



LOOKING AHEAD A "fishy" situation: social-ecological traps in small-scale fisheries and a gender transformative approach for synergistic solutions

Steven Cole
Senior Scientist, Gender Specialist / IITA

This study looked at social and ecological processes that reinforce poverty traps for small-scale fisheries in the Barotse Floodplain in Zambia where there is high consumer demand for fish but also high post-harvest loss and waste, compounded by weak regulatory institutions. A holistic approach yielded 1) identification of unequal gender relations; 2) reduced losses, and enhancement of gender relations through collective learning and social and technological innovations; and 3) increased women's empowerment and gender-equal attitudes by engagement of men and women throughout the value chain.

Overview

Poverty is reinforced by social, political, economic, cultural, and ecological factors which interact in a complex way. These factors limit people's capacity to adapt, working as a trap. These so-called poverty traps affect people differently based on their age, sex, marital status, ethnic group, skin color, and socioeconomic status. Hence, technocratic solutions for reducing poverty may amplify these traps or affect disproportionately the most vulnerable or excluded since the complexity and multi-dimensionality of poverty could be ignored. On the contrary, using system thinking approaches such as a gender transformative approach can help co-identify interventions that synergistically improve human well-being and the multiple social, political, economic, cultural, and ecological factors.

People dependent on small-scale fisheries in low-income settings experience very limited capacity to adapt, driven by an increased demand for fish, high postharvest losses and waste and weak or missing regulatory institutions. In this context, dependence on fishing for livelihood security increases, leading to higher pressure on fisheries, and in the long term, overexploitation drives resources to collapse. Hence, we used a gender lens and a holistic approach to understand the multiple and complex feedbacks between social and ecological processes reinforcing poverty traps in the Barotse Floodplain in Zambia. Additionally, we combined technical and social innovations to open up windows of opportunities for the value chain actors and to overcome the social-ecological traps.

CONTEXT: People in the dynamic Barotse Floodplain engage in multiple activities such as farming, fishing, and livestock rearing. Fishing occurs from May/June, when people migrate from the upland area to the plains, until December when the rains and the fishing ban starts. Fish is essential for income and nutrition security of locals and the country. The fisheries value chain tends to be gendered, where men fish and women primarily process. However, there are exceptions to this overall pattern.

APPROACH: Our team from WorldFish and partners assessed the poverty trap in the Barotse Floodplain and considered postharvest losses as an important factor driving the social-ecological trap, which aligns with the scientific evidence. Scientific evidence from fisheries in Africa suggests that postharvest losses lead to 1) lower incomes and a waste of natural resources, 2) perpetuate unsustainable fishing practices, and 3) lead to higher prices of available good-quality fish for consumers. Higher prices encourage poorer

consumers to demand cheaper fish that drive fishers (given their lower incomes) to use unsustainable fishing practices to meet market demands—these forces, coupled with the physical losses that occur, harm fisheries' resources. As the intensity of the fishing increases, resources continue to decline, thus trapping fishery-dependent people in a vicious cycle.

What interventions and data were collected? We did participatory action research and combined qualitative and quantitative methods where both women and men were actively engaged regardless of their role in fishing, processing, and trading. We assessed the impact of two interventions, including 1) a gender-transformative communication tool grounded in empowerment education and transformative learning theory and 2) improved technologies (solar tent dryer, salting, a Chorkor kiln [improved smoking device], and ice) to process fish. The communication tool comprised a manual¹ and drama skit highlighting the gendered power relations across the value chain, constraining women's abilities to participate in male-dominated activities freely, decide about finances or invest their time on paid and unpaid tasks compared to men. A group discussion and reflection followed each event. For two years, we measured the impact of these interventions (before and after) through collecting qualitative and quantitative information and through primary and secondary data for a comprehensive understanding. Qualitative data on gendered experiences dealing with postharvest losses and other fisheries-related issues was collected through in-depth interviews, focus group discussions, and participant observation. We also surveyed male and female processors to evaluate the fish processing technologies' efficacy and for quantifying reduced loss and sensory (organoleptic) evaluations. And finally, we developed and implemented a women's empowerment in fisheries index to evaluate the social change innovation.

