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AQUACULTURE & FISHERIES INNOVATION LAB

## RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

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**Title:** Genetically-Improved Tilapia Strains in Africa: Potential Benefits and Negative Impacts

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**Abstract:** AquaFish will not be distributing this publication. Copies may be obtained by writing to the authors.

Two genetically improved tilapia strains (GIFT and Akosombo) have been created with *Oreochromis niloticus* (Nile tilapia), which is native to Africa. In particular, GIFT has been shown to be significantly superior to local African tilapia strains in terms of growth rate. While development economists see the potential for food security and poverty reduction in Africa from culture of these new strains of tilapia, conservationists are wary of potential ecological and genetic impacts on receiving ecosystems and native stocks of tilapia. This study reviews the history of the GIFT technology, and identifies potential environmental and genetic risks of improved and farmed strains and tilapia in general. We also estimate the potential economic gains from the introduction of genetically improved strains in Africa, using Ghana as a case country. Employing a combination of the Economic-Surplus model and Monte Carlo simulation, we found the mean net present value (NPV) of the introduction of the GIFT strain in Ghana to be approximately 1% of the country's gross domestic product. Sensitivity analysis indicated that the difference in growth or yield between the GIFT and locally-available strains has the largest effect on mean NPV. We conclude that improvements in management practices and infrastructure could increase the yield and profitability of the local strains even if genetically-improved strains are not introduced. These improvements also will ensure the realization of the full potential of introduced strains.

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