



PARTNER COUNTRIES: Indonesia, the Philippines

PROJECTS: Artisanal shark and ray fisheries in Eastern Indonesia: their socioeconomic and fisheries characteristics and relationship to Australian resources (FIS/2000/062); Management and policy frameworks for illegal, unreported and unregulated (IUU) fishing in Indonesian and Philippine waters (FIS/2002/019)

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Shark longline boats in Lombok PHOTO: WILLIAM WHITE

Data harvest yields fisheries' future

Against a backdrop in Indonesia of over-fishing, illegal fishing and accelerating demand by China for shark fins, two ACIAR projects ran side-by-side to provide basic biological information about Indonesia's sharks and rays – a virtually unexplored world – and the local economies they underpin

BY KAREN MCGHEE

Before Australian fisheries biologist Dr William White visited Indonesia, he thought that gathering information about the sharks and rays caught by local fishermen would be a reasonably straightforward task. But his first forays into the fish markets of Australia's northern neighbour six years ago quickly taught him otherwise.

"We found all these species that just didn't fit in with what we knew," says Dr White, who was working

at the time on an ACIAR project exploring artisanal shark and ray fisheries—traditional operations run along subsistence lines—in eastern Indonesia. He saw sharks and rays of sizes and in locations that were not expected, and encountered species that turned out to be new to science.

The work grew, by necessity, into the most extensive biological and taxonomic investigation of Indonesian sharks and rays ever undertaken, a collaborative effort that ultimately involved scientists from Australia's CSIRO and Murdoch University and Indonesia's Institute of Sciences (LIPI) and Research Centre for Capture Fisheries (RCCF).

Dr White and his Indonesian colleagues, Dharmadi and Fahmi, trained local people in rudimentary aspects of shark and ray biology and taxonomy and, with their help, documented more than 40,000 individual sharks and rays from 14 fish landing sites and markets across Indonesia's east. Basic biological data, such as size and sex, were recorded for almost half of these.

At least 20 new shark and ray species were discovered and late last year ACIAR released a bilingual book, *Economically important sharks and rays of Indonesia*, based

on the project's findings (see box). It will radically expand global awareness of Indonesia's sharks and rays, and is seen as a critical tool for further research into commercial fish stocks of interest to Indonesia and Australia.

"Indonesia is the centre of the world's shark and ray diversity," says Dr White, a former postgraduate student at Murdoch University who recently joined CSIRO Marine and Atmospheric Research in Hobart. "Only about 60 species have been recorded from the more intensely studied North Atlantic Ocean, and yet we recorded 137 species just at fish markets in Indonesia—and these fishermen don't even fish below 500 metres. If you went below these depths you could expect to find a large number of additional species."

During the past 50 years, Indonesia's extraordinary shark and ray diversity has developed into a critical commercial commodity for many millions of people throughout the archipelago.

Massive growth in the exploitation of sharks has been driven in the region, as it has elsewhere in the world, by one key factor: escalating demand from China for shark fins. Almost all species are targets and large dried fins can attract as much as US\$1,500 each in Hong Kong. Unsurprisingly, the biodiversity and socioeconomic implications of the fin trade for Indonesia are enormous.

"Shark fins have really become an important source of income for millions of poor fishermen in Indonesia," says Dr Steve Blaber, project leader of ACIAR's shark and ray research. He has been involved with fishery studies in the region for almost two decades and believes most areas are now severely over-fished.

"When we began collaborating with the Indonesians 20 years ago, the government's view was that there were still lots and lots more fish to be exploited and they wanted production to be increased enormously," recalls Blaber. "But in the past five years we've managed to change the mindset in Indonesia on fisheries, and they now acknowledge that these are not bottomless resources that can continue to be exploited—they've got to be managed."

Dr Subhat Nurhakim, the Indonesian project leader, explained that Indonesia is now particularly concerned that over-fishing could lead to the collapse of its shark and ray stocks, with devastating consequences for the millions of people in the country now reliant on them. There is also anxiety that international pressure could force a downturn in the legal but widely condemned shark-fin trade, and that this will also cause hardship for local fishermen and their families.

