



40

**years of ACIAR**









**Australian Government**

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**Australian Centre for  
International Agricultural Research**



**40**

**years of ACIAR**



..... Mrs Fiona Simson and women farmers talk with media representatives at the site of an ACIAR-supported project trialling salt-tolerant wheat and pulses in smallholder farming systems in southern Bangladesh.

Photo: ACIAR | 2023





# Foreword

**For many years before my appointment as Chair of the Commission for International Agricultural Research, Australia, I was aware of the significant positive impact that the Australian Centre for International Agricultural Research (ACIAR) had both within Australia, and in the nations of the Indo-Pacific region.**

ACIAR began operating in 1982 to deploy Australia's strengths in agricultural science to improve the livelihoods of smallholder farmers, fishers and foresters in the Indo-Pacific region through international agricultural research for development.

This very special publication captures the story of ACIAR so far. It features achievements and highlights over four decades of Australia working with our regional neighbours to improve the productivity and sustainability of their agricultural systems, to increase food security and the resilience of supply chains.

I know firsthand that the funding ACIAR invests into research projects and capacity building also has a domestic benefit, with these activities focusing on topics that also matter to Australian agriculture – biosecurity, trade, supply chains and food security. The positive outcomes ACIAR generates are inspirational.

Farming is an industry of the future, and through collaboration and innovation, we can improve how the world produces food, nourishes people and manages natural resources.

What ACIAR has been able to achieve over such a long period of time, in so many different countries and contexts, as well as the benefits brought back to Australia, is astounding.

As an Australian citizen, a farmer and an industry leader, I am extremely proud of ACIAR. It is a unique part of our agricultural innovation system, delivering major benefits for our partner countries, and for Australia, for 40 years.

**Fiona Simson**

Chair, Commission for International Agricultural Research, Australia





**Mission,  
Vision and  
Objectives**

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to Australia**

**58**

**Building  
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**104**

**40 years  
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**Benefits for  
smallholder  
farmers**

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*Development assistance programs aimed at reducing poverty and improving health and resource management ... have a key role in strategies for peace building, peace keeping and peace restoration. In this sense, overseas aid is patently not charity. Rather, it is an investment in global and regional security and prosperity. It is also an investment in the future with all the inter-generational benefits that implies ... Agricultural research has proved one of the most effective forms of aid. It has brought improved living standards in developing countries and substantial benefits for Australian agriculture – and therefore the Australian community.*

**The Honourable Gordon Bilney**  
Minister for Development Cooperation and  
Pacific Island Affairs, Australia (1994)



# Introduction

**The Australian Centre for International Agricultural Research (ACIAR) was established by an Act of the Australian Parliament in 1982 'to encourage research for the purpose of identifying, or finding solutions to, agricultural problems of developing countries'.**

Forty years on, ACIAR has implemented more than 1,500 agricultural research-for-development projects, with more than 400 project partners, in almost 40 different countries. In doing so, ACIAR supports Australia's commitment to contributing to poverty reduction and livelihood improvement in the Indo-Pacific region.

Underlying strong partnerships and diverse projects are the people who have contributed to the story of ACIAR – starting with the people who conceived and developed such an agency, and the hundreds of ACIAR staff and project teams from Australian science institutions who worked with thousands of partner-country scientists and smallholder farmers.

While it is appropriate to celebrate the partnerships, projects and people across the history of the organisation, ACIAR acknowledges there is still much work to be done and the ACIAR mandate remains as relevant as it was in 1982.

All the stories of ACIAR would fill many books. To mark 40 years of operation, a small selection of partnerships, projects and people have been profiled to convey the impact of ACIAR across regions, countries and different fields of research.

This book is a tribute to the work of everyone who has been involved with ACIAR before and beyond 1982. To the many unnamed contributors to the ACIAR story, as well as to those appearing in the pages ahead, thank you and congratulations.

To all interested in agricultural research for development in the Indo-Pacific region, please enjoy reading about some of the highlights, successes and learnings from 40 years of ACIAR.



## Highlights and learnings

**This book is testament to how ACIAR has invested a small share of the Australian development assistance budget to broker and fund partnerships that foster the transfer of knowledge and expertise to support more productive and sustainable agriculture. Importantly, this approach to establishing science partnerships builds relationships that endure well beyond the life of a research project.**



### Establishment

ACIAR emerged and developed from the inspiration of a few and the passion of many.

The vision of a centre to coordinate the sharing of Australia's expertise and knowledge in agricultural sciences to contribute to global efforts to address food insecurity and poverty was first proposed in the 1970s.

ACIAR started its journey from vision to reality when the Australian Government sought ideas for an aid initiative to address global economic disparities to present at the Commonwealth Heads of Government Meeting (CHOGM) in Melbourne in 1981.

This book presents a brief account of the establishment of ACIAR. Not every person who advocated, championed and guided ACIAR to where it is today is acknowledged in this book; however, each person's valuable contribution is well recognised and gratefully appreciated.

**Read more - Page 7**



### Partnerships

ACIAR has a unique role in development assistance, in that it brokers, facilitates and invests in research partnerships, rather than directly funding community-based programs and infrastructure and working with beneficiaries.

ACIAR brings together public and private research institutions, in Australia and in partner countries, to work towards its strategic objectives. The achievements of ACIAR are very much due to the partnerships that have been developed and fostered over 40 years.

ACIAR is also mandated to be Australia's representative on the global stage for international agricultural research for development – the most significant of these collaborations is participation in CGIAR.

This book acknowledges the all-important partnerships that have been developed and fostered to improve the productivity and sustainability of agriculture, fisheries and forestry in the Indo-Pacific region.

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### Projects

ACIAR is recognised for its innovative and flexible approach to project design and support of research objectives.

ACIAR-supported research has ranged from investigating better grain storage techniques, to improving test methods for foot-and-mouth disease, protecting diversity of food crops, improving tree genetics, strengthening the sustainability of fisheries, managing groundwater better, adapting to and mitigating climate change impacts, and providing opportunities for women and minority groups within supply chains.

This book presents a very small selection of projects from 40 years, to convey the many shapes and forms of success and learning. It also highlights projects that were not successful in terms of planned and anticipated outcomes nonetheless imparted learnings and skills for project participants, and learnings for future project design.

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### People

People are the fabric of the success and longevity of ACIAR. This book captures some of the stories of people who have worked for and with ACIAR, demonstrating the power of connecting people and sharing expertise across communities and cultures.

For every story of ACIAR, there is a Research Program Manager and a Program Support Officer who have shepherded through a project from concept to conclusion. For most projects there are many contributors: a project leader and a team of researchers from Australia, partner-country researchers and partner-country agency personnel. And there are smallholder farmers and their families who contribute time, experience and enthusiasm.

It is not possible to name all the people who have been associated with ACIAR or an ACIAR project in this book. But the fact that ACIAR remains strong and valued is testament to each and every person who has been part of the ACIAR story.

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### Benefits to Australia

The improved practices and technologies that are developed through ACIAR-funded projects overseas also address challenges for agriculture, fisheries and forestry in Australia. Through building Australia's knowledge base and the capacity of researchers in Australia and partner countries, ACIAR is regarded as a trusted science partner across the region. Although difficult to assign a dollar value, there is significant soft power benefit from the contribution that ACIAR makes as a broker of agricultural science collaborations.

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### Building resilience

Rebuilding livelihoods is never simple, but ACIAR-supported projects in many locations of the Indo-Pacific region have contributed to resilience and rebuilding of communities and their production systems in the face of sudden shocks. Over four decades, many smallholder farmers and research partners have been impacted by natural disasters, civil unrest, economic downturns and, of course, the COVID-19 pandemic. Amid the disruption, often the knowledge, skills and capacity gained from an ACIAR project have contributed to recovery.

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### 40 years of impact

Assessing the impact of agricultural research for development is an integral part of the ACIAR operational model, enabling a better understanding of the value of investment of research funds, as well as learning how to design research more effectively in the future.

In the 100th ACIAR impact assessment, which analysed about 10% of ACIAR investment in research for development over 40 years, the total benefit was estimated to be in excess of A\$64 billion. This translates to a benefit of A\$43 for every dollar invested.

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### Looking forward

Professor Andrew Campbell, ACIAR Chief Executive Officer (2017–2023), contends that the need for ACIAR is more acute than ever and that the ACIAR business model needs to continue to adapt to contribute to sustainable development in the Indo-Pacific region. He has every confidence, given the calibre and commitment of people working within and with ACIAR that 'this mighty little organisation can continue to make a big difference in developing solutions for the biggest problems of our time'.

