

# Solar tent dryers lead to gender equality in the fish value chain

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## Context

The fish value chain in Malawi is dominated by men, particularly the marketing of perceived premium fish species (Nagoli *et al.*, 2016), whilst women are more frequently involved in the processing and marketing of small fish species, considered to be of low economic value (Chiwaula *et al.*, 2012; Nagoli and Chiwona-Karlton, 2017). The small fish species are sun-dried on racks, but this traditional technique often leads to infestation by microorganisms and insects, and contamination by dust resulting in quality, physical and economic losses for women. As such, open air fish drying is one of the factors contributing to post-harvest losses of 40% in Malawi (Béné, 2011; FAO, 2012; Nagoli *et al.*, 2016). The poor quality of fish dried in the open also results in the bulk of processed fish being marketed locally, as opposed to being sold at formal organized markets such as supermarkets. Most of the small fish species sold in supermarkets in Malawi are imported, thereby denying local fish processors the opportunity to penetrate high value markets.

A solar tent dryer was designed and promoted to reduce post-harvest fish loss in Malawi. The dryer – made up of ultraviolet (UV) treated polythene 200 µm sheet, fixed over a wooden frame – can reduce fish spoilage by, among other factors, protecting drying fish during periods of bad weather. A comparative study by the *Improved processing and marketing of healthy fish products in inland fisheries in Malawi* project established that microbial contamination and sensory characteristics (i.e. food taste, texture and appearance) of solar tent dried fish are superior to sun-dried fish. Results from the Cultivate Africa's Future (CultiAF) project also show that due to

## Key messages

- When compared to traditional sun drying methods, the solar tent technology has reduced the time taken for women to dry fish by more than 50%.
- With an average shelf life of seven weeks, compared to three weeks for traditional sun-dried fish, and reduced microbial infestation, solar dried fish products are more attractive at market and are of particular benefit to women as the primary processors of small fish.
- The use of fish solar tents has enabled 23 women and 12 men to supply fish to profitable, formal markets where dried fish products are sold at higher prices than at local markets.
- Through gender transformative approaches in the project's sensitization training sessions, more men are now encouraging women's full participation in using improved fish processing technologies, and accessing markets.

their low moisture content (less than 10%), solar dried fish have an average shelf life of seven weeks compared to three weeks for traditional sun-dried fish, and reduced microbial infestation. These attributes make fish products more attractive at market and are of particular benefit to women as the primary processors of small fish.

## Emerging outcomes

### Adoption of fish solar dryers by men and women

The project's baseline study used a combination of questionnaires and focus group discussions (FGDs) to interview 509 respondents from five fishing communities. Results showed that only 14% of fisher folk were aware of the solar tent drying technology at the start of the project in 2015, and none had used it before. Within the fish value chain, women were found to be mostly involved in fish processing (about 51%), but a significant proportion (35%) were involved in both processing and trading activities. Very few (2%) could be classified as 'fisherwomen' (defined in terms of fishing gear ownership and did not carry out physical fishing).

To promote the solar tent technology, the project directly sensitized 144 women and 143 men in five project sites through meetings and trainings. As a result of the sensitization initiatives, 70 fish processors (36 females and 34 males) are now using six solar tent dryers constructed by the project.

### Changing gender perceptions

Gender transformative approaches (GTA) were used in the project's sensitization training sessions, such as role plays, video clips and case studies, aimed at transforming stereotypes and beliefs that create gender gaps between men and women. Gender gaps currently exist in the unequal access by men and women to highly profitable fish species and to new processing technologies. A total of 208 participants (94 men and 114 women) were trained in gender equity. Due to the positive impacts of the training sessions and others hearing about the GTA trainings, a

second session on gender and leadership training saw an increase in male participation. The second session had 225 participants (128 men and 97 women). Men are now encouraging the full participation of women and girls in the promotion of their social and economic wellbeing through their involvement in using improved fish processing technologies and also easily accessing markets. Lingson Kapindira, Group Village Headman Mplilingidzo, from Chikombe observed that gender roles should transform so that men and women have equal access and control over resources.

*"Our cultural beliefs barred women from actively participating in businesses let alone going to markets to sell fish. We are now encouraging our wives to buy fish from the beaches and sell at outside markets. All this is because of the gender training sessions CultiAF is holding."*

— Lingson Kapindira, Group Village Headman Mplilingidzo, Chikombe Salima

### Solar tent driers are reducing the labor demands of women

The division of labor in inland fisheries is somewhat complex but distinct, with women mostly involved in transferring fish from landing sites to drying racks, as well as to markets (processing and trading). Conversely, men are mainly involved in fishing, and fish processing (Figure 1).

