NATURE-BASED PRACTICES OF MARINE SHRIMP FARMING MODELS IN THE MEKONG DELTA, VIETNAM

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INTRODUCTION: Marine shrimp farming in the Mekong Delta, Vietnam encompasses a wide range of practices, including both nature- and high-tech-based approaches. This Delta is also one of the world's five major deltas most severely affected by climate change. This study aimed to examine nature- and high-tech based practices, productivity performance, net income, and risks associated with extreme weather conditions and disease outbreaks.

METHODS: This study was carried out via interviewing 740 farmers. The samples included nature-based farming models such as rice-shrimp (RS, 253 households), shrimp-aquatic plants (SP, 150), and mangrove-shrimp (MS, 119), as well as high-tech model or intensive shrimp model (IS, 218) using a semi-structured questionnaire.

RESULTS:

- All farming models are frequently challenged by climate change-related factors (CCRs), including prolonged and abnormal droughts or rainfall, and extremely high temperatures.
- An analysis of three-year period revealed a declining trend in both productivity and net income of all four models. The proportion of farms reporting decreased productivity was highest in the MS model (77.3%) and lowest in the IS model (39.9%), with corresponding declines in incomes reported by 74.0% of MS farm and 44.0% of IS farms.

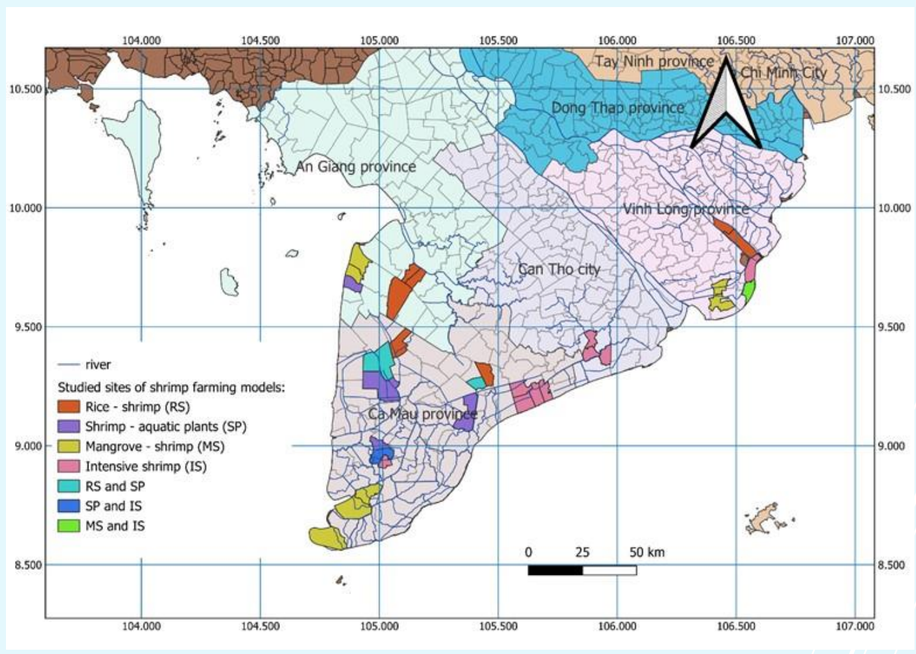


Fig. Study sites in the Mekong Delta, Vietnam.



Fig. Rice-shrimp - RS (above) and Shrimp-plant – SP (below) in Ca Mau province.



Fig. Integrated mangrove-shrimp – MS (above) and Intensive shrimp – IS (below) in Ca Mau

