

The study shows that the extensive monoculture of prawns and the extensive polyculture of prawn with shrimp and milkfish are profitable culture systems. Return on investment (ROI) and payback period for prawn extensive monoculture systems range from 10 to 65% and from 1.4 to 8.6 years, respectively. For polyculture systems, ROI ranges from 8 to 85% and payback period from 1.1 to 10.5 years. The semi-intensive culture of prawn shows moderate results. This is largely due to higher capital requirements for semi-intensive culture as compared to extensive culture. The extensive and semi-intensive monoculture of shrimps on the other hand show poor results, with semi-intensive monoculture registering net losses after all costs are considered.

### **A Preliminary Economic Analysis for Extensive and Semi-Intensive Shrimp Culture in South Carolina, U.S.A.**

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South Carolina has some 28,500 ha of impounded coastal wetlands. These impoundments are remnants of the rice culture industry of the 19th century and are now of interest for waterflow management and possibly aquaculture. The purpose of this study was to evaluate and compare the potential for extensive commercial culture of shrimp in salt-marsh impoundments with that for semi-intensive production of shrimp in highland ponds.

A hypothetical farm consisting of four 8-ha impoundments or ponds was chosen as the basis for the analysis, and it was assumed that only one crop of shrimp could be produced per year. Two alternative strategies for stocking the impoundments were evaluated: option 1, stock by natural recruitment via tide

gates; option 2, stock at low density (25,000/ha) with hatchery-reared postlarvae. Highland ponds were to be stocked at a density of 75,000 PL/ha with hatchery-reared animals. Major fixed costs other than land purchase were considered, including renovation of existing impoundments by cross-diking to form 8-ha units and addition of extra tide gates. Estimates of annual and variable costs for postlarvae (where applicable), feed, labor, chemicals, pumping, supplies, vehicle use, mowing, interest, overhead, and miscellaneous items were also included in the analysis.

Results indicated that extensive shrimp culture in salt water impoundments is likely to be a break-even or profitable activity for production levels of 90 kg whole shrimp/ha for stocking option 1, while option 2 would require yields of  $\geq 225$  kg/ha. In comparison, semi-intensive culture in highland ponds is likely to be successful if yields of  $\geq 800$  kg/ha are obtained. This preliminary analysis suggests that both extensive and semi-intensive culture of shrimp may be economically feasible in South Carolina, but this potential is as yet unproven and shrimp aquaculture must be considered a high risk venture in this area.

### **Cause of Musty Flavor in Pond-Cultured Penaeid Shrimp**

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In 1983, penaeid shrimp shipped into the United States from culture ponds in Ecuador were found to have an intense earthy-musty flavor which made them unmarketable. High concentrations of geosmin (trans, 1-10-dimethyl-1-9 decalol), a musty odorous compound, were found in the tail muscle of the shrimp. The level of geosmin, 78 mg/kg muscle, was much higher than levels usually found in pond-cultured freshwater catfish of  $13 \pm 3$  mg/kg muscle. Cause of the rare occurrence of off-flavor in the shrimp is hypothesized to be severe reduction in salinity in the coastal culture ponds which allowed growth of odor-producing blue-green algae.