The effects of social-ecological changes on the livelihoods of fishing communities in Mafia Island, Tanzania

Philosophiae Doctor (PhD) Thesis

Victoria Hippolite Moshy

Department of International Environment and Development Studies, Noragric
Faculty of Social Sciences
Norwegian University of Life Sciences (NMBU)

Ås 2016

Thesis number: 2016:85
ISSN: 1894-6402
ISBN: 978-82-575-1401-3

Abstract

Changes in social-ecological systems (SESs) may originate in natural environmental processes, conservation interventions, or from the introduction of new economic policies or other social, cultural or political processes. In Tanzania, changes in marine SESs have had profound effects, both on marine resources and on the livelihoods of the communities depending on them for survival. However, there is a lack of in-depth understanding of how such effects have unfolded and affected these communities and the environment, and of how the communities and the resource management bodies have responded to change in order to contribute to the well-being of marine resources and the maintenance of livelihoods.

This study draws upon empirical evidence from the Mafia Island Marine Park (MIMP), Tanzania, to explore how the marine environment is changing over time, and how these changes, together with changes in conservation and economic policies, affect the livelihoods of fishing communities. The study examines how fishing communities and the Park respond to changing social-ecological conditions to enhance the well-being and resilience of marine SESs. In doing so, it draws on both qualitative and quantitative methods of data collection, including key informant interviews, focus group discussions and interviews, informal conversations, direct observations, questionnaire surveys, and anthropometry methodology.

The study confirms that a multiple-evidence approach is applicable towards understanding the changes that occur in the seascape in a local setting. The fishing communities interviewed for the study reported improved coral conditions and increased fish abundance in some areas, an increase in water temperatures and a decrease in sea level, coral cover, and fish abundance in others. They also experienced reduced catch composition, catch quantities, and fish sizes. Various environmental processes, conservation approaches, marketing challenges, and human population dynamics were the key interrelated explanatory factors for the observed changes. This new knowledge of the changing marine environment in the MIMP suggests a weak collaboration between fishing communities and conservation managers, which impairs any efforts to promote adaptive management and support livelihoods.

The livelihoods of the fishing communities included in this study have been adversely affected by changing social-ecological conditions and processes. People's ability to access marine resources, earn an income, and meet household food requirements has decreased, with generational and gender implications. Elderly people and non-fishing households experience

more difficulty earning a living, and the majority (69%) of children, the component of SESs that is usually not adequately considered due to the generalised nature of SES analysis – were found to have poor nutritional status. Women now have to work even harder than previously, while household members tend to seek loans, reduce expenditure, skip meals, and sell their assets in order to meet basic household needs. People also diversify their livelihoods, practice collective fishing, change fishing gear and techniques, abandon fishing activities altogether, or even migrate to distant places. These responses, however, have had little capacity to resolve their livelihood challenges, and in some cases have exacerbated them. For example, by working harder, women substantially reduced the period of breast-feeding, but could not afford nutritious breast-milk substitutes. The resulting poor nutritional status and delayed development of children may have adversely affected their ability to learn and accumulate fishers' knowledge, which will be crucial for utilizing and managing marine resources in the future.

Meanwhile, the Park's responses to the changing social-ecological conditions also did not contribute meaningful improvements to livelihood conditions. These responses were geared mainly towards improving marine environmental conditions, without paying serious attention to human needs. This unbalanced approach, combined with the absence of a legally enabling environment or a common understanding of key issues, and unequal power relations among key actors in Park's SESs, are the key obstacles limiting the implementation of adaptive management in the Park. Expanding the human dimension to address the immediate need for livelihoods and flexible conservation strategies could contribute to cross-scale conservation efforts.

This thesis thus attempts to give a human face to prevailing perspectives on SESs by placing more emphasis on humans, and their needs, struggles, and responses to social-ecological changes as they pursue their livelihoods. It shows that focussing on the needs of fishing communities to have conventional managers and scientists respect traditional ecological knowledge, and to earn their livelihoods under adjustable conservation approaches, would contribute to social-ecological resilience in marine parks. New insights into changing sea levels and temperatures, the inability of fishing communities to resolve existing social-ecological challenges, and cross-scale obstacles to effective adaptive management are among the key contributions that could be made by focussing on the human aspect; and they must be addressed in order to enhance social resilience in the Park. Local and institutional responses

to social-ecological changes may promote resilience that is desired by all actors, if national policies and legislation are changed to create an enabling legal environment. This requires balancing demands for biodiversity conservation, foreign investment, and resilient livelihoods; responding to the changing contextual and global social-ecological conditions; and building the capacity to respond to future uncertainty.