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# Mission

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

# 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.

# Strategic objectives



**Improving food security and reducing poverty among smallholder farmers and rural communities**



**Managing natural resources and producing food more sustainably, adapting to climate variability and mitigating climate change**



**Enhancing human nutrition and reducing risks to human health**



**Improving gender equity and empowerment of women and girls**



**Fostering more inclusive agrifood and forestry value chains, engaging the private sector where possible**



**Building scientific and policy capability within our partner countries**



*ACIAR started with a distinct advantage of credibility and importance because of the reputation of Sir John Crawford. As the first Director of ACIAR, I had the privileged but daunting task of turning a concept into a functioning and successful organisation.*

*Sir John, as the first Chair of the ACIAR Board of Management, made very few demands but was always ready to offer support and influence. His directive was simple: get quality people and produce quality results, quickly.*

*The most important characteristic we wanted to establish for ACIAR was that it was an organisation that built true partnerships. That started with asking scientists in developing countries 'how can we help?'*

*Collaborative research was not a new concept but our approach of working with developing country research teams to develop and transfer appropriate technology and to build their own research capability, did represent a new approach to development. It was a model that soon started delivering sustained benefits and ultimately, stimulating agricultural economies.*

*Our approach was underpinned by engaging quality people. We had no trouble attracting distinguished scientists to lead projects. That immediately gave us gravitas in the partner country and ensured robust research was instigated.*

*We also appointed quality people within ACIAR. From those who managed the research program – internationally recognised scientists with strong networks and a passion for research for development – to those we needed to develop and manage rigorous administration and finance systems.*

**Professor Jim McWilliam AO**

ACIAR Director (1982–1989)



# Establishment

**The success of the Australian Centre for International Agricultural Research (ACIAR) started with the Australian economist, Sir John Crawford. He had a vision of sharing Australia's expertise and knowledge in agricultural sciences to contribute to global efforts to address food insecurity and poverty.**

Throughout the 1970s and into the early 1980s, Sir John and several prominent scientists, academics and public servants developed the concept of an Australian Government centre to realise this potential.

In 1982, the vision of an Australian international agricultural research centre became reality. The *Australian Centre for International Agricultural Research Act 1982* was passed in both houses of the Australian Parliament with bipartisan support and the Act was proclaimed by the Governor-General on 3 June 1982.

The science partnerships and projects that were required to address the challenges faced by smallholder farmers, fishers and foresters were envisaged to yield mutual benefits for the partner countries and Australia. That success has been consolidated and built upon by many people over four decades across four regions of the Indo-Pacific: Eastern and Southern Africa, East and South-East Asia, South and West Asia, and the Pacific.

This account of the establishment of ACIAR is brief. Many people advocated, championed and guided ACIAR to where it is today, however it was not possible to name them all in this book. The contributions of everyone involved in the establishment of ACIAR are highly valued and gratefully acknowledged.



## A government agency borne of vision and goodwill



Professor Gabrielle Persley AM has a distinguished career in international agricultural research, food security and biotechnology. First she worked as a plant pathologist in Australia, the United Kingdom and West Africa, focusing on the improvement of tropical crops. She joined the Australian Development Assistance Bureau (ADAB) in 1980. Professor Persley was the first staff appointment to ACIAR in 1982, as Scientific Adviser, and then Program Coordinator (1983–1991).

From 1991, Professor Persley worked with several multilateral organisations, including as Biotechnology Manager at the World Bank and Senior Adviser to the Director-General of the International Livestock Research Institute. Professor Persley has served on many Australian and international boards, including Australia's Commission for International Agricultural Research (2017–2020) and the Centre for Agriculture and Bioscience International (CABI) in the United Kingdom. She is currently Honorary Professor at the School of Agriculture and Food Sciences, University of Queensland, and Chair of the Doyle Foundation, Scotland, which advocates the role of science and technology in development.

Australian agriculturalists have found many opportunities over the years to share their expertise with developing countries.

The Colombo Plan, launched in 1950, provided one avenue to contribute to development in Asia. As well as supporting students to study in Australia, the plan facilitated technical assistance to developing countries.

Scientists of the Commonwealth Scientific and Industrial Research Organisation (CSIRO) worked on agricultural projects from the late 1950s in India, Thailand and Vietnam, and hosted visiting scientists in its own laboratories in Australia.

The Australian Government overseas aid program supported agricultural and rural development projects, mainly in Asia, from the 1960s onwards. These were primarily technical assistance projects, delivered overseas by Australian agricultural consulting companies.

There was, however, limited institutional engagement from Australian agricultural scientists, who were developing new technologies such as improved crop varieties, pest and disease control, and animal vaccines to increase the productivity of Australian agriculture, which were also of potential benefit to farmers in the developing world.

Increasingly, a growing number of Australians with experience in international agriculture could see the potential benefit of formal arrangements for sharing Australian expertise in agricultural science with researchers and farmers in developing countries.

The seeds from which ACIAR developed were sown during the 1970s, and a proposal evolved for an agency to facilitate the contribution of Australian agricultural science and innovation to global efforts to reduce food insecurity and poverty.

The proposal took flight in 1981 when the Australian Prime Minister, the Honourable Malcolm Fraser, sought ideas from his department (the department of Prime Minister and Cabinet) and the Australian Development Assistance Bureau (ADAB) for an aid initiative that he could present at the Commonwealth Heads of Government Meeting (CHOGM).

Professor Gabrielle Persley had the unique experience of working on both sides of the proposal.

Returning to Australia from a research position in West Africa in 1980, the then Dr Persley joined the Science and Technology Unit of ADAB. In early 1981, she was seconded to be science adviser on a task force established to prepare a Cabinet submission, legislation and implementation plans for a new agricultural research initiative within the Australian aid program. The end result was a new government agency to be called the Australian Centre for International Agricultural Research.





## The genesis of ACIAR

Australian economist Sir John Crawford could see the unique potential of Australian agricultural science in contributing to global efforts to address food insecurity and poverty. During the 1970s, Sir John was serving on the Board of Canada's International Development Research Centre (IDRC) – a government agency in the foreign affairs portfolio focused on improving the lives of people in developing countries through research, and one which strongly influenced the model for ACIAR.

Sir John's vision of Australia playing a more prominent role in agricultural research for development was the subject of several studies, most of which he led.

In 1974, he prepared a 'Proposal for an Institute of Development Studies' for the Advisory Board of ADAB. Subsequently, he convened a small private study committee to address the question, 'Would Australia's aid to developing countries in science and technology be more effective if it were managed by an independent body?'

Together with Mr Alban Gurnett-Smith, Mr Guy Gresford and Mr Anthony Neylan, Sir John prepared a report to the Australian Government in 1975 entitled 'Proposal to establish an International Research Assistance Foundation'. The committee reported in 1976 that the idea had merit and recommended a more comprehensive study.

At the same time, in his position as head of Australia's overseas aid agency, Mr Jim Ingram was concerned about the limited engagement of science institutions in overseas aid programs and committed to enhancing the role of science and technology in the Australian aid program.

## A remarkable Australian Sir John Crawford AC (1910–1984)

Sir John was a remarkable Australian who contributed at the highest levels to the economic development of Australia and other countries. He was also a passionate supporter of international agricultural research for development.



Among his many achievements and appointments, Sir John was:

- » an architect of Australia's postwar growth from the late 1940s and through the 1950s
- » instrumental in establishing the Bureau of Agricultural Economics (now Australian Bureau of Agricultural and Resource Economics and Sciences) in 1945 and was its founding Director until 1950
- » Secretary of the Department of Commerce and Agriculture (1950–1956), and after a reorganisation of government departments, Secretary of the new Department of Trade (1956–1960)
- » inaugural Director of the Research School of Pacific Studies and Professor of Economics, from 1960, Vice-Chancellor (1968–1973) and Chancellor (1976–1984) at the Australian National University
- » a strong advocate for the development of a global partnership of organisations engaged in research for a food-secured future, which resulted in CGIAR (formerly known as Consultative Group on International Agricultural Research) – Sir John was the first Chair of the CGIAR Technical Advisory Committee (1971–1976)
- » a member of the inaugural Board of Governors for the International Development Research Centre (IDRC), Canada (1970–1980)
- » instrumental in the establishment of the International Food Policy Research Institute (IFPRI) in 1975 and served as its first Chair (1975–1981)
- » lead architect of the proposal to establish the Australian Centre for International Agricultural Research (ACIAR) and served as the first Chair of the ACIAR Board (1982–1984).

The Crawford Fund, a not-for-profit organisation that highlights, promotes and supports Australia's engagement in international agricultural research for development, is named in honour of Sir John Crawford. The Fund is a close partner of ACIAR and is described in more detail on page 47.

In 1977, Mr Ingram established the Science and Technology Unit within ADAB and the Consultative Committee on Research for Development (CCRD).

Sir John was asked to chair CCRD, which brought together senior figures in the Australian Public Service and the Australian research community and quickly came to the attention of the Minister for Foreign Affairs. Dr Denis Blight, who was working at the Department of Foreign Affairs at the time, was seconded to ADAB as head of the new Science and Technology Unit and appointed Secretary to the CCRD.

At the first meeting of CCRD in November 1977, Sir John said, 'For many years, a number of us have felt that Australia has much to offer developing countries in the field of research and that a concerted effort should be made in this direction.'

The task for CCRD was to find ways to increase the engagement of the Australian scientific community in the Australian overseas aid program, including (but not limited to) agricultural research and development. The agricultural subgroup of CCRD, chaired by Dr Ted Henzell, Chief of the CSIRO Division of Tropical Crops and Pastures, was particularly concerned with how Australia's expertise in agricultural research could contribute towards improving agriculture in neighbouring countries in a more enduring, systematic way than by a project-by-project basis.

