Chapter 5
Fishery Indicators for Policy Use in the Mediterranean and Black Sea

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ABSTRACT

The pursuit of sustainable fisheries development as a policy objective has become increasingly important in recent years and policy makers are requiring more information on how to measure progress towards sustainable development goals. In order to accomplish an effective fisheries management, the understanding of how a combination of the aforementioned multiple pressures reduce sustainable limits of harvest is considered a necessity. The multi-species and multi-gears nature of the Mediterranean fisheries hampers the implementation of management processes based on single species analyses. Therefore, the development of methods to integrate information of the fishery systems complexity could be proven advantageous. Among the different approaches, the application of indicators consist a valuable tool for tracking changes and monitoring the implementation of relevant policies. By reviewing the current state of Mediterranean fisheries and linking it to the legal status of fisheries management, a broad spectrum of available indicators, useful for policy, were further considered.

INTRODUCTION

In order for the quality and productivity of the fishery resources of the Mediterranean and the Black Sea to be at least maintained and preferably restored to their full potential, urgent action needs to be taken across all fronts/sectors within the framework of Ecosystem Approach to Management (EAM) of human activities. The latter approach is reflected in the reformed Common Fisheries Policy (CFP) and is compatible with the overall aim of the Marine Strategy Framework

DOI: 10.4018/978-1-4666-8333-4.ch005

Directive (MSFD) to achieve Good Environmental Status (GES) of all marine waters of the EU by 2020. The Mediterranean and Black Sea are marine ecosystems having their origins in the ancient Sea of Tethys. However, as more or less closed basins, with relatively small size compared to the open oceans, their ecological features and dynamics are heavily influenced by adjacent terrestrial ecosystems and basin-wide processes (especially inputs from rivers). Their capacity to provide a rich variety of marine natural resources sustained human livelihoods for millennia. However, during the last century both seas suffered catastrophic ecological collapses mainly due to direct or indirect human activities, leading ultimately (and quite rapidly) to the destruction of fisheries on which many coastal communities depended for their economic well being. Other consequences also arose, including impacts on human health and loss of biodiversity. Today, Black Sea exhibits a rather simplified ecosystem, with fewer trophic levels and inter-specific interactions than they had before. This reduction of ecological complexity impairs the natural buffering capacity of the seas to absorb further shocks (not least from impending climate change) and calls for urgent research and development of appropriate natural resource management tools. The EU has recognized through its Marine Strategy Directive that there is a need for a gradual transition from the current fragmented management and exploitation of marine natural resources to a mature integrated management, including strategies for the implementation of the ecosystem approach at regional level, reconciling short-term economic objectives with long-term ecosystem sustainability objectives. In addition, the Bird and Habitat Directives requires member states to establish and manage a system of sites, including marine areas that will ensure favourable conservation status for vulnerable species and habitats. Following these concepts, the structure of this book chapter includes three sections which aim to provide information on (1) the Status and Trends of the Mediterranean fishery resources, (2) the Legal framework and (3) the use of indicators to address emerging policy needs.

BACKGROUND

Study Area

The Mediterranean and Black Seas are perhaps among the least typical of the world's Large Marine Ecosystems (Alexander, 1993) being semi-enclosed water bodies, subject to strong impacts from surrounding catchment basins, with only limited points of exchange with other marine areas. 23 different countries border its coastline. It extends from the Straits of Gibraltar to the Near East for about 4,000 km, reaching its maximum depth (5,121 m) in the eastern Ionian Sea. The Mediterranean Sea (Fig. 1) can be divided into three main basins: western and eastern separated by the Sicily–Tunisia ridge and the Black Sea. The eastern basin is characterized by great oceanographic variability on the surface with temperatures of 16∘C in winter and up to 29∘C in summer, as opposed to 12∘ and 23∘C in the western basin, and salinities of 39 psu as opposed to 36 psu in the west. The Black Sea forms in an east-west trending elliptical depression constrained by the Pontic Mountains to the south and by the Caucasus Mountains to the east, featuring a wide shelf to the northwest. In contrast to the remaining Mediterranean the Black Sea has a positive water balance; that is, a net outflow of water through the Bosphorus and the Dardanelles into the Aegean Sea. Mediterranean water flows into the Black Sea as part of a two-way hydrological exchange. The Black Sea outflow is cooler and less saline, and floats over the warm, more saline Mediterranean inflow – as a result of differences in density caused by differences in salinity – lead-