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## RESEARCH REPORTS

Sustainable Aquaculture for a Secure future

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**Title:** Waste Recycling in Fish Pond Culture through Integrated Culture Systems

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**Abstract:** Two new culture strategies, have been developed to recycle feeding waste derived from intensive aquaculture within a single pond, enhance nutrient utilization efficiency, reduce the nutrient contents in effluents discharged from intensive culture ponds, and mitigate eutrophication in receiving waters.

In the integrated cage-cum-pond culture system, high value species are stocked in cages suspended in ponds, and filter-feeding species are stocked in open water outside the cages. While in the integrated pen-cum-pond culture system, high valued species and filtering-feeding species are segregated by plastic netting, which partitions a pond into two compartments. High-value species in both systems are fed a high protein diet, while the filtering feeding species depend solely on natural foods generated from feeding wastes.

In the integrated culture systems, nutrients contained in wastewater of intensive fish culture can be effectively reused by filtering-feeding species, giving compatible yields with those achieved in organically or inorganically fertilized ponds. The integrated culture systems recycle wastes from intensive culture into semi-intensive culture, thereby reducing the nutrient input for pond fertilization, and minimize the impacts of pond effluents on environments. The integrated culture systems can also be used in polyculture ponds to confine costly high protein diets to the high valued species to achieve higher economic returns. The integrated culture systems can be adapted by small-scale farmers, especially suitable for low capital investment.

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