Enhancing Water Productivity of Shrimp Aquaculture in Coastal Ecosystem

Shrimp aquaculture

Developed by

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RELEVANCE

- Density-dependent demand-driven water use through water budgeting helps improve WUE, water productivity, and profitability and is essential in reducing total water footprint, sediment load, effluent output, and pollution potential in shrimp aquaculture.
- Water budgeting would help assess the total crop water demand, optimize shrimp-rearing efforts, and minimize operational costs.

DESCRIPTION

- The optimum rearing density of 50 post larva m^{-2} of *L. vannamei* shrimp led to the total water use of 3.25×104 m^3.
- Density-dependent water use was observed to improve water quality, productivity (10.58 t ha^{-1} 120 d^{-1}), consumptive water use index (1.72 m^3 kg^{-1} biomass), total water footprint (1,229 m^3 t^{-1} biomass) and net consumptive water productivity (₹ 89.6 m^{-3}).
- *L. vannamei* culture with low to moderate water exchange, improved water use efficiency (0.58 kg biomass m^{-3} water) and minimized sediment load (45.3 m^3 t^{-1} biomass), effluent outputs (0.63×104 m^3) and pumping cost (₹2110 t^{-1} biomass produced).

BENEFITS

- Water saving up to 30-33%.
- Energy/fuel saving ₹ 21700-22400 $ha^{-1}$$crop^{-1}$.
- Manpower saving ₹ 5040-5600 $ha^{-1}$$crop^{-1}$.
- Input saving (lime/ dolomite) ₹6169-6300 $ha^{-1}$$crop^{-1}$.
- Reduced sediment load by 12-16%.
- Lessening water exchange probability by 30%.
- B:C ratio - 2.44.
- This technology has the potential to be implemented on around 12 lakh ha in the brackish water aquaculture area of India.