

REBUILDING ACEH'S AQUACULTURE

More than 12 months after the Indian Ocean tsunami, ACIAR project leader Dr Jes Sammut, from the University of New South Wales, reports on work in Aceh to rebuild its aquaculture industry

It is more than a year since the tsunami caused widespread loss of life and damage to infrastructure and the environment in Aceh, Indonesia, where more than 90,000 people were directly or indirectly involved in the aquaculture industry.

Before the tsunami, the local aquaculture industry, which is based on low-intensity, extensive culture systems, produced 10,300 tonnes of shrimp and 6100 tonnes of milkfish annually. The farmgate value of shrimp is estimated at US\$46.5 million and for fish at US\$9.6 million.

Local broodstock, considered the best in the region, also formed a lucrative hatchery industry. Almost all of these hatcheries were lost. Brackish water aquaculture accounted for about 32 per cent of the total fishery value in Aceh. Many shrimp-farming families have no alternative income sources.

ACIAR's involvement in the rebuilding started soon after the emergency phase had passed, and focused on building technical skills among government staff who survived the tragedy. A new ACIAR project will continue to build technical capacity but with a wider reach and in partnership with other projects.

Information on environmental constraints is scant, making it difficult to rebuild sustainable systems. So the project team's first task is to determine the engineering and environmental limitations of local soils and hydrology before they can design ponds, canals and dykes. The next step will be to provide technical training to the government staff and NGOs who are driving the reconstruction effort. Many NGOs are funding small rehabilitation projects in the sub-districts, but lack the skills to deal with environmental issues. Many government staff are also unfamiliar with environmental limitations and suitable construction methods.

The team from the Regional Brackish Water Aquaculture and Development Centre (RBADC) and Gadjah Mada University will help develop and implement the new technical training and capacity-building program.

RBADC staff will play a major role in locally managing the technical training program and will be responsible for training people at Dinas Perikanan (Bureau of Fisheries). We aim to establish a core group of trainers at RBADC who will provide ongoing training of Dinas Perikanan staff and also help educate NGOs and farmers.

Donor agencies have recognised the need to collaborate and most have entered agreements to fund capital items, machinery and farm inputs. ACIAR's program will provide technical inputs across all programs.

This technical support will be essential for redeveloping ponds and infrastructure. For example, thousands of tonnes of soil need to be moved to rebuild ponds and canals. The risk of failure is high unless all of the programs apply best-management practices.

ACIAR is well placed to offer this support. Past and current projects on brackish water aquaculture elsewhere in Indonesia have produced technologies and information relevant to Aceh. A new manual on pond and canal engineering and soil management will be released mid-2006, along with a series of technical notes.

Soil constraints and disease are two of the greatest problems the industry must deal with to secure its long-term future. Acid sulfate soils are common and some farmers had previously constructed ponds in highly erodible, sandy soils. Fortunately, acid sulfate soils and sandy-textured soils are easy to identify in the field; nevertheless, some farmers unaware of the problems have redeveloped on these soils. Disease is a problem because it can be a symptom of poor hatchery and farm management practices.

The tsunami knocked out many of the primary dykes and demolished most of the secondary and tertiary dykes. This has led to the exposure of acid sulfate soils at low tide and increased acid production because more soils are exposed to oxygen and for longer periods. We know from our work in South Sulawesi and Australia that disturbed soils can produce acid for decades if they are not properly managed.

During our field visits we measured soil pH less than 4 and found that at some locations the pH was close to that of vinegar. Standard liming practices will not correct this.

We have started to promote low-technology solutions from our work in South Sulawesi but it will be hard to get the message out to all the farmers and to convince them that the cost of additional, higher-grade lime will bring them longer-term benefits and reduce the risk of total crop failures.

