



## Nile tilapia (*Oreochromis niloticus* Linnaeus, 1758) culture in Kenya: Emerging production technologies and socio-economic impacts on local livelihoods

Jonathan M. Munguti, Rita Nairuti, Jacob O. Iteba, Kevin O. Obiero, Domitila Kyule, Mary A. Opiyo, Jacob Abwao, James G. Kirimi, Nicholas Outa, Mavindu Muthoka, Erick O. Ogello

### Abstract

Nile tilapia (*Oreochromis niloticus*) is one of the most farmed fish globally, with a significant contribution to improving local livelihoods, especially in developing countries. Nile tilapia was first cultured in Kenya in 1924 and is the most cultured fish species. Annually, *O. niloticus* accounts for 62% (15,000 tonnes) of total aquaculture production. Although *O. niloticus* is the most preferred cultured fish, its culture faces challenges, for example, early maturation because of prolific breeding behaviour leading to stunted growth that limits its culture and profitability among smallholder farmers. With the surging demand for locally farmed fish, innovative technologies have emerged to boost aquaculture production. Donor and public research-funded projects, for instance, the Kenya Climate Smart Agriculture Project, are validating various aquaculture technologies, innovations and management practices (TIMPs) to achieve 'triple wins' of increased fish production, improved resilience and reduced greenhouse gas emissions. In addition, the International Fund for Agricultural Development (IFAD)-funded Aquaculture Business Development Programme aims at commercializing aquaculture to improve local livelihoods. In this study, we adopt a scoping review methodology to review and synthesize published literature on tilapia culture in Kenya to explore current and emerging tilapia production technologies and document their socio-economic impacts on farmers' livelihoods. These emerging innovative technologies range from culture systems, for example, biofloc, periphyton, fingerpond technology, integrated aquaculture, breeding and genetics (selective breeding), fish health and biosecurity measures, to post-harvest loss reduction, value addition and marketing. The study findings reveal that the technologies have great potential to increase tilapia production and profitability and positively impact the local livelihoods of smallholder fish farmers through employment creation, economic growth and better nutrition.

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