A basic design and operating for shrimp-settling-oyster integration system to reduce discharge problem

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Source: FISHERIES SCIENCE **Volume:** 68 **Supplement:** 1 **Pages:** 843-846 **Published:** 2002

Abstract: A basic design is proposed, in which the large suspended solid particles from the effluents of conventional intensive shrimp culture were removed by sedimentation pond. Oysters (Crasostrea belcheri Sowerby) were provided to filter the remaining suspended matter from sedimentation pond and fix some of the nutrients in their body. The system design and operating parameters were based on results from experimentation. The performance was evaluated under basic design and operation assumed 1 ha shrimp pond of 1.5 m depth with regular water exchange of 40% per day and re-circulating. Under a basic design, it was estimated that a settling pond removed 50% of total suspended solids, 239% of total N and 17.7% of total P, while the oysters removed 21% of total suspended solids, 9% of total N and 6% of total P. There was an estimated increased discharge of only about 2.7% of ammonia-N, 10.1% of nitrite, 4.6% of nitrate, and 02% of orthophosphate.

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