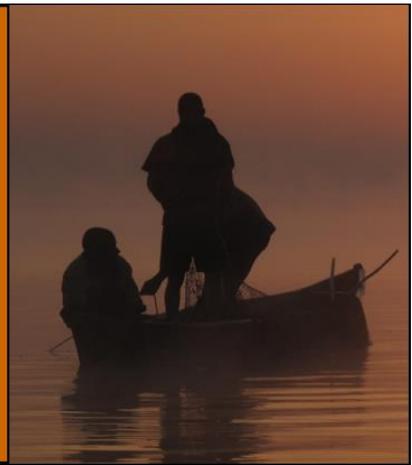


Policy Brief

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Developing adaptive capacity of fishing communities to climate change in the Lake Victoria basin of East Africa



In Brief

- Freshwater fisheries are essential to the livelihoods of millions of people in the Lake Victoria basin; however, climate change threatens to undermine this important natural resource. Fishing-dependent communities require adaptive strategies to cope with these changes.
- This study investigates the adaptive strategies used by fishing communities in the Masaka and Mpigi districts of the central region of Uganda, and investigates barriers to adaptation.
- The majority of households did not have adaptive strategies, but instead increased fishing pressure when faced with environmental shocks. Important barriers to adaptation include poverty, lack of low-interest credit, lack of land, lack of training, and poor communication.
- Several recommendations on how these barriers can be overcome are provided.

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Policy and research context

- Freshwater fisheries provide an important source of livelihoods and food security in the Lake Victoria basin. However, there is growing concern that global warming may have negative consequences for inland waters and the fishing communities that rely on them. Increases in air and water temperature, alterations in precipitation patterns, and increases in storm frequency can bring about significant biophysical changes to aquatic ecosystems and their resident fish populations with far reaching impacts on the livelihoods and economies of fishery-based communities. This makes it crucial to develop adaptive strategies designed to deal with emerging stressors.
- Ecologically, the Lake Victoria basin is extremely sensitive to climatic variation. Over the past 60 years numerous drought and flood events have led to fluctuations in lake, which have affected ecosystem function through changes in species distribution and habitat degradation. Water temperature increases of 0.2 - 1.5°C have been detected in Lake Victoria since 1900, and further air temperature increases of 1.3 - 4.3°C are expected by the end of the 21st century. Predictions also indicate that climate change in this region will manifest in less predictable seasonality and increased occurrence of extreme weather events. A major challenge facing the Lake Victoria basin is the need to develop appropriate strategies for improving the adaptive capacity of communities relying on the Lake's fishery resources.
- In Uganda specifically, freshwater fisheries provide a substantial contribution to the national economy through local markets, employment, and foreign export earnings. Fisheries provide approximately 30–50% of dietary protein and constitute the primary source of livelihoods for 1.2 million people living in Uganda's riparian areas. They contribute 12.5% to agricultural GDP and 2.5% to national GDP, and generate over \$150 million (USD) in export earnings (MAAIF, 2012). A number of recent international assessments rank Uganda as one of the world's most vulnerable countries to climate change based on its dependence on primary production and natural resources. Despite this, little directed local-scale analysis has examined the consequences of changing fishery ecosystems on human communities, creating barriers to coping with risks posed by global warming.

The Study

- This study examines pathways through which climate change affects fishing-dependent communities of the Lake Victoria basin, and assesses livelihood responses of households to these changes.
- Data were collected in 2016 in the Masaka and Mpigi districts of the Central Region of Uganda. Research was conducted at three sites on Lake Victoria (Lambu, Ggolo, and Nakiga) and two sites on Lake Nabugabo (Bbaale and Kaziru). Landing sites were chosen to represent a range of population size, wealth status, fishing capacity, and degree of reliance on the fishery. Since the completion of this study, Nakiga landing site was disbanded by the Uganda People's Defense Force (UPDF).
- Data were collected through 203 household surveys and 16 focus group discussions (FGDs) conducted with members of fishing communities. The study focused on four groups including boat owners, male fish traders, boat crew (*barias*), and female trader-processors. In addition, one-on-one interviews were conducted with community leaders (e.g., BMU leaders, Local Council 1, and landing site managers) at each landing site, and with fisheries officers and fisheries commissioners at MAAIF.
- Household surveys asked for information on demographics, access to capital assets, livelihood diversification options, perceptions of environmental change, adaptation strategies, and barriers to adaptation.
- FGDs involved detailed discussions of key issues raised during surveys, especially about adaptation strategies and barriers to adaptation.

