Ocean & Coastal Management 114 (2015) 88-101

Complementarity of fishers' traditional ecological knowledge and conventional science: Contributions to the management of groupers (Epinephelinae) fisheries around Mafia Island, Tanzania

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Article history:
Received 27 October 2014
Received in revised form
27 May 2015
Accepted 8 June 2015
Available online xxx

Keywords:
Epinephelidae
Fishers' ecological knowledge
Integrating
Fisheries management

A b s t r a c t

Traditional ecological knowledge (TEK) is increasingly advocated as a complementary source of information that can potentially be integrated into mainstream science, particularly to help improve fisheries management. However, less attention has been paid to identifying specific areas where the TEK of fishers may confirm or contradict conventional scientific knowledge (CSK); or where TEK may provide new insights for fisheries systems characterized by multi-species and multi-gear usage. We conducted a qualitative exploration of TEK of grouper fishing patterns and compared the findings with an analysis of catch data in order to elucidate the extent of fishing pressure on groupers. We further compared TEK of the ecology and biology of groupers with published CSK to understand the complementarity between the two domains. Data collection methods included structured open-ended questionnaire, semi-structured interviews with key informants, focus group discussions, personal observations and a literature review. Results indicate that TEK complements CSK in terms of catch assessment and the ecology of groupers. TEK provides additional information on fishing gear, specific grouper species caught, habitat use and feeding habits; however, TEK contradicts CSK regarding spawning aggregation behavior. TEK offers new knowledge on environmental threats facing groupers, but fishers lack knowledge on reproductive modes and life history traits (i.e. hermaphroditism and spawning season) of groupers. We conclude that, in a conducive democratic setting based upon mutual respect and trust, TEK can complement conventional science and help to make more informed management decisions for sustainable fishing.

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