, Guénette and Gascuel document the profound changes in marine resources that have occurred over the last 60 years in the Celtic Sea and Bay of Biscay. They show that the long-term stability in total landings masks the fact that the fisheries have been sustained at the cost of a dramatic increase in fishing pressure and a change in species composition. Major changes in fish stock abundance occurred between 1950 and 1970s; generations of stakeholders have only known low abundances and tend to consider this state to be the “normal” state of the system. The authors suggest that recovery of these marine resources would require a 2–3-fold reduction in fishing mortality.

In the third paper, Proelss and Houghton show that overfishing by European fleets above the catches permitted by fisheries regulations constitutes a violation of the precautionary principle and a violation of European and international law. The authors point out that many of the issues tackled in the proposed CFP reform have the potential to contribute to a truly environmentally sustainable fisheries policy. However, these contributions will have little effect if the culture of compliance among operators called for by the European Commission does not extend to the institutions of the EU themselves.

In the fourth paper, Villasante et al. analyze the evolution of catches of the deep-sea fleet in the EU before and during application of the CFP. A key finding of the study is that the EU fleet increased the average depth of fishing by 78 m between 1950 and 2006, almost doubling the values (42 m) reported previously for the world fleet. Moreover, the authors demonstrated that TAC proposals by European Commission have not been respected in about 60% of deep-sea stocks during 2002–2011, and the reported catches exceeded approved TACs 3.5 times on average.

In the fifth paper, Ulrich et al. underline the inconsistency of single-stock management objectives in a mixed-fisheries context. A number of intrinsic issues still remain for the operational implementation of alternative or complementary fleets/metiers based approaches. Nevertheless, there is no doubt that such kind of approaches would potentially address a wider range of problems than the current stock-based one. They appear more suited to account for economic, social and societal drivers behind exploitation of marine resources, contributing to enforcement of an ecosystem-based management.

The sixth paper by Da Rocha et al. summarize the nature of the non-stationary solutions in optimal fishery management problems when age-structured populations are considered. The authors also show that fishery agencies do not consider periodic fishing as a feasible management tool, mainly because its application may imply high financial and social costs.

The Special Issue also contains case studies of two commercial fisheries in Europe (i.e., Atlantic cod *Gadus morhua* and the Southern hake *Merluccius merluccius*). In both studies, authors estimated the economic losses due to overexploitation in the short and long term. In the seventh paper, Froese and Quaas investigate the consequences of overfishing of cod in the North Sea, which was one of the most important commercial fisheries in the world. The authors simulate the ecological and economic effects of closure of the fishery and conclude that a three-years closure would have rebuilt the stock sufficiently for fisheries to resume, and the economic benefits nearly would have doubled, increasing from €50 million in 2006 to €90 million in 2011. In the eighth paper, Antelo et al. present a surplus production model to simulate the direct economic value of the Southern hake stock under current and rebuilding scenarios. The authors conclude that the fishing industry prefers to maximize short-term economic benefits and ignores or underestimates the risks of collapse of the stock. They show that continuation of the exploitation pattern of the past 20 years would result in an economic value of the stock of US\$258 million for the period 2012–2022, which would be well below the value of US\$436 million that would occur if the fishery respected the scientific recommendations provided by ICES.

The papers in this Special Issue provide results that contain a variety of relevant and novel themes to the current discussion of the CFP reform. Given that we live in an increasingly globalized world, the existence of cascading social–ecological interactions can create strong vulnerabilities but it also can also provide exciting opportunities to develop more sustainable paths and better methods to assess the performance of marine ecosystems.

We wish to thank the reviewers of the papers for their valuable and constructive comments, which have helped to improve the contributions substantially. We also appreciate the support and guidance of the Editor-in-Chief of the journal, Dr. Victor de Jonge, and the assistants who generously helped us during the publication process.

Acknowledgments

Rainer Froese acknowledges the financial support of the Future Ocean Excellence Cluster 80, funded by the German Research Foundation on behalf of the German Federal and State Governments. Sebastian Villasante acknowledges financial support of the Swedish International Cooperation Development Agency, the International Development Research Center and the Campus do Mar – International Campus of Excellence. The author is also grateful to The Beijer International Institute of Ecological Economics (The Royal Swedish Academy of Sciences, Sweden) for awarding him the Karl-Göran Mäler Fellowship.

References

- European Commission, 2012. Communication from the Commission to the Council Concerning a Consultation on Fishing Opportunities for 2013. COM (2012) 278 final, Brussels, 7.6.2012.
- European Commission, 2011. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Reform of the Common Fisheries Policy, Brussels, 13.7.2011 COM (2011) 417 final.
- European Commission, 2009. Green Paper-Reform of the Common Fisheries Policy, Brussels, 22.4.2009, COM 163 final.
- Froese, R., 2011. Fishery reform slips through the net. *Nature* 475, 7.
- Froese, R., Branch, T.A., Proelß, A., Quaas, M., Sainsbury, K., Zimmermann, C., 2011. Generic harvest control rules for European fisheries. *Fish and Fisheries* 12, 340–351.
- Froese, R., Quaas, M., 2011. Three options for rebuilding the cod stock in the eastern Baltic Sea. *Marine Ecology Progress Series* 434, 197–2011.
- Froese, R., Proelß, A., 2011. Rebuilding fish stocks no later than 2015: will Europe meet the deadline? *Fish and Fisheries* 11, 194–202.
- Gascuel, D., Bez, N., Forest, A., Guillotreau, P., Laloë, F., Lobry, J., Mahévas, S., Mesnil, B., Rivot, E., Rochette, S., Trenkel, V., 2011. A future for marine fisheries

- in Europe (Manifesto of the Association Française d'Halieumetrie). *Fisheries Research* 109 (1), 1–6.
- International Council for the Exploration of the Sea (ICES), 2011. Report of the ICES Advisory Committee, 2011, ICES Advice, 2011. Book 9. 148 pp.
- Khan, A.S., Sumaila, U.R., Watson, R., Munro, G., Pauly, D., 2006. The nature and magnitude of global non-fuel fisheries subsidies. In: Sumaila, R., Pauly, D. (Eds.), *Catching More Bait: A Bottom-Up Re-Estimation of Global Fisheries Subsidies*, vol. 14(6). Fisheries Centre Research Reports, pp. 5–37.
- Srinivasan, U.T., Watson, R., Sumaila, U.R., 2012. Global fisheries losses at the exclusive economic zone level, 1950 to present. *Marine Policy* 36, 544–549.
- World Bank, 2009. *The Sunken Billions: The Economic Justification for Fisheries Reform*, Washington D.C., 130 pp.