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 **successstories**

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Resolving water disputes between shrimp and rice farmers in Vietnam

By zoning land use and developing a computer model for optimal sluice gate operation, CGIAR scientists, including a team from the International Water Management Institute (IWMI), helped resolve differences between shrimp and rice farmers in Southeast Vietnam.



Photo Credit: Chu Thai Hoanh/IWMI

Sign marking one of the experimental plots where shrimp and rice production under different water conditions was tested, Gia Rai District, Bac Lieu Province.

In 2001, shrimp farmers in the Bac Lieu Province of Vietnam's Mekong River Delta broke a major dam after they were denied access to the saltwater they needed for their livelihoods. This was a strong reaction by local farmers to the system of sluices and dams built by the government to supply freshwater for rice production. The infrastructure had been installed in line with a national policy to encourage farmers to grow two or three crops of rice a year, rather than the single crop that was possible under natural conditions. However, aquaculture was becoming more lucrative than growing rice. Shrimp farming now dominated western areas of the province, which had acidic soils that were not suitable for growing rice in the dry season.

Consultation with farmers

In 2001, scientists from IWMI, the International Rice Research Institute (IRRI) and WorldFish Center were alerted to the dispute and decided to try to resolve the issue. The first task was to review policies for land and water use. The researchers talked with rice growers, shrimp farmers and water managers, and revised the land-use plan with provincial and national authorities. Taking into account farmers' preferences, soil characteristics and the 'anticipated' water quality, the team delineated six zones with corresponding land uses, cropping calendars and salinity requirements. The zones provided for three rice or upland crops in the east to two shrimp crops in the west. In between were transitional zones with two rice crops or one shrimp crop in the dry season followed by one rice crop in the rainy season. "The government had originally seen saline or brackish water required

for shrimp farming as a problem, hence their decision to try and contain it," says Chu Thai Hoanh, Principal Researcher - Water Resources, at the Southeast Asia office of IWMI in Vientiane, Lao PDR. "Now they changed their opinion and viewed it as a resource."

Once the land-use zones were established, the researchers used a mathematical model that simulated hydraulic conditions to work out and test the optimal operation of sluice gates needed to maintain the correct water quality as required in each zone throughout the year. The team helped set up a Regional Water Management Alliance with members from Bac Lieu and surrounding provinces to coordinate the sluice gate operation. In 2003, they began testing different operational procedures. "During 2003 and 2004, a few conflicts still arose when saline water occasionally flowed into rice paddies or freshwater affected shrimp farming, but from 2005 onwards the control was much better," says Hoanh.

Increased production

Surveys undertaken during 2000 to 2005 showed that the more structured approach to managing water in the area improved fishery production significantly. The annual per capita gross domestic product (GDP) of approximately 800,000 people in the Bac Lieu Province increased from USD 248 to USD 648. In 2011, IWMI and IRRI researchers returned to the area and found that the Regional Water Management Alliance had been replaced by a new River Basin Organization led by the ministries of central government; this was not yet fully operational. As a result, there had been a few unwanted freshwater or saline water inundations, but generally the plan was still being followed. "We will try to find a way to improve this management situation while working on the new project," explains Hoanh. "However, in recent years, there have not been any major problems, like before. Most farmers are satisfied with their land-use systems and the current water management."

Donors and partners

Department for International Development (DFID), UK; Comprehensive Assessment of Water Management in Agriculture; CGIAR Challenge Program on Water and Food (CPWF); International Rice Research Institute (IRRI); WorldFish Center; Can Tho University, Vietnam; Provincial People's Committee, Bac Lieu, Vietnam; Department of Agriculture and Rural Development (DARD), Bac Lieu, Vietnam; and Southern Institute for Water Resources Planning, Vietnam.

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