ADAB commissioned a study, led by Professor Helen Hughes of the Australian National University, on the feasibility of Australia establishing an agency, similar to the Canadian IDRC addressing agriculture, health and education. Thus, when the timing was right, a plan for an agricultural research initiative within the overseas aid program had been conceived.

### **A distinguished diplomat and humanitarian** **Mr James (Jim) Ingram AO (1928–2023)**



Mr Jim Ingram had a long and distinguished career as an Australian diplomat. He attained a diplomatic cadetship with the Department of External Affairs in 1946, and from 1950 held many diplomatic positions. In 1964, Mr Ingram returned to Australia as Assistant Secretary in the Department for Foreign Affairs with oversight of Australia's relationships with the countries of East and South Asia, the Americas, the South Pacific and of the Asia Pacific Council.

In 1973 he was appointed Australian High Commissioner to Canada, and concurrently non-resident High Commissioner to several newly independent Caribbean nations. During his time in Canada, Mr Ingram observed the creation of the Canadian International Development Assistance Agency and its sister organisation, the International Development Research Centre (IDRC). This planted seeds for his thinking on comparable reforms to Australia's aid structures.

In 1975, Mr Ingram was appointed head of the Australian Development Assistance Agency, which became the Australian Development Assistance Bureau (ADAB) in 1977. The appointment was an opportunity to put into practice his deep, personal commitment to equity, efficiency and international peace through economic development.

Jointly with Sir John Crawford, and supported by others, he worked to improve the quality of Australia's bilateral and multilateral aid programs. With the support of Sir John, he carefully managed engagement and negotiations with politicians, scientists, bureaucrats and state governments that led to the creation of the Australian Centre for International Agricultural Research (ACIAR) in 1982.

In 1982, Mr Ingram started two terms as Executive Director of the United Nations World Food Program. His work there was described by former Minister for Foreign Affairs, the Honourable Gareth Evans: 'The World Food Program is now not only the world's biggest humanitarian agency, but one of its most respected and effective. That it became so is very much the legacy of Jim Ingram.'



## Inspiration becomes legislation

The 1981 meeting of CHOGM was to focus on global economic disparities. In preparation for the meeting to be held in Melbourne in October of that year, Prime Minister Fraser sought ideas for an aid initiative that he could present to the meeting from his department of Prime Minister and Cabinet and from ADAB.

Sir John and Mr Ingram put forward the idea of an agricultural research initiative, based on the recognition and discussions of CCRD that agricultural research for development was an area where the Australian aid program could achieve more. The concept was to create an Australian international agricultural research centre that would support partnerships between scientists in Australia and developing countries to solve problems of joint interest.

The concept of Australia supporting research partnerships with neighbouring countries to solve problems for mutual benefit to Australia and the partner countries was the critical distinguishing feature of the initiative,' said Professor Persley.

'A task force was formed within ADAB in January 1981, chaired by Dr John Baker, to develop the initiative further. As the only agricultural scientist working in ADAB at the time, I was seconded to work on the task force as science adviser. In February 1981, the Prime Minister decided he would announce the initiative at CHOGM. That basically gave us nine months to prepare a submission to the Australian Government.'

The Minister for Foreign Affairs, the Honourable Tony Street, was also crucial in supporting the vision of ACIAR and the legislation that would create it. Under his direction, Mr Ingram and Dr Baker established and drove the task force to develop a Cabinet submission.



The first professional scientific staff of ACIAR, in July 1983. Left to right: Dr Gabrielle Persley (Program Coordinator, Plant Protection and Plant Improvement), Dr John Copland (Program Coordinator, Animal Sciences and Fisheries), Dr Jim Ryan (Deputy Director and Program Coordinator, Socio-economics and Farming Systems), Professor Jim McWilliam (Director), Dr Denis Blight (Centre Secretary) and Dr Eric Craswell (Program Coordinator, Soil Science and Plant Nutrition). Photo: ACIAR Newsletter No.1, 1983

The Cabinet of the Australian Government approved the initiative in July 1981 and made a financial commitment of A\$25 million. Prime Minister Fraser announced the formation of the Australian Centre for International Agricultural Research at CHOGM in October 1981.

'In later years, some people, within and beyond Australia, have spoken as though the Australian international agricultural research initiative was a great idea and that ACIAR was born overnight. But it wasn't!' said Professor Persley.

'There were years of lobbying by Sir John and other members of the CCRD to gain political support, and there was the recognition by ADAB leadership of the window of opportunity presented with Australia hosting CHOGM for the first time in 1981. And then there were many months of work by ADAB and the Department of Foreign Affairs within the public service, including convincing Treasury officials that we were not about to break the bank – a task that John Baker accomplished with aplomb!

'The success of the proposal reflected the value of having the calibre of people like Sir John and Jim Ingram involved to get others to engage. Getting the engagement of the Australian agricultural research community and the farming community was also really important. Ted Henzell from CSIRO and Graham Alexander, then Director-General of the Queensland Department of Primary Industries, were critical players in that regard. The other thing that was important was making sure that there was early bipartisan support. The concept of an agricultural research initiative was soon supported by both the major parties, and both parties supported the legislation when it came before the House of Representatives and the Senate, ensuring its smooth passage through the Parliament.'

The legislation that established ACIAR as a statutory authority, the *Australian Centre for International Agricultural Research Act 1982* (ACIAR Act), was passed with bipartisan support by the House of Representatives in October 1981 and the Senate in May 1982. The ACIAR Act was proclaimed by the Governor-General on 3 June 1982.



Scientific and administrative staff of ACIAR, with Director, Professor Jim McWilliam, centre of the seated row. The ACIAR office was located at 10 Moore Street, Canberra. Photo: ACIAR | c. 1985

Sir John Crawford was the first Chair of the Board of Management for ACIAR. Dr Denis Blight was recalled from his position as First Secretary at the Australian High Commission in London to be appointed as interim Director of ACIAR and Dr Gabrielle Persley transferred from ADAB to be appointed Science Adviser of ACIAR. Sir John oversaw the recruitment of Professor Jim McWilliam as the first permanent Director in September 1982. Sir John and the newly appointed members of the ACIAR Board of Management then worked with the incoming ACIAR Director to recruit a core group of scientific staff from 1982 to 1983.

When the ACIAR Act was established in 1982, it included a clause that the Act would expire in 1994, should the operations and effectiveness of ACIAR prove not to be worthwhile. A review of ACIAR, colloquially referred to as the Sunset Review, by the Joint Committee on Foreign Affairs, Defence and Trade was tabled in both houses of the Australian Parliament in April 1992.

The review found that ACIAR 'has had remarkable success in solving major agricultural problems and has brought much goodwill and benefits for Australia'. It made 21 recommendations, including considerations for management and operations, extending the ACIAR mandate and increasing public awareness of ACIAR. It also recommended an increase in the ACIAR share of the foreign aid budget from about 1.5 to 3.5% by 1997.

The Sunset Review concluded that ACIAR had established itself successfully around its core mandate, and thus its responsibilities could safely be extended to allied areas such as research-related training, development activities to disseminate research results, and managing Australian support to the international agricultural research centres (first initiated in 1971 at the formation of CGIAR).

The Australian Centre for International Agricultural Research Amendment Bill 1992 was passed by Parliament on 19 August 1992, with strong and universal endorsement of the Parliament. The bill amended the 1982 ACIAR Act by removing the sunset clause and extending the ACIAR mandate.

### ACIAR Act

The legislation for the *Australian Centre for International Agriculture Act 1982* is described as 'an Act to encourage research for the purpose of identifying, or finding solutions to, agricultural problems of developing countries'.

The ACIAR Act establishes the Australian Centre for International Agricultural Research, and sets out its functions, under the direction of the Chief Executive Officer. Following are the key functions as set out in the ACIAR Act, as amended in 1992:

- a) to formulate programs and policies with respect to agricultural research for either or both of the following purposes:
  - i) identifying agricultural problems of developing countries;
  - ii) finding solutions to agricultural problems of developing countries;
- b) to commission agricultural research by persons or institutions (whether the research is to be conducted in Australia or overseas) in accordance with such programs and policies; and
- c) to communicate to persons and institutions the results of such agricultural research; and
- d) to establish and fund training schemes related to the research programs referred to in paragraph (a); and
- e) to conduct and fund development activities related to those research programs; and
- f) to fund international agricultural research centres.



## Partnerships from the start

The foundations for a culture of mutual benefit and partnership at ACIAR were laid from the very start by Sir John, Professor McWilliam and ACIAR staff.

ACIAR was clearly and deliberately established to commission scientists from Australian research institutes, such as CSIRO, state government departments of agriculture and universities, and from the private sector, to lead research partnerships – it was not mandated to conduct research in its own right.

ACIAR was to serve as a research and partnership broker, bringing together research organisations and investing funding in order to facilitate collaborative projects of mutual benefit to Australian and overseas partners in the Indo-Pacific region.

