

Is Better Management Practices (BMP) the solution for environmental management in shrimp farms?

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Abstract

Water quality is important for growth and survival of shrimps. Shrimp farming in Sri Lanka is under increasing criticism due to improper environmental management. Recently, Better Management Practices (BMP) was introduced to farmers, and complete recirculation of water is recommended as the best option. However, impacts of complete recirculation on spatiotemporal variations of water quality have not been well examined. Water quality data (Nitrate, Nitrite, Total ammonia, Sulfide, Phosphate and Alkalinity) from farm reservoirs, ponds and effluent canal were collected in 2006 from a commercial farm practicing complete recirculation in Puttlam district. Data were also collected from the surrounding environment (inlet and outlet of the BMP farm, outlet of a Non-BMP farm and halfway between the BMP and a Non-BMP farm). Spatiotemporal variations and correlations of water quality data were analyzed through Principal Component Analysis and ANOVA.

Culture cycle continued up to 126 days and the average weight of shrimp at harvest was 35 g. Apart from Black Spot disease, no disease outbreaks were recorded. Mean alkalinity level (38.07 ppm \pm 11.70) and mean sulfide level (0.00720 ppm \pm 0.00536) were low in reservoirs, compared to ponds and effluent canal. However, mean phosphate level (0.17444 ppm \pm 0.14369) was higher in ponds compared to reservoirs and effluent canal. The amount of phosphate in ponds decreased towards harvesting time. Outside the farm only total alkalinity (82.80 ppm \pm 40.66) was higher in outlet compared to inlet. The amount of sulfide was highest in the outlet near Non-BMP farm (0.06780 ppm \pm 0.01211). The water quality in ponds and effluent canal was similar when compared with the reservoirs. It is concluded that complete recirculation contributed for disease control thereby achieving a full culture cycle. However, the present level of application of BMP by farmers for proper environmental management is questionable.

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