



KENYA MARINE AND FISHERIES RESEARCH INSTITUTE

FRESH WATER AQUACULTURE

FACT SHEET

KMF/AQUA/GOK/2022/C2.1 (ii)

*Estimate of Nitrogen and Phosphorus loading from Nile tilapia (*Oreochromis niloticus* L) cage culture in Lake Victoria, Kenya: A way to increased sustainability*



December 2022

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Background information

- ❖ Being an essentially open system, cages are usually characterized by a high degree of interaction with environment and cage systems are highly likely to produce large bulk of wastes that are released directly into the environment.
- ❖ Large-scale cage aquaculture development in freshwater lakes such as L. Victoria, systems that are already under high environmental stress, is highly questionable.
- ❖ Sustainable cage fish culture and the development of sustainable blue economy will depend on understanding the nutrient loads of cage farms in fresh water aquaculture, since every ecosystem has a maximum assimilative capacity, which is determined by the maximum acceptable environmental impacts.
- ❖ Furthermore, reducing environmental footprint of cage culture operations requires estimation of the amount of waste associated with such systems and its management.
- ❖ Yet, the fate and quantitative contribution of the new N and P sources emanating from feed wastage in cage fish culture in African inland waters is scarce.
- ❖ We sought to estimate the nutrient load in the waste released into aquatic environments based on the feeding of Nile tilapia (*Oreochromis niloticus*, L.) with backyard pelleted and extruded feed.

Results

- More N (130.0) and P (31.5) was provided through the feed (as kg ton⁻¹ fish produced) when the fish were fed pelleted than extruded feed (Figure 1).
- More N (30) and P (8.5) was retained in extruded feed (as kg ton⁻¹ fish produced) than in pelleted fed fish (Figure 1).
- As a result, about double the amount of N (81.3%) and triple the amount of P (78.8%) were released into the environment when the fish were fed the pelleted feed (Figure 1).

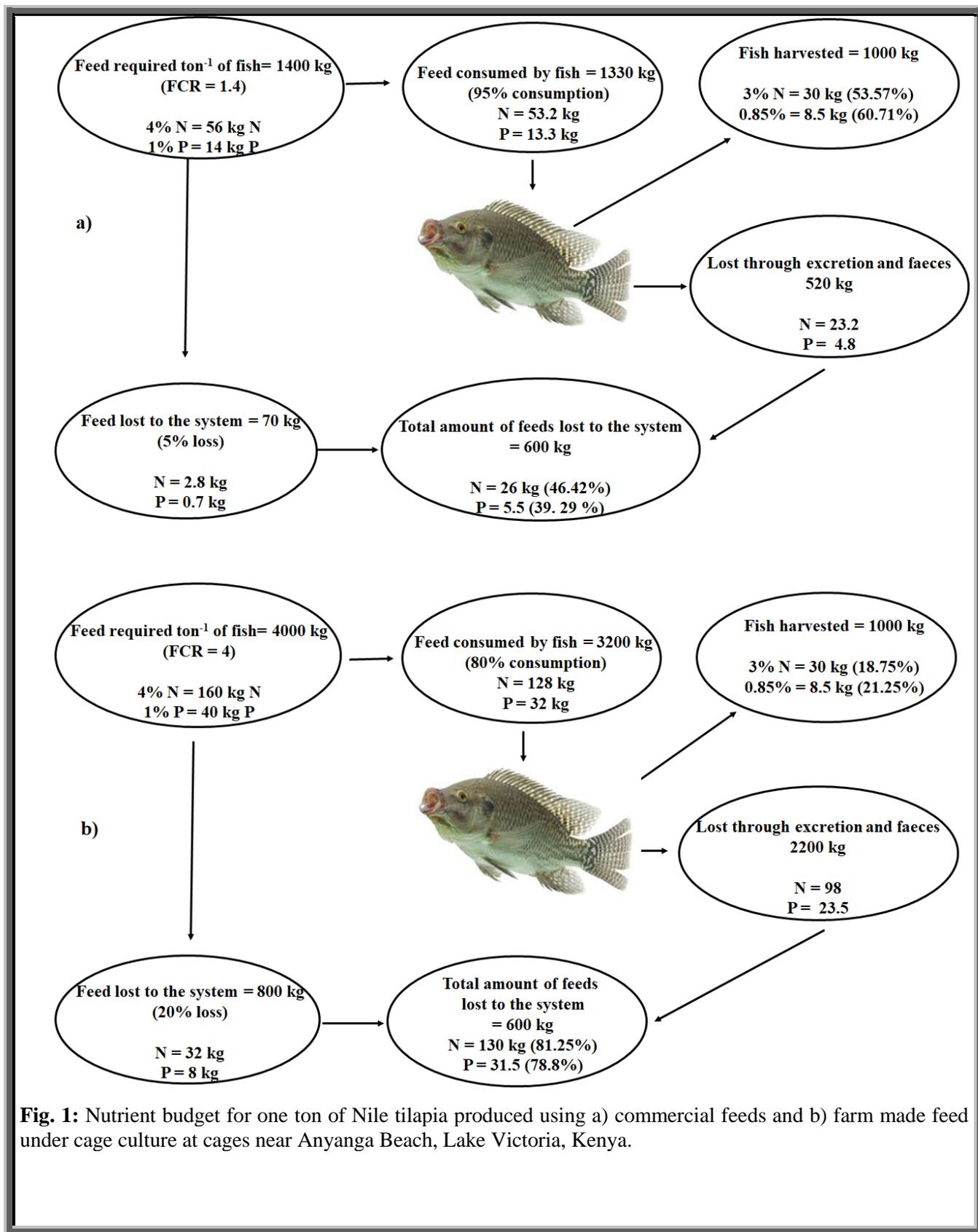


Fig. 1: Nutrient budget for one ton of Nile tilapia produced using a) commercial feeds and b) farm made feed under cage culture at cages near Anyanga Beach, Lake Victoria, Kenya.

Conclusion and recommendations

- ❖ The use of extruded commercial feed in the cage culture of tilapia is preferential to using artisanal feed as it produced less environmental impact.
- ❖ Extruded feed should be used for farming tilapia in cages for environmental reasons.