



Australian Government  
Australian Centre for  
International Agricultural Research

# ACIAR

## ANNUAL REVIEW 2018-19



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## ACIAR Annual Review

The Annual Review is a new ACIAR publication. It features key achievements and outcomes of the work of ACIAR and its partners during 2018–19, through quick facts and case studies.

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This report should be attributed as the *ACIAR Annual Review 2018–19*

ISBN 978-1-925747-72-0 (print)  
ISBN 978-1-925747-73-7 (PDF)

For enquiries about this publication and general information, please contact:

Australian Centre for International Agricultural Research  
GPO Box 1571 Canberra ACT 2601  
Phone: +61 2 6217 0500  
Email: [aciar@aciar.gov.au](mailto:aciar@aciar.gov.au)  
Website: [www.aciar.gov.au](http://www.aciar.gov.au)

Content research: Koru Communication  
Design: [Whitefox.com.au](http://Whitefox.com.au)  
Print: Instant Colour Press  
Cover photo: ACIAR/Conor Ashleigh (2014)



# 2018-19 AT A GLANCE

**240**

bilateral country  
research projects

**86**

John Allwright  
Fellows undertaking  
postgraduate study  
in Australia



**35**

partner countries  
in the Indo-Pacific  
region

**5:1**

economic return  
of each dollar  
invested in bilateral  
research projects  
since 1982

**25**

multilateral research  
programs and  
co-investment  
alliances



**70,000**  
followers

**25**

specialist leadership  
fellowships provided for  
senior scientists

**6000**

people received  
4 issues of *Partners*  
magazine

**490**

project partners



# Chief Executive Officer's review



**Agricultural research and policy are confronted by new challenges of unprecedented scale and complexity—climate change and nutrition insecurity. This was the focus of my address to the Crawford Fund parliamentary conference on ‘Reshaping agriculture for better nutrition’ in August 2018.**

To meet these challenges, we must develop new platforms for collaboration and innovation across the food system, between the food and health systems, and between the public and private sectors. ACIAR, as Australia's specialist agricultural research-for-development agency, has well-honed skills in brokering durable partnerships, involving end-users in the process of scientific inquiry, and developing enduring capabilities in science and policy in the countries with which we partner. These skills, and the networks and track record we have established over the last 36 years, are more relevant today than ever.

The 2018-19 year has been characterised by significant progress in building on those skills, and implementing the fundamental elements of the ACIAR 10-Year Strategy 2018-2027.





## Aligning with the national focus

We have refocused our priorities within our research program to better align them to meet these challenges in line with Australian Government priorities, and have a renewed emphasis on regional capacity building, especially in the Pacific. We have expanded our outreach activities to make our role in brokering and supporting targeted scientific collaboration more transparent and to raise awareness. We have also revisited how we monitor and evaluate the effectiveness of our diverse portfolio of projects, to ensure they meet the expectations and needs of government, people in the regions where they are located, and our scientific research partners, in Australia and regionally.

This refocusing of priorities took place through the lens of Australian Government policy, notably the Pacific Step-up, and the United Nations 2030 Agenda for Sustainable Development Goals. Areas of increased emphasis include climate change and gender equity and inclusivity. Gender equity in research-for-development is a high priority for ACIAR and the Australian aid program.

## Adapting to changing priorities and challenges

I was particularly delighted that ACIAR was a co-convenor of the 'Seeds of change—gender equality through agricultural research-for-development' conference held at the University of Canberra in February 2019, and attended by 280 delegates from 45 countries. Gender is now integral to our research project proposal template. This triggers teams to take a multi- or cross-disciplinary approach to their research, and to include people who have the knowledge and experience to work sensitively with communities and avoid the risks of unintended consequences.



While our focus and programs adapt to address new and evolving challenges facing agriculture in the Indo-Pacific region, our well-established partnership model continues to provide productive pathways for ACIAR to participate in agricultural research-for-development throughout the region. Our work aligns closely with Australia's broader development assistance program and contributes to Australia's security and economic interests, which are inter-linked with the countries of the regions in which ACIAR operates: Pacific, East and South-East Asia, South Asia and Eastern and Southern Africa.

### **Acknowledging commitment and expertise**

I would like to acknowledge the commitment and efforts of my ACIAR colleagues during 2018-19. Our tried and proven model of brokering research partnerships across the region relies most of all on people—skilled, experienced professionals with extensive networks and a high degree of sensitivity and credibility in the countries in which we work. We are blessed at ACIAR in being able to attract and retain people of outstanding calibre, who are highly committed to our mission. I cannot thank my colleagues, in Canberra and in our 10 country offices, enough for the great work they do, often in challenging contexts.

In designing and delivering our research programs, ACIAR staff, and particularly myself and the senior executive team, are guided by advice from the Commission for International Agricultural Research and the Policy Advisory Council (PAC) comprising senior experts from the countries in which we work. The Commission and PAC had an outstanding joint meeting in Laos in March 2019, and as ever, provided insightful and useful advice to the Minister for Foreign Affairs and valuable counsel to ACIAR.

Finally, the outputs reported here owe most of all to the people who carry out our research projects on the ground—scientists from our research partners in universities, research institutes and government agencies in Australia and in our partner countries—and the mostly smallholder farmers, women and men, who are the intended beneficiaries and often willing participants and helpers in this important work.



**Professor Andrew Campbell FTSE, FAICD**  
Chief Executive Officer

CASE STUDY

# Developing thriving oyster industries



Enhancing bivalve production in northern Vietnam and Australia  
FIS/2010/100



## CASE STUDY

# Developing thriving oyster industries

Annual production of juvenile oysters at the National Marine Broodstock Centre in Cat Ba, northern Vietnam, has jumped from 20 million to over 100 million. In 10 years, oyster farming in Vietnam has grown to 28 provinces, with an estimated annual production of 15,000 tonnes.

This thriving and sustainable oyster industry has developed, in large part due to a series of ACIAR-supported projects to increase hatchery-based bivalve mollusc production in Vietnam and Australia. In addition, the capacity building and mentoring programs have fostered a team of skilled researchers to continue and build upon this work. Over the life of the project, 25 staff from the Vietnamese Research Institute for Aquaculture were trained by international experts—through workshops and placements in Australian laboratories.

Mr Vu Van In, of the broodstock centre, and one of the in-country project partners, is an ACIAR John Allwright Fellow studying genetics and reproduction at the University of the Sunshine Coast. He said being involved in the oyster breeding program in Vietnam was the most exciting part of his PhD, as he can apply what he has learned in practice.

By breeding from local seed (spat) for quality, growth and survival in Vietnamese conditions, the program reduced the use of imported seed, with its corresponding biosecurity risks. A critical step in the breeding process was confirming the key commercial oyster species in Vietnam, and determining there was sufficient genetic diversity in local populations to establish a breeding program, without the need to import more broodstock.

Project leader, Dr Wayne O'Connor, New South Wales Department of Primary Industry, worked closely with researchers from Vietnam. In July 2018, his work in leading the projects was recognised with the Vietnam Medal for Agriculture and Rural Development.

The molecular tools for assessing genetic diversity developed by the project have brought significant benefits to the Australian oyster industry. The breeding program of the valuable Sydney rock oyster has been modified as a result of the project's work, and the reproductive behaviour of an increasingly sought-after, but diminished Australian species, the flat oyster, is being studied to increase production. Other bivalves, such as pipis (clams), were also studied and hatchery technology was refined. The use of a newly developed substrate settlement system has increased initial settlement success from an average of 29%–60%. Australia processes about 800 tonnes of pipi each year and is set to benefit from this work.

Juvenile oyster  
production from  
**20 million to  
100 million**

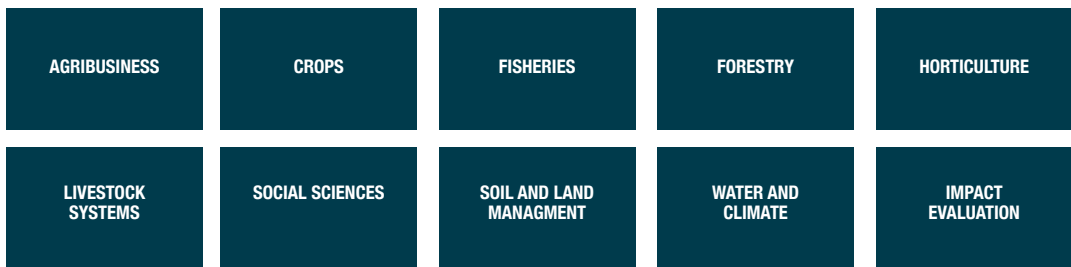
**25**  
oyster industry staff  
trained in new hatchery  
techniques

## ACIAR research structure

### RESEARCH PARTNERSHIPS



### RESEARCH PROGRAMS



### STRATEGIC OBJECTIVES



The ACIAR research structure is built on three types of research partnerships, which are supported by a suite of program areas and guided by six strategic objectives. This structure provides the framework for ACIAR to achieve its purpose, and is aligned with the key objectives of the Australian Government's aid policy and the United Nations 2030 Agenda for Sustainable Development.



# About ACIAR

**The Australian Centre for International Agricultural Research (ACIAR) is the Australian Government's specialist agricultural research-for-development agency, within the Australian aid program.**

The purpose of ACIAR is to contribute to reducing poverty and improving the livelihoods of many in the Indo-Pacific region through more productive and sustainable agriculture emerging from collaborative international research.

We work with public and private research institutions to improve the productivity and sustainability of agricultural systems and the resilience of food systems in partner countries. ACIAR identifies opportunities and partnerships to undertake international agricultural research and capacity building but does not undertake research directly.

Our efforts contribute significantly to Australia's aid program and the achievement of its goals.

The collaborative international programs and partnerships underpinning ACIAR-supported research also improve the productivity and sustainability of agricultural systems in Australia. Improved technologies and practices identified and developed through ACIAR research programs often address the shared challenges of all farmers in the Indo-Pacific region, Australia included. Innovations developed in ACIAR projects overseas often find their way back to Australia, for the benefit of Australian farmers and industries.

ACIAR-supported projects are designed to produce specific research outputs that translate to development outcomes such as improved food security, better nutrition, improved health and increased prosperity.

Economic returns to ACIAR bilateral project investments since 1982 have been conservatively valued at 5:1 but estimates of returns on some projects are as high as 60:1. Individual projects also deliver social, environmental and capacity benefits that are not included in these economic measures.

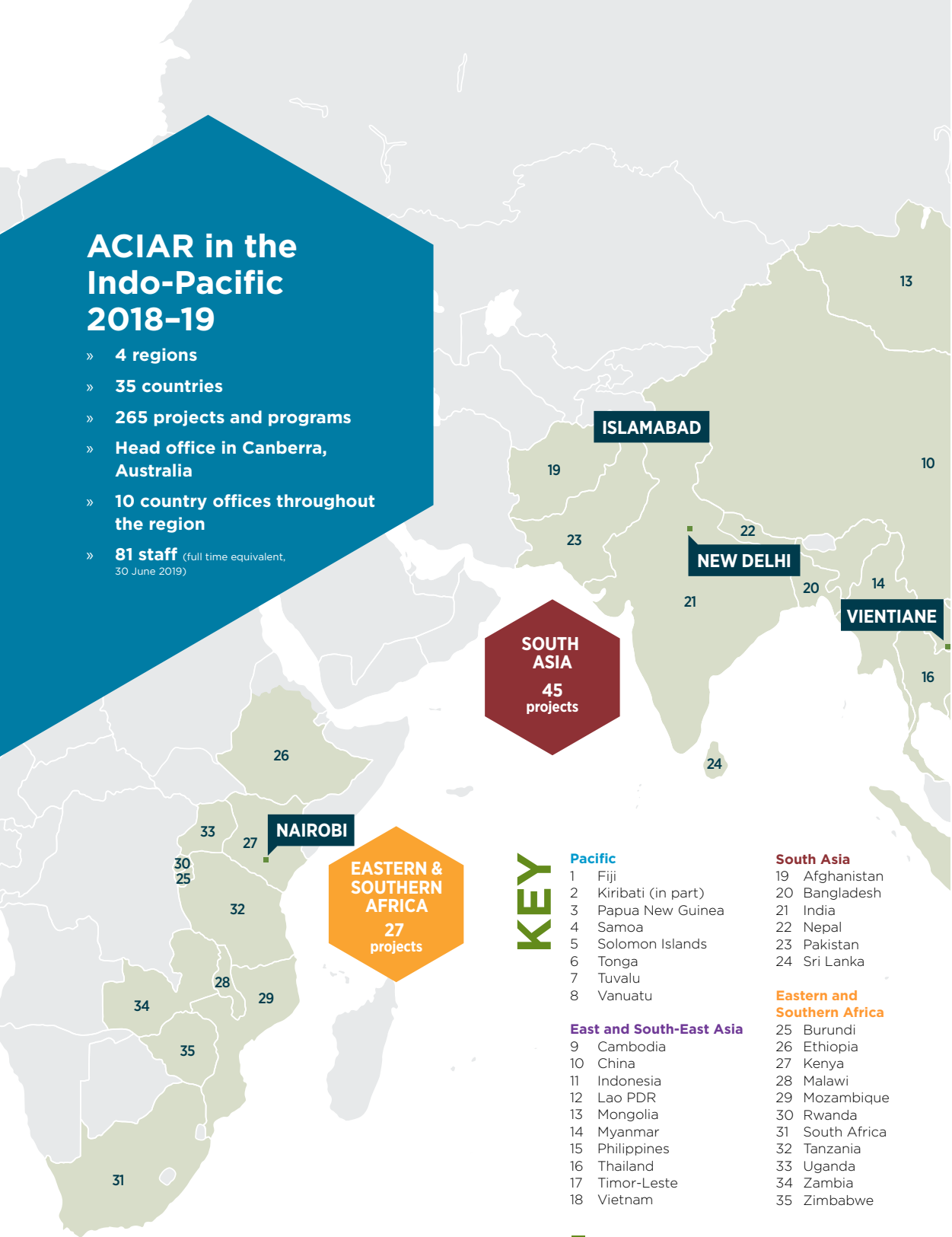
Success in ACIAR partnerships supports Australia's national interests in many ways. Enhanced prosperity and reduced poverty in partner developing countries contributes directly to regional peace and security. Economic prosperity in partner developing countries leads to stronger economies in the region, offering new trade, investment and business opportunities for Australia. These science partnerships also have brought regional and international respect for ACIAR and for Australia, and represent an integral part of the Australian Government's economic diplomacy strategy in the Indo-Pacific region.

