Environment-friendly schemes in shrimp farming

SEAFDEC/AQD's low discharge and closed-recirculating systems

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SEAFDEC/AQD through its Technology Verification Section has developed an intensive shrimp farming technology that is environment-friendly using the low-discharge and closed-recirculating systems. The protocol addresses the problem of, and provides solution to, our struggle against the dreaded luminous bacteria known to have caused the industry to decline sharply. It employs mitigation measures such as salinity reduction, physical and biological filtration of the culture medium, use of reservoir and settling ponds, biomanipulators, good quality shrimp fry, good quality feeds and an efficient feeding protocol, and long-arm paddlewheels for better aeration and water circulation. These physcial and biological components are integrated in the pond design and layout in order to satisfy the requirements of the system.

To fast track the transfer of technology, field testing was conducted in various sites in the Philippines under the *Joint Mission for the Accelerated Nationwide Technology Transfer Program*, a collaborative project of SEAFDEC/AQD and the Bureau of Fisheries and Aquatic Resources (BFAR). Phase I started with field tests conducted in AQD ponds in Dumangas, Iloilo (western Visayas) and BFAR ponds in Batangas (southern Luzon), Bohol (central Visayas), and Lanao del Norte (northern Mindanao) which successfully demonstrated the technical

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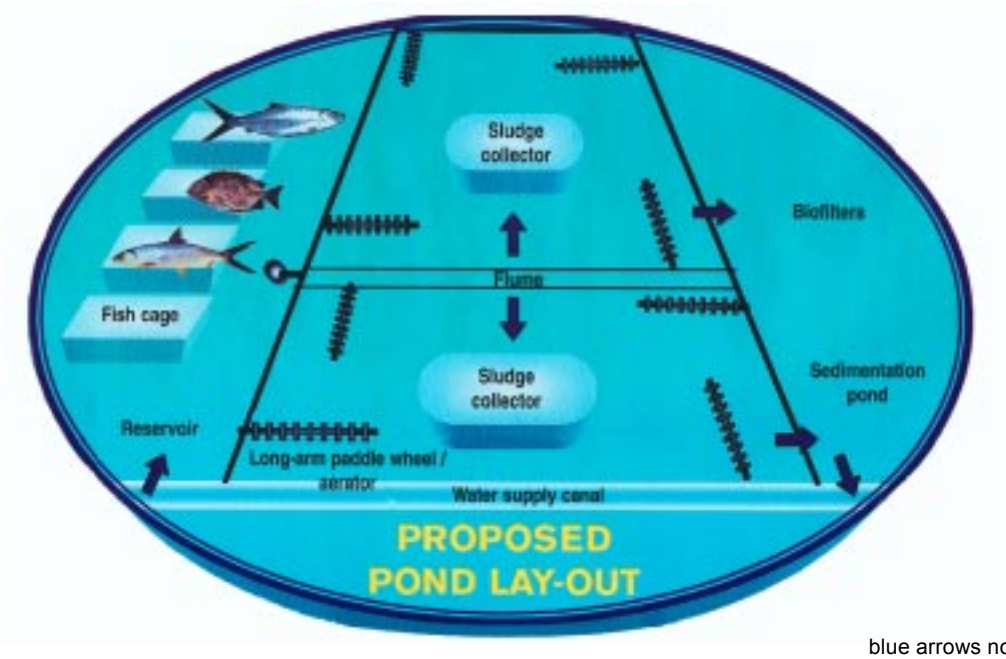
Indicative cost and return data from AQD's techno-demonstration ponds in the Dumangas Brackishwater Station, Iloilo

Area	10,000 m²
Total stock	400,000 pcs
Stocking density	40 pcs per m²
Average body weight of shrimp at harvest	25 g
Biomass	7,500 kg
Survival rate	75%
Average price per kg	P270
Gross sales	P2,025,000
Expenses	
Fry	100,000
Feeds	535,000
Salaries/wages	180,000
Pond preparation	50,000
Lime	10,000
Biomanipulators	6,000
Probiotics	16,500
Power/lights/water	190,000
Fuel/lubricants	70,500
Sludge collectors/cages	14,850
Feeding bridge/tray	10,000
Laboratory analysis	10,000
Depreciation	67,000
Repairs of dikes/equip	60,000
Miscellaneous expenses	2,470
Total operating expenses	1,322,320
Equipment	300,000
Investent requirement	1,622,820
Net profit	702,680
Return on investment	43.3%



blue arrows note direction of water flow in low discharge system, red arrows for closed-recirculating

and commercial viability under different climatic conditions at stocking densities ranging from 25-60 shrimp fry per m^2 with production ranging from 6-15 tons per ha. [Very recently, AQD has demonstrated this technology overseas in coordination with the Department of Fisheries in Myanmar with a consistent production of about 10 tons per ha.]

Phase II engaged the participation of private tiger shrimp operators nationwide by using their farms, which is the ultimate goal to revive the shrimp industry. The JMANTTP also includes the conduct of nationwide skills development sessions that consist of lectures and practicals on the environment-friendly intensive shrimp farming technology. ###

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PRINCIPLES OF MANGROVE-FRIENDLY ... FROM PAGE 4

- Know the local market channels.
- Market price of product

e) *Social Acceptability*
- Farm should have minimal to zero impact on the environment.
- Farm should have minimal to zero conflict with other users of common resource.
- Use local human resource where advanced technical skills are not required.
- Shrimp farm should have clear benefit to locality such as for instance payment of local taxes.
- Pay farm workers just and fair wages.
- Be a good neighbor

Conclusion

To sum up the above points a shrimp farm can be made mangrove-friendly by avoiding the selection of mangroves in the first place. Once operating, the farm should use only inputs that will not harm the environment. All types of wastes, whether solid or soluble, should be treated properly. Solid wastes which can be physically gathered such as dead fish and shrimps should not simply be thrown into the water where it will find its way out and decompose. They should be properly disposed of by burying. Water coming out of the farm in the course of water change and during harvest should be allowed to settle in a treatment pond and not released directly to the water. Further treatment should be done with the use of filter feeders such as oysters and finally aquatic plants such as *Gracilaria* to reduce the nutrient load. It is not enough to just consider the immediate environment. The shrimp farm should maintain good relations with the farm workers and the community. Farm workers should be paid fair and just wages. Permits and licenses that may be required by all levels of government must be properly complied with. It is only by so doing that shrimp farming can be made sustainable.

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