

Enhancing the Performance of Quota Managed Fisheries Using Seasonality Information: The Case of the Portuguese Artisanal Dredge Fleet

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Abstract

Several fisheries across the world are managed by a quota regime. These quotas can be set yearly, monthly, weekly or daily. For some fish species demand seasonality may occur, which should be taken into consideration in the establishment of quotas. This would allow fishermen to catch more fish in times of the year with higher demand in detriment of periods with lower demand. In the framework of the PRESPO project it was investigated the existence of demand seasonality for bivalves from the artisanal dredge fleet operating along the coast of Portugal. The analysis of fleets' revenue efficiency was assessed using a methodology based on the Data Envelopment Analysis technique, and the monthly seasonality effects on revenue efficiency were tested using truncated regression. The results revealed that in the South coast there is a strong demand in the summer whereas in the western coast demand increases during Christmas and New Year festivities. Since this fishery is managed by weekly quotas, it is proposed their redistribution in order to account for periods of higher demand, increasing in this way the profitability of the vessels. The approach developed to explore seasonality elements may be transferable to other industries or applied to other fisheries worldwide.

Keywords

Fisheries Management, Performance assessment, Data Envelopment Analysis, Sustainability of artisanal fisheries

Biography

Ana S. Camanho is an Associate Professor, and Pro-Director of the Master of Science in Industrial Engineering and Management of the School of Engineering of the University of Porto, Portugal. In 1995 she completed a degree in Industrial Engineering and Management at the School of Engineering of the University of Porto, and has a PhD in Industrial and Business Studies from Warwick Business School, University of Warwick, United Kingdom. She has published more than 30 papers in international peer-reviewed journals. She has done research projects in the following sectors: banking, retailing, healthcare, education, fisheries, construction industry, regulation of electricity distribution companies and urban quality of life. Her research interests include performance assessment, Data Envelopment Analysis, Productivity measurement, Data mining and Customer Relationship Management. She was vice-president of the Portuguese Operational Research Society and Pro-director of the PhD program in Industrial Engineering and Management of the School of Engineering of the University of Porto.

Manuela M. Oliveira is a PhD student focused on the sustainability of artisanal fisheries in Portugal following an interdisciplinary approach. Seeking an increasingly interdependent relationship between mathematical, economical and biological sciences, she proposed to develop her PhD thesis in Industrial Engineering and Management in the doctoral program of the School of Engineering of the University of Porto. The research is focused on the development of bio-socio-economic models and their application to achieve the sustainable management of artisanal fisheries.

Miguel B. Gaspar is a Senior Researcher at the Portuguese Institute for the Sea and Atmosphere (IPMA). In 1990, he completed a degree in marine biology and fisheries at the University of Algarve (Portugal) and undertook his

PhD at the same university, where he studied several aspects related to the bivalve dredge fishery that occurs along the south coast of Portugal. Currently, he is responsible for the management of the bivalve fishery in Portugal. He has been the coordinator of several research projects regarding management of small-scale fisheries as well as the ecological effects of artisanal fishing and other anthropogenic impacts on marine ecosystems, aiming to provide policy makers with the scientific information to best manage the marine environment and fish stocks. He is the author or co-author of more than 100 publications in international peer-reviewed journals and book chapters. He is a member of the editorial board of *Scientia Marina*.