Australia's contribution to the international agricultural research network, including the CGIAR (formerly the Consultative Group on International Agricultural Research), is managed by ACIAR. Dedicated to addressing poverty, hunger and nutrition, and environmental degradation, the CGIAR is a global research leader and a key partner for ACIAR and Australia. Outputs of the CGIAR research programs also flow to Australia.

The ACIAR 10-Year Strategy 2018-2027 guides our future direction, consistent with our enabling legislation, Australia's aid policy and the United Nations 2030 Agenda for Sustainable Development.

# ACIAR in the Indo-Pacific 2018-19

- » 4 regions
- » 35 countries
- » 265 projects and programs
- » Head office in Canberra, Australia
- » 10 country offices throughout the region
- » 81 staff (full time equivalent, 30 June 2019)



**SOUTH ASIA**  
45 projects

**EASTERN & SOUTHERN AFRICA**  
27 projects

## KEY

### Pacific

- 1 Fiji
- 2 Kiribati (in part)
- 3 Papua New Guinea
- 4 Samoa
- 5 Solomon Islands
- 6 Tonga
- 7 Tuvalu
- 8 Vanuatu

### East and South-East Asia

- 9 Cambodia
- 10 China
- 11 Indonesia
- 12 Lao PDR
- 13 Mongolia
- 14 Myanmar
- 15 Philippines
- 16 Thailand
- 17 Timor-Leste
- 18 Vietnam

### South Asia

- 19 Afghanistan
- 20 Bangladesh
- 21 India
- 22 Nepal
- 23 Pakistan
- 24 Sri Lanka

### Eastern and Southern Africa

- 25 Burundi
- 26 Ethiopia
- 27 Kenya
- 28 Malawi
- 29 Mozambique
- 30 Rwanda
- 31 South Africa
- 32 Tanzania
- 33 Uganda
- 34 Zambia
- 35 Zimbabwe

■ ACIAR country office



## Vision

ACIAR looks to a world where poverty has been reduced and the livelihoods of many improved through more productive and sustainable agriculture emerging from collaborative international research.

## Mission

To achieve more productive and sustainable agricultural systems, for the benefit of developing countries and Australia, through international agricultural research partnerships.

BEIJING

EAST & SOUTH-EAST ASIA  
140 projects

HANOI

MANILA

PACIFIC  
66 projects

JAKARTA

PORT MORESBY

CANBERRA

SUVA

CASE STUDY

## Cocoa— Bougainville's single malt?



Developing the  
cocoa value chain in  
Bougainville  
HORT/2014/094



## CASE STUDY

# Cocoa—Bougainville’s single malt?

At the outset of an ACIAR-supported project to train farmers in the remote Autonomous Region of Bougainville to grow better cocoa, project leader, Professor David Guest of the University of Sydney, knew that something more was needed for success.

‘Globally, there’s been a lot of investment in training farmers to be better at growing cocoa but average yields haven’t changed over 40 years. Instead, we took a broader approach and asked what were the constraints to smallholder farmers adopting new technologies and techniques,’ he explained.

Recognising that obtaining premium prices for products such as cocoa also requires marketing, the project team included Grant Vinning, a cocoa marketing expert with considerable experience in the region. Along with his expertise, he brought high hopes. He has dreams of artisan chocolate becoming as lucrative for Bougainville as whisky is for Scotland.

Cocoa is the major crop of the region but the bulk of production (60%) currently goes to ‘commodity chocolate’. The craft market consumes about 30% of production and the bean-to-bar market, 10%. Although the last sector is small, it returns premium prices to growers.

**A holistic approach**  
to improving cocoa production has improved growers’ livelihoods and earned international recognition for Bougainville cocoa beans.

The project aimed to develop a stronger, higher-quality cocoa industry through introducing new varieties and encouraging practices for better management of cocoa plantations, such as pruning of trees and removal of diseased pods.

The new practices benefited producers, such as Steven and Elizabeth Saveke who have a 600-tree plantation in Siwai, South Bougainville. They were winners at the 2018 Bougainville Chocolate Festival—an annual two-day event, bringing together growers, manufacturers and specialist chocolatiers to share information about cocoa growing and chocolate making, and benchmarking beans through competition.

The festival, which has grown enormously since its beginnings in 2016, helps cocoa farmers understand the end use of their product, and learn from chocolatiers and manufacturers how to deliver beans for the very best chocolate. Increasingly, the festival is showcasing Bougainville cocoa to the world.

As part of their win, Steven and Elizabeth participated in an ACIAR-supported event, Taste and Tell, held in Melbourne in March 2019. The event featured seven Australian chocolate manufacturers, who worked their magic with the Savekes’ award-winning beans, creating a surprising range of specialist products such as exotic chocolate bars and rich chocolate ice cream.

Steven’s message to take home to fellow growers on Bougainville was the importance of standardised processes for growing and drying beans to ensure that growers produce consistent, quality beans, and earn a premium for their efforts.

## An influential global partner

**ACIAR is mandated to manage Australia's investment in CGIAR, the world's largest agricultural research network, dedicated to reducing rural poverty and increasing food and nutrition security for human health.**

Our strong and productive relationship with the CGIAR continues to grow, which was demonstrated in November 2018, when ACIAR hosted the very well-attended forum, 'Transforming the global food system: challenges and opportunities' in Canberra.

Recognising that only one-third of the world's population eats a healthy diet, the forum was a wonderful opportunity to host the directors general of three CGIAR research institutes— Dr Martin Kropff of CIMMYT (maize and wheat research), Dr Jimmy Smith of ILRI (livestock research) and Dr Matthew Morell of IRRI (rice research).

The directors general explained the work of their respective research institutes to address the issue to the Australian agricultural research community gathered at the forum.

A panel discussion followed, where the challenges and future opportunities of increasing food and nutrition security were further discussed.

In addition to fostering and consolidating relationships with the CGIAR and its 15 research centres, ACIAR continued its work with 10 other international organisations to jointly address global challenges of agricultural development.

Among many highlights for the year, ACIAR was appointed chair of the Executive Council of the Asia-Pacific Association of Agricultural Research Institutions (APAARI) and the Asia-Pacific Consortium on Agricultural Biotechnology and Bioresources. APAARI provides research communication, knowledge management, advocacy for agricultural biotechnology, support for capacity building and participation in expert consultations with national agricultural research system leaders in the region.



Dr Jimmy Smith (centre), Director General of ILRI, addresses the audience during a panel discussion at the global food system forum in Canberra. Seated with Dr Smith are, from left, Dr Martin Kropff, Director General of CIMMYT, Dr Roslyn Prinsley of the Australian National University, Caroline Rhodes of Grain Producers SA and Foodbank SA, Dr Matthew Morell, Director General of IRRI and Professor Gabrielle Persley of the University of Queensland and Commission for International Agricultural Research.

In December 2018, we signed new four-year partnerships with the Centre for Agriculture and Bioscience International (CABI) and the World Vegetable Centre. The partnership with CABI will support the global program Plantwise, which assists growers to minimise crop losses from pests and diseases.

ACIAR supports WorldVeg's program of vegetable breeding and capacity building in Asia and sub-Saharan Africa. Notably, the partnership includes support of the International Mungbean Improvement Network—of benefit to farmers overseas and in Australia.

Co-investment alliances and partnerships are a growing component of our research program. Building on our reputation as a valued and trusted science partner, ACIAR works on a number of programs where financial support, design and management of programs are shared with another Australian Government agency, an overseas counterpart to ACIAR or private foundations and investors.

A significant achievement in this area of operations for 2018–19 was the negotiation and launch of Phase 2 of the Cultivate Africa's Future (CultiAF) partnership with the Canadian International Development Research Centre (IDRC). This builds on the first phase of the program, and comprises nine projects across seven countries in eastern and southern Africa, addressing post-harvest management, food processing, nutrition, business opportunities and value chains.

## Cultivating Africa's future

High-quality applied research that addresses food and nutrition security in Africa will continue in Phase 2 of the Cultivate Africa's Future program—CultiAF2.

### **CultiAF project: Integrating insects into poultry and fish feed**

This project has demonstrated a way to alleviate poor human sanitation and environmental problems in Nairobi. Dry waste from portable toilets in Nairobi was successfully used as a substrate to raise black soldier fly larvae. The larvae, high in macro- and micronutrients, were treated and made into a high-protein meal for use in fish and poultry feed.

Scale out activities commenced in 2018 to build businesses on the ground, and create job opportunities, especially for women and youth, in feed and poultry production, as well as waste management.

### **CultiAF project: Improving post-harvest processing of fresh fish**

In the Barotse floodplain of Zambia and the Lake Chilwa basin of Malawi, people rely heavily on fish for income, food and nutrition. However, sub-Saharan Africa has the lowest fish supply per person globally, mostly because up to 38% of fish caught is lost through insect or bacterial contamination.

Among a range of activities, the project introduced technologies, such as solar dryers and an enclosed kiln for smoking fish, which reduced the hours women spent turning and watching over the fish, used less wood (a scarce resource), and eliminated insect infestation.

The second phase of this project aims to facilitate access to microfinance for both men and women, to enable them to invest in better technology.

## Landcare legacy

Strong country partnerships enable the legacies of ACIAR projects to live on. Chief Executive Officer (CEO), Professor Andrew Campbell reflects on almost two decades of ACIAR support of landcare in the Philippines.

“ACIAR-assisted landcare has mobilised grassroots community action to change farming systems and practices, increase returns to farmers, improve livelihoods and nutrition and more than halve poverty rates.

In August 2018, I viewed landcare work around central Bohol, Visayas. We visited tenant farmer, Cipriano Curiba, who moved from rice to diversified vegetable production. His income has increased, risks are reduced and vegetable traders now come to him. The extra income enabled Cipriano and his wife to extend their house and educate their son, now a licensed forester.

According to the mayor, poverty has more than halved in the Pilar municipality over the last decade, largely due to more food being grown, sold and consumed locally. Notably, the landcare program has been strongly supported by three successive mayors, and appears to be an established element of the social infrastructure.

Improved land management has reduced sedimentation rates in the Malinao Dam, the largest dam in the province, supplying irrigated rice in five municipalities.

This inspiring example of grassroots community landcare delivering substantial benefits for livelihoods, nutrition and the environment is a sound reminder of the importance and value of the social dimensions of the program. It has obvious relevance in conflict-vulnerable areas like Mindanao, which is partly why ACIAR landcare work in the Philippines is so strongly supported by the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (PCAARRD).”

More: The essence of Landcare—flourishing in the Philippines on [reachout.aciar.gov.au](http://reachout.aciar.gov.au)

## A respected bilateral partner

**The foundation of our research partnership model is bilateral partnerships with organisations in partner countries throughout the Indo-Pacific region.**

In addition to brokering and managing approximately 240 bilateral country research projects and activities addressing specific issues related to agriculture, forestry and fisheries in 35 countries, ACIAR also entered into agreements and compacts with partner countries to focus in-country research on clearly-articulated and mutually-agreed priorities.

