

## Australia Indonesia collaborations

How much do barnacles and algae slow our ships; energy efficient houses to suit tropical climates; a new vaccine for tuberculosis—Indonesian and Australian scientists are tackling some of the biggest challenges facing both nations.

With its supporters, the Australia Indonesia Centre is funding collaborative research in health, energy, food and agriculture, infrastructure, and resilient communities. Here are some highlights.



## Fishing for food security

Local fishermen in Indonesia are catching less fish. Whatever the reason, it is a significant problem for those who live on small islands in particular, as fish make up about 90 per cent of the protein they eat.

A team of Indonesian and Australian social scientists is looking at how communities adapt to these changes. Initially, in a pilot project funded by the Australia Indonesia Centre, the researchers are examining whether there is a link between fishing productivity and feelings of food insecurity in the small islands off Kai Kecil, and if so, whether a weakening of local management of fish populations and a rise in intercommunity conflicts over fish resources play a role.

The researchers are also studying how individuals cope with food insecurity, and attitudes to alternative ways of making a living.

"There are a lot of small islands in the world," says project coordinator Dr Rudy Resosudarmo of the Crawford School of Public Policy at the Australian National University. "Indonesia is a good case for this issue. If we can find out how to handle this, maybe we can provide answers to the rest of the world, particularly the islands of the Torres Strait and the Pacific Ocean. Improved transportation could also create a better flow of goods and services, and that could generate the possibility of joint trade with the rest of the world and a bigger market for Australian agriculture, in particular," Budy says.

The collaboration has drawn upon resources of two universities in Indonesia, Hasanudin in Sulawesi and Pattimura in the regional capital of Ambon; the Tual Fisheries Polytechnic in Kai Kecil; and from two universities in Australia, the Australian National University and the University of Tasmania, where there are experts in fisheries economics.



## Putting a window and lasers in a ship's hull to improve efficiency

Every shipping manager wages an endless battle against fouling—the bacteria, seaweed, barnacles and other marine life that take up residence on the hull of ships within days of it entering the water.

This biofouling is thought to add more than 20 per cent to the fuel costs of commercial shipping; not to mention the added journey time for a ship weighed down with barnacles. That's a big cost for the maritime trading nations of Australia and Indonesia, potentially adding up to billions of dollars per year. Using lasers and a window in a ship's hull, researchers will assess how quickly the efficiency of the ship declines, and then how to balance fuel efficiency and the cost of putting a ship in dry dock to clean it.

"Essentially we've built a laboratory worth thousands of dollars inside the hull of the ship. Once we clearly know how things are growing on the bottom, and the effect this has on fuel efficiency, we can suggest more informed anti-fouling strategies, saving time and money for boat operators and passengers," says Professor I Ketut Arie Fria Utama of the Institut Teknologi Sepuluh Nopember (ITS).

The team combines the maritime experience of engineers from ITS in Surabaya with fluid mechanics led by Dr Nicholas Hutchings at the University of Melbourne, in partnership with the University of Southampton in the UK and a protective coating group, Hempel.