

July 21, 2023

## FISH FEED TRIALING AND ITS IMPACT ON *TILAPIA SPP* GROWTH

### 1.0 Background and Objectives

Mzuzu University and Urban Research and Advocacy Center (URAC) with support from Australian Centre for International Agricultural Research (ACIAR) and International Development Research Centre (IDRC) implemented the research project using a farmer-to-market value chain approach with Kamuzu View Co-operative at Mpamba in Nkhata Bay district. The research trial ran from February to June 2023 and commenced with a farmers' training on feed formulation. Prior to the training the farmers had a one-week exchange visit to Zambia. Technical support for the feed formulation training and sampling were supported by the Department of Fisheries in the Ministry of Natural Resources.

The fish trial intervention was a result of the findings which showed that fish farmers faced several challenges to reduce losses and increase their incomes. The project, *Managing Food Value Chains for Improved Nutrition for Urban Vulnerable Populations in MZUZU City (Malawi) (AfricitiesFood)*, systematically screened several challenges that contributed to the food losses along the fish value chain and isolated fish feed formulation and its management as the key contributing factor to the losses. The main objective was therefore of the trial was to assess the effectiveness of the feed formulated by the project on growth of *Tilapia spp.* subjected to different feeding and pond management procedures.

On 27th February 2023, the project organized a two-days fish feed formulation and management training for Kamuzu View Cooperative with an objective of



Picture 1: Mr Mbamba from Fisheries Dept. farmers on feed and fingerling

practically empowering farmers on feed formulation and pond management in order minimize fish

losses from pond to market.

Table 1 highlights the feed that was formulated by the project.

| Ingredients     | Quantities |
|-----------------|------------|
| Fish meal       | 10 Kg      |
| Soya            | 40Kg       |
| Sunflower       | 12 Kg      |
| Maize/Rice bran | 30 Kg      |
| Cooking oil     | 1 liter    |
| Wheat flour     | 5 Kg       |
| Cassava flour   | 3 Kg       |
| Premix          | 300 grams  |
| Salt            | 200 grams  |

This trial was implemented with the background that fish farmers in Malawi believe that floating feed imported from other countries like Zambia give high return as compared to locally available formulated feed. This belief led to high cost being incurred on import of fish feed.



Picture 2: Stocking fish at Mpamba, 19 April 2023

### 2.0 Sampling to check fish growth

After the training on fish feed formulation conducted on 27 February, 2023 the fish in the five (5) selected ponds were harvested and the ponds drained of all the water on 10<sup>th</sup> March 2023. Different sizes were fished out, many of them too small. On the 17<sup>th</sup> May lime was applied to the drained ponds to control frog infestations and other unwanted animals in the ponds. On 28<sup>th</sup> March fingerlings were stocked in the ponds. Each pond was stocked with a specific number of fingerlings depending on the size of the pond. The fingerling had an average body weight of 8grams. Sampling to check growth was undertaken fortnightly. The first sampling was conducted on the 13<sup>th</sup> of April, 2023; the second sampling was on 27 April, 2023 and the third sampling was done on 18<sup>th</sup> of May, 2023. Fourth and last sampling was done on 1 June, 2023. Table 2 specifies pond details and fish growth trends.

### 3.0 Impact of locally formulated feed on fish growth

The trial results show that the feed formulated by the project was very effective when fed to *Tilapia spp.* The initial average body weight during stocking was 8grams. First sampling average body weight was 10g and biomass was 20000g. The average body weight of



the second sampling increased to 17.5g with biomass of 35000g. The third sampling average body weight was recorded at 29.5g while the fourth sampling average body weight was 39.8 with the biomass of 79600. This shows that the fish responded well to the fish feed formulated. Performance of fish fed with locally sourced feed mixed with manure was not good as the average body weight for the fish was 11.7 grams from 8 grams with the biomass of 23,400 grams from 14,228 grams. However, the ponds that were applied with local feed comprised of manure did not perform well even though there was a better result when a similar pond was fenced. A key result is that whereas floating feed is sought after by fish farmers and does have significantly positive growth results, there was no major difference with sinking when a feeding tray was provided. In otherwise the key to reduction of loss is the need to reduce or avoid feed wastage.

#### 4.0 Conclusion

The fish trial results at Mpamba Kamuzu View Fish Farmers Co-operative show that they were wasting feed using crude methods of feeding such as just throwing the fees into the pond for the fish to scramble and without measuring the amount of feed. Farmers would wait for more than 6 months to harvest fish of the sizes sampled at 8 weeks. This fish trial implies that with proper feed formulation and management, a pond measuring 50 metres by 20 metres stocked with 3,000 fingerling, and assumed 10% mortality rate and selling at MK1,200 per gram, would earn approximately MK3.24 million. This potential harvest is impossible for cash crop earning on land of equal size. Farmers have already recommended the feed formulated by the project for adoption as it has proved to be effective as observed from the two samplings.

#### For more information, contact:

Department of the Built Environment, Mzuzu University, Private Bag 201, Mzuzu 2, Malawi. Urban Research & Advocacy Centre, P.O. Box 876, Mzuzu. Email: [manda.ma@mzuni.ac.mw](mailto:manda.ma@mzuni.ac.mw); [uracmalawi@gmail.com](mailto:uracmalawi@gmail.com)



Picture 3: Sampling of fish after 6 weeks of stocking fingerlings on 19 April 2023



Picture 4: Growth after 8 weeks of stocking on 19 April 2023

| Type of Treatment                 | Variable (grams)    | Sampling Period |        |        |        |
|-----------------------------------|---------------------|-----------------|--------|--------|--------|
|                                   |                     | Week 1          | Week 2 | Week 3 | Week 4 |
| Floating Feed                     | Average Body Weight | 10              | 17.5   | 29.5   | 39.8   |
|                                   | Body Mass           | 20000           | 35000  |        | 79600  |
|                                   | Feed                | 1000            | 2000   |        | 4000   |
| Sinking with Tray                 | Average Body Weight | 11              | 15.6   | 29.8   | 38     |
|                                   | Body Mass           | 22188           | 32200  |        | 76000  |
|                                   | Feed                | 1100            | 1500   |        | 4000   |
| Sinking feed without tray         | Average Body Weight | 12              | 17300  | 21.8   | 41.8   |
|                                   | Body Mass           | 17342           | 27680  |        | 66880  |
|                                   | Feed                | 1000            | 1500   |        | 3500   |
| Local feed with manure            | Average Body Weight | 8               | 11.7   | 24.1   | 25.5   |
|                                   | Body Mass           | 14228           | 23400  |        | 51000  |
|                                   | Feed                | 1000            | 1200   |        | 2500   |
| Local Feed without manure (fence) | Average Body Weight | 8               | 10     | 21.6   | 22     |
|                                   | Body Mass           | 14762           | 20000  |        | 44000  |
|                                   | Feed                | 1000            | 1000   |        | 2500   |