In addition to the labor demands of fishery activities, women also have to attend to domestic chores including caring for children, the sick and the elderly, and fetching water and firewood for food preparation. From FGDs conducted in five project sites comprising 54 men and 55 women, participants concluded that the

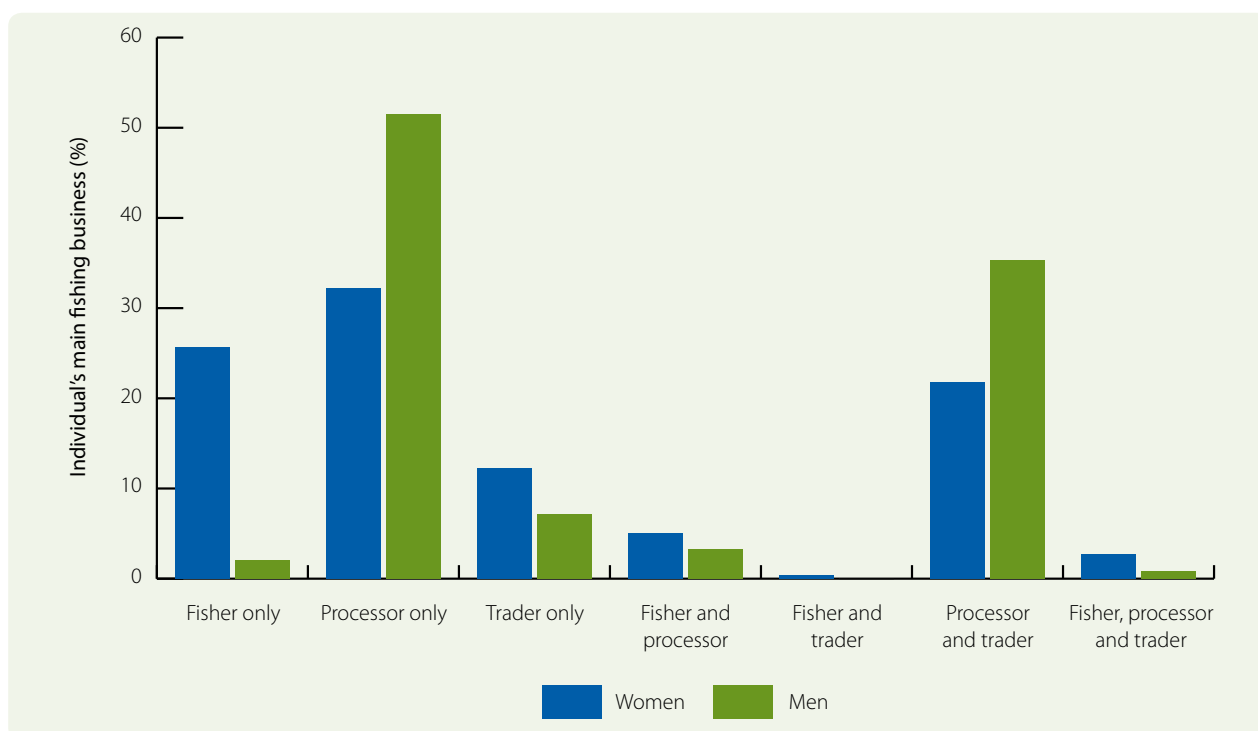


Figure 1: Distribution of workload in small-scale fisheries in Lake Malawi

multiplicity of women’s roles has contributed to their drudgery, and hindered their participation in community development programs.

