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Sustainable Aquaculture for a Secure Future

Title: Integrated Cage-Cum-Pond Culture: Stocking Densities of Caged Climbing Perch in Nile Tilapia Ponds

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Abstract: An experiment was conducted for 150 days at Cantho of Vietnam to determine the appropriate stocking density of caged climbing perch (*Anabas testudineus*) in Nile tilapia (*Oreochromis niloticus*) ponds, to assess the economic and environmental benefits of this integrated cage-cum-pond culture system. One of the 4m³ cage was suspended in each of twelve 100-m² earthen ponds, and three ponds of same size served as control without cages. Climbing perch fingerlings 9 g in size were stocked at 50, 100, 150, and 200 fish/m³ in cages, while Nile tilapia fingerlings of 10g size were stocked at 2 fish/m² in all fifteen ponds, giving caged climbing perch to open-pond Nile tilapia ratios of 1:1, 2:1, 3:1 and 4:1, respectively. Caged climbing perch were fed commercial pelleted feed (26-28% crude protein) at rates of 5%, 3% and 2% body weight per day during the first, second and the remaining months, respectively. The control ponds were fertilized weekly with urea and TSP at 28 kg P/ha/week, while no fertilizers were applied in the treatment ponds.

Survival of climbing perch in the highest density treatment (97.1%) was significantly lower than that in other treatments (99.3-99.6%; P<0.05), while there was no significant difference in survival of Nile tilapia, ranging from 72.5% to 87.2% (P>0.05). Final mean weights of

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both climbing perch and Nile tilapia were not significantly different among all treatments, ranging from 19.5 to 20.5 g and from 111.5 to 133.9 g, respectively ($P>0.05$). Total Harvest weight of climbing perch, ranging from 400 to 15.2 kg/cage, increased significantly with increasing stocking density ($P<0.05$), while total harvest weight of Nile tilapia was highest in the 150 fish/m³ treatment (22.7 kg/pond), immediate in other cage treatments (19.0-20.7 kg/pond), and lowest in the control (15.8 kg/pond; $P<0.05$). The combined total weights of both climbing perch and Nile tilapia in the high density treatments (35.0 kg/pond in 150 fish/m³ treatment and 35.8 kg/pond in 200 fish/m³ treatments) were significantly greater than those in the low density treatments (23.0 kg/pond in 50 fish/m³ treatment and 28.2 kg/pond in 100 fish/m³ treatments; $P<0.05$). FCR of climbing perch in all treatments was very high, ranging from 5.05 to 6.00. FCR was lowest in the 150 fish/m³ treatment, intermediate in the 100 and 200 fish/m³ treatment, and highest in the 50 fish/m³ treatment ($P<0.05$). The results indicate that caged climbing perch to open-pond Nile tilapia ratio of 3:1 was the best. Further research in feed protein level and feed strategy should be conducted.

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