‘Developing the idea of partnerships was quite a new approach at the time. It was not just about aid or technical assistance flowing in one direction. It was really a true commitment to developing partnerships with scientists and farmers and communities in the partner country and in Australia, for mutual benefit,’ Professor Persley recalled.

As a small government agency within the portfolio of Foreign Affairs and Trade, led by agricultural science professionals, ACIAR was unique and had a relatively high degree of autonomy compared with other government agencies.

The partnership model of operation continues 40 years later, enabling ACIAR to bring together the best people in the country to co-design research projects with scientists from Australia and partner countries to address a specific issue or opportunity. As a result, ACIAR has a widely and highly regarded reputation for building unique, innovative and agile teams that make a positive and significant impact.



ACIAR Director, Professor Jim McWilliam, centre and back, travelled to China in 1984 to establish the identity of ACIAR with appropriate ministries and officials, and match China's agricultural research priorities with Australian research expertise. Professor McWilliam is pictured with, from left, forester Professor Lindsay Pryor, entomologist Dr Douglas Waterhouse, Dr John Copland (ACIAR), Chinese hosts, and at back, Dr Eric Craswell (ACIAR). Photo: *Partners* magazine, 30th Anniversary edition, 2012

After experiencing the genesis, establishment and ongoing development of ACIAR, Professor Persley concluded, ‘Myriad people have contributed to ACIAR to create an institution that has improved the lives of millions of people in the developing world, and of which all Australians can be proud.’

### Further reading

There is much greater depth to the origins of ACIAR and Australia's involvement in agricultural research for development than is possible to recount in this chapter of *40 years of ACIAR*. A list of some of the publications, essays and articles written by and about those involved with ACIAR can be found on page 150.

## ACIAR governance

The ACIAR Act established that ACIAR would be governed by a Board of Management, which was responsible for the conduct and control of the affairs of the centre. The Board was answerable to the minister responsible for ACIAR, the Minister for Foreign Affairs.

In addition to establishing the functions of a centre to manage Australia's contributions to international agricultural research, the ACIAR Act also established the Policy Advisory Council. The function of the council was to advise the Minister for Foreign Affairs on agricultural problems of developing countries and on agricultural research programs and policies to identify and find solutions to these problems.

The President of the Policy Advisory Council would also serve as the Chair of the ACIAR Board of Management. The Director of ACIAR and the Director of ADAB were ex-officio members of both the board and the council.

The Australian Government commissioned a review of corporate governance of statutory authorities in 2002. Headed by Mr John Uhrig, the review examined the relationships between statutory authorities and the responsible minister, to identify ways to improve performance without compromising statutory functions.



The original and current governance structure of ACIAR and bodies established under the Australian Centre for International Agriculture Act 1982

The Australian Centre for International Agricultural Research Amendment Bill 2007 changed the original governance arrangements to reflect the executive management model recommended in the Uhrig Review. Key changes involved abolishing the Board of Management and the office of Director.

The amendment established the Commission for International Agricultural Research, to provide expert advice to the Minister on specific aspects of the centre's operations, including program formulation, priority setting and funding. Responsibility for the administrative and financial management of the centre was conferred on the new position of Chief Executive Officer, directly accountable to the Minister.





### Expert advice for the Minister

The Policy Advisory Council was established by the ACIAR Act to advise the Minister responsible for ACIAR on the agricultural problems of developing countries and to identify and find solutions to these problems.

Members of the council are appointed by the Minister and comprise outstanding international agricultural research leaders from partner countries and international research organisations, as well as leading Australian agriculturalists and economists. A substantial number of council members are required to reside in countries other than Australia and have expertise in agricultural problems of developing countries or experience in organising or conducting agricultural research.

The Commission for International Agricultural Research was established by the 2007 amendment of the ACIAR Act to provide expert advice on international agricultural research to the Minister.

Eminent Australians from the farming and agricultural research sectors are appointed to the Commission by the Minister. Specifically, the members of the Commission provide recommendations on program formulation for agricultural research and development, priority setting, funding and other matters as requested by the Minister.



Members of the Policy Advisory Council and ACIAR staff at the fourth meeting of the Policy Advisory Council in Bogor, Indonesia, 30 January to 1 February 1984. Front row (left to right): Professor ME Nairn (Murdoch University), Mr Taullili Uili Meredith (Western Samoa), Dr Tim Bhannasira (Thailand), Mr SW Sadikim (Indonesia), Sir John Crawford (President Policy Advisory Council), Dr HK Jain (India), Mr PA Oram (ISNAR), Mr AJ Satrapa (ACIAR), Dr P Chigaru (Zimbabwe); back row (left to right): Dr JG Ryan (ACIAR Deputy Director), Dr LT Evans (CSIRO), Dr RB Dun (ADAB), Dr J Copland (ACIAR), Professor JR McWilliam (ACIAR Director), Dr NK Boardman (CSIRO), Sir Samuel Burston (Australia), Dr EF Henzell (CSIRO), Dr ET Craswell (ACIAR), Dr DG Blight (ACIAR). Mr Brown Bai (Papua New Guinea) not in frame. Photo: ACIAR | 1984

*Partnerships – both formal and informal – are at the heart of the ACIAR model. Mobilising Australia’s agricultural research capability in bilateral projects is perhaps what ACIAR does best. The ‘mutual benefits’ concept is an important element of this. Internationally, working within each partner country to identify the right research partners is just as crucial. Every country has a different national agricultural research system.*

*Visualising and implementing a ‘product delivery path’ to get the research outputs to farmers or policymakers is just as crucial and often involves additional partners, sometimes informally. Here in Australia the ‘informal’ partners and stakeholders range all the way from parliamentarians and research managers to farmers, with plenty of agricultural businesses and organisations in between.*

*I think 40 years of history show that ACIAR’s ability to identify, mobilise and motivate people and partners of all kinds from its vast network is its most valuable asset.*

**Dr Bob Clements AO**  
ACIAR Director (1995–2002)



# Partnerships

**The Australian Centre for International Agricultural Research (ACIAR) has a unique role in development assistance, in that it brokers, facilitates and invests in research partnerships, rather than working directly with beneficiaries, by providing funds for community-based programs and infrastructure.**

Since 1982 ACIAR has worked with public and private research institutions to improve the productivity and sustainability of agricultural systems and the resilience of food systems in the Indo-Pacific region. The achievements of ACIAR are very much due to the partnerships that have been developed and fostered over 40 years.

The calibre and commitment of these research partnerships is a defining element of the success of ACIAR. They bring together the best of Australian agricultural research expertise and partner-country researchers to work together to find solutions in a changing world. Successful research partnerships in turn strengthen diplomatic relationships between Australia and partner countries.

While collaboration between scientists is at the heart of these research partnerships, there are other stakeholders who contribute and strengthen the partnerships to increase impact. Farmers, communities, civil societies, government representatives, international research networks and the private sector all bring unique knowledge and perspective to research questions and solutions.

ACIAR has maintained continuity of purpose and a reputation as an honest broker. Through the dedication of its staff, ACIAR has established deep trust and respect with its partners. The relationships that develop during a project, with ACIAR partners, and between Australian and in-country science partners, endure for years beyond the project life cycle.

In addition to bilateral and regional project partnerships, ACIAR has invested time and funds in partnerships with national, international and multilateral organisations that share similar goals. These partnerships help deliver outcomes more effectively and efficiently, and ultimately with greater impact, because the expertise and resources of different partners enable more ambitious and wider-reaching programs.

The work of ACIAR and its diverse range of partners over 40 years has greatly contributed to Australia's positive international reputation, which has been acknowledged within and outside of Australia.



..... Cambodian rice farmer Mr Phoun Phall (right) participated in an ACIAR-supported project to help farmers to grow profitable crops with less water. He tested growing forage crops instead of rice and is discussing the results with project staff Mr Lim Vanndy, CARDI (left) and Dr Wendy Vance, Murdoch University. Photo: ACIAR | 2018



## Science partnerships for innovation and impact

**Australian scientists working across the agriculture, fisheries and forestry sectors have long been recognised as innovators and world leaders in their respective fields. This reputation was the foundation of Sir John Crawford's belief and proposal that Australian scientists had much to offer scientists and farmers in developing countries of the Indo-Pacific region.**

The original ACIAR partnership model of bringing together the best people from Australia and partner countries to co-design research projects to address a specific issue or opportunity, remains largely unchanged 40 years later. ACIAR has built a reputation for brokering unique, innovative and agile research teams that make a positive and significant impact.

The research partnerships that ACIAR has brokered have given rise to new knowledge, which has informed science for many years to follow, they have enabled the development of new tools and systems that remain fundamental to scientific practice decades later, and they have fostered the development and adoption of technologies that have changed the livelihoods of smallholder farmers, fishers and foresters across the Indo-Pacific region.

While innovation and impact are the clear deliverables of research, ACIAR partnerships have also provided opportunities for Australian and overseas scientists to embark upon and consolidate a career in science.