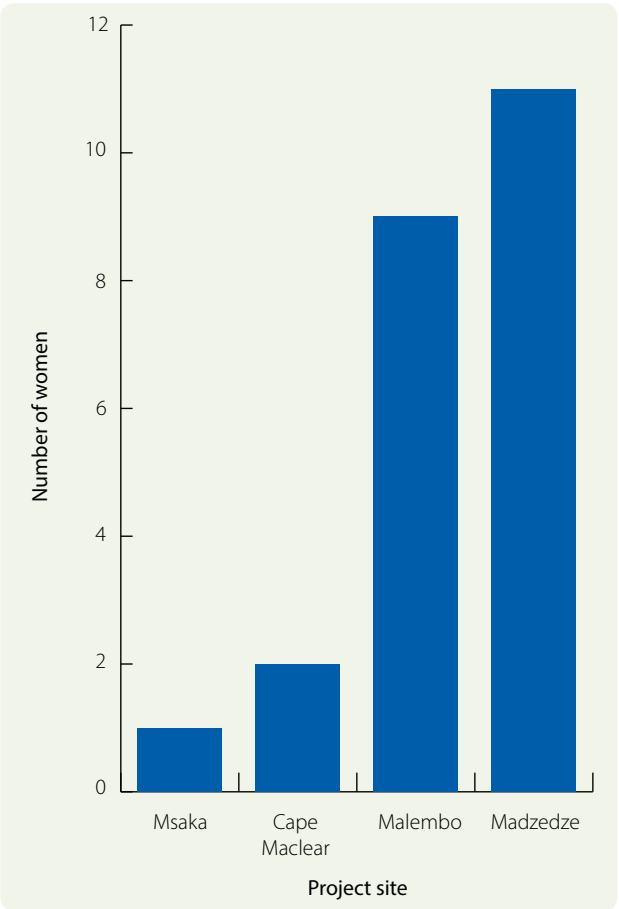
The solar tent technology has reduced women’s labor demands by over five hours a day. Margaret Phiri is head of her household at Cape Maclear landing site and talks about the benefits of the solar technology:

*“In the solar tent dryers, fish turning is only carried out twice on the first day, whilst on the open fish drying racks, this must be done four times. On the second day, fish turning in the tent dryers can be done at any time, whilst on the open drying racks it has to be done early in the morning as the fish are wet with dew. With the saved time, I am able to attend to my family and other community development activities.”*

— Margaret Phiri, Cape Maclear

**The solar technology is opening up new markets and increasing incomes for women**

Women from the project sites depend largely on fishing activities for their income, and their earnings differ significantly to those of men. Results from project studies indicated that on average women earned one-fifth less than men. However, the introduction of the solar tent technology is enabling women to access lucrative markets,



**Figure 2: Number of women supplying Peoples supermarkets**



Fish solar tent dryer at Cape Maclear

catalyzing their entrepreneurial capacity and income potential. Of the 36 women fish processors using solar tent dryers, 23 are now selling their fish products to Peoples supermarkets (Figure 2). They supply usipa (*Engraulicypris sardella* – a small sardine-like fish), and the freshwater ndunduma (*Diplotaxodon ecclesi*) in 100 and 500 g packs. Usipa is sold for about MK 2,300 (US\$3) per kg at local markets, whereas at the supermarket the fish is sold for roughly MK 4,500 (US\$6) per kg.

Use of the solar tent technology and guidance from the CultiAF project has enabled two young female fish processors to set up their own businesses. Linda Rashan and Brenda Nyirenda from Cape Maclear each accessed a loan of MK 100,000 (US\$130) to start their own processing enterprises. Using a solar dryer built during the design and experimentation phase of the project in 2015, the young women are now processing and supplying dried *E. sardella* to Peoples supermarkets. They have each paid back their loans and now earn an average working capital of MK 300,000 (US\$413) per month.

The technology is also being utilized by older women, for example 70-year-old NyaChirwa is able to use the solar dryer built by her son who works as a fisherman. Within six months of the dryer’s operation NyaChirwa has been able to improve her household income by over 200%, from monthly earnings of MK 100,000 (US\$138), to MK 300,000 (US\$413). She hopes to expand production and start supplying fish to the formal market.

For the women processing and selling solar tent dried fish at local markets, they are enjoying the popularity and market preference of their products:

*“Our fish are drying with freshness and when we are at the market they are being preferred as they are straight and not broken as compared to those from open drying racks.”*

— Mrs. Elida Chirwa, fish processor, Msaka fish landing

**Conclusion**

The solar tent dryers have proved to be effective in improving economic and social aspects of fish processors’ work, and have therefore generated interest from many female processors and entrepreneurs. The technology has simplified the drying process and increased product quality, leading to improved industry links with supermarkets, and improved livelihoods.





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Esnart Mhone drying fish in solar tent dryer at Msaka

Women are too often marginalized to the periphery of fish value chains, where activities are associated with the processing and trading of small fish species, and low incomes. To overcome the gender gaps related to women's access to resources, female fish processors need to be incorporated into fish value chain developments and enabled to access new technologies that lessen their labor demands. Women involved in fishery activities must also be empowered to engage in lucrative markets to improve household incomes.

To build upon these initial stages of active engagement and further enhance the livelihoods of female processors, capacity building in proper handling and market skills is required. Above all, women's roles in the fishery sector need to be acknowledged in national policies, especially those related to food and nutrition and trade.

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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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