Title: **Integrated Boro rice-prawn system for adaptation and food security in southwest coastal Bangladesh**

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Abstract: Rice-based farming systems play a vital role in ensuring food security and sustaining rural livelihoods in Bangladesh. However, Boro rice cultivation remains limited in the salinity-affected southwestern coastal region due to high soil salinity and a scarcity of fresh water. Integrating Boro rice with freshwater prawn *gher* system has emerged as a climate-smart alternative for this climate-vulnerable zone. This study compared the profitability, energy efficiency, and agronomic sustainability of prawn *gher*-based Boro rice with traditional upland Boro using a mixed-methods approach. Data on production practices, input use, cost–benefit performance, and irrigation management were collected through household case studies, focus group discussions, and key informant interviews. Soil health data were found from the soil samples collected from both systems. The findings indicate that *gher* Boro is both agronomically sustainable and economically advantageous, characterized by higher yields, greater profitability, minimum tillage, lower input requirements, reduced energy use, and more efficient farm management. The net income from *gher* Boro (USD 662) far exceeded that of the traditional upland Boro (USD 86), underscoring its economic viability. Scaling up this prawn–Boro integrated system in the southwestern coastal belt and neighbouring districts with suitable biophysical conditions could significantly enhance national rice production and strengthen food security in salinity-affected, climate-vulnerable areas of Bangladesh.

Keywords: Boro rice Freshwater prawn Profitability Farming system Food security Coastal Bangladesh

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