A 35-year relationship with the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (PCAARRD) will continue to flourish. A new agreement was signed in December 2018, marking a new stage in a very productive relationship.



Dr Reynaldo Eborra (left) from PCAARRD and ACIAR CEO, Professor Andrew Campbell (right), prepare to sign a partnering agreement that will see the two organisations continue to share interest and commitment in identifying and providing solutions to challenges for agriculture, aquaculture and natural resource management in the Philippines, through research and development.





ACIAR CEO, Professor Andrew Campbell, on behalf of ACIAR, accepted the Friendship Order from the Government of Vietnam. The award ceremony was also witnessed by the Deputy Prime Minister and Foreign Minister of Vietnam H.E. Pham Binh Minh (second from right), the Australian Minister for Foreign Affairs, Senator the Hon. Marise Payne, (centre) and a senior official from each delegation.

We will continue to focus on collaborative research across the sectors, with a new emphasis on capacity building in the Philippines and a shared approach with PCAARRD to evaluating the impact of our investments.

Over the years of working closely with PCAARRD, 179 projects have been completed. As well as working hard to build relationships and deliver results to smallholder farmers and fishers in the region, it was very pleasing to receive acknowledgement of the contribution of ACIAR to agricultural research-for-development by partner countries.

In June 2019, Professor Andrew Campbell was honoured to accept, on behalf of ACIAR, the Friendship Order from the Vietnam Government. The award is the country's most prestigious for foreign organisations and recognises more than 25 years of partnership with ACIAR in supporting Vietnam's agricultural and rural development.

Since 1993, ACIAR has invested A\$105 million in 175 projects. These projects have significantly contributed to the strong and sustainable development of Vietnam's agriculture sector and enhanced agricultural research capacity for Vietnam.

In addition to funding research collaboration, ACIAR has helped 74 Vietnamese scientists attain their PhD and Master degrees in Australia and 18 research managers have contributed to Australian research leadership programs. Many of these people have become leading experts in Vietnam.

The award has only previously been awarded to an organisation (as opposed to individuals) on one other occasion.

CASE STUDY

# Evidence swells the tide of reform



Policy and institutional reforms to improve horticultural markets in Pakistan  
ADP/2014/043



## CASE STUDY

# Evidence swells the tide of reform

Pakistan is a major world horticultural producer, well situated to take advantage of growing consumer demand for fresh produce. Currently, however, Pakistan exports only 1%–2% of production, the quality of fresh produce is inconsistent, and there is estimated post-harvest wastage of 20%–40% of production (World Bank).

An antiquated marketing system dictates where and to whom farmers can sell their produce. Government regulation permits fresh produce to be sold only through public agricultural produce markets—a post-colonial legacy of the forwarding agent tradition.

Producers are bound by government regulation controlling the markets—regions channel their produce through government licensed agents (arhtis) and officially approved market structures. Marketing flexibility is further hindered by the fact that the government-controlled public market system has not kept pace with demand and is limited in size and facilities. The markets operate on a bulk commodity model, so that vulnerable and perishable produce, such as mangoes, which are transported to market in 40-kilogram wooden crates, with no temperature control, are auctioned by the truck load or half-truck load. This system impedes grading of produce and quality control, in turn leading to downgrading or wastage.

There is considerable appetite for reform, but at the same time, a distinct lack of empirical evidence to support policymakers in influencing the political process. To fill these gaps, Professor Sisira Jayasuriya of Monash University led a large team of scientists and economists from Pakistan and Australia, in an ACIAR-supported project to build a case to support reform, using a multi-pronged approach that included interviews, surveys and case studies of participants throughout the value chain.

Sindh, the second largest of Pakistan's provinces by population after Punjab, is a leading producer of red chillies. The project found that chilli growers, mostly smallholder farmers, generally sold their crop through local commission agents, from whom they also obtain credit. This credit, in the form of cash or fertiliser, traps smaller farmers in the system, binding them to the commission agent. Importantly, such farmers typically do not sort their chillies before marketing—the system provides little incentive for doing so—potentially leading to downgrading of the product, or contamination.

Research data showed the situation was similar in Punjab, home to 77% of Pakistan's mango production. The majority of growers are smallholders and 80% sell their crop to contractors pre-harvest, often two years in advance—locking them into an inflexible system, and potentially at the mercy of licensed commission agents.

Armed with the project's evidence, Pakistan's policy specialists started discussions with political decisionmakers.

### Post script

In July 2019, the Prime Minister of Pakistan announced a national agricultural 'emergency' program, including a PKR23.6 billion (A\$223 million) scheme to transform Punjab's agricultural produce markets. This will involve establishing four new markets and upgrading infrastructure in 54 existing markets.

Significantly, in September 2019, the Punjab provincial government showed its commitment by promulgating an ordinance containing a raft of legislative reforms broadly reflecting the project's recommendations. Among other changes, farmers will be able to send their goods wherever they want, and sell to whomever they choose, allowing private markets to flourish and increase farmers' marketing choices. The new legislation also puts in place stakeholder-led governance structures for each public market.



## Regional highlights for 2018-19

# Pacific

**The ACIAR Pacific region encompasses eight Pacific island nations, as well as Papua New Guinea.**

Our program in the Pacific region throughout 2018-19 was guided by our medium-term strategy, which has a strong regional focus but still acknowledges individual needs and research and development priorities of partner countries. Our work in the region is also developed to align with the Australian Government's intensified engagement in the region, through the Pacific Step-up.

Our portfolio of projects and programs in the Pacific region reflects the particular research and adoption challenges in the region, which are inherent with nations of small size and populations, the consequent limitations to institutional capacity, and the remoteness of farmers, fishers and foresters from markets.

Our continued support of programs such as PARDI (Pacific Agribusiness Research in Development Initiative Phase 2) and TADEP (Transformative Agriculture and Enterprise Development Program) enables a multi-pronged approach to research for development, through capacity building of individuals and institutions, improving productivity and sustainability of food production systems, fostering resilience in a changing climate, and identifying and strengthening inclusive business opportunities.

This regional approach continues to be validated with demonstrated cross-learning between countries, while at the same time individual country projects also achieved outcomes and success in 2018-19.

Launch of the inaugural John Dillon Fellowship for institutions (i-JDF) with the participation of 16 fellows from four partner institutions in Papua New Guinea.

Launch of the Australia-Pacific Plant Biosecurity Partnership, where national plant protection organisations nominated 19 fellows for workshops for placement in Australian plant protection host organisations such as Plant Health Australia and CSIRO.  
ACIAR project GP/2018/109

Easy-to-make desks and chairs from waste timber in Papua New Guinea were designed by industrial design students from the Queensland University of Technology, and now the winning design will be manufactured locally by timber company, the RH Group.  
ACIAR project FST/2014/065

Ways to expand production of sweetpotato, a staple food for Papua New Guinea landholders, and new methods to control pests, such as using mulches to reduce weevil attacks, were explored to increase food security and improve livelihoods.  
ACIAR project HORT/2014/097

Local pearl farmer and master carver, Leonati Fakatava, carved a AAA mabé pearl wristband and pendant to present to the Duke and Duchess of Sussex (Prince Harry and Duchess Meaghan) during their visit to Tonga in October 2018.  
ACIAR project FIS/2014/060



## Regional highlights for 2018–19

# East and South-East Asia

**ACIAR partners with 10 countries in its East and South-East Asia region. We have enjoyed an enduring relationship with these countries, which is largely and traditionally characterised by bilateral country research partnerships.**

Several developments in recent years and including 2018–19 demonstrate a move away from traditional donor–recipient relationships, towards a more cooperative, collegiate approach, characterised by parallel or aligned investments and jointly funded projects by partner countries and ACIAR.

The Philippines and Australia, for example, renewed a 35-year relationship in late 2018 with a new partnership agreement between PCAARRD and ACIAR.

Many countries in the region are becoming stronger on the world stage. Vietnam, for example, has been rated as a middle-income country by the World Bank.

A highlight for ACIAR was winning the Public Affairs Asia 2018 Gold Standard Awards in the Country or Trade Promotion category for the Australia in Vietnam Agriculture Strategy 2017–2027. The strategy outlines the coordinated and collegiate approach characterised by the Australia–Vietnam partnership.

Also demonstrating evolving relationships with regional partners, ACIAR continued developing trilateral relationships for research collaboration to cooperate on shared research objectives with China, recognising China’s growing role as an aid donor in the region.

The Qinghai-Tibet plateau, often called the roof of the world, feeds 13 of the great rivers of Asia. These rivers sustain billions of people across the region, so managing this critical watershed sustainably is fundamental to global food security. China and ACIAR co-invested in research work investigating stocking rates of yaks, goats, sheep and cattle, to improve the animals’ resilience and nutrition, and reduce their impact on the fragile grasslands of these high-altitude plains.  
ACIAR project ADP/2012/107

Reducing the area of land cultivated with rice by 13% to provide fish refuge areas led to telling results in the rice-fish systems in the Ayeyarwaddy Delta project in Myanmar. Despite the reduction in cropping area, rice production rose by 6%, and net profit by 132%, because of returns from the sale of fish.  
ACIAR project FIS/2016/135

The success of ACIAR-supported work on fish passages in the Mekong Basin, led by Dr Lee Baumgartner and his team from Charles Sturt University, was recognised with a Distinguished Project Award at the 2018 International Fish Passage Conference. The diverse fish fauna of the Mekong River Basin provides food, employment and income for millions of people but its sustainability is threatened by barriers preventing fish migration up and down the river. Fish passage work in Laos is now being scaled out to other parts of South-East Asia.  
ACIAR project FIS/2014/041

4

Locally-based staff

45

ACIAR-supported projects



## Regional highlights for 2018-19

# South Asia

**The South Asia region for ACIAR takes in six Indian Ocean rim countries. These countries are important strategic partners for Australia, which is also an Indian Ocean Rim country.**

During 2018-19, ACIAR work in South Asia continued with its focus of cultivating cross-country collaboration and cooperation. ACIAR has had longstanding and productive relationships with its South Asia partner countries and has supported regionally-based research since 1983. At a workshop in July 2018 the Bangladesh Minister for Agriculture spoke highly of the value of the 25-year ACIAR-Bangladesh partnership. And for even longer, this year marked a productive 35-year research-for-development partnership with Pakistan, particularly in regard to horticulture and livestock production.

ACIAR is fostering regional collaboration to promote sustainable, diversified, more intensive cropping; developing improved varieties of the regional staples—wheat and mungbeans; and developing an integrated policy regarding agricultural livelihoods and climate change.

Water is a key concern for the region. As climate variability and competing and increasing demand for water from agriculture, industry and growing population significantly affect this precious resource, regional collaboration to manage the shared resources sustainably is essential, and is a strong characteristic to current ACIAR-supported projects in region.

ACIAR continues its partnership with the Department of Foreign Affairs and Trade and manages 10 projects, addressing food security and sustainable agriculture on the Eastern Gangetic Plain, within the Australian Government’s Sustainable Development Investment Portfolio (SDIP).

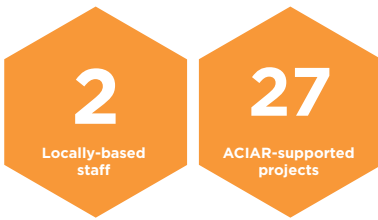
In the global food security hotspot of the Eastern Gangetic Plains, which is home to 300 million people and has the world’s highest concentration of rural poverty, ACIAR worked in three countries, with more than 20 collaborating organisations and across 40 locations to sustainably increase and diversify agricultural systems (see page 25).

The ACIAR Pakistan office launched its new gender strategy, which complements ACIAR Gender Equity Policy and Strategy. The strategy aims to foster gender inclusive research, as well as helping to ensure gender roles are considered in project teams and partner organisations. To this end, ACIAR sponsored two young Pakistani women researchers to participate in a year-long program (Homeward Bound) developing leadership in women scientists.

The Afghanistan program concluded in December 2018. Despite the challenges of three decades of war and extreme weather, key successes included the introduction of new rust-resistant wheat varieties and new water-efficient forage species, and training of almost 1500 people in sustainable technologies for watershed management.

The ‘Sustainable and Resilient Farming Systems Intensification’ project encouraged farmers of the Eastern Gangetic Plains, especially women, to adopt new agricultural practices, including zero tillage. Hosneara Bibi, a farmer in West Bengal embraced the new technology, improved her wheat yield by 50% and expanded her farm, and now grows wheat, rice and jute.

