Growth performance, yields and economic benefits of Nile tilapia Oreochromis niloticus and kales Brassica oleracea cultured under vegetable-fish culture integration

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Abstract

An experiment was conducted for 210 days to demonstrate the role of vegetable-fish culture integration in the growth, yields and economic benefits of fish and vegetables. Two 200 m2 earthen fishponds were stocked with Nile tilapia Oreochromis niloticus at 20,000 fish fingerlings per hectare. Pond A was fertilized with chicken manure and stocked fish fed on 35% crude protein supplementary diet referred to here as treated fish pond (TFP). Another fish pond was not fertilized and the fish stocked in it did not receive any supplementary diet referred to here as non treated fish pond (NTFP). Twelve vegetable plots of 7.2 x 3 m were planted with kale seedlings at a spacing of 0.45 x 0.6 m. The first, second and third sets of three vegetable plots were irrigated by water from stream (SW), treated fish pond (TFP) and non treated fish pond (NTFP) respectively. The last three vegetable plots were not irrigated (NI). Sampling of kale leaves was done by removal of the lowest three leaves per plant every four days. Results showed that fish reared under integrated systems attained significantly higher growth than those reared under non integrated systems (t-test, $t=14.38$, d.f. = 118, $P<0.001$). One way Analysis of Variance showed a significant difference in kale leaf yields and income (ANOVA: $F=63.17$; $P<0.05$; d.f.=3) among plots receiving different sources of water with plots receiving water from treated fish pond (TFP) attaining highest yield and income. Gross and net yields of 2,806.969±198 and 2706.569±194 2 kgha-1 (for fish) and 51,970.49 and 51,968.63 kgha-1 (for vegetables) respectively attained were highest from integrated than non-integrated systems. Partial enterprise budget analysis showed

that net returns were higher from integrated than non integrated systems. Results from this study

demonstrate that fish farmers could improve yields and profits by integrating fish farming with other on-farm activities.

Key Word Tilapia Oreochromis**,** Fish Culture