

NOTICE OF PUBLICATION



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Title: Chemical budgets for organically fertilized fish ponds in the dry tropics

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Abstract: Chemical budgets were determined for nitrogen, phosphorus, dissolved oxygen, and chemical oxygen demand for three 0.1-ha earthen ponds stocked with *Oreochromis niloticus* at the El Carao National Fish Culture Research Center, Comayagua, Honduras, for two 150-d culture periods, corresponding to the rainy and dry seasons. Layer chicken litter was added to ponds weekly at 500 kg dry matter/ha. Concentrations of nitrogen, phosphorus, and chemical oxygen demand (COD) in pond water increased during each season. No significant seasonal differences in concentrations of water quality variables were observed. Chicken litter added to ponds represented 92-94% of N input, 93-95% of P input, and 43-52% of COD input. Photosynthesis by phytoplankton provided 47-56% of COD and 98% of dissolved oxygen (DO) added to ponds. Net inward diffusion of oxygen added 1.2-1.5% of total DO. Regulated inflow was a minor source of nutrients, and contributed 3-4% of input N, 3-4% of input P, 1% of COD input, and 1% of DO input. Nutrient inputs from rain were 1% of total for each nutrient. Fish harvest accounted for 18-21% of total N, 16-18% of total P and 2% of COD added to ponds. Community respiration accounted for 48-57% of COD and 99.5% of DO added to ponds. Nutrient losses in pond effluent at draining were: 7-9% of total N, 29-37% of total P and 2-3% of COD. While measured gains exceeded measured losses, significantly greater N, P, and organic matter concentrations in pre-drain samples indicated pond mud was a major sink for added nutrients; accumulation in mud represented 70% of total N, 35-40% of total P, and 38-46% of COD.

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