ACIAR project CSE/2011/077



## Regional highlights for 2018–19

# Eastern and Southern Africa

**The ACIAR region of Eastern and Southern Africa currently takes in 11 countries, where there are ACIAR-supported projects and programs. Our footprint however, extends beyond these borders due to our association with the four CGIAR centres and many regional organisations in sub-Saharan Africa.**

A significant partnership was renewed in 2018, with the commencement of Phase 2 of the Cultivate Africa’s Future program—CultiAF. More than 70% of the rural population in eastern and southern Africa depends on agriculture but poor performance in the sector has limited regional economic growth. Building on the successful alliance between ACIAR and the IDRC (the Canadian-based International Development Research Centre), CultiAF2 will continue research-for-development that aims to foster economic growth, reduce poverty and improve food security in the region. CultiAF2 comprises nine projects across seven countries, with five projects being extended from Phase 1. See examples of two projects on page 13.

In late 2018, ACIAR hosted an event at the African Green Revolution Forum in Rwanda to canvass key stakeholders’ (partner governments, national agricultural research institutes, non-government organisations, CGIAR research centres and donor agencies) views on the new ACIAR Eastern and Southern Africa strategy.

The new strategy, to be launched in 2020, is guided by the ACIAR 10-Year Strategy 2018–2027, and aligned with the 2030 Agenda for Sustainable Development and the Comprehensive Africa Agriculture Development Programme. It also acknowledges the African Union declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods.

Honey and coffee are being successfully marketed by smallholder farmers in Uganda and Zambia because of innovation platforms—where groups of fellow farmers share knowledge and pool resources. In Uganda, farmers built a communal bee house together, which houses 150 modern beehives. Before the bee house, hives were out in the open and exposed to animal predation (by the aptly named honey badgers) and theft—people stealing both honey and hives.

ACIAR project FST/2014/093

A 30% increase in productivity and a 30% reduction in production risks are the potential results of a project concluding in 2019. Investigating the sustainable intensification of maize and legume-based cropping systems, the SIMLESA project (page 22) identified conservation farming techniques, improved availability of germplasm and developed crop value chains to improve food security in five countries in eastern and southern Africa.

ACIAR project CSE/2013/008

Smallholder and communal cattle producers in South Africa have better opportunities to participate in a new and growing free-range beef market, with the second stage of a value-chain development project. Stage 1 of the project initiated two value chains and demonstrated that small-scale producers can meet high-value market specifications, through improved feed supplements and grazing management.

ACIAR project LS/2016/276

CASE STUDY

# Big project with a big vision



Sustainable intensification of maize-legume cropping systems for food security in eastern and southern Africa II (SIMLESA II)  
CSE/2013/008

Reach  
**650,000**  
farmers  
by 2023



## CASE STUDY

# Big project with a big vision

The sustainable intensification of maize-legume cropping systems for food security in eastern and southern Africa (SIMLESA) is a big title for what ACIAR Crops Research Program Manager, Dr Eric Huttner, describes as 'one of the largest projects we have dealt with'. Spanning almost 10 years, from 2009, the second phase of the project concludes in 2019.

The objective of the SIMLESA project was to build the resilient farms needed to feed Africa's growing population. The project's targets are ambitious: to increase overall productivity by 30% from 2009-23, and reach 650,000 farmers in the process.

Dr Huttner says there are considerable challenges for the sustainable intensification of cropping systems in Africa.

'You must generate more food from the same area, ideally using the same amount of resources. For conservation agriculture sustainable intensification (CASI) to be effective, you need to use water and fertiliser carefully, and increasingly manage scarce labour resources, as the farming population ages and the younger generation moves away from rural areas,' Dr Huttner said.

The project approached CASI from several different perspectives:

- » new and improved varieties of maize and legumes, primarily beans, and channels to make seeds available, to enable the project to meet the scale required
- » crop rotation, alternating maize with beans, to increase soil fertility and crop yield
- » influencing cultural practices, such as application of fertiliser and animal manure, and minimal tillage
- » post-harvest marketing to understand the maize, legume and fodder/forage value chains.

Dr Huttner says the final phase of the project involved a big policy push, engaging with all research systems in the partner countries to ensure they were aware of the research findings, and then in turn, could inform policymakers and government officials.

Agriculture ministers came together in Kampala, Uganda, in May 2019 at an ASARECA (Association for Strengthening Agricultural Research in Eastern and Central Africa) summit. At the meeting, the high-level ministerial panel on SIMLESA signed a joint communiqué declaring the importance of CASI 'in boosting and stabilising productivity and safeguarding the resource base in the face of climate change'.

The ministers went on to say that 'CASI should be promoted as a regional initiative ... using it as a framework to instigate critical paradigm shifts in smallholder farming systems'.

The final project report is imminent, but Dr Huttner says a lengthier, more detailed book will be published, in recognition of the significance of the project.



**30%**

**Increase in  
productivity**

# Strategic facilitation of development

## Effective use of funds for research-for-development requires a clear pathway to impact.

Our research portfolio is guided by six strategic objectives, which are articulated in our 10-Year Strategy 2018–2027. The strategy is aligned with our enabling legislation, key objectives of the Australian Government’s aid policy, and the goals of the United Nations 2030 Agenda for Sustainable Development.

Our re-focused research portfolio, operational for its first full year during 2018–19, is designed to encompass key agriculture sectors and the disciplines supporting and connecting these sectors.

While each project is managed within one of our nine program areas (see page 32), it also addresses several or all of our strategic objectives, as well as contributing to knowledge or developing new technology within its own sector or discipline.

The achievements of our research program in 2018–19, through ACIAR bringing together the best teams to address the issues at the heart of each project, made significant contributions to our strategic objectives and overall mission.

## ACIAR strategic objectives





## More production, more opportunities

ACIAR works throughout the Indo-Pacific region to improve food security and reduce poverty among smallholder farmers and rural communities. In doing so, we contribute to our mission of improving livelihoods and making production systems more sustainable.

Increasing the economic and disaster resilience of regionally-significant fruit crops is the aim of a project<sup>1</sup> led by Professor Steven Underhill of the University of the Sunshine Coast, working with communities in Fiji, Samoa and Tonga. Despite a favourable climate and increasing market opportunities, fruit production represents less than 10% of total horticultural output in the Pacific. The planting of improved varieties of citrus trees in Tonga has led to rebuilding and expansion of commercial citrus production. Economic benefits for communities are anticipated from 2020 onwards, when trees reach bearing age.

Much of Myanmar's population depends on coastal fisheries and rice for food and livelihoods. ACIAR-supported projects in the Ayeyarwady Delta contribute to the sustainable management of coastal fisheries and inland aquaculture, as well as increase production and household income. Dr Mike Phillips of WorldFish leads a project<sup>2</sup> that is improving the productivity and profitability of rice-fish production systems, as well as identifying opportunities for diversification. Midway through its term, the project reported a 40% increase in fish production and a 50% increase in overall farm income in some areas. Additionally, almost 15,000 rural households were trained in small-scale aquaculture.



## Efficient, resilient production

Across the Indo-Pacific region, ACIAR supports many projects that strive to improve livelihoods through the sustainable use and management of natural resources and sustainable intensification of farming systems. Increasingly, we focus on climate-smart agriculture, for adaptation to and mitigation of climate change impact on agriculture and land use.

ACIAR supports and coordinates the food and agriculture component of a large and multi-faceted Australian Government initiative—the Sustainable Development Investment Portfolio (SDIP), funded by the Department of Foreign Affairs and Trade. ACIAR works with a range of partners in Australia and South Asia to improve the integrated management of water, energy and food in the major Himalayan river basins—the Indus, Ganges and Brahmaputra.

Ten projects<sup>3</sup> in Bangladesh, India and Nepal contribute to Phase 2 of the initiative, which builds on our existing program of field research, local policy engagement and strong partnerships in the region. During 2018-19, the projects established the basis to support sustainable intensification of farming systems, with a focus on two of the most pressing issues in the region—adaptation to climate change and promotion of gender equality by empowering women and girls. These projects also work to address region-wide barriers to sustainable economic growth.

1 ACIAR project HORT/2014/077

2 ACIAR project FIS/2016/135

3 ACIAR projects CSE/2011/077, CROP/2018/210, LWR/2018/104, WAC/2018/168, WAC/2018/169, WAC/2019/104, WAC/2018/211, WAC/2018/211, WAC/2018/220, LWR/2018/111

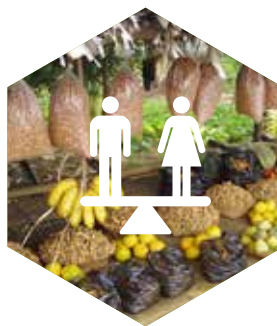


## Good food, healthy people

Although global malnutrition levels are declining, millions of people, mostly in developing countries, still die from the consequences of malnourishment each year. ACIAR is supporting projects that not only increase agricultural production but also focus on better nutritional outcomes and address risks to human health through diseases linked to livestock, agrichemical use and food safety issues.

A project<sup>4</sup> that improved post-harvest management of fruit and vegetables in the southern Philippines, led by Dr Jenny Ekman of Applied Horticultural Research, had wide-ranging impacts from higher smallholder incomes to increased capacity of research institutions. Safer technologies that were introduced to reduce post-harvest losses will mean safer food for Filipino consumers. Improved quality of produce will increase supply and likely reduce the price, which in turn improves affordability and consumption of fresh fruit and vegetables.

In Laos, diseases of livestock severely reduce village incomes and present risks to human health. The constant threat of transboundary animal diseases, including foot-and-mouth disease, limits opportunities for expansion of the livestock industry. Dr Russell Bush of the University of Sydney<sup>5</sup> leads a project that is testing a 'whole-of-village biosecurity program' for pigs, poultry, goats, cattle and buffalo, with a view to improved human health as well as increased market opportunities.



## Equitable participation

In addressing key challenges and opportunities in the agriculture, fisheries, forestry and horticulture sectors, ACIAR-supported projects are designed to be equitable, inclusive and empowering.

Gender equality is crucial to alleviating poverty in rural communities. Women already play a significant role in agriculture in many countries across the globe. In developing countries, women do much of the manual labour on farms, as well as domestic duties. ACIAR recognises the yet untapped potential for improved production, income and family nutrition, which occurs when women play a more visible and equal role in agricultural decision-making. Accordingly, ACIAR projects are designed to sensitively facilitate social and cultural change.

Growing success in this dimension was profiled and celebrated at the international conference, Seeds of Change (see page 40), which placed gender firmly on the agricultural research agenda, with a thought-provoking and engaging three days of presentations and discussion from global leaders in the field.

There is increasing evidence, in both the public and private sectors, that organisations drawing equally on the talents of women and men at all levels outperform those that do not. Within ACIAR, the proportion of women in senior roles increased from 11% in 2016 to 63% by July 2019.

4 ACIAR project HORT/2012/098

5 ACIAR project AH/2012/067



## Inclusive value chains

Providing opportunities for farmers to engage in commercial value chains is one of the most effective ways of reducing poverty in rural smallholder communities. Industry value chains must be functional so as to not create barriers to adoption of new knowledge and technologies.

Farm power and conservation agriculture are important to sustainable intensification of agriculture in sub-Saharan Africa. Access to farm power is constrained due to the collapse of tractor-hire schemes, the diminishing numbers of draught animals and the scarcity and cost of human farm labourers. A market-oriented approach to the manufacture of farm machinery, in a six-year project<sup>6</sup> led by Dr Frédéric Baudron of CIMMYT, accelerated the delivery and adoption of two-wheel tractor-based technologies and small-scale grain processing by smallholder farmers, with subsequent benefits to livelihoods.

New marketing opportunities have grown for *Canarium* or galip nuts for communities in East New Britain of Papua New Guinea. Galip nuts traditionally have been collected by women smallholders and traded locally. A whole-of-value chain approach by a project<sup>7</sup> led by Professor Helen Wallace of the University of the Sunshine Coast has taken the enterprise to the next step and developed commercial-scale processing facilities and marketing opportunities in the capital, Port Moresby (see page 46).

6 ACIAR project FSC/2012/047  
7 ACIAR project FST/2014/067



## Capable partners

Growing more food and fibre in resource-efficient production systems with less post-harvest waste, and then having access to more inclusive and resilient market chains, challenges the capacity (scientific, managerial, policy and governance) of many of our partner countries across the Indo-Pacific region.

Building capacity to inform scientific understanding and the design and implementation of policy is core to our mandate. ACIAR builds capacity through structured training, informal networking and learning at the project level.

During 2018–19 we concentrated on building on previous years' investment in postgraduate and in-service training for individual scientists from partner countries, many of whom are now in influential leadership positions. In line with our 10-year strategy and feedback from our partner countries, we established the John Allwright Fellowship Executive Leadership (JAFel) program, to foster fellows' leadership capacity.

