

Only as good as your people

ACIAR has been committed to capacity building for many years to deliver sustainable and lasting outcomes in agriculture and food security. The benefits—gains in scientific knowledge, capacity and networks—flow as much to Australia and its scientists as to the partners ACIAR works with.

BY DR WENDY HENDERSON

When ACIAR contributed to funding Jes Sammut's PhD back in the 1990s there was nothing to indicate how vast the outcomes were going to be for Australia. Dr Jes Sammut worked with Dr Dick Callinan to investigate disease outbreaks in fish that were affecting 80% of the Australian commercial catch. The project was run in partnership with Indonesia.

They found that the disease—known as 'red spot' (epizootic ulcerative syndrome)—was the result of a chain reaction inadvertently triggered by drainage of coastal wetlands to create land for farming and other uses.

In a case of unintended consequences, the land-use changes inadvertently exposed the

acid sulfate soils that usually occur under other soil layers.

The run-off from these soils then entered the local estuaries during wet weather, making the water more acidic than usual, often more acidic than vinegar.

Dr Callinan had previously found that a fungus was involved in the disease, but infection only occurred if fish had skin damage.

Together, Dr Sammut and Dr Callinan found that acidic water could cause sufficient skin damage to enable the fungus to infect fish and cause disease. They also found that acidic water caused skin and gill damage that led to catastrophic fish kills in estuaries.

The discovery was significant enough to lead to a summit on the problem of acid sulfate soils in New South Wales. The research findings



Dr Jes Sammut at the Markham Valley cooperative fish farms in Papua New Guinea with fish farmers involved with mutually beneficial ACIAR aquaculture research on feed formulations, pond site selection and pond management.

had cleared an information bottleneck that had previously fuelled tensions between stakeholders.

An advisory and technical committee on acid sulfate soil was formed in NSW, and

AUSTRALIAN AID INSPIRES YOUNG SCIENTISTS

ACIAR projects are inspiring young Australian scientists to pursue careers in agriculture at a time when universities are struggling to attract and retain agricultural science students.

BY MELISSA BRANAGH-MCCONACHY

Dr Darryl Savage says applying his agricultural expertise to benefit developing countries is the most rewarding experience of his career.

The agricultural science lecturer and researcher, based at NSW's University of New England, is investigating how beef cattle can contribute to food security in Asia as part of a project funded by ACIAR.

"We aim to alleviate poverty in Cambodia by increasing beef productivity, improving biosecurity and identifying new markets for red meat in Vietnam and southern China," Dr Savage says.

The project, which commenced in 2007, is

driving significant change in the former war-ravaged nation.

Along with growing demand for cattle production, the introduction of new cattle raising approaches has reduced the need for child labour on smallholder farms, increasing school attendance.

"One of the Cambodian farmers' highest priorities is education for their children, so technology adoption was a no-brainer," Dr Savage says.

The project team has also partnered with Cambodian universities and trains undergraduate students in research skills, a process that is inspiring many to undertake further studies in Australia.

"The legacy of this project is much greater than the project itself; it is creating life-changing opportunities with long-term gains and sustainable outcomes," Dr Savage says.

"And there are net benefits for Australia. Foot

and mouth disease is endemic in Cambodia, so understanding how to reduce its spread is very important for us."

According to the United Nations, one billion people worldwide are malnourished, largely due to protein deficiency.

"Red meat is the world's number one source of protein and I am convinced we can improve the efficiency of how it becomes available by reducing the environmental impact of methane emissions through animal selection, nutrition and better production systems, which also improves productivity," Dr Savage says. "UNE is a major player in this field of research.

"Australia is one of the most efficient red meat producers in the world so we have an important role to play in food security, which creates wonderful opportunities in science at both the applied and high-tech ends.

"And part of our responsibility is passing knowledge on overseas."

another later in Queensland. A national committee was formed some time later because the problem of acid sulfate soils and their impact became a national concern.

Environmental plans have since been developed not only for the local region, but also at a national level.

The National Strategy for the Management of Coastal Acid Sulfate Soils is considered critical to resolving acid sulfate soil issues affecting industrial, environmental, agricultural and residential developments.

Development proposals in the coastal zone must now consider acid sulfate soils as a risk factor. Many coastal councils across Australia have developed policies and procedures to assess the risks associated with developing acid sulfate soils.

This research has led to substantial changes in environmental policy, land management practices and community awareness that are still ongoing since Dr Sammut's and Dr Callinan's work in the 1990s.

It has also triggered the provision of funding for further research—for example on oysters—that will benefit the Australian environment, commercial and recreational fishing and the aquaculture industry.

The research also led to major projects in Indonesia, where acid sulfate soils are a threat to the livelihoods of coastal communities and

to important outputs for various aquaculture reconstruction projects in Aceh following the 2004 Tsunami.

Dr Sammut says that research activities in developing countries provide valuable experience on topics of practical importance to Australia. This is especially true for aquaculture—broodstock and fingerling management—since Australia uses some of the same species, such as grouper and tiger shrimp.

Other impacts relate to experience and knowledge gained on environmental and production limits. This can involve issues such as the types of environment that can sustain agriculture or the optimal environmental conditions and risk factors. Affected areas include soil processes, rice and shrimp farming practices, and farming fish in earthen ponds.

The costs of research can also be lower and may even permit research that would not be done at all in Australia.

"For example, aquaculture research is on the decline here, so ACIAR can enable Australian researchers to maintain and grow research programs that bring benefits to our local industries," Dr Sammut says.

There are numerous examples of benefits that reach Australia.

Several projects on shrimp, mollusc and fish farming in Vietnam, Indonesia and elsewhere included studies of disease spread and

management. Gaining a better understanding means Australia is better prepared to respond to a disease outbreak, and also to have improved quarantine protocols.

Shark research in Indonesia by CSIRO assessed ocean stocks in internationally shared waters to help avoid mismanagement by overfishing. New shark and ray species were discovered and this research led to a manual on shark and ray species.

The manual enables more accurate identification of sharks and rays. Similar research on sustainably managing sharks will soon commence in Papua New Guinea. It is important for Australia to know which species are out there and what is being fished (and how) by our neighbours.

Australia plays an important role in protecting these species, which are apex predators at the top of the food chain. Agreements need to be reached to allow the equitable exploitation and proper management of the species.

The ultimate results are a win-win: sustainable fishing practices for our neighbours and a positive environmental outcome for Australia. ■

More information: National Strategy for the Management of Coastal Acid Sulfate Soils, www.mincos.gov.au/_data/assets/pdf_file/0003/316065/natass.pdf

Dr Savage regularly discusses his work with groups that promote the uptake of science by young Australians and answers questions about his own career path. This started with a degree in agricultural science at the University

of Queensland and has included stints as a jackaroo, running research programs in the Northern Territory's Barkly Tableland, and completing doctoral studies on beef cattle nutrition and reproduction. ■

