# Center for Community-Based Resource Management (CBRM)

## Natural Resources Institute, University of Manitoba

## CBRM Database

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| **Date:** | June 2014 | **Entry Number:** | 1303 |
| **Case Study Name:** | **Identifying Reefs of Hope and Hopeful Actions: Contextualizing Environmental, Ecological, and Social Parameters to Respond Effectively to Climate Change** | | |
| Author: | T.R. McClanahan, J.E. Cinner, N.A.J. Graham, T.M. Daw, J. Maina, S.M. Stead, A. Wamukota, K. Brown, V. Venus, and N.V.C. Polunin | | |
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| Region: | South Asia | | |
| Country: | Indian Ocean – The Seychelles, Mauritius, Madagascar, Kenya, Tanzania | | |
| Ecosystem Type: | Coral reef, fisheries | | |
| Social Characteristics: | Coastal communities | | |
| Scale of Study: | Regional, oceanographic, socioeconomic | | |
| Resource Type: | Fisheries, coral reefs, protected areas | | |
| Type of Initiative: | Environmental planning, conservation | | |
| Community-Based Work: | Conservation, protected areas | | |
| Keywords: | Adaptive management, coral bleaching, global climate change, marine protected areas, resilience, | | |

| | socio-ecological systems |
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| **Summary:** | Priorities for conservation, management, and associated activities will differ based on the interplay between nearness of ecosystems to full recovery from a disturbance (pristineness), susceptibility to climate change (environmental susceptibility [ES]), and capacity of human communities to cope with and adapt to change (social adaptive capacity [AC]). We studied 24 human communities and adjacent coral reef ecosystems in 5 countries of the southwestern Indian Ocean. We used ecological measures of abundance and diversity of fishes and corals, estimated reef pristineness, and conducted socioeconomic household surveys to determine the AC of communities adjacent to selected coral reefs. We also used Web-based oceanographic and coral mortality data to predict each site's ES to climate warming. Coral reefs of Mauritius and eastern Madagascar had low ES and consequently were not predicted to be affected strongly by warm water, although these sites were differentiated by the AC of the human community. The higher AC in Mauritius may increase the chances for successful self-initiated recovery and protective management of reefs of this island. In contrast, Madagascar may require donor support to build AC as a prerequisite to preservation efforts. The Seychelles and Kenya had high ES, but their levels of AC and disturbance differed. The high AC in the Seychelles could be used to develop alternatives to dependence on coral reef resources and reduce the effects of climate change. Pristineness weighted toward measures of fish recovery was greatest for Kenya's marine protected areas; however, most protected areas in the region were far from pristine. Conservation priorities and actions with realistic chances for success require knowledge of where socioecological systems lie among the 3 axes of environment, ecology, and society. |