Another highlight of 2018–19 was the establishment of the Australia-Pacific Plant Biosecurity Partnership. The program follows on from the success of the Australia-Africa Plant Biosecurity Partnership, which ran from 2014 to 2017. Developing biosecurity capacity is a vital part of protecting the agricultural economies of Australia and developing countries. The program works with eight Pacific island nations: Fiji, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

CASE STUDY

Step back and  
look, to move  
forward



Improving the  
production and  
competitiveness of  
Australian and Philippines  
pig production  
through better health  
and disease control  
AH/2012/066



## CASE STUDY

# Step back and look, to move forward

A sharp eye for animal health and sophisticated diagnostic techniques are important for pig production. However, any improvement must consider its fit with the overall farm ecosystem.

A project that set out to improve the production and competitiveness of Australian and Philippines pig production through better health and disease control was led by Dr Pat Blackall, University of Queensland, a laboratory-based researcher with longstanding experience in bacterial respiratory diseases of pigs and poultry.

‘What we learned in the Philippines,’ Dr Blackall said, ‘is that you have to take a step back and look at the whole system, not just consider them as pig farmers, but farmers generally and adopt an integrated approach.’

A previous project developed local capacity in diagnostic work on respiratory diseases. Dr Blackall explained that ‘the students from the first project became the ‘teachers’ in part of the new project, delivering the program to other areas of the Philippines. It is a wonderful way of embedding programs long term’.

The project worked mainly with barangays (village groups), where the Philippines-based research team organised a series of meetings with local smallholders to discuss pig farming issues.

The meetings provided a forum for the farmers to ‘tell us what their problems were, and then we worked with farmers and local and provincial agricultural advisors to come up with solutions, and apply them,’ said Dr Blackall.

‘High-tech members of the team, like me, very quickly became irrelevant! We quickly understood that many of the farmers’ issues were animal management ones, needing low-cost, low-tech, sustainable solutions, such as replacing traditional open troughs for their pigs’ drinking water, to reduce contamination and spread of disease. Nipple drinkers deliver clean water more efficiently and were low-cost, and were readily adopted by the farmers.’

Another example of a readily-implemented solution was in response to farmers’ reports of little knowledge of market prices for their pigs, hampering their effectiveness in negotiating with the middlemen traders. A simple and effective use of mobile phone technology, which has high take-up in the Philippines, was to send text blasts to farmers of current pig market prices.

‘In Australia, the project remains focused on high-tech diagnosis of respiratory diseases in pigs, such as porcine pleuropneumonia, pasteurellosis and Glässer’s disease, which affect pig industries in the Philippines and Australia. Our lab in Queensland is a reference centre for the Australian pork industry, and quickly able to develop and provide the new tests to government and industry,’ said Dr Blackall.

The project is operating at the two ends of the pig production spectrum, but is delivering valuable practical and technical results.



**High  
take-up  
of  
low-tech  
solutions**

## Organising our program



**Throughout 2018–19, ACIAR worked with scientists, extension officers and policy specialists from about 490 organisations in Australia and partner countries, using science and technology to solve local problems for farmers, fishers and foresters across our four regions in the Indo-Pacific.**

Most of our research partnerships were brokered to work on 240 bilateral country research projects in 35 countries. In addition, about 25 projects and programs were established through multilateral and co-investment partnerships.

## Results through partnerships

ACIAR facilitates collaborative international partnerships between public and private research institutions. We provide the vehicle for Australia to strategically contribute to poverty reduction and improved livelihoods in our region. We bring together researchers from Australia and throughout the Indo-Pacific to deliver a research project or program in partner countries, developed against mutually-agreed objectives.

Each project is led by a commissioned organisation. In addition, scientists and specialists from several collaborating agencies may also be part of the project team. Often, several teams from the same institution may work on a number of ACIAR-supported projects—sometimes as the commissioned organisation and other times as collaborators.



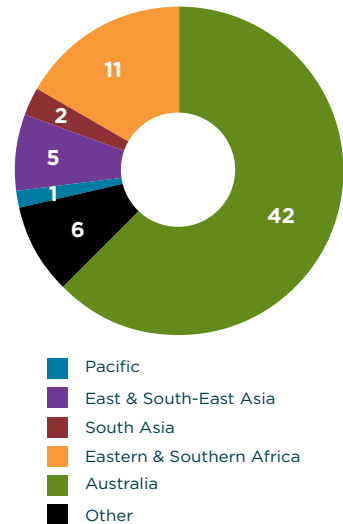
67

## Commissioned organisations

A little over 60% of our commissioned organisations during 2018-19 were based in Australia. These included schools and faculties of universities from all states and territories of Australia, from the School of Ecosystem and Forest Sciences at the University of Melbourne to the Division of Tropical Environments and Societies at James Cook University in Townsville. There were projects led by CSIRO Agriculture and Food, CSIRO Land and Water and CSIRO Oceans and Atmosphere. We also had projects led by Australian state departments of agriculture and private firms.

Our overseas commissioned organisations include research groups working from the centres of the CGIAR system, such as the International Rice Research Institute in the Philippines and the International Livestock Research Institute in Kenya. In the Pacific region, we have the Pacific Community (SPC) as a commissioned organisation for some projects.

### Regional location of commissioned organisations



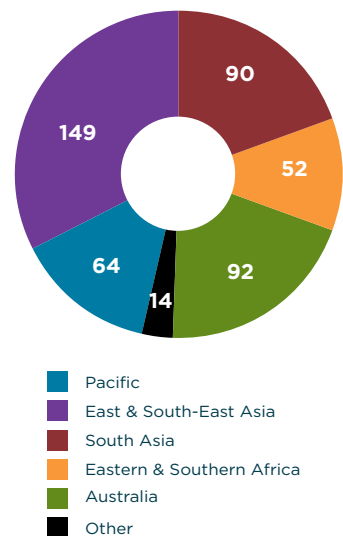
461

## Project collaborators

During 2018-19, our commissioned organisations contracted approximately 461 project collaborators. About 20% of collaborators are from science organisations in Australia. Most collaborators are from in-country or international agencies, providing local expertise and access to local networks.

Our collaborators include: scientists from most of the 15 research centres of the CGIAR; universities in partner countries, such as Uttar Banga Krishi Vishwavidyalaya in India and the University of the South Pacific; institutes such as the Ethiopian Institute of Agricultural Research and the Institute of Policy and Strategy for Agriculture and Rural Development in Vietnam; through to small specialist organisations such as the Bougainville Women's Federation and the Centre for Seaweed Culture Research and Development in Indonesia.

### Regional location of project collaborators



# Measuring impact to plan investment

**The ACIAR Portfolio Planning and Impact Evaluation Program helps to refine our priorities, learn lessons, and report accurately to the Minister, the Parliament and the wider Australian public.**

The Portfolio Planning and Impact Evaluation Program has been under development and was consolidated during 2018–19. The program is responsible for the ongoing development of organisation-wide performance frameworks, and the evaluation of our investments in the medium and long term. It develops processes to engage with emerging thinking on designing effective research-for-development portfolios, and invests in identified methods to appropriately monitor and assess the contribution of our investment to development outcomes.

The program continued the established process of evaluation of ACIAR investments through a combination of medium-term adoption studies and longer-term impact assessments.

## Research evaluations, 2018–19

### Adoption of ACIAR project outputs, 2017 (AS014)

#### Editors

David Pearce, Centre for International Economics, and Andrew Alford, ACIAR

### Impact assessment of ACIAR-supported research in lowland rice systems in Lao PDR (IAS097)

#### Authors

John Mullen, Consultant; Bill Malcolm, The University of Melbourne; and Bob Farquharson, The University of Melbourne

### ACIAR investment in citrus rootstock, scion and production improvement in China, Vietnam, Bhutan and Australia (IAS098)

#### Author

Michael Clarke, AgEconPlus

# Areas of research

**Our research portfolio continues to evolve in response to new research opportunities enabled by new knowledge and technologies, and in response to new research and development imperatives.**

The 2018–19 year was the first full year of ACIAR operating across nine program areas:

- » agribusiness
- » crops
- » fisheries
- » forestry
- » horticulture
- » livestock
- » social sciences
- » soil and land management
- » water and climate.

While each program focuses on priorities within its field, the development of projects across programs is also guided by the objectives of the ACIAR 10-Year Strategy 2018–2027. Further, many aspects of the research challenges associated with converging food, water and energy insecurities sit at the interface between our program areas.

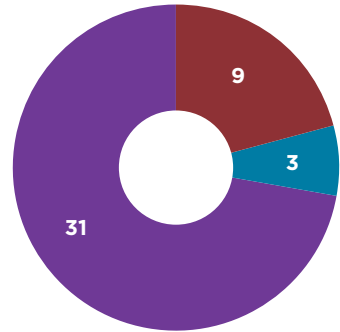
ACIAR has identified a set of ‘cross-cutting’ issues, and throughout 2018–19 we developed program descriptions and engaged Associate Research Program Managers to work with the research programs and projects, to connect areas of common focus and research. Associate Research Program Managers were appointed to support the following high-priority, cross-cutting issues:

- » climate change
- » farming systems
- » economics and policy
- » gender
- » One Health.
- »



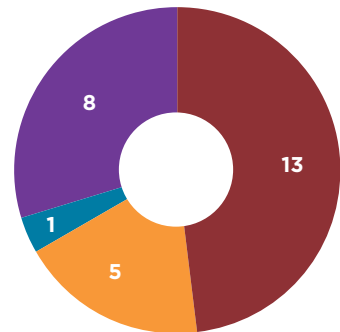
The **Agribusiness Program** focuses on research and adoption of initiatives and innovations to improve business outcomes for smallholder farmers, their communities and their industries. It includes research at all points along the agricultural, forestry and fisheries value chain, such as input supply, production and harvest at the farm level, as well as post-harvest activities and shipping, processing, packaging and marketing of farm products.

**Projects in 2018-19**



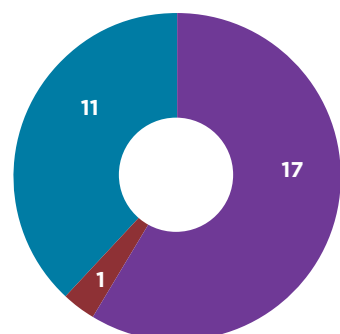
The **Crops Program** aims to increase the productivity, sustainability and use of major crops, by applying genetic and agronomic innovations to cropping systems of mutual importance to Australia and partner countries. The program is built on two complementary and integrated themes of genetics and sustainable intensification and diversification.

**Projects in 2018-19**



The **Fisheries Program** works to improve fishers' livelihoods from productive aquatic farming systems and sustainable wild-catch fisheries. The program's focus is on small-scale artisanal fisheries and low-technology aquaculture methods, suitable for both men and women, and includes research on post-harvest processing and trade along the supply chain.

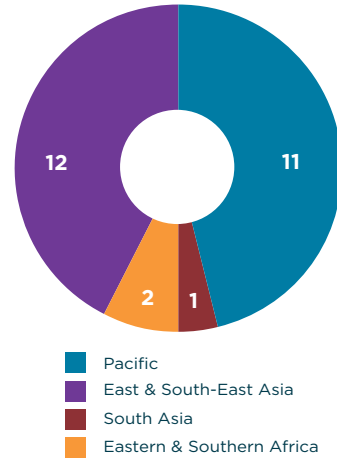
**Projects in 2018-19**





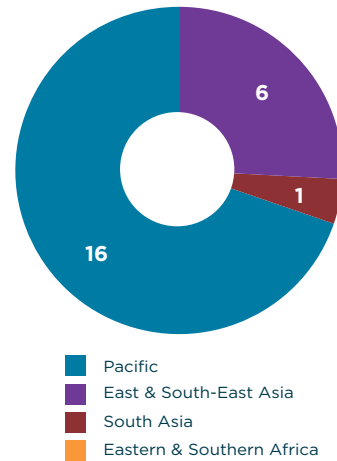
The **Forestry Program** contributes to economic development and natural resource conservation and rehabilitation, through scientific support for the establishment, management and sustainable use of forests, providing optimum social, economic and environmental benefits to partner countries and Australia.

**Projects in 2018-19**



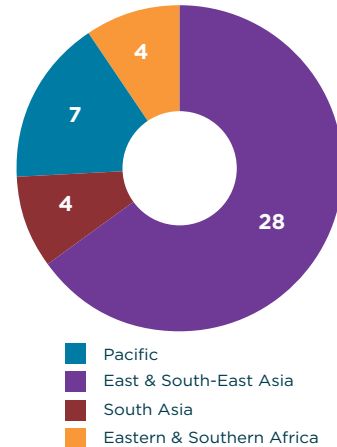
The **Horticulture Program** establishes partnerships to improve the productivity, profitability and sustainability of horticultural crop production. It emphasises improvement of practices to increase yield, and minimise pre-harvest and post-harvest loss, across a large variety of commodities, including banana, mango, pineapple, citrus, sweetpotato, coconut, cocoa, coffee and various indigenous and traditional vegetables.

