RESEARCH BRIEF

Marine Protected Areas

Lessons from Costa Rica and Tanzania

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In 1992, in response to a growing commitment to sustainable development and conservation of biological diversity, the 168 country signatories of the United Nations Convention on Biodiversity agreed to expand the amount of coastal/marine conservation to 10% of each country's marine area by 2020. For many low and mid-income countries, that expansion of Marine Protected Areas (MPAs) represents a dramatic change in total marine area conserved. Both Tanzania and Costa Rica have extensive terrestrial protected area (TPA) systems that draw large numbers of international tourists. Despite that experience, MPAs and TPAs differ in important ways, including the goals of management, how the PA helps/hurts nearby areas, and the role of tourism. Similarly, MPAs in low or mid-income countries differ from their high-income country counterparts in their emphasis on management of fishing activities rather than completely closing the MPA to fishing, as in a reserve or "no-take" area.They also differ in regard to the concern for benefits accruing to local people, and in the cost of enforcement. EfD's Coastal Conservation Collaborative conducted surveys and interviews in Costa Rica and Tanzania to compare and contrast the two country's experiences with MPAs. Both conceptual and data analysis based on the experiences of these countries identified three critical aspects of MPAs in low/mid-income countries: enforcement, benefits to local people, and the role of off-sea income-generating activities.

Sea Turtle Conservation

Both Tanzania's and Costa Rica's beaches provide important nesting sites for endangered sea turtles. Poaching of eggs by local people for food or for sale presents a major threat to these species, as do other predators. This harvesting of eggs in MPAs, and throughout Costa Rica, remains illegal, but enforcement on long beaches proves difficult. Both countries have active organizations that attempt to reduce this poaching, sometimes involving moving nests. The Tanzanian NGO Sea Sense works directly with local communities to increase knowledge and to provide cash from tourist viewing of hatchlings to local communities to generate incentives to refrain from harvesting eggs. Similarly, but on a much larger scale, Tortuguero National Park in Costa Rica manages a guide system that provides employment to local people while maintaining controls on the number and behavior of tourists watching turtles hatch or lay eggs.

Enforcement

As with parks or protected areas on land, marine protected areas impose various restrictions on the types and amounts of activities that can occur within the area; these restrictions are the primary mechanism by which the resources and ecosystem within the MPA are protected or conserved. Neither Costa Rican nor Tanzanian MPAs have sufficient budgets to fully enforce either access restrictions, which limit or prohibit people from fishing within the MPA, or gear restrictions, which define the types of equipment, such as the mesh size of nets, that can be used for fishing within the

MPA. Managers describe only limited numbers of scheduled patrols of marine areas, supplemented by patrols in response to tips about illegal activities. Fishers concur that they see patrols infrequently but describe the confiscation of fishing gear, including nets, as a significant deterrent to illegal activities. In most Tanzanian marine parks, "insider" villages located within the MPA receive rights to fish in the MPA, as well as projects or payments in exchange for village environmental committees conducting some enforcement patrols, both with and without park officials. In the early days of MPAs, several Tanzanian marine parks had Nongovernmental Organizations (NGOs) such as the World Wildlife Fund to undertake enforcement activities against outsider villages and against illegal gear such as fine mesh nets and dynamite. Fishers on Mafia Island report that that the level of enforcement was rigorous enough that the fish stocks recovered significantly as a result, with insider village fishers feeling the benefits of the MPA from those increased stock sizes, but limited enforcement in recent years has meant outsiders fishing in the MPA with relative impunity. In contrast, however, villagers and managers suggest that enforcement of regulations in mangroves and river mouths occurs at a higher rate.

- Small enforcement budgets imply that managers need to make decisions about which locations and activities to prioritize for protection.

- Enforcement patterns should recognize ecological connections between land or near-shore protection and marine benefits, such as mangroves' role for juvenile fish and beaches' role for sea turtles (see box).