We need more skilled people working in the community where they can directly advise farmers and demonstrate the neces-

PARTNER COUNTRY: Indonesia

PROJECT: Technical capacity building and research support for the reconstruction of tsunami-affected, brackish water aquaculture ponds in Aceh (FIS/2005/028)

DESCRIPTION: Training staff and developing strategies to support technical teams working with farmers in rebuilding aquaculture ponds for production

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Dinas Perikanan technical team members sampling for acid sulfate soils in a damaged dyke.



Dinas Perikanan staff measuring the pH of soil before and after oxidation to determine the acid-generating capacity of the soils.

PHOTOS: JES SAMMUT

sary reconstruction methods. Demonstration sites will be established in collaboration with other agencies in different districts.

Although we have raised awareness of technical issues, in particular highlighting soil and disease problems and how to tackle them, getting the technical teams out into the community has been a challenge.

We trained several teams and equipped them with field sampling equipment, but the scale of the problem is enormous and staff are thinly spread. Team members also reported that they were still grieving and coming to terms with the impacts of the tsunami. Many are still homeless and picking up the pieces of their shattered lives. The pressures on staff are intense and there is a need to continue offering support.

By late 2005 the need for technical assistance from NGOs and farmers exceeded the capacity of the local fisheries staff and we seconded one of our Acehese team members, Mr Aliman, from another ACIAR project in South Sulawesi to Aceh to provide technical inputs while we developed a new training and capacity-building program.

Mr Aliman, from the Research Centre for Coastal Aquaculture in Maros, moved to Aceh, where his skills are desperately needed on the ground, in September 2005.

On his return he expressed an enthusiasm for the task ahead: "There is a lot to do – more than you can imagine – but you can see positive changes already. The farmers have a will to restart their businesses. There are thousands of kilometres of dykes to rebuild and this will take a long time," he said.

The UN's Food and Agriculture Organization (FAO) has initiated a farm cluster program to help facilitate the reconstruction efforts. This approach has already been applied by ACIAR in South Sulawesi through Dr Dick Callinan's disease management project. The program establishes small groups of farmers who can share resources and cooperate to rebuild farms, manage production systems and eventually to work together on the market end of their business.

We will target technical extension activities through the farm clusters. We will also help the FAO and the farm clusters to produce rehabilitation plans. We will provide pond and canal design criteria,

TIDAL HYDROLOGY TEAMWORK

A new member of the project team, Mr Taruna from the Research Institute for Coastal Aquaculture in Maros, South Sulawesi, describes what he thinks of the project:

"Hydrology is an important factor to consider in reconstruction. Tidal hydrology will need to be considered for the design of the ponds and canals and pond management. There is no use in rebuilding dykes, ponds and canals if their dimensions are all wrong. There will be too much erosion and sedimentation and pond management will be difficult. We will be modelling tidal hydrology and producing tidal charts for the farm clusters. We have been writing computer programs to make it easier for consultants, NGOs and government officers to apply the hydrological data. The software is user-friendly and we will train people in its use.

"Being involved in the ACIAR programs is exciting for me. I learned a lot from past ACIAR projects and here I am, applying the information in one of the most challenging situations. Knowing you can make a difference is exciting. I feel privileged to be a part of this and I know my colleagues in South Sulawesi are very happy that our past research is being used. This is a good example of how Australia and Indonesia can achieve good results working together."

Damage to primary and secondary dykes has left many ponds exposed to air on every low tide since the tsunami. These soils are producing more acid than before the tsunami and if not properly managed will cause production losses when the ponds are rebuilt.



advise on the soil constraints and how to manage them, and also help to produce maps and plans.

Mr Taruna, an AusAID-funded Masters student at the University of New South Wales, has given up his spare time to help out by translating educational materials, authoring software and technical information and helping with the coordination of activities.

Some of the participants from the earlier ACIAR project stay in regular contact by email or text messages. They keep me up to date on how they are going personally and professionally. In between requests for technical information the participants share how they are feeling and rebuilding their lives.

At one of the workshops I asked the participants to write down their name, address and other contact details. One of them joked that for most of them their mobile number was their address; although said in jest, his comment was a reminder that most of them were left with nothing. ◀