**Projects in 2018-19**



The **Livestock Systems Program** brokers research partnerships that develop more productive, profitable and sustainable livestock systems for the benefit of humans, animals and the environment. The program takes a holistic view of livestock systems, considering animal health and production technologies within the broader sociocultural, policy and economic contexts. Animal welfare and gender-sensitive approaches are central to the research design.

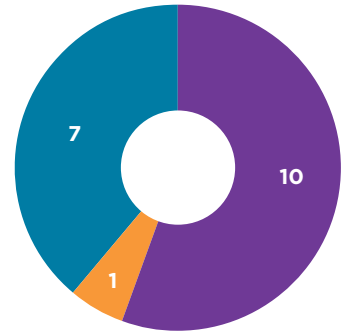
**Projects in 2018-19**





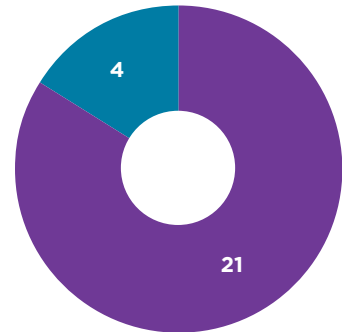
The **Social Sciences Program** commissions research to address questions most effectively answered, or led primarily, by qualitative social scientists, with elements of quantitative social science, where relevant to the issue under investigation. All projects endeavour to conduct trans-disciplinary research to deliver innovation and speed up poverty reduction.

**Projects in 2018-19**



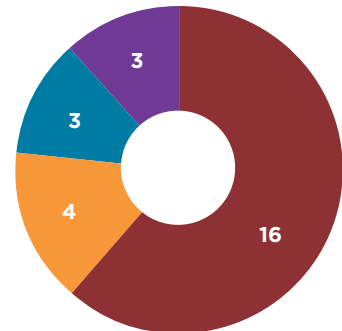
The **Soil and Land Management Program** aims to help smallholders boost productivity, while ensuring soil and food security are achieved, through sustainable use of limited resources in a changing climate. The program takes an integrated approach to identify promising practices within farming systems in specific agroecological zones. Intersecting with socioeconomic factors, it develops technologies that enable farmers to sustainably use resources and intensify production.

**Projects in 2018-19**



The **Water and Climate Program** addresses the challenge of efficient, sustainable water use to support agricultural production, in a context of an increasingly uncertain climate, competition from other sectors and declining water quality. The program works to improve agricultural water management through innovative technical and policy approaches.

**Projects in 2018-19**



CASE STUDY

# Enriching life on coral atolls



Improving soil health, agricultural productivity and food security on atolls  
SMCN/2014/089

Tailored compost, using locally available ingredients is improving production of traditional and nutritious vegetables



## CASE STUDY

# Enriching life on coral atolls

Growing food on coral atolls such as Kiribati and Tuvalu is challenging on a number of fronts.

Coralline soil generally is not fertile. Composed essentially of calcium carbonate, the soil is strongly alkaline, does not hold moisture and is often deficient in essential plant nutrients. Inorganic fertilisers are often prohibited on these atolls as they have the potential to pollute fresh groundwater. Therefore, soil conditioning is required to supply the missing nutrients to produce root crops and leafy green vegetables efficiently and sustainably.

Adding to the food production challenge, the coral atolls are subject to saltwater inundation during storm surges, salinising groundwater supplies. On average, Kiribati's 33 atolls sit at less than two metres above sea level, so they are extremely vulnerable to rising sea levels and strong tides.

Increasingly, the population has been importing food such as rice and flour. This however, makes food security perilous, and the adoption of a Western-style diet has led to a rise in non-communicable diseases such as diabetes, hypertension and micronutrient deficiency.

Sustainable food production systems are needed on the islands of these two small nations. ACIAR supported a four-year project, led by Dr Siosiu Halavatau of the SPC to analyse indigenous plants to assess their suitability for compost and develop sustainable composting systems for the islands.

The team of researchers from the Kiribati and Tuvalu departments of agriculture, the SPC, the University of Adelaide and the University of Tasmania produced a number of recipes for a compost mix comprising brown materials, such as fallen breadfruit leaves; green materials, like beach cabbage; and ash from burning coconut shells or husks to provide potassium. Nitrogen can be sourced from human and animal waste. Initial reluctance to this nutrient source was overcome by using a system engineered by Southern Cross University to process the waste, killing pathogens and creating a commercial, nutrient-rich product.

Wicking garden beds are also being trialed to raise traditional, nutrient-rich, leafy green vegetables. These self-watering beds minimise use of fresh water, another scarce commodity for the islanders, and contribute to the improvement of food security and islanders' diets.

The next step is to develop a business model around the whole system to ensure an efficient and sustainable use of compost, and more widespread adoption of innovations such as the wicking beds to conserve scarce freshwater supplies.

**New food  
production systems  
overcome challenges  
of infertile soil  
and saltwater  
inundation**

## Strengthening our partners and partnerships

Capacity building has been an enduring focus of ACIAR and this intensified during 2018–19, building on a 2017 review of our activities. Through consultation with program participants and partner countries, the review identified gaps in the program and potential improvements, leading to further development of our established and highly-regarded John Allwright (JAF) and John Dillon Fellowships (JDF). For example, partner countries have told us that not only do they have expectations that John Allwright Fellows be accomplished scientists but that they should also be confident and capable of taking up leadership positions when they return to their home countries.

86



**John Allwright Fellowships (JAF)** are awarded to partner-country scientists involved in ACIAR-supported research projects. The fellows undertake postgraduate study, at Master or PhD level, in an Australian university. The study focuses on a theme or topic related to the ACIAR project in which the fellow is engaged. In 2018–19, seven new fellowships were awarded, bringing the total of active fellows in the year to 86.

25



The **John Allwright Fellowship Executive Leadership** program (JAFel) was established in response to the Capacity Building Program review, to foster fellows' leadership capacity. The aim is to produce balanced researchers with strong academic skills and specialist expertise, as well as good communication, project management and team-building skills. The first intake of the program took place in January 2019, with 25 fellows participating in an intensive, 10-day face-to-face leadership course at the University of New England.

15



**John Dillon Fellowships (JDF)** are awarded to outstanding mid-career agricultural scientists or economists associated with an ACIAR-supported research project. The fellowship is a six-week professional development program focusing on leadership, communication, project managements and policy development. Fellows also engage in networking events, field trips and a short placement at an Australian institution related to their field of work. For the first time in 2018–19, ACIAR conducted two rounds of the program, in which a total of 15 fellows participated.



# 16



The **Institutional John Dillon Fellowship** (i-JDF) is a new initiative launched by ACIAR in 2019. The fellowship brings together colleagues who are strategically positioned to advance their institution in line with the ACIAR strategic plan. It is an intensive professional development program combining training modules with industry visits and networking opportunities, to strengthen Australian linkages. The inaugural program focused on four institutions and 16 participants from the Pacific region.

# 34



**Alumni events** for John Dillon and John Allwright fellows were held regionally throughout 2018–19, to strengthen the impact of the programs by holding several local meetings of alumni fellows. The Vietnam event, for example, attracted 34 John Allwright and John Dillon fellows—key managers, senior experts and researchers from ACIAR partner institutions in Vietnam—who valued the opportunity to develop an alumni network strategy and learn from one another.

# 19



The **Australia–Pacific Biosecurity Partnership** follows the success of the Australia–Africa Biosecurity Partnership (2014–17) in building biosecurity capacity with Africa partners. Commencing in May 2019, the targeted training for national, institutional and individual needs is backed up by a mentoring program, which includes work placements in Australian and New Zealand institutions. ACIAR is partnering with New Zealand agencies in this capacity-building program, to capitalise on their considerable Pacific biosecurity experience.

# 20



Internally, the **ACIAR graduate program** for early-career scientists in agricultural research-for-development goes from strength to strength. Since 2009, 20 young researchers have taken part in the program. In June 2019, the program was short-listed in the best Graduate Development Program category in the 2019 Australian HR Awards.

# 3



**Farmers without Borders** was piloted by ACIAR to capitalise on the experience of Australian farmers and their long history of using scientific innovation to improve their practices. Australian farmers will volunteer for in-country placements of 3–6 weeks, with the first countries in the program being Myanmar, Samoa and Timor-Leste during 2019. In Myanmar, the pilot will focus on soil and land management; in Samoa, on horticulture; and in Timor-Leste, on livestock-handling techniques.



CASE STUDY

## Sowing the seeds of change



Seeds of change—  
gender equality through  
agricultural research-  
for-development  
Conference

**45**

countries  
represented

## CASE STUDY

# Sowing the seeds of change

Gender equality is crucial to alleviating poverty in rural communities. In April 2019, ACIAR and the University of Canberra, with support from CGIAR, hosted the Seeds of change conference. This international agricultural research-for-development gender conference brought together 280 experts and researchers from 45 countries to participate in three days of discussion on gendered relationships in agriculture.

Delegates heard from prominent researchers and workers in the field, including:

- » Professor Naila Kabeer, Professor of Gender and Development at the London School of Economics
- » Professor Katherine Gibson, of the Institute for Culture and Society at Western Sydney University
- » Dr Jayne Curnow, ACIAR Social Sciences Research Program Manager
- » Vicki Wilde, Senior Program Officer, Agricultural Development and Women's Economic Empowerment, Bill and Melinda Gates Foundation.

Dr Jayne Curnow gave a well-received address, emphasising that just as successful bio-physical scientific research requires appropriately qualified experts in cropping, livestock or soil, so too gender-focused research requires social science experts, not bio-physical scientists 'doing gender'.

Conference attendees enjoyed what one speaker described as 'energising and honest conversations about what was working and what was not' in tackling the complex and multidimensional normative and power structures that prevent people from enjoying a gender-equitable society.

The conference considered the role of men and masculinity in poverty reduction, with Juan Gonzalo Jaramillo, formerly of CIMMYT, saying that 'gender is a relational concept ... we need to examine how the configuration of the masculine is linked with the definition of femininities in a given time and place'.

The conference was also notable for its use of innovative technologies aimed at reaching a wider audience, and allowing those unable to attend in person to participate in real time. In a first for ACIAR Outreach, five lectures and panel discussions, representing nine hours of footage, were live streamed online. These can now be viewed on the ACIAR YouTube channel. Eighteen panellists and presenters featured in a series of interviews also posted on YouTube, and a dedicated 'Gender Portal' website, created as a taster for the conference, now serves as an archive and extension of conference proceedings.

Professor Naila Kabeer delivered a public lecture to a capacity-filled auditorium, examining themes of empowerment and agency, arguing that 'empowerment cannot be conflated with labour force participation'. She pointed to the complexity of interconnected norms, resources, rules and identities that constrain the agency and empowerment of individuals, saying gender is only part of that social structure.

**280**

**delegates  
attended**

## Extending influence and impact

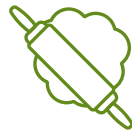
Through our outreach activities, we endeavour to extend the influence and impact of the results and outcomes of our diverse research program. We also have a responsibility to demonstrate to the Australian public the value of government investment in agricultural research-for-development.

Our stakeholders are as diverse as is the ACIAR research program. We communicate to broad communities in Australia and overseas, we engage with our partner research organisations, industry associations and technical specialists, and we report to the Australian Government.

Throughout 2018-19, our Outreach team continued to develop and engage in a growing range of activities to raise awareness of ACIAR-funded research, including organising and supporting ACIAR-sponsored events, publishing our magazine, *Partners in Research for Development*, being prominent across a range of social media, partnering with The Crawford Fund in publicity activities and engaging with major media organisations.

Among our major outreach achievements during 2018-19 were the screening of the Good Cooks program on SBS (page 43), the profiling of the impact of research in tsunami-affected Aceh on ABC Landline and contributing to two major international conferences (page 44).

At the end of the 2018-19 year, ACIAR Outreach finalised plans to implement a network of communicators throughout the Indo-Pacific region. The network will enable ACIAR to find and tell great stories locally, as well as in Australia. The network will also manage in-country media and assist ACIAR with hosting visits by dignitaries and delegations.



**470,000**  
viewers of *Good Cooks* TV program



**6000**  
readers of *Partners in Research for Development*



**355,000**  
visits to ACIAR website



**70,000**  
followers on social media



**2.9 million**  
impressions on social media



**150**  
new project fact sheets



**15**  
new or reprinted publications



**10**  
conferences and events sponsored



## Promoting food security R&D to 1.5 million people

Select six high-profile Australian foodies or celebrity chefs, take them to six unique locations in the Indo-Pacific region, and have the locals teach them to cook. At the same time, blend in vignettes about Australian-supported agricultural research that is improving food security for the often-vulnerable communities on location.

That was the recipe for the new TV series, *The Good Cooks*, which aired on Australian television during November and December 2018. ACIAR partnered with SBS to produce the six-part series.

