

The challenge

Sub-Saharan Africa has the lowest fish supply per person of any global region, and this is predicted to fall by 20% in the next two decades. Poor processing and management of fish products results in losses worth up to US\$5 billion each year. The limited involvement of women in fish processing and marketing further weakens the economic value of fish at household, community and regional levels.

In the Barotse floodplain (Zambia) and the Lake Chilwa basin (Malawi) such issues have resulted in substantial economic losses, reduced fish nutrient content, and unfair distribution of benefits among women and men. Both areas depend heavily on fish for income, food and nutrition. However, they differ in fish value chain structure, post-harvest technologies, and social and cultural contexts, offering strong opportunities to learn what works in reducing loss and achieving equitable benefit sharing in the fisheries value chain.

Objectives

To increase the adoption of innovations for post-harvest management of fish and to address social norms governing benefit sharing across fish value chains.

The solution

- The project worked with fishing communities in the Barotse floodplain and Lake Chilwa to analyze fish value chains, including the differing roles of men and women, and how and where losses (physical, economic and nutrient) occur in the value chain.
- Working with fishing communities organized in participatory action research groups, researchers tested several improved fishing methods including salting, kiln smoking, access to cold chain facilities, and solar tent drying.
- Behavior change communication activities including community theatre were implemented to address gender and social relations in the fisheries value chain.
- The team worked with policymakers to increase recognition of the importance of fish post-harvest loss and gender equality in national and regional policies.

Key results

Increasing production and reducing post-harvest loss

- Gross margin analyses showed that improved processing technologies and methods reduce fish losses significantly and consequently improve incomes of the actors. Fish salting, for example, resulted in 0% insect infestation compared to 10.8% in open-air sun-drying. The salting process only takes around one day as opposed to open-air sun-drying which takes almost four days.
- Analysis of the nutritive value of fish groups (fresh and processed) revealed that kiln smoked fish (catfish



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Woman drying fish in a solar tent dryer in Barotse Floodplain

and *Oreochromis spp.*) had significantly higher protein content than traditionally smoked fish, and solar tent dried fish had significantly lower amounts of fat compared to open sun-dried fish.

Increasing access to resources, markets and incomes

- The reduction in fish losses has improved the incomes of fish value chain actors. For example, by utilizing the introduced technologies, fish processors increased their gross margins from 4.7% to 25.26%, while traders saw an increase from 22.8% to 25.3%
- The project has installed an ice plant and cold room in Senanga, Zambia, which provides ice and freezing facilities to fishers, processors and traders in the area. Since its installation, 775 people have utilized the facility saving 75.8 tons of fish valued at US\$240,000.

Gender equity and empowerment of women

- The use of a gender transformative approach, incorporating communication tools (such as drama skits), had a greater impact on improving gender equal attitudes than a practical gender approach – which accommodates existing gender norms and power relations.
- The gender equal attitude scores of men who participated in drama skits increased from 17.6 in 2015 to 23.9 (out of a total score of 24), while the scores of those who did not participate increased only marginally.
- Women who participated in the drama skits increased their involvement in fishing from 5% to 75%. A greater percentage of women also made larger

contributions to decisions regarding fish processing and the associated income (a 30% and 49% increase, respectively). Women's involvement in decisions about income generated from fish trading significantly increased for those who participated in drama skits, from 65% to 94%.

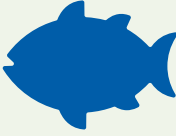




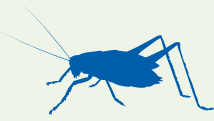

- Women's ownership of fishing assets increased over the course of the project, with joint ownership increasing from 44% in June 2015 to 76% by December 2016.

Capacity and policy influence

- The project has helped to foster a strong relationship between the fish value chain actors and the government. Government officers were seen as partners rather than enforcers of the law which resolved enmity between the two.
- The Department of Fisheries (DOF) in Western Province is promoting salting to fish farmers who are very far from markets. The DOF has proposed that the same is considered in other parts of the country.
- 40 participants (18 women) attended an entrepreneurial workshop in Malawi in 2016. The workshop provided training on best practices in budgeting, record-keeping, marketing, customer satisfaction and business environment, along the whole fish value chain. In Zambia, 41 participants (14 women and 27 men) attended the same entrepreneurship course.

Conclusions and recommendations

- While the improved fish-processing technologies helped reduce women's time burdens and losses, and improved the quality of the fish processed, the market for salted fish is relatively nascent in Zambia, and thus testing different strategies to improve women's abilities to market their products (e.g. through communication channels, including radio, or by conducting cooking demonstrations in local markets) is one gap that future research and development projects should fill.
- Based on the positive impacts on gender attitudes and reduction of fish losses, the improved technologies (integrated with a gender transformative approach) should be replicated in other fishing areas in Malawi and Zambia where similar problems regarding fish post-harvest loss and gender equality exist.

	4 fish processing technologies were introduced
	Fish processors increased their gross margins from 4.7% to 25.26% by using the new technologies
	An ice plant and cold room in Zambia has preserved 75.8 tons of fish valued at US\$240,000
	Women who participated in drama skits increased their involvement in fishing from 5% in 2015 to 75% in 2016
	Men involved in drama skits improved their gender equal attitude scores from 17.6 in 2015 to 23.9 in 2016 out of 24
	Fish salting resulted in 0% insect infestation compared to 10.8% in open-air sun drying
	Women's joint ownership of fishing assets increased from 44% in 2015 to 76% by 2016

- The cost of the plastic sheeting used to construct solar tent dryers is relatively expensive for many users. Future research should explore how women's and men's access to microfinance could be increased to enable them to adopt this technology at scale.

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Cultivate Africa's Future (CultiAF) supports research to achieve long-term food security in Eastern and Southern Africa.



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