The establishment of ACIAR provided a new source of funding to address challenges common to tropical production systems in agriculture, fisheries and forestry. This also meant that science organisations in Australia with a focus on tropical production systems had a new opportunity to expand their research programs and endeavours, which may not have been possible without ACIAR.

**Benefits for  
smallholder  
farmers**



### Low-cost solution lifts returns

*Partners in Research for Development, Winter 2006*

Over the past decade, Mr Nguyen Van Dung and his neighbours in the Chau Thanh district of Vietnam, in the Mekong Delta region, have been putting the culture and knowledge of traditional rice farming behind them to become fruit growers. Several years into this endeavour, Mr Nguyen and his neighbours were losing up to 90% of their crops to fruit flies because there was neither the local knowledge nor the practical tools for combatting the pest.

While pesticides initially seemed a straightforward solution, they are problematic in a landscape where open water is used for both farming and domestic water supply. What was needed – and what was developed with Australian help – was a low-cost bait for specific fruit fly species, which was safe for both users and the environment.

Mr Nguyen has been trialling the bait for the past two years and says his farm income has risen by some 70 million dong (about A\$5,000), which he is now investing back into his farm for further crop improvement.

'It is giving my family a more reliable future,' he said.

## Lasting legacy and career-shaping experience

The ACIAR mandate to commission research to identify and find solutions to agricultural problems of developing countries made it inevitable that one of its most significant and enduring partners would be Australia's national scientific research agency – the Commonwealth Scientific and Industrial Research Organisation (CSIRO). Since ACIAR was established, it has supported approximately 270 projects in which a CSIRO scientist was project leader, and countless more projects where CSIRO staff were members of the project team.

The collaborations and partnerships between ACIAR and CSIRO have led to innovations benefiting agriculture in partner countries and in Australia. These innovations have lifted crop and livestock productivity, increased the efficiency of inputs and resources, and reduced adverse impacts of agriculture on communities and the environment.

The crop modelling platform Agricultural Production Systems sIMulator (APSIM) is a classic example of innovation and ongoing impact arising from an ACIAR–CSIRO partnership. As an early career scientist with the CSIRO research team, Dr Brian Keating was posted to work on the project in 1985. The project was the first ACIAR-supported farming systems research in Africa in the 1980s and early 1990s (and the largest ACIAR project at the time) between partners CSIRO and the Kenya Agricultural Research Institute, under the title 'The improvement of dryland agriculture in the African semi-arid tropics'. The aim of the project was to find effective management responses and affordable technological innovations to solve some of the problems of dryland farming in the semi-arid tropics.

'The whole farm "systems" approach of the project was ambitious, and researchers had to develop new analytical technology to identify pathways to sustainably intensify maize/bean/livestock farming systems in semi-arid landscapes. A sister project was undertaken in Katherine, in Australia's Northern Territory, and this saw Dr Peter Carberry start his long and successful career in CSIRO,' said Dr Keating.

Informed by this research, CSIRO partnered with the crop and soil modelling work of the State of Queensland, and with training opportunities through the University of Queensland, in a joint venture.

The resulting technology was APSIM, a software program to interpret and integrate data about landscapes, soils, climates, germplasm and farming practices. The program can run (model) simulations, based on the data, and in effect enable virtual experiments on ways to improve farming systems. APSIM meant research could truly address climate variability and risk in ways that otherwise require decades of experimentation. APSIM's applications have extended from agronomic research to include on-farm decision support, the design of breeding programs, greenhouse gas mitigation and climate change adaptation research, and more recently continental-scale yield forecasting and analytics.

Not only was the approach itself groundbreaking at the time, but APSIM remains in use by agricultural scientists all over the world. The original design continues to be refined and developed with other partners to broaden its applications and develop the now internationally recognised and leading platform for scientists to model a diverse range of crop, animal, soil, climate and management options.



Mr Bob McCown and Dr Brian Keating (in hats, left and right) with project collaborators from the Kenya Agricultural Research Institute, Machakos. Photo: supplied by Brian Keating | 1986



'The farm systems model became a means to these ends rather than an end in itself, and the approaches and tools that the ACIAR projects of the 1980s and 1990s developed continue to deliver value in diverse partnerships around the world to the present day.

'The impacts of the research program over the next 40 years went well beyond the APSIM model itself, to include a transformation in the way agronomic research was conducted in Australia and abroad, with shifts towards greater on-farm and participative approaches, stronger integration of socioeconomic considerations and greater focus on climate variability and risk considerations in technology development and adoption.'

In addition to the lasting legacy of APSIM and the new approaches to agronomic research developed during his time on the project, Dr Keating also described great personal rewards from being involved in the ACIAR-supported program.

'My time in Kenya with ACIAR was transformational. In terms of problem-solving, building confidence and sheer research opportunities, it shaped my career. It was enabling and uplifting. And best of all, because of the way ACIAR is set up to promote research in both the partner country and Australia, it did not require a choice between working internationally and remaining engaged with promoting Australian agriculture. Looking back now, I can see how this experience ended up shaping the evolution of CSIRO's capabilities in farming systems research over the last 35 years.'

Dr Keating acknowledges Dr Jim Ryan, Dr Gabrielle Persley, Dr Denis Blight and Professor Jim McWilliam as the visionaries who, alongside Sir John Crawford, were most responsible for creating the ACIAR partnership model, which is built on strong relationships with Australian research institutions.



The ACIAR/CSIRO Dryland Farming Systems Project Team in Kenya (including locally engaged staff at the time).  
Photo: supplied by Brian Keating | 1985

'CSIRO was always a strong advocate for ACIAR given the common interest in projecting Australian science into the wider world. Drs Ted Henzell and Bob Clements were CSIRO leaders who laid an incredibly strong foundation for the ACIAR–CSIRO partnership in the 1980s and 1990s.

'So strong are those bonds that CSIRO has remained engaged in agricultural research aid in Africa every year since 1984, and the APSIM team is today the strongest in the world at computational modelling of farm systems.'

ACIAR partnerships are also career-shaping experiences for the scientists involved. Dr Keating is now Adjunct Professor at the University of Queensland and Chair of the Advisory Board of the Queensland Alliance for Agriculture and Food Innovation (QAAFI). Dr Keating built on his work in Africa, to become a pioneer of the application of simulation models in farming systems research in Africa and Australia. He continued working for CSIRO throughout his career, including senior roles of Chief of Sustainable Ecosystems (2004–2008), Director of the Sustainable Agriculture Flagship (2008–2013) and CSIRO Executive for Agriculture, Food and Health (2014–2015).



## Opportunities and benefits for tropical agriculture

Brokering partnerships to provide solutions to agricultural problems in neighbouring countries and the Indo-Pacific region meant that many research projects were naturally based on subtropical and tropical farming systems. In turn, this means science agencies with expertise and experience in subtropical and tropical agriculture were obvious partners of the newly established agency.

Over 40 years, Queensland-based organisations have been the commissioned organisation for about 25% of projects brokered by ACIAR.

Dr Beth Woods has had a long association with ACIAR in many different capacities and explained the significance of the establishment of ACIAR to research agencies in Queensland.

'ACIAR provided one of the few sources of funding support for collaborative research into tropical and subtropical farming systems, because this was the production environment in important partner countries in the 1990s,' said Dr Woods.

'There was almost no research into these systems in the rest of Australia, and therefore very limited opportunities for Queensland scientists to collaborate.

'In addition, ACIAR provided a way to support small Australian industries which would otherwise not have had sufficient resources to mount an effective research program, and also a way to prepare for biosecurity threats which might eventually get to Australia from neighbouring countries.'

Dr Woods is an ardent believer that partnerships are crucial for research impact, and those partners should not only include the funder, but also the beneficiaries of the research.

'In our national system for agricultural R&D [research and development], partners are needed from the outset to secure funding for part or all of the research work. In my view we also need to think through the implementation or delivery partners, before we start, for research to have impact. Of course, it may change over time – research does not always follow a straight line – but community and industry beneficiaries ideally will come along on that journey with you. From fruit fly to TR4 (Panama disease in bananas) to grain and pulse diseases and insects, I can think of a myriad of examples where we needed a broad set of community members to understand the research and to be part of the solution.'

Through ACIAR support, research organisations in Queensland have been able to build knowledge and tools to deal with the most serious of horticultural pests – fruit fly. Fruit fly poses a major obstacle to the sustainability and success of many horticultural crops in the Indo-Pacific region. Horticulturalists in Australia rely on their fruit fly free status to minimise crop losses and, more critically, to maintain access to international markets.

Management of fruit fly was the focus of some of the earliest ACIAR-supported projects. In 1984, the Queensland Department of Primary Industries and research organisations in Malaysia and Thailand were funded to investigate the biology and control of fruit flies. In addition to reducing economic losses and improving knowledge of species causing damage (there are at least 200 species of fruit fly in South-East Asia), the research partnership was motivated by the desire to increase coordination between neighbouring countries and countries involved in fresh fruit trade to achieve more effective regional management of the fruit fly pest.