As well as being a cooking and travel show, the cooks and the locals showed how agricultural research is making a difference to people in the developing world.

The series was viewed by 464,000 people and a subsequent 4000 people viewed the series 'on demand'. The series was also supported by a strong social media campaign over six weeks, which took the total reach of the project to more than 1.5 million people.

The six cooks were powerful supporters of the campaign, and used their respective and strong social media followings to convey their enthusiasm for the work they had witnessed in their travels.



## Sharing and promoting

ACIAR participated in conferences and forums as contributor of knowledge, co-host and/or sponsor. These events provide another forum for ACIAR to share and promote research findings, and bring together stakeholder and target audiences.

### Key events and conferences 2018–19

The Crawford Fund Conference, Canberra (August 2018)

AgCatalyst 2018, Melbourne (August 2018)

National Farmers' Federation National Congress, Canberra (October 2018)

International Leucaena Conference, St Lucia, Queensland (November 2018)

Transforming the Global Food System, Canberra (November 2018)

Global Soil Security Conference, Sydney (December 2018)

Australasian Aid Conference, Canberra (February 2019)

Research for Development Impact Network Conference, Melbourne (June 2019)



Seeds of Change, Canberra (April 2019)

- » ACIAR hosted the international conference in partnership with University of Canberra and the CGIAR Gender Platform.
- » ACIAR Outreach managed the media campaign for the conference, live streaming of sessions and interviews with conference speakers.
- » Through a strong social media campaign, ACIAR Outreach promoted the sell-out public lecture delivered by Naila Kabeer.
- » ACIAR Outreach developed a conference website and gender-focused portal.

World Congress on Agroforestry, Montpellier, France (May 2019)

- » The ACIAR CEO moderated a plenary panel on the opening day of the congress.
- » A captivating video explaining the importance of trees in the planet's biosphere, produced by ACIAR Outreach, was screened at the opening address.
- » The ACIAR exhibit displayed our work in agroforestry and delegates were offered galip nuts from Papua New Guinea.

## Increasing online impact

After redevelopment throughout 2018–19, the ACIAR website soon will have a new look and enhanced functionality. Included in the work is the creation of 500 new project pages, with easy-to-find key details, and linked project-related documents. A significant new feature will be the ACIAR Research Portal, which will host project sub-sites to share detailed research information and outputs.

## Spreading the word

A key element of the ACIAR Outreach program is to synthesise learnings, new knowledge, and new practices and techniques, and package that information into a range of publications.



### Partners magazine

Four editions of our flagship publication *Partners in research for development* were produced in 2018–19. The magazine captures our work in an engaging way, to take the science and impact of our work to a diverse audience in Australia and throughout the Indo-Pacific region.



### Project fact sheets

New easy-to-read and informative fact sheets provide key project information, an overview of each project, why the research was needed and expected outcomes.

## Scientific publications

Our publications are tailored for the specific information needs of diverse audiences. They range from academic to practical in content, and from online documents to a spiral bound, waterproof manuals, in format. Publications produced in 2018–19 included:



### Transforming smallholder irrigation schemes in Africa (MN202)

#### Authors

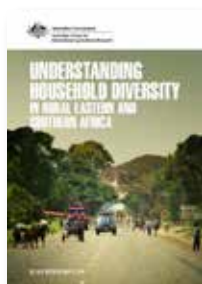
Jamie Pittock, Peter Ramshaw, Henning Bjornlund, Emmanuel Kimaro, Makarius V. Mdemu, Martin Moyo, Sithembile Ndema, Andre van Rooyen, Richard Stirzaker and Wilson de Sousa



### A diagnostic framework for equitable mariculture development in the Western Indian Ocean (MN204)

#### Authors

Hampus Eriksson, Max Troell, Cecile Brugere, Mohan Chadag, Michael Phillips and Neil Andrew



### Understanding household diversity in eastern and southern Africa (MN205)

#### Editors

Erin Wilkus, Caspar Roxburgh and Daniel Rodriguez



### A guide to the rotary veneer processing of coconut palms (MN206)

#### Authors

Rob McGavin, William Leggate, Henri Bailleres, Gary Hopewell and Chris Fitzgerald

Many of our publications are available in hard copy and all are available online at [www.aciar.gov.au/publications-and-resources](http://www.aciar.gov.au/publications-and-resources)

CASE STUDY

# Consumers are nuts about galips



Enhancing  
value-added products  
and environmental  
benefits from  
agroforestry systems in  
PNG and the Pacific  
FST/2014/067





## CASE STUDY

# Consumers are nuts about galips

Growing demand for healthy nuts has driven the success of an ACIAR-funded project in the East New Britain region of Papua New Guinea (PNG). The project, one of five in the Transformative Agricultural Enterprise Development Program (TADEP), empowered farmers, especially women smallholders, to expand their growing, processing and trading of *Canarium* nut, known in PNG as galip nuts. As a niche product, and with very few new nut varieties coming onto the market, galip nuts have the potential to be a 1000 to 2000-tonne industry. *Canarium* trees are native to the humid, lowland areas of eastern Indonesia, PNG, Solomon Islands and Vanuatu, and have been an important tree in traditional life.

Galip nuts, from the species *Canarium indicum*, have many qualities, making them a valuable commercial crop. Roasted, they have a unique, delicate taste, and they have a hard, non-perishable shell, meaning they can be transported and stored without damaging the nut. The nuts are highly nutritious, protein-rich and have a high oil content (about 70%), which can be used for cooking or for cosmetic manufacture. Additionally, the large *Canarium* tree and its leafy foliage provide protection for shade-loving crops such as cocoa.

Traditionally, women smallholder farmers have been the galip nut collectors, processors and traders. Developing a commercial industry gave these women the opportunity to participate more fully in enterprise management and ownership. The project also targeted small- and medium-sized enterprises, as well as large-scale processors. A whole-of-value-chain approach was adopted—undertaking market research, providing technical advice, building capacity and mentoring in business management, and accessing infrastructure for both private and public sector operators.

Previous ACIAR-funded projects had focused on developing commercial processing capability, encouraging smallholders to adopt more efficient technologies.

Project leader, Professor Helen Wallace, of the University of the Sunshine Coast, and colleagues from the University of Adelaide, worked with PNG's National Agriculture Research Institute to set up a commercially viable factory to kickstart the fledgling industry. The pilot factory, at Kerevat in East New Britain, has grown from 100 kilograms to over 65 tonnes. Initially, the nuts were sold at regional markets in the province but the project's market research identified potential markets for the processed nuts in regional hotels, tourist venues and supermarkets. In 2018, the Galip Nut Company was launched, producing three lines of packaged galip nuts— natural, peeled and roasted.

The Port Moresby launch, in July 2018, targeted hotels, duty-free outlets and selected supermarkets. According to Professor Wallace, 'the nuts have flown off the shelves of the local supermarkets and duty-free shops. We have now employed about 1000 smallholders, who are often women with little farms, who now have a new income stream'.

**0.1 to 65 t**

**pilot factory output  
over project period**



## Enabling legislation

ACIAR is established by the *Australian Centre for International Agricultural Research Act 1982*, as amended. Also established under the Act are the Commission for International Agricultural Research, and the Policy Advisory Council.

## Responsible minister

ACIAR is part of the Australian Government's Foreign Affairs and Trade portfolio, and is accountable to the Minister for Foreign Affairs, Senator the Hon. Marise Payne.

## Governance

ACIAR has an executive management governance structure headed by the Chief Executive Officer.

## Vision

ACIAR looks to a world where poverty has been reduced and the livelihoods of many improved, through more productive and sustainable agriculture emerging from collaborative international research.

## Mission

To achieve more productive and sustainable agricultural systems for the benefit of developing countries and Australia, through international agricultural research partnerships.



# How ACIAR operates

**ACIAR is a non-corporate government entity that has an executive management governance structure.**

The CEO is directly responsible to the Minister for managing the affairs of ACIAR, in a way that provides proper use of Australian Government resources for which the CEO is responsible. As agency head, the CEO is also responsible for managing the agency with direct accountability to the Australian Government.

An executive team supports and advises the CEO on strategic priorities and corporate and operational policies.

## ACIAR Executive 2018-19

### Chief Executive Officer

Professor Andrew Campbell

### Chief Finance Officer

Ms Audrey Gormley

### Chief Scientist

Dr Daniel Walker

### General Manager, Outreach and Capacity Building

Ms Eleanor Dean

### General Manager, Country Programs

Dr Peter Horne

### General Manager, Global Program

Ms Mellissa Wood

## Snapshot of ACIAR staff at 30 June 2019

### Staff\* employed under Public Service Act

Staff employed	61 (57.91 FTE)
Median length of APS service	3 years
Median age	43
Females as % of total	70%
NESB staff as % of total	26%
Part-time staff as % of total	18%
Non-ongoing staff as % of total	42%
Employee turnover for 2018-19	21%
Employees who identify as Indigenous	0%

### Staff employed overseas (non-APS staff)

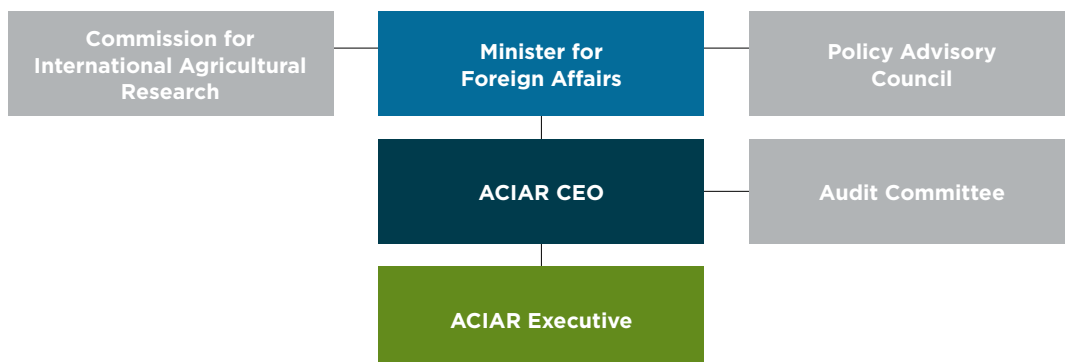
Staff employed	22
Females as % of total	68%
Part-time staff as % of total	0%

\*excludes CEO

For more information about corporate planning and reporting, please consult the following publications, which are available at [aciar.gov.au](http://aciar.gov.au) or on request:

- » ACIAR 10-Year Strategy 2018-2027
- » Annual Operational Plan 2018-19
- » Corporate Plan 2018-19
- » Annual Report 2018-19

## Governance structure of ACIAR



# Financial overview

**As an agency of the Australian Government, the operations of ACIAR are categorised as departmental or administered activities.**

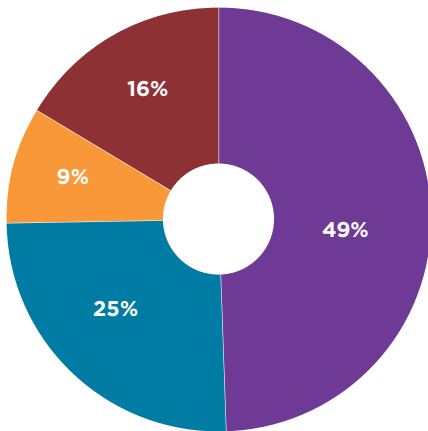
Departmental activities involve the use of assets, liabilities, income and expenses controlled or incurred by ACIAR in its own right, i.e. the costs of running the business.

Administered activities involve the management or oversight by ACIAR, on behalf of the Australian Government, of items controlled or incurred by the government, i.e. the costs of program delivery.

The proportion of research expenditure in each of the ACIAR regions of operation is shown in the charts below.

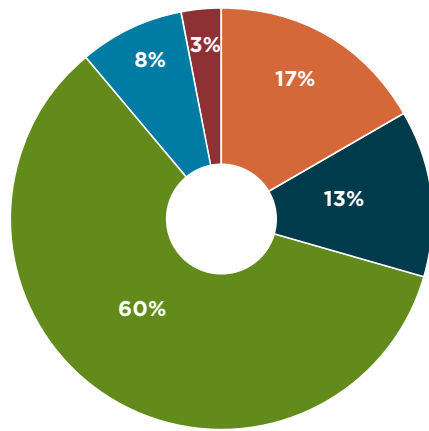
The table (right) shows administered expenditure by ACIAR on programs and activity in partner countries.

