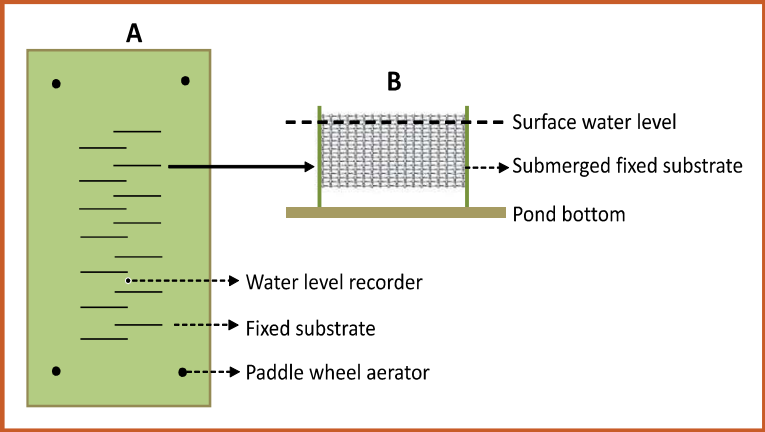
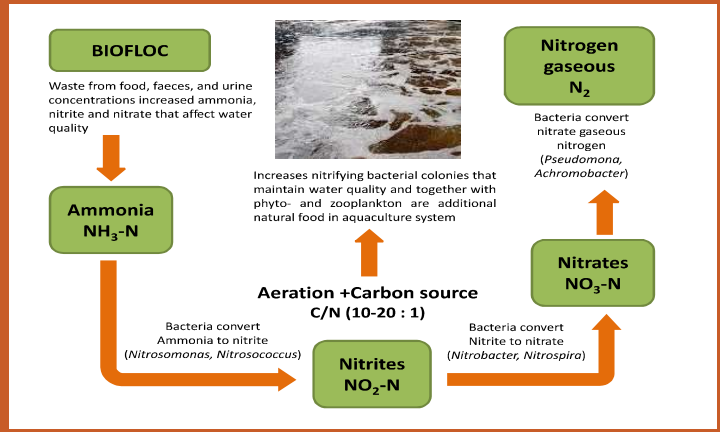
Periphyton-based Aquaculture for Enhancing Water Use Efficiency



Installation of nylon net (400 mesh) as a substrate for periphyton growth



Schematic diagram of a periphyton-based aquaculture system

Experimental site at Erasama, Jagatsinghpur, Odisha

Different stages of periphyton growth

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RELEVANCE

- Periphyton substrates in shrimp ponds improve water quality by absorbing nutrients, controlling dissolved oxygen concentration, and keeping the pH stable.
- It improves the growth performance of shrimp by providing natural food and saves supplemental feed input.
- Improved water quality using periphyton biomass helps prevent wasteful water use and enhance water productivity in grow-out ponds for Pacific white shrimp (*L. vannamei*).

DESCRIPTION

- A nylon net (400 µ mesh) was installed vertically, 30 cm above the pond bottom, as a substrate for periphyton growth.
- It additionally created a surface area ≈ of 10% water surface area (WSA).

BENEFITS

- This production system significantly increases yield (11.79 t ha^{-1} 120 d^{-1}), economic benefit (OV: CC, 2.88), net total water productivity (₹ 71.3 m^{-3}), and lessen sediment load (37.3 m^3 t^{-1} biomass).
- This system minimizes the total water requirement by 30% and enhances yield by 17.2%.
- It helps in optimizing shrimp rearing and lessening effluent output and pollution of the system.
- This technology has the potential to be implemented in 12 lakh ha brackish water aquaculture ecosystem in the Country.