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AQUACULTURE & FISHERIES INNOVATION LAB

## RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

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**Title:** Low-Cost tilapia production with fertilization and supplemental feeding

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**Abstract:** The production of tilapia, like other fed species, has been constrained by the cost of feeds, which can account for about 70 percent of the production costs of tilapia in several countries and regions (Bolivar et al. 2006, Elnady et al. 2010). There have been many attempts to replace expensive animal protein in tilapia feeds with plant protein sources, such as soybean meal, groundnut seed cake and others. Although animal protein replacement in tilapia feeds has been successful, feed continues to represent a major cost item in tilapia production.

Rural pond aquaculture is typically practiced as small-scale fish polyculture systems, where natural productivity is enhanced with fertilizers and fish or shrimp are provided with supplemental feeds. The major constraints for small-scale, resource-poor farmers are fish feeds and chemical fertilizers, which are expensive and not readily available. Reducing feed costs in aquaculture is, therefore, important for long-term sustainability of rural aquaculture, where profit margins often tend to be rather small. There is potential to reduce feed costs in aquaculture by using less expensive feed and through adoption of prudent feed management strategies.

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Field trials in Nepal, Thailand, Vietnam, Kenya and China has demonstrated that several best practices in pond culture of tilapia species can reduce feed costs by half (Diana et al. 1994, Yi et al. 2001). These practices include adequate fertilization using organic manures, fertilization and supplementary feeding, feeding on alternate days or reducing the daily feed ration to half the satiation level with adequate fertilization. These trials have demonstrated reasonably good growth and better performance of tilapia at relatively lower feeding costs. These approaches rely on the dynamics of pond productivity in response to different fertilizer and feed treatments.

The overall purpose of the research trials was to develop a low-cost pond culture system that could lead to increased profits, improve the supply of high quality fish protein to communities with limited food resources, and contribute to the overall growth of national aquaculture sectors. This article highlights the effects of combinations of fertilizers and feed on tilapia productivity in small earthen ponds. Experiments were conducted in Nepal, Cambodia and Kenya using a similar experimental design, stocking density and feeding regime. [This excerpt is the first four paragraphs of the publication]

This section was excerpted from the original paper, which was in the *World Aquaculture* (2015), 46(1): 43-46.