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BOOK OF ABSTRACTS

- Increasing Aquaculture Production
- Sustainable Fisheries Management
- Marketing, Value Chain & Fair Trade
- Socioeconomics & Livelihood
- Post Harvest and Food Safety

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RICE-SHRIMP SYSTEM AT FRESH AND SALINE WATER INTERFACE: APPROACH OF INCREASING PRODUCTIVITY FOR SUSTAINABLE LIVELIHOODS

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Depending on the seasonal salinity variations in south-west coastal waters, rice cultivation during the low salinity period of mid-August to December is commonly being followed by shrimp (Penaeus monodon) culture during the high salinity period of February to mid-August. Attempts have been made during the period of 2005-2006 for an appropriate farming approach that may increase production and income of the rice-shrimp system as whole. In the rice season of 2005, integration of rearing GIPT (Genetically Improved Farmed Tilapia) and prawn (Macrobrachium rosenbergii) was tested, with different treatment combinations (GIPT, GIPT and prawn (1:1), and prawn), at a total stocking density of 5,000/ha. In 2006 rice season, effects of stocking of prawn either in June, July, or August at 1:1 combination with GIPT, stocking at August along with rice plantation, were studied. Several HYVs of rice (BR 23, BRRI dhan 40 and 41, PVS T2 and T5) were also tested simultaneously for their yield response to salinity influenced environment. In the shrimp growing season, three stocking patterns of (i) single (5/m²), (ii) double stocking (1/m² followed by 2/m²), and (iii) double stocking (2/m² followed by 3/m²) were tested in shrimp gher of low (30-50 cm), medium (40-60 cm), and high (60-80 cm) water depth categories. For three stocking combinations of (i) GIPT, (ii) GIPT-prawn (1:1) and (iii) prawn, per ha aquaculture production was 258±6.35 kg GIPT, 211±12.70 kg GIPT and 28.83±10.36 kg prawn, and 70.91±16.47 kg prawn, respectively. While the aquaculture component (GIPT alone) presented the highest (p<0.05) eco return (43%) with a BCR of 1.56, prawn resulted in a marginal or negative net return. In another experiment, shift of he stocking time of prawn in June resulted in the highest (p<0.05) production of 72.53±4.76 kg/ha and that in August the lowest of 27.84±1.53 kg/ha. Production of GIPT that were stocked in August varied from 179.69±2.82 – 193.57±2.85 kg/ha without any significant difference among the treatments. However, aquaculture production represented the highest (p<0.05) net economic return (59%) with the BCR of 3.26 for the treatment where prawn were stocked in June. Among different HYVs that were cultivated during two consecutive seasons, BR 23, 40, and 41 produced a similar average higher yield of rice ranging from 3.45 t/ha.

Though the single stocking resulted in average higher production, either of the stocking pattern had no significant (F=1.59; p>0.05) impact on average shrimp yield that ranged from 311.48±189.42 - 371.20±200.15 kg/ha. However, variations in production of shrimp in ponds with different depths of water were highly significant (F=45.20; p<0.01). Ponds with
high water depth (60-80 cm) resulted in the highest yield of 538.21±40.82 kg/ha, compared to those with medium (40-60 cm) and low (30-50 cm) depth ponds. The variation in shrimp production with medium (260.98±73.58 kg/ha) and low (194.72±27.50 kg/ha) water depth ponds was not significant. A highly significant positive correlation (r=0.855; p<0.01) between shrimp yield and mean water depth indicates the importance of maintaining required water depth for increased shrimp production.

While integrating aquaculture in rice season, followed by either of single or double stocking of shrimp with maintaining a water depth of 60-80cm, may increase the total farm output from a single piece of coastal land under rice-shrimp system, improvement of land-water infrasstructures within and outside the polders is highly required to manage the optimum water level for synchronized production in both alternate rice-fish and shrimp cropping pattern.