Like the shortfall in basic biological knowledge about Indonesia's sharks and rays, there is also a dearth of knowledge about the local economies these fish underpin. So while Dr White's study was gathering

baseline biological and taxonomic data, Dr Malcolm Tull, Associate Professor of Economics at Murdoch University, was steering research for ACIAR to gain a better understanding of the socioeconomic issues surrounding eastern Indonesia's artisanal shark and ray fisheries.

Similarly to the biologists, Associate Professor Tull, who was assisted by Simon Vieira, an honours student now working for the Australian Bureau of Agricultural and Resource Economics (ABARE), also relied on close collaboration with Indonesian researchers Dr Heri Purnomu and Ms Tenny Apriliani. The socioeconomic research involved gathering information at fish landing sites and markets.

"We collected catch data, market-price data, sales data—anything we could get to give us an estimate of the value of the trade in sharks and rays; and we also made estimates of boat operational data," Associate Professor Tull says.

It was preliminary work that will set the stage for a more expansive investigation, but it has been sufficient, so far, for Associate Professor Tull and his colleagues to prepare advice on policy and management strategies to support more sustainable economic activity for the region's subsistence fishermen. The work confirms that a 'one-size-fits-all' approach to managing the various small local economies that exploit sharks and rays in Indonesia will not work. "Our argument is that there will need to be a disaggregated approach," he says.

Book review

ECONOMICALLY IMPORTANT SHARKS AND RAYS OF INDONESIA (HIU DAN ARI YANG BERNILAI EKONOMIS PENTING DI INDONESIA)
By W.T. White, P.R. Last, J.D. Stevens, G.K. Yearsley, Fahmi and Dharmadi, 2006. ACIAR Monograph No. 24, Canberra, 335pp. \$47 incl. GST.

The management of commercially important fisheries and the conservation of threatened species share a basic need: the correct identification of the species involved. Similar-looking species do not always have the same biological attributes, such as maximum size and age, number of progeny, food, or habitat. All are important in designing and implementing management or recovery plans.

Indonesia has the largest fishery for sharks and rays in the world, hence the importance of this identification guide to the country's economically important sharks, rays and chimaeras. Written in English and Indonesian, the 335-page soft-cover book provides descriptions of 137 species, including common and scientific names, colour photos of the whole animal and underside, drawings of teeth and other features, size, distribution, habitat, biology, fisheries, IUCN conservation status and an Indonesian distribution map. A key to the 34 separate families is also included.

Sharks and rays are among the most threatened marine vertebrates, closer to marine mammals and reptiles than fishes because of their internal fertilisation and relatively low number of progeny (as few as one per litter for the gulper sharks, *Centrophorus*). Good catch statistics for the more fragile species are as important for conservation monitoring as for fisheries management. This concise volume should be in the hands of every fisheries officer in the field in Indonesia.

– John R. Paxton, Australian Museum, Sydney





(Above) Fahmi and Jenny Giles taking genetic samples; (right) drying shark fins.



PHOTOS: WILLIAM WHITE

The big question now for Barney Smith, ACIAR's fisheries research program manager, and his Indonesian counterparts in the Indonesian Ministry of Marine Affairs and Fisheries, is how best to capitalise on the strong biological and socioeconomic foundations established through this collaborative research effort.

ACIAR is keen also for future work to draw on the experience and expertise gained from another recently completed ACIAR project involving the Indonesian fishing industry. The project explored issues relating to illegal, unregulated and unreported (IUU) fishing in the Sulawesi Sea. IUU fishing has become a hot topic world-wide in recent years because, without full reporting, accurate monitoring becomes impossible, and therefore also the ability to detect accelerating stock collapses and biodiversity losses. The team working on this project comprised Dr Martin Tsamenyi and Associate Professor Ron West, from the University of Wollongong's Centre for Maritime Policy, and their Indonesian colleagues Dr Subhat Nurhakim, Dr Etty R. Agoes, Dr Purwanto, Budi Iskander and Dr Gede Sedana Merta.

