

Climate change vulnerability and adaptation responses among fish dependent communities in the Albertine and Victoria drainage basins in Uganda

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Abstract

This research assessed the climate change vulnerability and adaptation responses among fish dependent communities in the Albertine drainage basin in Uganda. Results revealed that fishing communities in the three landing sites visited were very vulnerable to impacts of climate change.

Key words: Adaptation responses, Albertine, climate change, fish dependent communities, vulnerability

Résumé

Cette recherche a évalué la vulnérabilité au changement climatique et les réponses d'adaptation au sein des communautés dépendantes de poissons dans le bassin versant Albertin en Ouganda. Les résultats ont révélé que les communautés des pêcheurs dans les trois sites d'accostage visités étaient très vulnérables aux impacts du changement climatique.

Mots clés: réponses d'adaptation, Albertine, changement climatique, communautés dépendantes de poissons, vulnérabilité

Background

Worldwide, over 500 million people depend directly or indirectly, on fisheries for their livelihood (FAO, 2010). In Africa, fishing provides employment for up to 10 million people and is a vital source of protein to 200 million people (Adebo & Ayelari, 2011). In Uganda, the fishery industry contributes 5 - 12% to Gross Domestic Product (GDP) and generates about Uganda shillings 442 billion annually at fish landing sites (NAFIRRI, 2010). The fisheries sector remains the second highest foreign exchange earner for Uganda with over 100 million US \$ in regional and international exports (NAFIRRI, 2010). World wide, including in Uganda, climate change poses a big risk and could have dramatic impacts on fish production and supply to the already

struggling sector (FAO, 2010). This study was therefore carried out to assess the Climate change vulnerability and adaptation responses among fish dependent communities in the Albertine drainage basin in Uganda.

Literature Summary

Inland fisheries which form a very important source of livelihood for small-scale fishers in developing countries will be severely impacted by climate change. The impacts of climate change will occur in form of changing water levels and flooding events which will further devastate the already struggling fisheries sector (Allison *et al.*, 2005). African countries including Angola, Congo, Mauritania, Mali, Niger, Senegal and Sierra Leone are most at risk of climate change. Other vulnerable African nations include rift valley countries such as Malawi, Mozambique and Uganda. This is partly because many are semi-arid with significant coastal or inland fisheries, giving them high exposure to future increases in temperature, linked to changes in rainfall and hydrology. These countries also depend greatly on fish for protein, and have low capacity to adapt to change due to their comparatively small or weak economies and low human development indices (The UN report Defend Humans Right, 2008). Adaptation has the potential to reduce adverse impacts of climate change and to enhance beneficial impacts, but will incur costs and will not prevent all damages (IPCC, 2001). In India, for example, fishers are forced to make opportunity cost by not fishing during monsoon heavy rainfall and cyclones (Shimpei *et al.*, 2009).

Study Description

The study was carried out in Butiaba fish landing site (Magali and Boma fishing villages) located on the shores of Lake Albert, Kahendero fish landing site (Kahendero Cell 1 and Kahendero Cell 2 fishing villages) located on the shores of Lake George and in Katwe fish landing site (Kiganda Lower and Kiganda Upper fishing villages) located on the shores of Lake Edward-all in Albertine rift drainage system. Data were collected using questionnaires, through Focus Group Discussions, and key informant interviews. Respondents included Local Council Leaders (LC1), District Fisheries Officers, fishermen, fishmongers, boat and net makers. Descriptive statistics were then used to explore background and independent variables. Chi-square (cross tabulations) was used for measuring association between landing sites and qualitative determinants of vulnerability. One-way ANOVA was used to determine variability of determinants of vulnerability across the three landing sites and Fishers. Subsequently, the Least Significance

Research Application

Difference (FLSD) test was used to separate the means in the multiple comparisons at 5% level of significance.

Among the responded, 70% never went beyond Primary School, 40% had limited and unstable sources of income and 80% had no fixed assets. Determinants of vulnerability were not uniform across the three fish landing sites visited. Number of sources of income for example significantly varied from one landing site to another ($P < 0.026$).

Most of the adaptation to climate change reported appeared not sustainable. Majority (17% of the respondents) for example borrowed money to survive, 12% temporarily migrated to other fishing grounds with the hope of catching more fish, 11% used their personal savings to replace lost fishing equipments like fishing nets, lamps and boats while 11% did nothing after a climate related shock.

This study has generated preliminary data that can help understand climate change vulnerability of fish dependent communities in the Albertine drainage basin, the different adaptation strategies currently being used and the factors that influence the choice of the various adaptation responses at the household level. Since the study involved trans boundary resources (Lakes Albert and Edward) the results can be used to inform policies within the regions that share the transboundary resources, and the wider East African region especially now that governments are developing their country specific climate change mitigation programmes and adaptation strategies.

As observed in Table 1, there existed a high significant association between the landing sites and the sources of income ($PV = 0.045$). Overall, 54% of the respondents had 2 sources of income. About 40% of the respondent in Katwe fish landing site had more than two sources of income as compared to Butiaba (14%) and Kahendero (10%).

From Table 2, majority (17%) of the respondents in the Albertine borrow money, 12% temporarily migrate to other fishing areas, 11% use their personal savings to replace lost fishing equipment (fishing nets, lamps, boats etc.). And 11% do nothing after a climate related shock.

Table 1. Number of sources of income and climate change vulnerability.

Landing sites		Sources of income				Total
		1	2	3	4	
Butiaba	Respondents	18	25	7	0	50
	%	36.0%	50.0%	14.0%	0.0%	100.0%
Kahendero	Respondents	13	32	5	0	50
	%	26.0%	64.0%	10.0%	0.0%	100.0%
Katwe	Respondents	11	24	12	3	50
	%	22.0%	48.0%	24.0%	6.0%	100.0%
Total	Respondents	42	81	24	3	150
	%	28.0%	54.0%	16.0%	2.0%	100.0%
Chi Square	12.940	PV=0.045				

Table 2. Adaptation responses of the three fish dependent communities in the Albertine.

Adaptation responses		Fish landing site			Total
		Butiaba	Kahendero	Katwe	
Temporarily migrated to other fishing areas	Respondent	6	18	10	34
	%	17.64%	52.94%	29.41%	12%
Borrowed money	Respondent	13	18	16	47
	%	27.66%	38.30%	34.04%	17%
Started peasant farming	Respondent	9	10	6	25
	%	36.00%	40.00%	24.00%	9%
Used personal savings	Respondent	18	5	8	31
	%	58.06%	16.13%	25.81%	11%
Permanently/Temporarily abandoned fishing for other non fish related jobs	Respondent	10	3	3	16
	%	62.5%	18.75%	18.75%	6%
Started working for another boat owner	Respondent	4	1	5	10
	%	40.00%	10.00%	50.00%	4%
Sold catch at a cheaper price	Respondent	19	2	2	23
	%	82.61%	8.70%	8.70%	8%
Started mining salt	Respondent	0	0	22	22
	%	0.00%	0.00%	100.00%	8%
Started Business	Respondent	5	15	11	31
	%	16.13%	48.39%	35.48%	11%
Gave the stale fish to chicken	Respondent	2	0	0	2
	%	100.00%	0.00%	0.00%	1%
Ate other foodstuff during scarcity	Respondent	4	0	0	4
	%	100.00%	0.00%	0.00%	1%
Did nothing	Respondent	13	13	4	30
	%	43.34%	43.33%	13.33%	11%
	Count	105	85	90	280

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