

Economic profitability of Nile tilapia (*Oreochromis niloticus* L.) production in Kenya

Aloyce R Kaliba, Charles C Ngugi, John Mackambo, Kwamena K Quagrainie

First published: 01 August 2007

<https://doi.org/10.1111/j.1365-2109.2007.01772.x>

Citations: 15

✉ **Correspondence:** A R Kaliba, Department of Economics and Finance, Southern University and A&M College, P.O. Box 9723, Baton Rouge, LA 70813-9723, USA. E-mail: aloyce_k@yahoo.com

Abstract

Economic profitability of Nile tilapia production in Kenya was analysed using a model that simulated individual fish growth and took fish population dynamics in the pond into account. The results suggest that the currently practiced mixed-sex tilapia culture is economically unsustainable. It is suggested that research and extension efforts be geared towards developing monosex Nile tilapia production systems. Nile tilapia culture with African catfish predation should be viewed as an intermediate step towards all-male Nile tilapia culture. This will allow accumulation of both physical and human capital to support all-male tilapia culture. Under all-male culture, economic returns are high enough to justify investment in Nile tilapia culture using borrowed capital. However, the success of monosex culture will depend on the availability and affordability of quality fingerlings and low-cost fish feeds. The results have a wide application in Sub-Saharan Africa where mixed-sex Nile tilapia culture is common.

References

Barry P.J., Ellinger P.N., Baker C.B. & Hopkins J.A. (1995) *Financial management in agriculture*. Interstate Publisher, Darville, IL, USA.

[Google Scholar](#)

Central Bank of Kenya. (2007) *2005/06 annual report*. Central Bank of Kenya, Nairobi, Kenya (available at <http://www.centralbank.go.ke>).

[Google Scholar](#)

De Graaf G.J., Dekker P.J., Huisman B. & Verreth J.A.J. (2005) Simulation of Nile tilapia culture in ponds, through individual-based modeling, using a population dynamic approach. *Aquaculture Research* 36, 355-471.

[Web of Science®](#) | [Google Scholar](#)

Engle C.R., Brewster M. & Hitayezu F. (1993) An economic analysis of fish production in a subsistence agricultural economy: the case of Rwanda. *Journal of Aquaculture in the Tropics* 8, 151-165.

[Google Scholar](#)

Fischer G.W. & Grant W.E. (1994) Use of native predator to control overcrowding in warm-water polyculture ponds: simulation of a tucunare (*Cichla monoculus*)-tilapia (*Oreochromis niloticus*) system. *Ecological Modeling* 72, 205-227.

[Web of Science®](#) | [Google Scholar](#)

Food and Agriculture Organization of the United Nations (FAO) (2004) *Aquaculture Extension in Sub-Saharan Africa. FAO Fisheries Circular No. 1002*. Fisheries Department, Rome, Italy.

[Google Scholar](#)

Food and Agriculture Organization of the United Nations (FAO) (2007) *FAO Statistical Year Book 2004: Web Edition*. FAO Statistical Division, Rome, Italy.

[Google Scholar](#)

Hopkins D.K. & Cruz E.M. (1982) *The ICLARM-CSLU integrated animal-fish farming project: final report*. ICLARM contribution no. 86, Hamburg, Germany.

[Google Scholar](#)

Hotland G. (1993) *Ecological sustainability and economic viability of smallholder zero-grazing system in destocked areas of semi-arid Central Kenya*. Livestock based systems in semi-arid area workshop, Arusha, Kenya.

[Google Scholar](#)

Kaliba A.R., Osewe K.O., Senkondo E.M., Mnembuka B.V. & Quagrainie K.K. (2006) Economic analysis of Nile tilapia in Tanzania. *Journal of the World Aquaculture Society* 37, 464-473.

[Web of Science®](#) | [Google Scholar](#)

Liti D., Cherop L., Munguti J. & Chhorn L. (2005) Growth and economic performance of Nile tilapia fed on two formulated diets and two locally available feeds in fertilized ponds. *Aquaculture Research* 38, 746-752.

[Web of Science®](#) | [Google Scholar](#)

MacPherson N.J. (1990) *Integration of fish-farming with small-scale farming system in Zambia*. Project report, Food and Agricultural Organization of the United Nations, Washington, DC, USA.

[Google Scholar](#)

Moehl J. Halwart M. & Brummett R. (2004) Report of the FAO-Worldfish Center Workshop on small-scale aquaculture in Sub-Saharan Africa. Revisiting the aquaculture target group paradigm. CIFA Occasional Paper No. 25, FAO, Rome, Italy.

[Google Scholar](#)

Molnar J.J., Rubagumya A. & Adjavon V. (1991) Sustainability of aquaculture as a farm enterprise in Rwanda. *Journal of Applied Aquaculture* 1, 37–62.

[Google Scholar](#)

Muir J.P. & Massaete E. (1996) Seasonal growth in rabbits fed wheat and maize bran with tropical forages. *Livestock Research for Rural Development* 8, 1–8.

[Google Scholar](#)

Nefisco. (2003) *Tilapia Farming Support Tool: TFST 1.0 Manual*. Nefisco Foundation, Amsterdam, the Netherlands.

[Google Scholar](#)

Ngugi C.C. & Manyala J.O. (2004) Aquaculture extension services in Kenya. In: *Aquaculture Extension Services in Sub-Saharan Africa. Fisheries Department Circular – C1002*. (ed. by FAO), pp. 35–42. FAO Fisheries Department, Rome, Italy.

[Google Scholar](#)

Okechi J.K. (2004) *Profitability assessment: a case study of African catfish (Clarias gariepinus) farming in the Lake Victoria basin Kenya*. Final report, United Nation University, Skulagata/Reykjavik, Iceland.

[Google Scholar](#)

Ross L. & MacKinney R. (1989) *Production modeling*. Aquaculture News, January 1989.

[Google Scholar](#)

Somers I.F. (1988) On a seasonal oscillating growth function. *ICLARM Fishbyte* 6, 8–11.

[Google Scholar](#)

Sparre P. & Venema S.C. (1992) *Introduction to tropical fish stock assessment*. FAO Fisheries Technical Paper 306-1. FAO, Rome, Italy.

[Google Scholar](#)

Wijkstrom U.N. & MacPherson N.J. (1990) *A cost benefit analysis of culture based fisheries development in small dams and dugouts*. Field Work Paper 1: The Economics of Culture Based Fisheries, Field Doc, F1:TCP/GHA0051, FAO, Rome, Italy, p. 7.

[Google Scholar](#)

World Bank. (2006) *Kenya inflation data*. 2006 Development Report, Washington DC, USA.

[Google Scholar](#)

Citing Literature



[Download PDF](#)

ABOUT WILEY ONLINE LIBRARY

[Privacy Policy](#)

[Terms of Use](#)

[About Cookies](#)

[Manage Cookies](#)

[Accessibility](#)

[Wiley Research DE&I Statement and Publishing Policies](#)

[Developing World Access](#)

HELP & SUPPORT

[Contact Us](#)

[Training and Support](#)

[DMCA & Reporting Piracy](#)

OPPORTUNITIES

[Subscription Agents](#)

[Advertisers & Corporate Partners](#)

CONNECT WITH WILEY

[The Wiley Network](#)

[Wiley Press Room](#)