The maritime boundaries in the Sulawesi Sea are fuzzy, but essentially the northern section is controlled by the Philippines, while Indonesia has rights to the west. Local fishing fleets exploit confusions about the boundaries, but both nations also have problems with several countries known to be fishing illegally in the sea.

Dr Tsamenyi and Associate Professor West acted as facilitators to guide Indonesia and the Philippines through shaping the legal and policy frameworks thought necessary to address the increasing incidence of IUU fishing in the Sulawesi Sea, and the project is now

regarded as a case study with wider application.

"When we started in mid-2003, knowledge and awareness in Indonesia and the Philippines of issues relating to IUU fishing was almost nil," Dr Tsamenyi says. "Half-way through the project, addressing the problem became a national priority for both countries."

Through the efforts of the project team, the Philippines and Indonesia have now entered into an agreement to tackle the problems at a bilateral level. The two nations have committed to work together on joint stock assessments, sharing information on matters such as the licensing of boats and exploring the possibility of sharing surveillance information.

Although the Indonesian Government estimates that IUU fishing costs it US\$2 billion annually, it remains a poorly understood parameter in its shark and ray fisheries.

When it comes to the artisanal operators, the IUU fishing issue becomes particularly murky. Indonesian and Australian researchers are reporting that there is a rising trend for large-scale operators to fund traditional fishermen to supply shark fins. These fishermen would once have used all parts of any sharks they caught, but increasingly there are direct economic incentives for them to invest greater effort in chasing more sharks and supply just fins. The lines between commercial and subsistence fishing are, as a result, becoming increasingly blurred.

According to Mr Smith, the sort of diplomatic and legal parameters used to steer a path to resolution in the Sulawesi Sea might go a long way to addressing IUU issues now thought to be besetting Indonesia's shark fisheries. ■

Partnership key to progress

Dr Achmad Suryana, director general of the Indonesian Agency for Agriculture Research and Development

BY ROBIN TAYLOR

Growing up in a small village in west Java in the 1960s, Achmad Suryana decided to pursue a career in agriculture because he recognised its importance to the country's economy.

Now, Dr Suryana is director general of the Indonesian Agency for Agriculture Research and Development (IAARD) and a member of ACIAR's Policy Advisory Council. He heads an organisation of 8,000 staff including 1,800 researchers, who carry out research into food crops, horticultural crops, estate crops (such as palm oil and coconut) and livestock.

After completing Bachelor and Masters degrees in agricultural economics at Bogor Agricultural University, he went to the US for four years to complete a PhD in economics at North Carolina State University.

"I chose agriculture as a profession because at that time it was the backbone of the Indonesian economy," Dr Suryana says. "Even today, although only 16% of the GDP of Indonesia comes from agriculture, 40% of Indonesian workers are employed in agriculture and 70% of people in Indonesia live in rural areas, most of them below the poverty line."

He strongly believes that agriculture has an important part to play in improving the economy and the livelihoods of the poor.

ACIAR and IAARD have a long history of collaboration and Dr Suryana has been involved with ACIAR projects since the early 1980s. He cites some examples of these successful collaborations, such as the series of projects to improve the quality of Bali cattle and ACIAR's response to the December 2004 tsunami, which included a project to rehabilitate degraded aquaculture ponds in Aceh.

"I very much appreciate the partnership model of ACIAR projects because we can share our views, and our researchers can learn from working together with Australian scientists under the ACIAR framework," Dr Suryana says.

One of the main benefits he has seen

delivered through collaborative projects between Indonesian and Australian researchers, supported by ACIAR, is an increase in research capacity, for institutions and for individual researchers, as a result of working with international colleagues.

On top of this, Dr Suryana says that "in many areas of research—in the livestock, food crops and economics sectors, for example—findings and recommendations from ACIAR projects have been extended and applied in the field."