**Research expenditure by region, 2018-19**



- Pacific
- East & South-East Asia
- South Asia
- Eastern & Southern Africa

**Research expenditure by program, 2018-19**



- Multilateral partnerships
- Co-investment programs
- Bilateral research projects
- Capacity building
- Outreach

Note: due to rounding, totals may not add up to 100%

## Administered expenditure by ACIAR, 2016-17 to 2018-19

	2016-17 actual (\$)	2017-18 actual (\$)	2018-19 budget (\$)	2018-19 actual (\$)
Multilateral partnerships	22,642,074	20,710,000	19,107,000	19,204,000
Bilateral research projects & co-investment programs				
Pacific	21,514,066	19,830,000	19,160,000	18,013,241
Papua New Guinea	13,074,941	10,500,000	8,220,000	7,881,344
Pacific island countries	8,439,125	9,330,000	10,940,000	10,131,897
East & South-East Asia	31,010,857	30,250,000	35,290,000	34,738,450
Cambodia	2,858,176	2,730,000	2,940,000	2,660,631
China	685,844	700,000	790,000	632,705
Indonesia	6,371,288	7,780,000	9,960,000	10,191,129
Laos	5,257,492	4,670,000	4,760,000	4,867,819
Malaysia	—	—	190,000	66,000
Mongolia	199,073	200,000	190,000	176,031
Myanmar	4,155,367	4,200,000	4,340,000	4,655,008
Philippines	4,860,647	3,660,000	4,130,000	3,986,761
Thailand	173,111	—	20,000	69,000
Timor-Leste	1,523,684	1,190,000	2,380,000	1,904,368
Vietnam	4,926,175	5,120,000	5,590,000	5,528,998
South Asia	13,545,229	11,710,000	12,470,000	11,414,960
Afghanistan	3,125,196	480,000	—	—
Bangladesh	2,117,308	2,590,000	3,550,000	3,318,764
Bhutan	61,718	—	—	—
India	3,197,360	3,150,000	2,580,000	2,648,028
Nepal	1,465,173	1,310,000	1,580,000	1,203,628
Pakistan	3,558,474	4,180,000	4,640,000	4,102,607
Sri Lanka	20,000	—	—	141,933
Other	—	—	120,000	—
Eastern & Southern Africa	12,175,417	11,810,000	9,020,000	6,731,266
Bilateral research projects & co-investment programs (total)	78,245,569	73,600,000	75,940,000	70,897,917
Capacity building	7,545,969	8,300,000	8,418,000	9,339,656
Outreach	607,327	1,320,000	2,500,000	2,864,927
Impact evaluation	400,371	780,000	1,040,000	361,897
Program support	2,064,454	7,781,000	10,625,000	10,548,603
<b>TOTAL</b>	<b>111,284,622</b>	<b>112,491,000</b>	<b>117,630,000</b>	<b>113,217,000</b>

CASE STUDY

# Being water smart



A Virtual Irrigation Academy to improve water productivity  
LWR/2014/085,  
WAC/2018/162



## CASE STUDY

# Being water smart

A group of Malawi farmers sing enthusiastically, and with a compelling rhythm, 'VIA ... lift us up; VIA ... lift us up'. They are singing about the Virtual Irrigation Academy (VIA) and celebrating the benefits of innovative irrigation technologies. This can be viewed on the Virtual Irrigation Academy website—[via.farm](http://via.farm).

According to Dr Richard Stirzaker of CSIRO and project leader of the ACIAR-supported Virtual Irrigation Academy project, it is primarily the smallholder farmers that 'have lifted themselves up'. The aim of the academy is to build a social movement around water and food, combining simple irrigation monitoring technology with an online communication and learning system.

The key element of the irrigation monitoring technology is the Chameleon, which like its African namesake, changes colour according to its environment. In this case, the Chameleon is a set of sensors that measures soil moisture levels at three depths in the soil. Indicators change colour (red, green or blue) depending on moisture levels. The device also has sensors to measure soil nutrient and salt levels. A wi-fi reader in the device sends captured data to the Virtual Irrigation Academy cloud.

The project has been running in Malawi, Tanzania and South Africa, where it has been so successful the approach is now being adopted more widely across Africa, and in South Asia countries such as Pakistan.

Where farmers had been irrigating five to six times a week, they are now watering once to twice a week, saving water, money and time. There was also much less conflict over water, and valuable nutrients were not leached out by overwatering. Crop quality and yield also have improved.

In Zimbabwe, local farmer, Mr Sergent Nkomo explained, 'there is a big difference between how our parents did it (irrigated) and now. Growing up, I knew it was Friday, so we must irrigate. We didn't think of fertiliser being washed away when using excessive water'.

Improved water use efficiency and reduction in diseases promoted by overwatering have seen up to 30% reduction in water usage and a 30% increase in crop yields.

The program now covers over 1000 crops across 17 countries in Africa, Asia and the Pacific—from the original African countries of Malawi, South Africa and Tanzania, with over 1000 operational sensor arrays between them; to Australia, with almost 200; and small Pacific nations such as Kiribati, with six operational arrays.

Less water

**30%**

More yield

## In the national interest

**Australia's security and economic interests are interlinked with those of our partner countries in the Indo-Pacific region.**

Investment by the Australian Government in agricultural development, through ACIAR, provides support and opportunity for our partners, and contributes to processes promoting peace and economic growth. Our participation in such processes maintains and builds Australia's reputation as a trusted science partner and leader in the agriculture and natural resource management sectors.

ACIAR-supported research primarily helps smallholder farmers, fishers and foresters in low and middle-income countries in the Indo-Pacific region, and the supporting science and policy organisations in those countries. However, our research partnership models also deliver benefits to Australian agriculture, aquaculture and forestry, through access to new technologies, more productive and resilient plants and livestock, and better understanding of pests and diseases, as well as increased knowledge and skills of our scientists.

### Mungbeans in Australia

Australia's five-year average for mungbean production was 76,000 tonnes, with a value of \$86 million. More than 90% of production is exported to India and South-East Asia. Export standards are stringent and there are big price differentials between the three grades: sprouting, cooking and processing. Even minor insect damage to the bean, for example, will reduce quality grading.

The ACIAR-supported International Mungbean Improvement Network is contributing to Australia's competitiveness in a growing world market.

Speaking to mungbean growers in Queensland, in April 2019, Dr Col Douglas, senior plant breeder with Queensland Department of Agriculture and Fisheries, reinforced the benefits of Australia participating in the network, and contributing to the vast amount of data being generated on higher yielding and pest- and disease-resistant lines of mungbean. Dr Douglas is the Australian project leader for the network.

'We have an exciting project ... to implement new breeding technologies and crop physiology—work that is beyond the scope of what we in Australia could achieve alone,' Dr Douglas said.

Through the network and the National Mungbean Improvement Program, and in conjunction with QDAF and the Grains Research and Development Corporation, Dr Douglas says the focus on genetic resistance to disease is the cornerstone of mungbean research.

'Combined with breeding for high-yielding varieties, genetic resistance is key to securing a reliable future for the (Australian) mungbean industry,' Dr Douglas said.

ACIAR project CIM/2014/079







### Breeding better bivalves

The bivalve production project that facilitated expansion of the oyster industry in Vietnam, also has advanced production techniques and seed supply in Australia for Sydney rock oyster, the flat oyster, pipis and razor clams (see page 4).

The Australian flat oyster (*Ostrea angasi*) is increasingly sought after in Australian restaurants. Flat oysters were abundant in pre-colonial times, as evidenced by shells deposited by Aboriginal people in coastal middens. However, colonists soon exhausted supplies of these shells, which they burned to produce quicklime for mortar and plaster, and they then dredged bays and estuaries for live oysters. Ongoing dredging decimated flat oyster reefs by the early 20th century.

The project produced 3.8 million flat oyster seeds and distributed them to industry—at a farmgate value of more than \$1 million. The project refined production methodology and shared it with hatcheries around the country. This has contributed to flat oyster seed for reef restoration projects in Tasmania, Victoria and South Australia, and commercial production trials in South Australia.

ACIAR project FIS/2010/100

### Protecting Australia and the Pacific

Enhanced biosecurity capacity in the Pacific region is vital for protecting the agricultural economies of Australia and its close neighbours. The Australia-Pacific Plant Biosecurity Partnership commenced in 2019 to increase biosecurity capacity throughout the region, and in turn increase production, market access, food security and incomes.

Many Pacific island countries are increasingly important trading partners to Australia, such as: Papua New Guinea for coffee; Fiji, Samoa and Solomon Islands for coconut oil; Samoa and Tonga for coconuts, brazil nuts and cashews; and Tonga for cassava. Several plant diseases and pests found in these products have the potential to adversely affect Australian agriculture.

The program will also prepare the region to manage new threats, such as the giant African snail, the coconut rhino beetle and the coffee berry borer. These threats are growing due to expanding trade in agricultural commodities, increasing tourism and international travel, and a changing climate creating conditions to allow pests and diseases to spread.

ACIAR project GP/2018/109

# Contact ACIAR

## Australian Centre for International Agricultural Research

GPO Box 1571, Canberra ACT 2601, Australia

**Phone** +61 2 6217 0500

**Fax** +61 2 6217 0501

**Email** [aciar@aciar.gov.au](mailto:aciar@aciar.gov.au)

**Facebook** [ACIARAustralia](#)

**Twitter** [@ACIARAustralia](#)

**Instagram** [@ACIARAustralia](#)

**LinkedIn** Australian Centre for  
International Agricultural  
Research

**YouTube** [ACIAR Australia](#)

**Enquiries about this report are  
welcome, and should be directed to:**

General Manager, Outreach and  
Capacity Building

# Key staff at ACIAR

## ACIAR Executive

### Chief Executive Officer

Prof. Andrew Campbell  
Phone: +61 2 6217 0578  
andrew.campbell@aciar.gov.au

### Chief Finance Officer

Ms Audrey Gormley  
Phone: +61 2 6217 0567  
audrey.gormley@aciar.gov.au

### Chief Scientist

Dr Daniel Walker  
Phone: +61 2 6217 0561  
daniel.walker@aciar.gov.au

### General Manager, Country Programs

Dr Peter Horne  
Phone: +61 2 6217 0522  
peter.horne@aciar.gov.au

### General Manager, Outreach and Capacity Building

Ms Eleanor Dean  
Phone: +61 2 6217 0547  
eleanor.dean@aciar.gov.au

## Country and Regional Managers

### Africa

Dr Leah Ndungu  
Phone: +254 20 2177 782  
leah.ndungu@aciar.gov.au

### East and South-East Asia

Ms Dulce Simmanivong  
Phone: +856 21 353 800 ext. 227  
dulce.simmanivong@aciar.gov.au

### China

Mr Wang Guanglin  
Phone: +86 10 5140 4172  
guanglin.wang@aciar.gov.au

### Indonesia

Ms Mirah Nuryati PSM  
Phone: +62 21 2550 5577  
mirah.nuryati@aciar.gov.au

### Pacific region (including PNG)

Ms Florence Rahiria  
Phone: +679 3388 284  
florence.rahiria@aciar.gov.au

### Papua New Guinea

Ms Doreen Iga  
Phone: +675 325 9333 ext 299  
doreen.iga@aciar.gov.au

### Pakistan

Dr Munawar Raza Kazmi  
Phone: +92 51 8355 367  
munawar.kazmi@aciar.gov.au

### Philippines

Ms Gay (Mai) Maureen Alagcan  
Phone: +632 757 8241  
mai.alagcan@aciar.gov.au

### South Asia

Dr Pratibha Singh  
Phone: +91 11 4139 9925  
pratibha.singh@aciar.gov.au

### Vietnam

Ms Nguyen Thi Thanh An  
Phone: +84 24 3774 0263  
an.nguyen@aciar.gov.au

## Research Program Managers

### Agribusiness

Mr Howard Hall  
Phone: +61 2 6217 0541  
howard.hall@aciar.gov.au

### Crops

Dr Eric Huttner  
Phone: +61 2 6217 0527  
eric.huttner@aciar.gov.au

### Fisheries

Dr Ann Fleming  
Phone: +61 2 6217 0508  
ann.fleming@aciar.gov.au

### Forestry

Dr Nora Devoe  
Phone: +61 2 6217 0549  
nora.devoe@aciar.gov.au

### Horticulture

Ms Irene Kernot  
Phone: +61 2 6217 0530  
irene.kernot@aciar.gov.au

### Livestock Systems

Dr Anna Okello  
Phone: +61 2 6217 0560  
anna.okello@aciar.gov.au

### Social Sciences

Dr Jayne Curnow  
Phone: +61 2 6217 0532  
jayne.curnow@aciar.gov.au

### Soil and Land Management

Dr James Quilty  
Phone: +61 2 6217 0558  
james.quilty@aciar.gov.au

### Water and Climate

Dr Robyn Johnston  
Phone: +61 2 6217 0540  
robyn.johnston@aciar.gov.au

### Portfolio Planning and Impact Evaluation

Ms Bethany Davies  
Phone: +61 2 6217 0510  
bethany.davies@aciar.gov.au

