Fisheries R&D nets improved livelihoods for Indonesian farmers

ACIAR’s specialist R&D support is helping revitalise Indonesia’s ailing aquaculture industry and ensure the sustainability of wild fisheries.

BY CARMEN MYLER

The destruction of thousands of shrimp ponds in Aceh during the 2004 tsunami was another blow for Indonesia’s struggling small-scale aquaculture farmers. ACIAR’s support proved crucial to the rebuilding effort, capitalising on more than a decade spent revitalising Indonesia’s fishing and aquaculture industries.

Associate Professor Jes Sammut from the University of New South Wales (UNSW) visited Aceh in 2005 to advise donor agencies on rebuilding the province’s brackish-water ponds, or ‘tambaks’.

A timely response was essential, and Australian and Indonesian researchers trained through ACIAR projects provided technical guidance that helped agencies respond quickly.

An independent impact assessment report commissioned by ACIAR and undertaken by IDA Economics has formerly examined the impacts of ACIAR fisheries projects run from...
1997 to 2008 in Indonesia. It found that without the capability provided by the ACIAR team “it is highly probable that the shrimp farm recovery in Aceh would have been delayed and may have totally failed since the underlying problems of shrimp farming in acid sulfate soils are not well understood outside the ACIAR-funded research.”

Dr Sammut led the project that proved crucial to reconstruction efforts. His team conducted training in soil assessment and remediation for international agencies including the Food and Agriculture Organization of the United Nations, the Asian Development Bank, French Red Cross and various non-government organisations.

Dr Sammut visited agencies involved with rebuilding the ponds and found many engineers were not aware that acid sulfate soils were an issue.

“Acid sulfate soils are sediments that commonly occur in coastal lowlands and cause acidification that can kill shrimp or at least contribute to poor growth rates, and higher pond-management costs,” he says.

Dr Sammut’s team undertook soil mapping to identify whether problem soils were present in the areas where rebuilding of tambaks was planned.

“Indonesian researchers trained through the ACIAR project worked with us to map 470,000 hectares of acid sulfate soils in Aceh, where we also found about 80% of soil in farming areas was sandy,” he says.

“The donor agencies were facing a double whammy. Their efforts to rebuild tambaks in the same areas would have disturbed the acid sulfate soil and there would be engineering issues trying to rebuild in sandy soil.

“We were able to advise them of potential soil problems and how to identify and avoid them where possible, or to manage them in existing ponds through more efficient liming strategies, improved ways of preparing pond bottoms and dykes, water management techniques and fertiliser application.

“In some cases where it is just too costly to remediate we suggested other economically viable commodities and farming methods as an alternative to high-risk shrimp monoculture.”

The scientists had the capacity to act quickly because of their experience in ACIAR projects supporting Indonesian tambak research since 1997.

Aquaculture had been a beacon of hope for thousands of Indonesian farmers since the 1980s when many converted rice paddies into tambaks to produce higher-returning shrimp. Their hopes were dashed, however, as disease devastated shrimp stocks and farmers abandoned their tambaks, leaving them to lie idle.

ACIAR’s initial projects focused on combating disease outbreaks but researchers soon turned their attention to investigating shrimp health, soils and developing mapping techniques to assess land suitability.

On the ground in Aceh the project led by UNSW continues to support a broader effort to revitalise smallholder shrimp farming, with particular emphasis on building technical capacity within Aceh’s Brackishwater Aquaculture Development Centre. It works in partnership with another ACIAR project—the Aceh Aquaculture Rehabilitation Project—which is led by James Cook University and funded by AusAID under the Australia Indonesia Partnership for Reconstruction and Development. Together, the teams are working to develop technical expertise in Indonesia’s Ministry of Marine Affairs and Fisheries and to implement district-level extension teams to bring the research to farmers.

Assessing impacts

The ACIAR fisheries projects in Indonesia: review and impact assessment report is part of a series of ACIAR impact assessments. These examine and report on economic, environmental and social impacts of ACIAR’s R&D investment. From 1983 to the present ACIAR has invested around A$20 million on 41 research projects targeting Indonesian fisheries.

The report assessed two project areas in detail: smallholder shrimp farming and tuna fisheries. Both assessments showed the investment in research is expected to significantly impact on the livelihoods of Indonesian shrimp farmers and fishers. A further major achievement has been substantial improvement in research, extension and technical capability within Indonesia to identify and address production issues.

CSIRO led a research project from 2005 to 2008 focused on improving catch data collection and analysis, and improved fisheries management capabilities. The project was found to contribute significantly to Indonesia’s membership of a regional tuna management organisation, thus improving export opportunities and the likelihood of more sustainable fisheries.

The report estimates potential benefits of $168 million are attributable to ACIAR’s R&D investment in tuna fisheries, which is a return of $180 for every $1 invested and an internal rate of return of 210%.

With more reliable modelling of the tuna fisheries, Indonesian fisheries management and sustainability is expected to improve. Benefits to Indonesia over the next 20 years are estimated to be close to $10 million, while countries such as Japan, Korea, Taiwan, Australia and New Zealand also stand to gain. Fishers and consumers will benefit from lower costs and more guaranteed supplies.

ACIAR’s project teams use demonstration ponds in coastal communities to share their expertise in better management practices, aquatic animal health and seed production.

Across Indonesia, the external assessment of smallholder shrimp farming projects found the major achievement has been the development of technology to locate problem soils—technology that helps governments avoid planning mistakes and farmers to systematically remEDIATE idle tambaks.

The ultimate benefits of the ACIAR R&D investment in smallholder shrimp farming will depend on adoption of the remediation strategies.

In 2006 the Indonesian Government launched an aquaculture revitalisation plan. Given the government’s support for tambak remediation as part of this plan, it is estimated that benefits over the next 20 years will total about A$227 million in present-value terms. That is a return of $52 for every $1 invested by ACIAR and an internal rate of return of 26%.