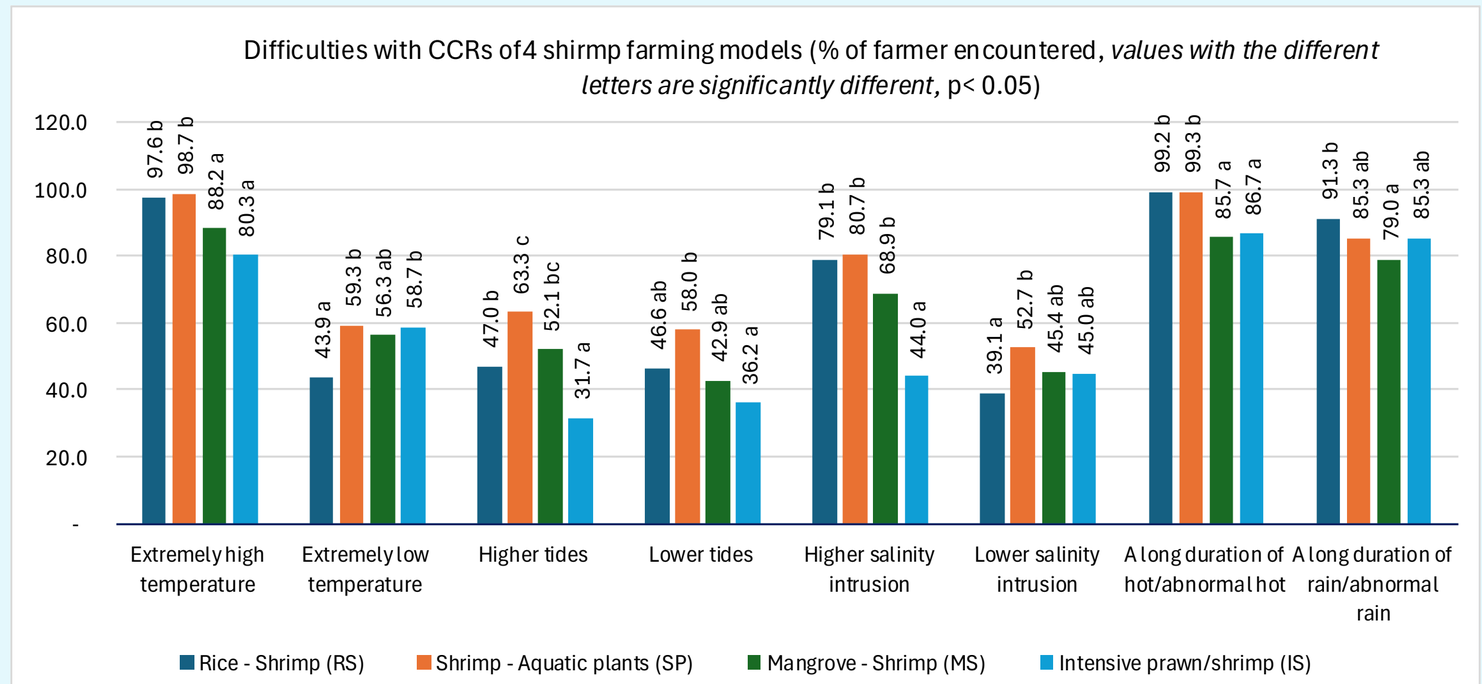


Fig. Difficulties with climate change related risks (CCRs)

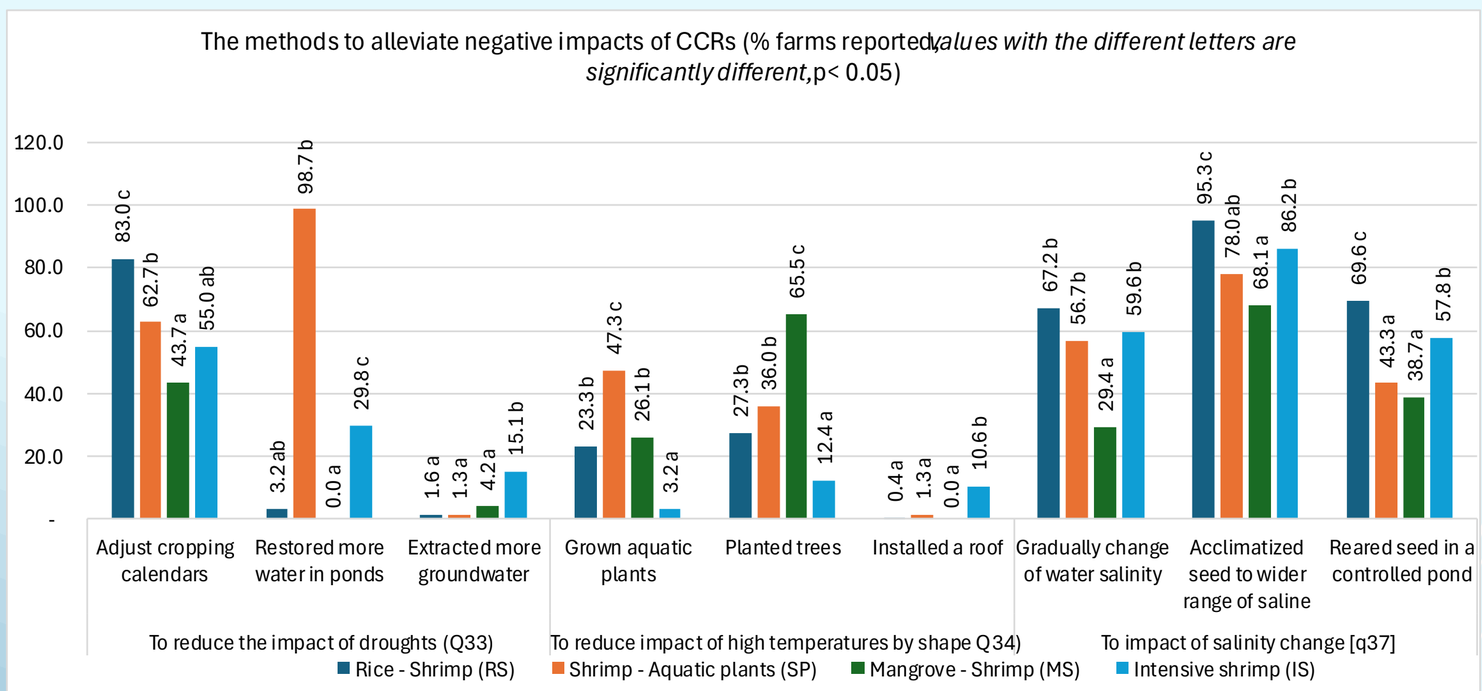


Fig. The method to alleviate negative impact of CCRs and poor water



Fig. Survey interviews in An Giang.

RESULTS (Continued):

- Risks associated with extreme weather events and disease outbreaks have increased across the studied models. The IS model, which integrates both nature-based and high-tech practices, is likely to have an advantage in improving shrimp productivity. The SP and MS models show no clear relationship between nature-based and high-tech practices.
- Nature-based solutions alone are insufficient to significantly enhance shrimp productivity in IS model and may primarily contribute to stabilizing production. In contrast, high-tech measures, such as the treatments of water and the application of multi-stage culture models, appear more effective in improving productivity.

CONCLUSION:

- Nature-based models appear to be more vulnerable to climate-related stressors compared to high-tech model. However, their resilience could be enhanced through the integration of environmentally friendly technological solutions.
- To effectively adapt to climate change and improve the productivity of target species, further research and application of both NB and high-tech solutions are required. Such efforts should aim toward ecologically intensive aquaculture, which enhances ecosystem services while increasing the productivity and resilience of farming models.

Keywords: nature-based, high-tech practices, marine shrimp farming, climate change, effective solutions.

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