THE FUTURE OF FISHERIES IN A GLOBAL BIODIVERSITY HOTSPOT: FISHER ADAPTATIONS TO CLIMATE CHANGE ON LAKE TANGANYIKA

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Global climate change is increasingly and disproportionately impacting communities in developing countries, where it is intensifying both real and perceived conflicts between conservation and development goals. A key area where this has been documented is on Lake Tanganyika in East Africa. A global biodiversity hotspot, Lake Tanganyika sustains one of the largest inland fisheries in Africa, which has been declining at an alarming rate due to climate change and overfishing. This poses a serious threat to both biodiversity conservation and the wellbeing of millions of people who depend on the fishery for livelihoods and nutrition.

While research is currently focused on the ecological changes on Lake Tanganyika, greater attention needs to be invested in understanding the human dimensions of the changing fishery. This project is focused on surveying small-scale littoral fishers along the Tanzanian shoreline to analyze how they respond to current and future changes in the fishery, the socioeconomic and cultural variables connected with how they adapt, and the impacts of their adaptations. It is being conducted in collaboration with the Tanzania Fisheries Research Institute (TAFIRI) as well as CLEAT—an international DANIDA funded project focused on the projections of climate change impacts on Lake Tanganyika (http://cleat.au.dk/).

Data collection was completed during May-July, 2017, and included surveys of 154 littoral fishers across eleven major fish landing sites in the Kigoma region. The surveys were translated from English into Kiswahili and were conducted by trained TAFIRI staff. Littoral fishers primarily use gillnets and hooks to target the littoral (shallow water) zones of the lake, which contain the vast majority of the lake's rich biodiversity. Kigoma served as an ideal base for this study as it houses a local TAFIRI center along with highest population density and fishing pressure along the Tanzanian shoreline.

Survey respondents ranged from eighteen to eighty-seven years of age with a mean age of thirty-six. Their length of time in the fishery (fishing tenure) ranged from half a year to sixty-one years, with a mean of ten and a half years. We found that 71.7% of littoral fishers perceived a decline in annual fish catches over the past five years, compared with 28.3% who perceived either no change or an increase in their catch. In contrast, only 47.4% of littoral fishers perceived a decline in income over this same period, versus 52.6% who perceived that their incomes stayed steady or even increased. These differences between perceived changes in catch versus income are connected with rising fish prices, and they demonstrate the importance of developing a robust and nuanced understanding of change and adaptation in complex social-ecological systems.

In addition to the quantitative surveys, semi-structured interviews were obtained from select key informants including fishery officers and religious leaders. These interviews helped bring to light other fishing influences—including various religious and spiritual beliefs and practices—that we were not initially aware of.

Data from this mixed-methods study is in the process of being analyzed and written up as a Master's thesis at the University of Florida, and an oral presentation on initial results was given at the American Fisheries Society's annual conference in August 2017. Our findings will complement the CLEAT project by more fully integrating social and ecological data on this fishery system, which is critical for developing effective management and adaptation strategies that sustain people's livelihoods while conserving this unique lake and its irreplaceable biodiversity.

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