This study aimed to answer four main questions:

- 1) What are the effects of climate change on the fishery and on the livelihoods of people in fishing communities?**
- 2) What are the strategies used to maintain livelihoods when environmental changes occur?**
- 3) What barriers are faced by people in fishing communities to maintain livelihoods?**
- 4) What can help to overcome these barriers?**

Key findings

<p><i>What are the effects of climate change on the fishery and on the livelihoods of people in fishing communities?</i></p>	<p>The most important effects of climate change include the increased frequency of drought and flood events, increased erratic storm events, changes in wind patterns, and unpredictable timing of the rainy and dry seasons. All of these can lead to changes in the abundance and distribution of fish species.</p> <p>These changes negatively affect livelihoods of people in fishing communities. Unpredictable seasonal patterns can lead to heavier reliance on fishing as fewer community members are willing to diversify to agriculture when there is high risk of crop failure. Changes in the distribution and abundance of fish cause reduced income and food security leading to more illegal practices. Crop failure, livestock death, disease, and damage to infrastructure (e.g., roads, houses, landing sites) are other common effects of climate change.</p>
<p><i>What are the adaptive strategies used to maintain livelihoods when environmental changes occur?</i></p>	<p>Many households do not have adaptive strategies and simply increase fishing pressure in response to droughts and floods. Desirable strategies include diversifying to non-weather-dependent activities (e.g., shop, bodaboda, mechanics), taking advantage of opportunities presented by climate change (e.g., sun-drying fish, storing water), planning ahead for droughts and floods (e.g., traditional gardening, irrigation systems, solar dryers for fish), and mitigating effects of climate change (e.g., protection and restoration of forest and wetland ecosystems).</p>
<p><i>What are barriers faced by people in fishing communities to maintain livelihoods?</i></p>	<p>Fishers are prevented from adapting by poverty, lack of low-interest credit facilities, lack of supplies or education to diversify, lack of access to land, immediate pressures of hunger, illness, and child care, lack of trust within community, lack of motivation, unpredictable seasons, and poor communication among fishers, fishery leaders, fisheries officers, and enforcers.</p>
<p><i>What can help to overcome these barriers?</i></p>	<p>Suggestions to improve adaptive capacity of households include provision of low-interest credit (e.g., fisheries-specific banking facilities), asset-based interventions (e.g., seeds, pigs, solar dryers, legal gears) with consistent and reliable follow-up from DFOs etc., training on financial planning and saving, sensitization to diversification options, education on sustainable resource use, sensitization to the effects of climate change, and improving consistency of communication among all parties involved in the fishery (UPDF, DFOs, landing site leaders, resource users).</p>

Policy recommendations

- Improve access to low-interest loans: For households in chronic poverty, diversification is more likely if the associated financial risks are reduced. Provision of fishery-specific credit facilities paired with education on financial planning can increase diversification.
- Provide asset-based interventions: Similar to above, providing asset-based interventions such as starting seeds or livestock, especially for groups, reduces risks of diversification. Follow-up is extremely important to ensure success of these projects.
- Access to land and improvements in agricultural practices: Even though crops and livestock are also at risk from climate change, they are important diversification options. Opening access to land for group-based agricultural or livestock projects can help those without land to diversify. Combining this with recommendations to build drainage systems and terraces in gardens and to plant drought- and flood-resistant crops, and aiding installation of irrigation systems can improve crop and livestock production.
- Sensitization, training, and education: Some fishers, particularly youths, may not be aware of the options for diversification, nor the importance of doing so. Sensitization of young people on HOW to diversify and WHY they should diversify is important.
- Sensitization on the importance of community cohesion: Social organization allows communities to work together and facilitates knowledge sharing. Involvement in community groups provides opportunities to learn new skills and opens access to government interventions. In the past, groups have failed because of to lack of trust, partly due to the highly migratory nature of many individuals.
- Promoting community agency through improved governance, improved enforcement: Negative interactions among governing bodies, enforcers, landing-site leaders, and fishing communities can undermine capacity for adaptive action. Improved communication among stakeholders and frequent meetings between fishers, governing bodies, and managers may help to clarify misperceptions.
- Local and group-specific intervention: Every community and group has specific needs and opportunities. Vulnerable groups include women and youth as both groups are poor, under-educated, and lack diversification options. These groups should be the focus of intervention activities.
- Sensitization of the UPDF to fisheries livelihoods: Better communication between the UPDF and DFOs can improve consistency of enforcement activities, avoid misunderstandings at landing sites, and minimize frustrations of community members.