Dr Beth Woods OAM has been involved with ACIAR in many capacities, from project collaborator to Chair of the ACIAR Board of Management (2000–2004). Dr Woods served as a member of the Policy Advisory Council from 1991 to 1997, and as President for two terms, 2000 to 2004 and 2007 to 2014. The first term as President also meant she was Chair of the then ACIAR Board of Management. In 2020, Dr Woods was appointed to the Commission for International Agricultural Research.

As a leading agricultural researcher and manager in Australia and internationally, Dr Woods has also served on the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Board and held leadership positions at both the University of Queensland and the Queensland Department of Agriculture and Fisheries; and chaired the boards of the International Rice Research Institute (IRRI) and WorldFish.





Subsequent projects were funded by ACIAR to continue building the knowledge base and to develop practical management strategies. The new projects included Pacific island countries, Bhutan, Papua New Guinea, Vietnam and Indonesia, in addition to Malaysia and Thailand.

Australian agriculture saw the benefit of this ACIAR-funded work in 1995, when a new species of fruit fly, papaya fruit fly, was discovered near Cairns in north Queensland. As a result of the knowledge and expertise developed by the projects, the new pest was quickly identified, and its range of host plants understood. Knowing characteristics and life cycle of the fruit fly also meant that appropriate management strategies could be quickly implemented. Papaya fruit fly can be hosted by 160 different fruit species (but not papaya!) so rapid identification was critical to prevent devastating impact on Australian horticultural businesses.

From 1984 until 2009, ACIAR invested A\$22.9 million across 17 fruit fly research projects, which delivered benefits worth more than A\$46.2 million to Australia and A\$212 million to partner countries, in net present value terms in 2007.

ACIAR also facilitated the establishment of the International Centre for the Management of Pest Fruit Flies at Griffith University in Queensland. The research centre operated until 2019. In 2022, Griffith University hosts an international fruit fly management laboratory at its Centre for Planetary Health and Food Security.

While the impact assessment of the program (published in 2008) showed significant returns on total investment, it also highlighted that in the large and complex program, there were some research components that had large impacts and others that had none. The pattern of benefits was variable by type of benefit and by country.

Biosecurity benefits, for example, were realised in some Pacific island countries but there were few or no biosecurity benefits for other partner countries. Biosecurity benefits were not realised where necessary preconditions were absent, such as countries with long land borders and countries with large numbers of endemic pest fruit fly species that infest and damage a range of economically important crops. Biosecurity benefits were also absent in the countries without the financial and organisational capacity and commitment to continue necessary ongoing quarantine activities.

The results of the assessment served as a good reminder to ACIAR and its partners that benefits from research may not be realised by partner countries due to factors beyond the control and reach of the researchers and beneficiaries. With the benefit of such experiences and ongoing impact assessment, ACIAR project planning and design processes have evolved over the decades to include beneficiaries, extension agents and value-chain experts to maximise the opportunity for impact.

# 5.1 : 1

return on ACIAR investment

## Benefits included:

- improved biosecurity measures to reduce the risk of pest incursions and improve market access
- new post-harvest treatments for export market access
- capacity building.

Source: ACIAR Impact Assessment No. 56, 2008



Professor Dick Drew of Griffith University works with a participant during an ACIAR course in Fiji, training people in aspects of fruit fly pest management. Photo: *Partners* magazine No.16, 2003





..... A farming family from Tanzania participated in the 10-year 'Sustainable intensification of maize-legume cropping systems for food security in eastern and southern Africa' (SIMLESA) project, supported by ACIAR. The project was implemented by CIMMYT in partnership with national agricultural research institutes in seven countries (Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania and Uganda). At the end of 2017, over 230,000 farmers had adopted sustainable farming intensification practices. Photo: Peter Lowe | 2020



## Global partnerships for strategic outcomes

**Australia has been a longstanding partner and supporter of global networks and international organisations that foster research collaborations to support the strategic development of the agriculture, fisheries and forestry sectors.**

Historically, Australia's interest and commitment to international development organisations was managed by the Australian development assistance or aid program agency of the day. Recognising the reciprocal benefits to developing countries and Australia from participation in global networks for agricultural development, the responsibility of Australia's representation and financial contribution to international agricultural research centres was assigned to ACIAR with the amendment of the ACIAR Act in 1992.

Since 1992, ACIAR has worked with international agricultural research centres in two ways. First, to manage Australia's contribution to core funding of international centres, which supports operational activity and long-term programs, such as genebanks, big data management and mapping activities. Second, and as it has done since 1982, to provide funding support for projects.

The most significant global partnership for ACIAR is with CGIAR. However, ACIAR also supports and participates in other international networks in the Indo-Pacific region.

While ACIAR is primarily a broker and investor in research partnerships, the amendment to the ACIAR Act also enables ACIAR to invest in development activities, such as programs that enable smallholder farmers to learn about, have access to or be trained in new technologies and practices.

As development is generally significantly more costly than research, investment must be highly strategic and catalytic. To this end, ACIAR also works with other development organisations and donors, through co-investing, co-designing and co-managing projects. Co-investment partnerships enable funding organisations to leverage resources and complement expertise to implement more ambitious programs than could be achieved by a single organisation.

The global partnerships that are formed between ACIAR and international organisations, to tackle shared challenges through agricultural research collaboration, are an important element of Australia's science diplomacy in the Indo-Pacific region.

In 2014, then Minister for Foreign Affairs, the Honourable Julie Bishop, described ACIAR as 'a jewel in the crown' in the Foreign Affairs and Trade portfolio, and explained that Australia had an outstanding research arm in ACIAR 'with a focus on important agricultural research for developing countries'.

**Benefits for  
smallholder  
farmers**



### Greater bargaining power

*Partners in Research for Development, Issue 1, 2011*

Ms Felista Mateo, a farmer from Kilima Tembo village, in Tanzania, is benefiting from participating in the project 'Sustainable intensification of maize-legume cropping systems for food security in eastern and southern Africa' (SIMLESA). A single mother of four, Ms Mateo supports her family with produce from her land, mainly maize and pigeon pea. Any surpluses, though small, are stored in a granary and used domestically or sold to middlemen.

Following advice from government extension officer Mr Frank Swai, Ms Mateo achieved yield gains that her neighbours are now attempting to duplicate. As her harvest increases, she plans to build a larger granary and sell more grain.

Traditionally, farmers have had no way of tracking the market, and the middlemen who buy their produce have exercised control over prices. However, Ms Mateo owns a mobile phone, and since the inception of SIMLESA and its support network, she can now call an extension officer and check market prices. The result is greater bargaining power for the villagers when the middlemen come calling.

## Australia's contribution to global agriculture

### Benefits the world over

Through 15 agricultural research centres, CGIAR:

- » has a presence in 89 countries
- » employs more than 9,000 scientists, researchers, technicians and support staff
- » contributes to global targets such as the United Nations Sustainable Development Goals
- » hosts 11 gene banks that conserve seed for more than 700,000 types (accessions) of the world's major food and forage crops
- » enabled 5,000 new innovations in technology in the five years to 2021
- » provided short and long-term training for 4 million scientists in the five years to 2021
- » provided a tenfold return for each research dollar invested.

Notable impacts of CGIAR include:

- » fortifying major food crops with vitamin A, iron and zinc to improve the nutrition of 20 million people in low-income countries
- » testing and scaling resilient food systems to improve climate resilience in farming communities in 21 countries.



CGIAR – a network of 15 international agricultural research centres – is the world's largest agricultural innovation network dedicated to reducing rural poverty, increasing food and nutrition security for human health and improving natural resource systems and ecosystem services. The centres conduct world-class, interdisciplinary research that combines biophysical and social sciences to deliver development impact at scale. CGIAR operates on an annual budget of about US\$900 million.

The origins of the international agricultural research system can be traced back to the 1940s, when the Rockefeller and Ford foundations funded two research centres, the International Maize and Wheat Improvement Center (CIMMYT) in Mexico and the International Rice Research Institute (IRRI) in the Philippines. With a rapidly increasing global population and increasing concern about global food shortages, the centres were established to focus on increasing the productivity of staple food crops, wheat and rice. Over the following decades, more centres were developed to focus on other staple crops and production systems. In 1971, the international agricultural research centres formed an international network called the Consultative Group for International Agricultural Research. The network is now known simply, and officially, as CGIAR.

Australia recognised the immense value of the research network and provided funding to CGIAR from the outset. CGIAR and ACIAR share a champion in Sir John Crawford.



Sir John was a strong advocate for the development of CGIAR, to create a global partnership of organisations engaged in research for a food-secure future. He chaired the first Technical Advisory Committee of CGIAR in the 1970s. Sir John's experience in the CGIAR research network fuelled his vision and energy for the creation of an Australian organisation to contribute to global efforts in agricultural science to address food insecurity and poverty.

With the amendment of the ACIAR Act in 1992, the management of funding and Australia's partnership with the CGIAR was handed to ACIAR. Under such an arrangement, and reflecting Australia's significant financial and technical contribution to CGIAR, the ACIAR Chief Executive Officer represents Australia on the CGIAR System Council.

### Reciprocal benefits for partners

ACIAR has supported many research programs and projects within the 15 centres of CGIAR, which has provided rich career opportunities for Australian scientists, and an active exchange of knowledge between the Australian innovation system and CGIAR.

