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The U.S. Government's Global Hunger & Food Security Initiative

ACHIEVING CORAL REEF FISHERY SUSTAINABILITY IN EAST AFRICAN BIODIVERSITY AND CLIMATE REFUGIA CENTERS

The Feed the Future Innovation Lab for Fish Achieving Fisheries Sustainability in a Climate Sanctuary activity aimed to address challenges of suboptimal seafood production in a climate refugia in Kenya. Coastal development and promotion of fishing on a national scale could undermine the ability of the poor indigenous coastal communities to sustain their livelihoods and benefit from sustainable fisheries. Small-scale fisheries management and control have been enhanced by Kenya's Beach Management Units over the past decade. Nevertheless, overfishing and lost yields have not been reversed potentially due to poor knowledge of fisheries status or underproduction relative to potential. Among the barriers are destructive fishing gears such as beach seines (long, vertical fishing nets), small-mesh nets, inadequate national and local level cost-benefit sharing, monitoring and subsequent knowledge of the status, weak governance institutions, and associated compliance. This study provided technical information to produce reliable data on fisheries production, effort, catches and their trends, and potential production or sustainable yield goals.

Deploying the trap, Mpunguti Reserve, Mkwiro Fishermen. Photo by Inês Gomez.

The communities and their landing sites occurred within the international transboundary zone of Kenya and Tanzania planned for transboundary conservation activities. Several climate change studies have identified the area as a high biodiversity climate refuge. Thus, the long-term sustainability will be an important contribution to preservation of coral reefs in the coming decades. Finally, there are numerous economically valuable natural resources and tourist attractions associated with the well-established and successful Kisite-Mpunguti Marine Park and Reserve system. Support for this park system is generally strong but varies among the communities. The fishing grounds within the Mpunguti Marine National Reserve are managed by the Kenya Wildlife Service while the surrounding waters are under the jurisdiction of the Kwale County Fisheries Department. Some community fisheries closures (locally called *tengefu*) are managed by the Shimoni, Kibuyuni, Mkwiro, and Wasini Beach Management Units. Seafood consumption by local fisher communities is high and plays an essential role in health through the provision of protein and other micronutrients.

STAKEHOLDERS ENGAGEMENT AND TRAININGS

The Fish Innovation Lab activity organized small group meetings and trainings at landing sites. Activities began by testing stakeholder knowledge of the fishing sector, future livelihood preferences, and community needs in the context of feedback sessions to communicate objectives. A baseline household survey estimated wealth, perceptions of the benefits of fisheries restrictions, and the efficacy of informal and formal governance institutions. Surveys were repeated after the intervention activities to measure changes in wealth, governance, and support for fisheries restrictions.

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The activity trained high performers on the test on data collection protocols and use of mobile phones. The team compared communities to national government fisheries officers' data in terms of thoroughness of the catch recordings. Additionally, the activity trained fishers in underwater survey methods to estimate the stock biomass of fish in different management zones. Thus, both catch rates and stock biomass training should create the potential for communities to estimate the status of their fishery. In-person training coupled with the development a Swahili language training manual enabled community data collectors to determine fisheries status. Finally, the team queried fishers' households about their knowledge and perceptions of fisheries laws and alternative livelihood options. These activities created a comprehensive baseline to craft a locally supported fisheries recovery program.

CONCLUSIONS AND RECOMMENDATIONS

Stakeholders expressed their gratitude for the activities and the team's involvement. The most preferred future scenario was community and fisheries management programs with less support for offshore fisheries and coastal developments. This varied by community, with those more dependent on natural resources strongly supporting community management while those dependent on trade supporting infrastructure development. The scaling of governance institutions and many fisheries restrictions was variable but low during the initial survey. By the end of the study, nearly all governance institutions and fisheries restrictions were scaled higher. The largest changes were some of the more contentious restrictions, such as closures and species restrictions. Household wealth and size increased marginally. Surveys found women had less information, but they also increased their support for restrictions more than men. Nevertheless, demographic metrics, such as gender, youth, household size, and wealth were considerably smaller influence than the Fish Innovation Lab interventions.

Community members were more effective at measuring catch than equally trained government staff. The community recorded rare and more catches which might be attributed to residing within the community and their commitment. The team suggests that community measurements of stock be promoted throughout this region, with the caveat that testing of knowledge and training are needed to ensure high quality data. Results indicated that the fisheries catch or yields from dependent stock assessments were overexploited in all fisheries except for the national marine reserve. Yields declined with distance from park and reserve, with many fisheries underperforming by 1–2 tons/km2 per year. More discussions and government involvement will be needed to ensure that increased preferences for management restrictions and governance effectiveness are implemented. Given the existing institutional setting in the region and its impact on the sustainability of fisheries stocks in climate refugia in coastal Kenya, short-term priorities to address challenges include supporting the implementation of stronger governance principles of intercommunity and trade conflicts, ecological monitoring or stock assessment, cost benefit sharing, and fair, consistent, graduated sanctions.

ABOUT THE FISH INNOVATION LAB

The Fish Innovation Lab supports the United States Agency for International Development's agricultural research and capacity building work under Feed the Future, the U.S. Government's global hunger and food security initiative. Mississippi State University is the program's management entity. The University of Rhode Island, Texas State University, Washington University in St. Louis, and RTI International serve as management partners.

www.fishinnovationlab.msstate.edu

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