But what drives postharvest losses? Among multiple factors, gender constraints are at the center. For example, in the Barotse Floodplain, as in many African regions, women comprise the bulk of the value chain actors involved in postharvest activities, hence, the gender implications of postharvest losses as a driver of the social-ecological trap in small-scale fisheries is noteworthy. The team identified various harmful gender norms, practices and power relations, or the underlying causes of postharvest losses, including:

- Gendered roles (e.g., women primarily carry out domestic chores, caretaking, and postharvest activities) that reduce women's time to balance all their "unpaid" (e.g., domestic chores) and paid (e.g., processing) work.
- Women have less decision-making power and lack access to knowledge-generating or training opportunities.
- Women are often excluded from certain value chain activities and lack access to improved processing, storage, and handling technologies.
- Poor market facilities and conditions and low bargaining skills, for example, create additional losses, especially for women.

¹ [Gender Transformative Communication Tool Manual](https://idl-bnc-idrc.dspacedirect.org/handle/10625/56856) - Addressing the harmful norms, practices and power relations within the natural fishery value chain in the Barotse Floodplain, Western Province, Zambia - From the project: *Improving Livelihood Security and Gender Relations in Rural Zambia and Malawi through Post-Harvest Fish Value Chain Innovations and Social Change Interventions*. Mtonga, Johans; Mwiinga, Emma; Masheke, Akufuna; and Garise, Tsungai. (2016). <https://idl-bnc-idrc.dspacedirect.org/handle/10625/56856>



Figure 1. Sub-optimal methods and technologies that cause post harvest fish losses. A) Fish being smoked using a bicycle rim and wire mesh over an open fire. Photo by Alexander Kaminski. B) Small mixed fish species being open-air sun dried on a papyrus mat on the ground. Photo by Steven Cole. C) Catfish being open-air sun dried on a raised reed mat. Photo by Alexander Kaminski.

CONCLUSIONS: Our holistic approach mixing technological and social innovations and deepening the understanding of the local context permitted 1) identification of the unequal gender relations underpinning postharvest losses contributing to an increased outtake from the small-scale fishery and a reduction in its productivity, 2) reducing fish losses and addressing some of the unequal gender relations by deploying social and technological innovations through a participatory approach for collective learning, and 3) increasing women’s empowerment and gender-equal attitudes by actively engaging in the process both, women and men throughout the value chain.

Relevance to different spatial and temporal levels

The contexts where social-ecological traps play out comprise different actors operating at different levels across different spaces and influence both the social and ecological systems and their interactions. Local, regional, and national demand for natural resources + local use of unsustainable harvesting practices together with other factors such as poverty and lack of alternatives or additional livelihood options, create such social-ecological traps. And thus, social-ecological traps are path-dependent processes (not conditions) that are caused by a combination of events over time.

Key terms

- **Social-ecological traps** - refer to the dynamic interaction between poverty and natural resource use that creates situations that are considered undesirable in mainstream normative views of development.
- **Postharvest losses** - Two main types (physical and quality losses). Physical losses are those whereby fish gets discarded (wasted) because of a total degradation of the product (e.g., spoilage, breakage). Quality losses result in fish being sold at a reduced price because of a slight degradation of the product leading to lower value.

Key references

Cinner, J.E. 2011. Social-ecological traps in reef fisheries. *Global Environmental Change* 21(3): 835-839. <https://doi.org/10.1016/j.gloenvcha.2011.04.012>

Cole, S.M., McDougall, C., Kaminski, A.M., Kefi, A.S., Chilala, A., Chisule, G. 2018. Postharvest fish losses and unequal gender relations: drivers of the social-ecological trap in the Barotse Floodplain fishery, Zambia. *Ecology and Society* 23(2):18. <https://doi.org/10.5751/ES-09950-230218>

Diei-Ouadi, Y., B.K. Sodoke, F.A. Oduro, Y. Ouedraogo, K. Bokobosso, and I. Rosenthal. 2015. Strengthening the performance of postharvest systems and regional trade in small-scale fisheries: case study of postharvest loss reduction in the Volta Basin riparian countries. FAO Fisheries and Aquaculture Circular No. 1105. Food and Agriculture Organization of the United Nations, Rome, Italy. <http://www.fao.org/3/i5141e/i5141e.pdf>