Before taking over the leadership of IAARD in 2004, Dr Suryana held senior positions in the Ministry of Agriculture, most recently director general of food security.

As the research arm of the Ministry of Agriculture, IAARD is responsible for providing technology and information to help the other divisions (directorate

generals) support improvements to livestock and crop production. Asked to describe the challenges and obstacles in achieving such goals, Dr Suryana says that limited infrastructure is a major obstacle.

He recently visited Australia for a meeting of the ACIAR Policy Advisory Council and toured CSIRO's Black Mountain laboratories in Canberra: "Compared to their facilities my agency has very limited capacity to come up with modern technology," he says.

"Another challenge is developing our human capital. There is a lack of opportunity for training, and researchers cannot keep up with new information."

But Dr Suryana believes collaborative work with organisations such as ACIAR is an important way to increase capacity. "I work very hard to give my best for the institute and I ask my staff to do the same. We have to be professional." ■



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– DR ACHMAD SURYANA

ROUNDUP

Australia and Thailand working together

CANBERRA: On 23 and 24 November 2006, ACIAR hosted a joint agricultural research forum between Australia and Thailand. A grant from the Australia–Thailand Institute (ATI) made the forum possible.

The research relationship between Thailand and Australia has matured over the past few years and is now a non-aid, collaborative and co-investment system. A discussion between the two parties was therefore timely, to take stock of the changes and the possibilities those changes bring for future cooperation.

During the two-day meeting in Canberra the participants explored current and future research priorities in both countries and discussed common issues. The parties agreed that there are several research themes on which Australia and Thailand can cooperate with regard to agricultural research, both bilaterally and regionally.

The meeting was held in an open and constructive atmosphere and a full report was sent to the ATI for further consideration.



Dr Suthiporn Chirapanda, Deputy Permanent Secretary of Thailand's Ministry of Agriculture and Cooperatives, presents ACIAR's director Peter Core with a gift at the forum dinner.

PHOTO: ANUSORN SOMSIRI, WORLD VISION THAILAND

Vietnamese Vice-President visits ACIAR

CANBERRA: On Tuesday 10 October 2006, ACIAR had the honour of hosting a visit by the Vietnamese Vice-President, Madame Truong My Hoa. The Vice-President was in Australia as a guest of the Australian Government, and a visit to ACIAR was included in her itinerary in recognition of the long-standing relationship between Vietnam and ACIAR.

During the visit, ACIAR agreed to explore the scope for involving the Women's Union of Vietnam in a new horticultural project on indigenous vegetables. Development of the project proposal is well under way, and will aim to reduce rural and peri-urban poverty and enhance the role of women in the production, promotion, sale and consumption of Vietnamese vegetables.



(From left to right) interpreter Dr Bui Kim Chi, ACIAR director Peter Core, Vice-President of Vietnam Her Excellency Truong My Hoa, and His Excellency Mr Ha Van Hien.

Fun Run in the East Timorese sun

DILI: The 'Seeds of Life' (SoL) program's East Timor team raised \$1,600 to win the First Lady's Cup and take home a kiss from the nation's First Lady, Kirsty Sword-Gusmão, in the annual 'Fun Run in the East Timorese Sun'.

Staff from the SoL program turned out in force to meet their country's First Lady at the annual fun run event, which was held in front of the Government Palace in Dili on Sunday 26 November 2006. All funds raised from the event went to the Alola Foundation for needy women and children in East Timor and to Rotary.

The First Lady's Cup is in fact a coffee mug on which are scribbled words of support for Xanana Gusmão. The mug was smuggled into gaol by the now First Lady during Gasmão's incarceration in Jakarta between 1992 and 1999. The cup presented to the team representative, Jose Edy, is now proudly displayed in the SoL office in Dili.



East Timor's First Lady, Kirsty Sword-Gusmão, presents Jose Edy from the 'Seeds of Life' program with the First Lady's Cup after his team's win in the annual fun run in Dili.

PHOTO: LEITH CARROLL