



High-density deep-water rice-fish system in low land ecosystem

TECHNOLOGY BRIEF

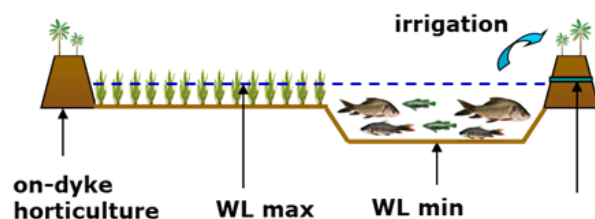
Monolateral-type refuge (30-35% of total land area with a depth of 1.5-1.75m) that acts as a drainage system and helps in lowering the water table, is found optimum for **high-density deep water rice-fish culture**. As density-dependent growth performance takes place at higher population density, culling/phased-harvesting help in reducing size heterogeneity, weight distribution and stunting growth of fish and prawn. Existence of fish & prawn in the rice field can enhanced rice yield by more than 22%. This technology has the potential in enhancing net water productivity more than 11 fold over deep-water rice mono crop. In this co-production system, 20-25% feed can be reduced during each meal as fish and prawn get $27.4 \pm 5.8\%$ natural food from the system, even in presence of supplemental feed. In this system, paddy yield of 3.4 t/ha and fish yield of 5.6 t/ha can be achieved with B:C ratio of 3.4 and net water productivity of ₹ 14.5 per m³ of water. The system has potential to generate net profit of ₹ 1,15,000 ha⁻¹ in one crops. Moreover, in the rice-fish culture, when selective harvesting was practiced, the net return was enhanced further by 49%. This infers that the initial high stocking density, followed by selective harvesting in rice-fish culture is more beneficial than traditional rice-fish farming.

HIGHLIGHTS

- Fish & prawn in the rice field enhanced rice yield by more than 22%.
- Net water productivity more than 11 fold over deep-water rice mono crop.
- Paddy yield of 3.4 t ha⁻¹ and fish yield of 5.6 t ha⁻¹ 180d⁻¹ a can be achieved.
- Rice-fish culture makes multiple use of the rice field, thereby maximizing the utilization of land & water resources & increase the production value of rice fields.

IMPACT / UTILITY

This replicable technology has successfully been transferred to several farmers in Cuttack, Balasore, Kendrapara, Puri and Bhadrak Districts of Orissa. Further, Agricultural Promotion and Investment Corporation of Orissa Ltd. (APICOL); Command Area Development Agency (CADA), Govt. of Orissa; and NGOs like SRADHA, IYWW have already recommended this production technology for mass scale adoption. This eco-friendly dual production system (rice and fish) and on-dyke horticulture, which generate near-term lucrative returns and generates employment opportunities, can be adopted and expanded in lowlands/ waterlogged areas in India & S-E Asia.



Lay out of monolateral type deepwater rice-fish system (1 ha unit)

Project Details

On-farm study on integrated high density deep water rice-fish culture in seasonal waterlogged areas. (Project Code: WTCER/03/89)

Publications

- Mohanty et al., (2010) *Aquaculture Research*, 41:1402-1412
- Mohanty et al., (2009) *Agricultural Water Management*, 96:1844-1850
- Mohanty et al., (2010) *Aquaculture International*, 18:523-537



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