Benefits to local people

Early pressure to expand MPAs centered on the ability of no-take zones to increase stock sizes within the MPA to such high levels that large numbers of fish would disperse from the MPA to other locations, with the result that high enough fish stocks in the unrestricted locations would generate harvests that offset lost harvests from the MPA. No analysis yet exists to determine whether such zones create large spillovers of fish outside MPAs in Costa Rica or Tanzania. So far, fishers do not describe such benefits from no-take zones, although Costa Ricans report that the MPAs do contain higher fish stocks. Instead, MPAs provide benefits to local fishers and other people through other mechanisms. Neither country's MPAs provide more than a few employment opportunities directly, nor does Costa Rica have programs to compensate locals for lost access to resources. In contrast, Tanzania's MPAs have dual goals of biodiversity conservation and poverty alleviation. The poverty alleviation components of management occur through a portion of MPA tourist and hotel fees going directly to villages as cash or development projects and through alternative income-generating projects, such as honey production and fish ponds, in villages within MPAs. Although some projects employ people who would otherwise be fishing, the projects and payments rarely generate incentives for villagers to connect their behavior to the health of the MPAs. In fact, villagers report that they are unaware of the MPA's involvement in paying for community development such as dispensaries. The projects rarely effect many people. In addition, the tourism receipts differ widely across Tanzanian marine parks, which implies lower opportunities to induce cooperative behaviour in the less touristed parks.

- The lack of incentives for conservation created by the payments and programs in Tanzania implies a large missed opportunity to promote poverty alleviation while linking improved livelihoods to the marine resource stock.

Off-sea labor opportunities

In both Tanzania and Costa Rica, most fishers undertake some non-fishing income-generating activities. The minority of fishers who specialize only in fishing tend to fish away from the coast and with more costly gear. Despite Costa Rica's lack of direct programs to create non-fishing

jobs, the tourism industry associated with the Carribbean MPAs provides many jobs with pay rates that compete well with fishing benefits. In fact, the majority of fishers see the MPA as positive due to the benefits to the local economy. In contrast, the off-sea labor opportunities for most coastal people in Tanzania are low-productivity agriculture and low-wage menial labor. Hotels/inns hire some local people but villagers suggest that that work is both limited in number and primarily low-wage work. Some inns and tourist facilities provide direct training to local people and conduct projects within local villages, perhaps to a larger degree than occurs in Costa Rica, where the tourism industry finds local qualified people for many positions. While most fishers in both countries undertake non-fishing activities, those activities pay more in Costa Rica and therefore encourage less fishing overall.

- Well-paid off-sea labor opportunities reinforce MPA rules in Costa Rica by decreasing incentives to undertake illegal and destructive activities within the MPA.

Conclusions

MPA managers in low/mid-income countries should consider how their limited enforcement activities could be augmented by strategic implementation of benefits-sharing programs to create incentives for local people to cooperate with MPA rules. Similarly, off-sea wage opportunities in general, and in particular those that depend on the ecosystem's health, create incentives to reduce fishing activities and dovetail nicely with MPA programs for conservation of marine and coastal resources.

ABOUT THIS BRIEF

This brief is based on "Marine Protected Areas in Artisanal Fisheries: A Spatial Bio-economic Model Based on Observations in Costa Rica and Tanzania" (2015), EfD Discussion Paper 15-16, by H.J. Albers, L. Preonas, R. Madrigal, E.J.Z. Robinson, S. Kirama, R.B. Lokina, J. Turpie, and F. Alpízar, published by Environment for Development, University of Gothenburg, Sweden, and Resources for the Future, Washington, DC; and "Spatial Decisions, Livelihoods and Perceptions of Marine Protected Areas in Small-scale Fishing Grounds of Costa Rica," EfD Discussion Paper (forthcoming) by R. Madrigal, H.J. Albers, F. Alpízar, and T. Capítan.

FURTHER READING

"The Role of Incentives for Sustainable Implementation of Marine Protected Areas" (2014), EfD Discussion Paper 12-03, by E.J.Z. Robinson, H.J. Albers, and S. Kirama.

"Managing Marine Protected Areas through Incentives to Local People: The Case of Mnazi Bay Ruvuma Estuary Marine Park," by H.J. Albers, E.J.Z. Robinson, and S. Kirama. EfD Policy Brief Series 17, January 2012.

"Success Factors for Pairing Conservation with Enhanced Forest and Fish-based Livelihoods," (2012), by E.J.Z. Robinson, H.J. Albers, R. Lokina, and S. Kirama. EfD Policy Brief Series 19, 2012.

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