Dr Martin Kropff was Global Director, Resilient Agri-Food Systems, for CGIAR and Director-General of CIMMYT, one of the 15 centres of CGIAR. He recounted his experiences working with ACIAR.

'ACIAR was one of our biggest funders of research when I came to CIMMYT in 2015, as Director-General. ACIAR doesn't just invest money in the research – they really think about and contribute to the design of the project, and it was inspiring to work with their teams.'

While Dr Kropff was at CIMMYT, he was involved with several major collaborative projects brokered and supported by ACIAR, which brought together teams of Australian scientists working with partner-country scientists.

These projects included:

- » 'Sustainable intensification of maize-legume cropping systems for food security in eastern and southern Africa' (SIMLESA) (2010–2019)
- » 'Farm mechanization and conservation agriculture for sustainable intensification' (FACASI), eastern and southern Africa (2013–2017)
- » 'Sustainable and resilient farming systems intensification in the Eastern Gangetic Plains' (SRFSI), South Asia (2014–2021).

'SIMLESA was a program where everybody worked together and there was an enormous boost to crop yields and soil health, as well as conservation agriculture and small-scale mechanisation, which was an example of systems thinking supported by Australia,' explained Dr Kropff.

'Australian farmers also benefit from the development work that is funded through CGIAR. In the past many CIMMYT wheat varieties were used by Australian farmers, including Borlaug100, a wheat variety developed by CIMMYT, that was released in Australia in 2020.

'And we work with Australian scientists – for example, we use the Australian crop modelling system APSIM in our research – so it's not just funding but also about access to knowledge and tools that are useful.'

### Benefits to Australia

CGIAR research outputs have helped Australian farmers increase yields and reduce costs. For example, superior genes in plants and livestock, identified by CGIAR programs, have been incorporated into plant and animal breeding programs in Australia, giving Australian farmers access to better performing crops and livestock.



### Australia well represented

Over the 50-year history of CGIAR, Australia has been well represented at the highest levels of CGIAR itself, as well as in leadership positions of the international agricultural research centres. Many Australian scientists and economists have demonstrated that despite its relatively small population and a challenging agricultural environment, Australia is well placed globally to share knowledge and skills, and to contribute to global efforts to improve the livelihoods of smallholder farmers, fishers and foresters.

Sir John Crawford paved the way, chairing the first Technical Advisory Committee of CGIAR, following strong advocacy for the development of CGIAR.

Dr Lloyd Evans was another Australian whose influence was instrumental in Australia's support of the CGIAR centres, as well as the establishment of ACIAR. A pioneering crop physiologist, Dr Evans served on the Technical Advisory Committee for many years, on the boards of IRRI and CIMMYT, and on the Policy Advisory Council (1982–1988) for the Australian Minister for Foreign Affairs. Dr Jim Ryan and Dr Ted Henzell also served on the CGIAR Technical Advisory Committee.

Many other Australians and associates of ACIAR have contributed to the international agricultural research centres as board members and chairs of boards, as well as senior managers. To name just a very few – Professor John Dillon served on the boards of five CGIAR centres, was Chair of three, and twice served as the Chair of the committee of the CGIAR Board; Dr Meryl Williams was Director-General of WorldFish (1994–2004); Dr George Rothschild was Director-General of IRRI (1995–1997); and Dr Jim Ryan was Director-General of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) (1991–1997).

### ACIAR sets up a CGIAR centre

ACIAR was commissioned by the CGIAR in 1992 to establish its forestry research centre. Dr Ian Bevege, ACIAR Principal Adviser, led the process, which included selecting a host country for the centre, the first Director-General and a governing board. The work was completed in 1993 when the Center for International Forestry Research (CIFOR) was established in Bogor, Indonesia.



Representatives of three of the sponsor countries for the new Center for International Forestry Research (CIFOR) exchange congratulations after signing the agreement establishing CIFOR as a legally constituted entity. Left to right: Mr Bo Heineback, Sweden; Mr John Kerin, Australia; and Mr Peter Niederberger, Switzerland. Photo: ACIAR | 1993





### ACIAR hosts CGIAR System Council

As Australia's representative in international agricultural research networks, ACIAR has hosted the world's leading scientists and policymakers on agricultural production and food security, providing opportunities to showcase Australia's agricultural science innovation system and strengthen Australia's relationship and contribution to international networks.

In November 2022, ACIAR hosted the CGIAR System Council. The CGIAR System Council comprises representatives of funders and developing countries, and is the strategic decision-making body that reviews the strategy, mission, impact and continued relevancy of CGIAR in a rapidly changing landscape of agricultural research for development.

The System Council works in partnership with the CGIAR System Board, which is responsible for providing leadership and governance for CGIAR in the delivery of its mission.

Dr Juergen Voegele, System Council Chair (2016–current) and World Bank Vice President for Sustainable Development, invited Australia to host the 17th CGIAR System Council meeting. ACIAR timed the System Council meeting to coincide with the TropAg International Agriculture Conference in Brisbane, a biennial conference attended by more than 1,000 food and agricultural scientists. Hosted by the University of Queensland, a major ACIAR collaborator, the conference featured scientists actively engaged in agrifood systems research for improved nutrition, sustainability and human health.

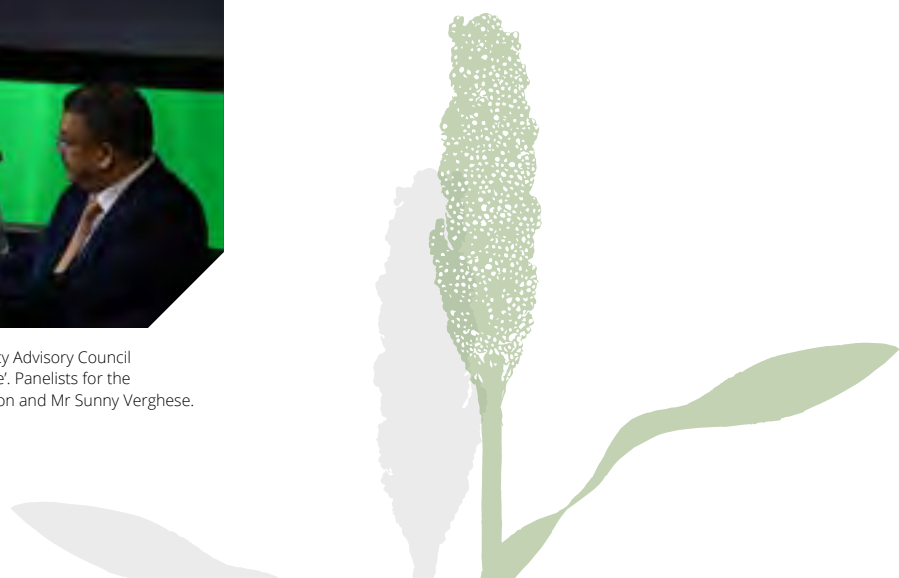
The Commission for International Agricultural Research and the Policy Advisory Council – bodies established under the ACIAR Act to advise the Australian Minister for Foreign Affairs – also met at this time. To capitalise on the presence of global leaders and leading scientists, the Commission, supported by the Policy Advisory Council, hosted a 3-part dialogue entitled 'Food security and food systems transformation in the Indo-Pacific – the role for science'.



ACIAR hosted the 17th meeting of the CGIAR System Council in Brisbane in November 2022. Left to right: Professor Andrew Campbell, ACIAR Chief Executive Officer; Mrs Fiona Simson, Chair of the Commission for International Agricultural Research; the Hon Mark Furner MP, Queensland Minister for Agricultural Industry Development and Fisheries and Minister for Rural Communities; Dr Juergen Voegele, World Bank Vice President for Sustainable Development; and Dr Marco Ferroni, Chair of CGIAR System Board. Photo: ACIAR | 2022



Coinciding with the CGIAR System Council meeting, Australia's Commission for International Agricultural Research and the Policy Advisory Council ACIAR and CGIAR hosted a dialogue on 'Food security and food systems transformation in the Indo-Pacific – the role for science'. Panelists for the session were, from left, Professor Ramesh Chand, Dr Ruben Echeverria, Dr Segenet Kelemu, Dr Claudia Sadoff, Mrs Fiona Simson and Mr Sunny Verghese. Photo: ACIAR | 2022



### Australia hosts CGIAR Consultative Group

In 1989, at the invitation of the Australian Government, CGIAR held its mid-term Consultative Group Meeting in Canberra. At this time, the CGIAR governance structure comprised the Consultative Group, which was advised by a Technical Advisory Committee. Australia's contribution to CGIAR was managed by the Australian International Development Assistance Bureau (AIDAB).

The Director-General of AIDAB requested that ACIAR Director, Dr Jim McWilliam, represent Australia at the meeting, with assistance from staff from AIDAB and ACIAR.



