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Reporting Agriculture for the 21st Century

Bac Lieu to the future

When Vietnam launched economic restructuring in 1986, a high priority was to boost rice production. The country quickly regained its status as a leading rice exporter by improving irrigation infrastructure and introducing modern, high-yielding rice varieties. The government also pursued an ambitious plan to protect nearly half a million hectares in the southern tip of the Mekong Delta from seawater intrusion in the dry season. This helped many farmers in impoverished Bac Lieu province, tucked along the underside of the delta, to grow a second or even third crop of rice. However, it also devastated the livelihood of shrimp farmers who could neither draw brackish water from canals to fill their shrimp ponds nor profitably convert them to rice.

Scientists led by the International Rice Research Institute (IRRI) studied how salinity protection affected farmers, and the alternatives available. Vietnamese policymakers wisely paid heed to them, reversed course and partly rolled back salinity protection in Bac Lieu. They did so to balance the goals of higher national rice production, foreign currency earnings from shrimp exorts, and improved rural livelihoods overall.

The salinity protection scheme used the existing embankment of National Route 1, which runs parallel to the coast. Sluice gates to close the canals that traverse the embankment were completed one by one, from east to west, through the 1990s. As they came on line, the limit of year-round salinity protection progressed steadily westward.

Virtual time travel

When Mahabub Hossain, head of IRRI's Social Sciences Division, and his collaborators set out to study the livelihood effects of the project in 2000, they realised that the gradual spread of saline protection provided an opportunity for virtual time travel. By dividing the study area into three zones they could conduct surveys simultaneously across the zones to measure how salinity protection affected livelihoods "over time".

"The no-intervention zone west of the protected area represents the situation in the coastal area before saline protection, or in the absence of it," Hossain explains. "The recent-intervention zone in the western part of the protected area represents the situation in transition, when farmers move from the traditional shrimp-rice system to intensified rice. The early-intervention zone in the eastern part represents the final situation of stability after the transition is complete, with farmers reaping the full benefits of the rice intensification that was the objective of the government intervention."

Hossain found that the high prices paid for shrimp had propelled average per capita income in the no-intervention zone to US$635, or more than six times higher than in the recent-intervention zone. This

despite the migration into the no-intervention zone of landless poor driven from the other two zones by the decline of the natural fisheries upon which they depended. Even in the stabilised early-intervention zone, the average per capita income was less than a quarter of that in the no-intervention zone because of the low price farmers received for rice. Despite severe income inequality in the no-intervention zone - a common complaint against shrimp farming - this zone had the lowest poverty rate. Hossain concludes that salinity protection resulted in substantially lower farm income across the board, even after farmers gained experience with the new cropping patterns.

Acid soils

Complicating analysis are acid sulphate soils in the recent-intervention and no-intervention zones, which depress rice yields. They also kill shrimp unless farmers treat their ponds with lime. Hossain notes that lime invested in shrimp culture in the no-intervention zone carried over to the following rice crop, helping to improve rice yield from 2 tonnes per hectare in 1998 to 3-4 tonnes per hectare in 2000. The low value of rice would make adding lime to this crop alone uneconomic.

"Compared to the most intensive rice system that the government intervention has induced, the traditional rice-shrimp system provided more than 100 per cent higher incomes," Hossain adds. "Brackish water in the coastal area is no less important a natural resource than rice lands."

Guided by water and soil analyses and modelling studies led by To Phuc Tuong, head of IRRI's Crop, Soil and Water Sciences Division, and financed by Britain's Department for International Development, the government adapted a new sluice-gate management regime*. It is designed to maintain salinity protection in the early-intervention zone - where most farmers now grow two rice crops and an upland cash crop - but restore brackish water to the acid sulphate-affected recent-intervention zone. This has permitted a revival of fisheries and traditional rice-shrimp rotation in the zone, though many farmers are concentrating more on shrimp.

Research continues on how to maintain the productivity and sustainability of the extensive shrimp farming generally practised in Bac Lieu, in which a maximum of three shrimp per square metre feed primarily on blue algae that grow naturally on rice stalks or native grasses. Scientists, farmers and policymakers believe that this extensive, non-chemical practice can avoid the environmental degradation that has accompanied shrimp aquaculture elsewhere. Certainly, farmers in the province relish having a second chance to try.

* see Some like it salty, some like it not in New Agriculturist 02-4.

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