Soil and Land Management

Improving the sustainability of rice-shrimp farming systems in the Mekong Delta, Vietnam

Australian Government
Australian Centre for International Agricultural Research

Overview

The Mekong Delta is Vietnam's most important rice-producing region, accounting for more than half of the country's annual rice production.

Rice and shrimp have been farmed in rotation in the Mekong Delta for 40 years. Rice is farmed in the wet season when water salinity is low, while shrimp is farmed extensively and semi-intensively during the dry season when water salinity is too high for rice production.

Increased salinity, a result of changing environmental conditions and catchment-wide water management, has led to rice crop losses and reduced yields in the normally productive wet season. Shrimp yields have been affected by recurrent disease outbreaks exacerbated by the stocking of poor-quality post-larvae and declining pond soil and water quality.

Research is already underway to test redesigned rice-shrimp farming systems and new salt-resistant rice varieties, but the mechanisms underpinning the sustainability of rice-shrimp production systems are poorly understood. Further research is required on key factors, mechanisms and constraints that influence the productivity of new rice–shrimp farming systems. The research would enable scientifically-validated modifications to the farming system to increase profitability and ensure the promotion of sustainable practices.

KEY FACTS

ACIAR Project No. SMCN/2010/083
Duration: June 2013 to May 2017 (4 years)
Target areas: Vietnam
Budget: A$2,129,516

Project Leader
Jesmond Sannut, The University of New South Wales

Key partners
- Griffith University
- Charles Sturt University
- Research Institute for Aquaculture 2 (RIA2)
- Can Tho University (CTU)
- Cuu Long Rice Research Institute (CLRRI)

ACIAR Research Program Manager
Dr Gamini Keerthisinghe and Dr Christopher Barlow

Objective

The project's overall aim was to understand the mechanisms, processes and functionality of rice–shrimp farming systems through rigorous scientific investigations to achieve sustainable production.

The specific objectives were to:

- Better understand the key components of the sustainability of rice–shrimp farming systems.
- Determine the sustainability of the rice–shrimp farming system by testing the identified key risk factors and system components.
- Determine, explain and quantify the benefits to productivity of integrating rice and shrimp farming.
- Identify and promote better management strategies to improve productivity and sustainability of rice–shrimp farming systems.

Expected scientific results

- Scientific knowledge on: nutrient budgets and nutrient cycling in rice–shrimp production systems; interactions between soil and water processes and their influence on pond conditions; the influence of rice and shrimp cultivation on soil and water processes/interactions; and the effectiveness of natural and stable isotope tracers to measure carbon and nitrogen contributions to rice–farming systems.
- Scientific knowledge on the benefits of rice–shrimp farming, constraints and opportunities for enhanced production and management practices presented in research, technical and extension publications.
- Provision of information, through the RIA2 and partners, to inform policy and mechanisms for supporting the future of rice–shrimp farming.
- Formal training programmes using the 'train-the-trainer' approach for staff of the Department of Agriculture Extension Stations and on-farm training of lead farmers and farmer groups.

Expected outcomes

- Adoption of sustainable rice–shrimp farming systems and promulgation of the farming system through development programmes and policy.
- Improved research, technical and extension services through capacity building.
- Farmers equipped with better skills and knowledge and engaging in community cooperation.
- Reductions in on- and offsite environmental degradation.
- More resilient rice–shrimp systems with fewer crop failures, ensuring greater stability of farm income and rice export, thereby aiding Vietnam's terms of trade.
- Improved farming practices leading to greater efficiencies in production, decreasing the quantities of farm inputs, such as fertiliser, and increasing farm profitability.
- Adoption of technologies enabling farmers to earn income from salt-impacted areas no longer suitable for rice monoculture.
- The introduction of the Bayesian belief network (BBN) methodology creating an opportunity for more efficient expenditure of research funding.

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