

Use of Innovative Fish Trap Improves Household Food and Nutrition Security – Lessons from Malawi

Summary

A prevailing challenge in low-input aquaculture systems stocked with mixed-sex Tilapia is the uncontrolled reproduction of fish during grow-out. The management of mixed-sex fishponds is difficult, and ponds easily get overcrowded, resulting in poor growth of the fish. To turn this challenge into an opportunity, a size-selective, low-cost wire mesh fish trap (material cost around 3 USD) was developed to harvest offspring on an intermittent basis, whilst leaving the initial fish stock (parent fish) in the pond for grow-out. Fish farmers using this technology are satisfied with the minimal workload required to harvest the fish, as well as amount and size of fish harvested. Results of a comparative study revealed that fish farmers using the technology eat significantly more fish (3-4 times a week) and tend to eat more fish from their own ponds, compared to fish farmers not using a trap. Additionally, households using the innovative technology had more diversified diets and were also less likely to experience food insecurity than both control groups.

Background

A lack of easy-to-handle harvesting technologies often discourage smallholder fish farmers and their families from eating fish from their own ponds more regularly. And this even though their ponds are often overcrowded due to mixed-sex fish and harvesting would make sense for reasons of productivity.

More regular harvesting of small fish (offspring) from aquaculture could therefore help producers in two ways: they control and optimize stocking rates to ensure the natural carrying capacity of the pond system, and they gain regular access to fish to consume or sell.

The Aquaculture Value Chain for Higher Income and Food Security Project (AVCP), part of the Global Programme “Sustainable Fisheries and Aquaculture” commissioned by the German Ministry for Economic Cooperation and Development (BMZ), and the Malawi Government, through the Department of Fisheries, supported the development of a trap for intermittent harvesting and tests to determine its technical functionality.



Technical manual and Factsheet <https://www.giz.de/de/downloads/giz2023-en-intermittent-harvest-malawi.zip>

To evaluate the impact of the intermittent harvest on household food and nutrition security, the AVCP commissioned a three-arm comparison study in the Northern Region (districts Mzimba and Nkhatabay) of Malawi. The study aimed at (1) assessing the impact of intermittent harvesting on diet and nutrition of fish farming communities (2) establishing the attitude of fish farmers towards usage of the technology and (3) determine the potential of scaling up the technology within the region and country at large.



L. to r.: Example of an individual fishpond – Female farmer harvesting with innovative wire mesh fish trap.

Research study

Data was collected at two assessment rounds in June and August 2022.

Intervention group: Households with access to fishponds + fish trap + aquaculture training on intermittent harvest

Control group 1: Households with access to fishponds + aquaculture training

Control group 2: Households with no access to fishponds nor aquaculture training

Main indicators

Nutrition indicators

1. Household dietary diversity score (HDDS)
2. Fish consumption

Food security indicators

3. Food consumption score (FCS)
4. Household food insecurity experience scale (HFIES)

Results

Main indicators (based on scores) significantly differed between the study groups at both assessment rounds (except for HFIES at round 1) with the intervention group achieving higher nutrition and food security values compared to both control groups. Looking at HFIES and FCS categories, intervention households tended to be more food secure than the other two groups.

Indicator 1 and 2

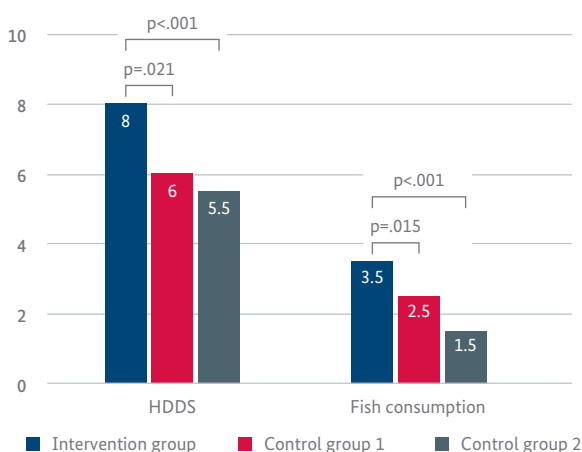


Figure 1: Median values of household dietary diversity scores (HDDS) and fish consumption based on both assessment rounds; (Kruskal-Wallis with Bonferroni for pairwise comparison)

Indicator 3 and 4

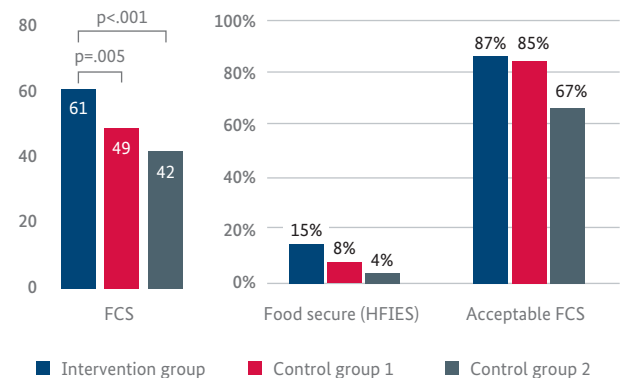


Figure 2: Mean values of food consumption scores (FCS) (left side) and share of households considered as food secure (HFIES) and having an acceptable food consumption averaged over both assessment rounds; (Kruskal-Wallis with Bonferroni for pairwise comparison)

