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Journal of Applied Aquaculture ›
Volume 22, 2010 - Issue 4

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Production Parameters and Economics of Small-Scale Tilapia Cage Aquaculture in the Volta Lake, Ghana

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Pages 337-351 | Published online: 06 Dec 2010

Cite this article https://doi.org/10.1080/10454438.2010.527591

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Abstract

To calculate the potential for cage aquaculture to create economic opportunities for small-scale investors on the Volta Lake, Ghana, a local NGO with technical support from the Government of Ghana ran two trials (one of four and one of six units) of small-scale cage aquaculture in the town of Dzemeni. Cages were built locally from available materials at a cost of approximately US$1000 per 48 m^3 cage. An indigenous line of Nile tilapia, Oreochromis niloticus, was stocked either as mixed sex (first trial) or all-males (second trial) at an average rate of 103 fish/m^3 and grown on locally available pelleted feeds for approximately six months. Total costs averaged US$2038 per six-month production cycle. Gross yield ranged from 232 to 1176 kg/cage, averaging 460 kg/cage (9.6 kg/m^3). Final average weight of mixed sex populations (253.05 ± 47.43g) was significantly less than of all-males (376.7 ± 72.30g). Likewise, percentage of fish

over 300 g at harvest was significantly lower in mixed-sex (38.3%) compared to all-male (75.7%) populations. Mortality resulting primarily from poor handling during transport and stocking averaged 70% and was a major determinate of production and profitability. To break even, harvested biomass of fish needed to exceed 15 kg/m^3. At 25 kg/m^3, small-scale cage aquaculture generated a net income of US$717 per cage per six months (ROI = 30.2%) on revenues of US$3,500. Water quality in the area surrounding the cages was not negatively affected by aquaculture at the scale tested (5 tons of feed per six months).

Keywords:

freshwater | small and medium scale enterprise | locally sourced inputs

This research was co-funded by Rural Wealth and the CGIAR Water and Food Challenge Program Project 34: Increasing Fish Production from the Volta Lake. Special thanks to Tropo Farms, Ghana; Lake Harvest, Zimbabwe, and the FISH-Uganda project for sharing production data.

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