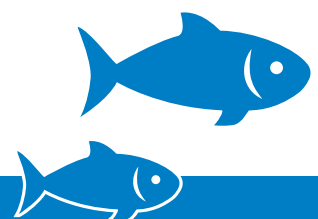
Higher fish consumption in intervention group

A significantly higher fish consumption was observed in the intervention group (3-4 times/week) compared to fish farmers without the trap (2-3 times/week) and farmers without fishpond (1-2 times/week).

Usage of innovative trap and harvested fish

The innovative trap was the major technique used for intermittent harvest in both assessments. Most households appreciated the amount and size of fish caught with the trap and over 90% reported a positive workload-benefit ratio for its use.

Regarding the usage of fish produce, own consumption (49%) as well as selling (34%) were the highest priorities for small fish among intervention households in August.



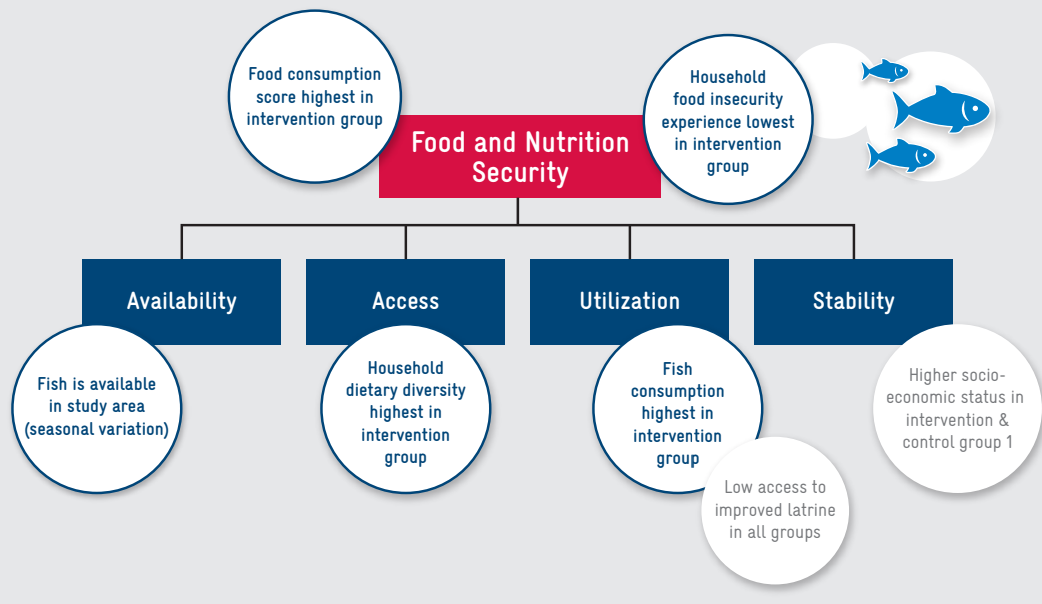


Figure 3: Results of three-arm comparison study on innovative wire mesh fish trap in relation to food security

Conclusions

Food access, availability, and overall food security was highest in intervention group. This might be linked to higher economic capability to purchase a variety of foods. The research design and data do not allow any conclusions to be drawn about the effect of the trap in relation to the indicators used, but the results indicate that the trap is a highly valued tool for harvesting fish for home consumption and sale, used by households that are relatively food secure.

Since the construction of the trap is easy and the material is generally available and inexpensive the potential for scaling up is high. In Malawi fish farmers have started to buy the material and construct the traps on their own.

Recommendations

- Scaling up the emerging technology and creating awareness about the nutritional benefits of intermittent fish harvesting as a nutrition sensitive approach within the context of food and nutrition in Malawi and beyond.
- Recommend technology as an effective and easy-to-use tool – for both men and women.
- Promote use of small fish in production of value-added products, such as fish flour, which can be added to porridge for feeding infants.
- Promote integration of aquaculture with horticulture (fruits and vegetables) for improved food and nutrition security.
- Encourage intermittent harvest to provide farmers with immediate and ongoing benefits from aquaculture and thereby reduce potential losses in yield due to unpredictable and extreme weather events induced by climate change.

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Sector Project “Food and Nutrition Security” in collaboration with the Aquaculture Value Chain Project (AVCP), Malawi GIZ Office Malawi Area 43, Plot 498, Lilongwe 3, Malawi www.giz.de
Contact Jens Kahle (jens.kahle@giz.de), Ladislao Di Domenica (Ladislao.di@giz.de)
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