Professor John Dillon (left), Chair of the ACIAR Board of Management, chairs the opening session of a seminar on 'Lessons from Australian Research' which preceded the formal mid-term meeting of the CGIAR in Canberra in June 1989. Professor Derek Tribe (right), Executive Director of the Crawford Fund, and other eminent Australian agricultural scientists made presentations at the seminar. Photo: ACIAR Annual Report 1988-89

The meeting started with a one-day seminar. It was opened by the Australian Minister for Primary Industries and Energy, the Honourable John Kerin MP. The seminar was entitled 'Lessons from Australian Research', and eight distinguished Australian scientists gave meeting delegates a broad overview of Australian agricultural research, highlighting that 'Australia is one of the few developed nations which faces economic pressures and environmental conditions similar to those in many developing countries' and therefore emphasising the relevance of Australian research to 'CGIAR's client countries'.

ACIAR co-sponsored two other seminars in conjunction with the meeting. One on 'Agricultural Biotechnology Opportunities for International Development' was drawn from a World Bank study by Dr Gabrielle Persley. The other was based on the theme of 'Agricultural Prospects and Challenges in Developing Countries', and was presented by economists associated with CGIAR, Dr John Mellor and Professor Alex McCalla, and CGIAR Chairman, Dr David Hopper.

The formal Consultative Group Meeting was opened by the Australian Minister for Foreign Affairs and Trade, Senator the Honourable Gareth Evans. In the opening address, Senator Evans also announced that the Australian Government had pledged \$A0.5 million over the next five years to the recently established Crawford Fund.

### Participating in international agricultural research networks

Australia's representation in international agricultural research is longstanding and diverse. CGIAR, with its 15 international agricultural research centres, is the largest international organisation that ACIAR has engaged with over its 40 years.

ACIAR has also represented Australia and supported international research centres and networks, in addition to those of CGIAR, providing core funding, funding for research projects and/or scientific expertise. Current and previously supported organisations include:

- » Adaptation Research Alliance (ARA)
- » Asia-Pacific Association of Agricultural Research Institutions (APAARI)
- » Centre for Agriculture and Bioscience International (CABI)
- » Global Research Alliance on Agricultural Greenhouse Gases (GRA)
- » International Board for Soil Research and Management (IBSRAM)
- » International Center for Integrated Mountain Development (ICIMOD)
- » International Foundation for Science
- » The Pacific Community (SPC)
- » World Vegetable Center (WorldVeg) – previously known as the Asian Vegetable Research and Development Center (AVRDC).



## Working with like-minded partners



Ms Talash Huijbers of Insectipro is rearing crickets and black soldier flies. Ms Huijbers is an entrepreneur supported by the ICIPE-implemented 'Insects for feed' project. The project is part of the CultiAF program and seeks to achieve long-term food and nutritional security through the use of insects as a reliable, sustainable, safe and cost-effective source of protein for small-scale livestock farming feeds. Photo: ACIAR | 2020

The International Development Research Centre (IDRC) of Canada has much in common with ACIAR. IDRC is a government agency, established by an Act of the Canadian Parliament in 1970, with a mandate 'to initiate, encourage, support, and conduct research into the problems of the developing regions of the world and into the means for applying and adapting scientific, technical, and other knowledge to the economic and social advancement of those regions'. IDRC has a broader remit than ACIAR – in addition to food systems, IDRC also supports research and innovation in human health, education, governance, and sustainable and inclusive economies.

Australian economist Sir John Crawford served on the Board of IDRC during the 1970s. The IDRC was the inspiration for the model of ACIAR that Sir John proposed to the Australian Government. While sharing common goals and modes of operation, it was not until several decades later that IDRC and ACIAR would become research and innovation partners.

IDRC President from 2013 to 2023, and previously Vice-President, Program and Partnership Branch, Dr Jean Lebel, said ACIAR and IDRC have built a very strong and loyal friendship.

'I made my first contact with ACIAR through its Deputy Director, Dr Jim Ryan, when I was sitting at the executive commission of the CGIAR in the early 2000s. But of course, the connections between IDRC and ACIAR go back to much further than that.

'I had regular contact with Dr Nick Austin, when he was Chief Executive Officer, and we talked about collaborating for several years. In 2013 we got our first program together – Cultivate Africa's Future.

'IDRC celebrated 50 years in 2020. It's quite remarkable that IDRC and ACIAR have maintained the partnership with its intellectual underpinning and the level of relationship between staff over all these years. ACIAR is one of the very few organisations in the world with the same motivation as IDRC.'

Since 2013, IDRC and ACIAR have identified several opportunities to combine expertise and resources in supporting research that focuses on broad-scale issues. Both organisations place high importance on designing targeted programs that take account of local conditions and cultural factors.

### Combating food insecurity

Key to enhancing Africa's capacity to sustainably feed itself is ensuring that local agricultural scientists have the capacity and opportunity to conduct innovative research, to facilitate adoption of research to smallholder farmers.

The establishment of a competitive research grant program in 2013, named Cultivate Africa's Future (CultiAF), reflected commitment from Canada and Australia to deliver food security innovations to more people in Sub-Saharan Africa. African and international research organisations were invited to compete for grants of up to CA\$3 million each to support innovative applied research. Under the call, research organisations from 10 countries – Burundi, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zambia and Zimbabwe – were eligible.

Seven collaborative research projects were selected for the first phase of the program. The projects helped smallholder farmers reduce post-harvest loss of crops, improve yields and livestock productivity through better water use, and improve nutrition. Resulting innovations were expected to be applicable to other parts of Africa and could support national and regional food security efforts on the continent.

CultiAF, which extended to a 2-phase program, was the first formal co-funded collaboration between ACIAR and IDRC, with a total investment of A\$37 million between 2013 and 2023.

CultiAF successfully led to 19 innovations in African food systems, which included adoption of new technologies for soil moisture monitoring for irrigation, solar tents for fish drying, and increased production of bean varieties suited to use in higher-value pre-cooked consumer products.

### Reducing food loss

Global estimates suggest that 30% of food is lost in the value chain. However, in developing countries, losses can be as high as 80% during production and processing. In 2021, ACIAR and IDRC launched the Food Loss Research Program – a partnership to support in-country research teams to identify and test opportunities to reduce food loss.

While increasing food production is the traditional goal of much agricultural research for development, the Food Loss Research Program looks at how much food can be saved through improvements to the value chain, so that less product is lost or wasted before it gets sold. Savings throughout the value chain also have potential to improve livelihoods and income for smallholders, as well as increase local food security.

Three projects in the program aim to reduce losses along value chains: horticultural produce in the Pacific region, mango and tomatoes in Sri Lanka and Pakistan, and catfish in Vietnam and Laos. A fourth project will investigate food loss affecting vulnerable urban communities in Zambia and Malawi.

In the Pacific project, it is hoped that reducing loss at all points in the value chain will help to boost the availability and affordability of nutritious fruits and vegetables. Project leader Dr Seesei Molimau-Samasoni of the Scientific Research Organisation of Samoa said that getting the fresh food system operating efficiently is critically important for the region to address non-communicable diseases such as diabetes.

### A history of working together

ACIAR and the International Development Research Centre (IDRC) enjoyed a strong working relationship for many years before embarking on co-funding research collaborations in 2013.

The ACIAR communication program was developed with the benefit of the experience of IDRC. In 1983 former Director of the Publications Division of IDRC, Mr David Spurgeon, was engaged to develop the ACIAR Communications Program. In 1984, the Director of Communications at IDRC, Mr Reg MacIntyre, took sabbatical leave and worked at ACIAR to develop and manage the Publications Program.

In 1985, ACIAR and IDRC jointly supported the *East African Agricultural and Forestry Journal*, published by the Kenya Agricultural Research Institute. The ACIAR-IDRC assistance funded a scientific editor to travel to promote the journal and solicit manuscripts, and provided training for the editor. It also funded training to improve the scientific writing, interpretation and presentation skills of African scientists. The journal is still active in 2022 and is published by the Kenya Agricultural and Livestock Research Organization.

In 1989 ACIAR and IDRC co-sponsored a workshop in Fiji on the dissemination of agricultural research results in the South Pacific. The workshop was attended by 35 publishers or extension agents from six South Pacific countries, regional organisations, and Australia and Canada. The workshop shone a spotlight on the need to improve the transfer of results from researcher to end user; a need for better training of agricultural extensionists and finding more effective ways of sharing information.

‘Lost productivity also disincentivises farmers from participating in commercial value chains, has adverse gender impacts in terms of female market vendor economic loss, and increases the region’s reliance on imported produce. Food loss means income loss for farmers, and nutrition loss for consumers,’ she said.

‘Using a gender-inclusive approach, we will work with farmers and vendors to identify the levels of food losses in each country. Then, using foresighting and key informants in each partner country, we will prioritise value chains for interventions that can produce the most social, health and economic benefits for farmers and vendors.’





In partnership with IDRC, ACIAR is supporting a research program investigating ways to reduce food loss throughout the value chain. The broad aim of the program is to improve farm incomes and local food security, while reducing pressure on water, land and nutrients, as well as greenhouse gas emissions. Photo: ACIAR | 2014







..... A commitment to good science is at the heart of partnerships between ACIAR and partner-country science organisations. These partnerships enable strategic development and implementation of programs that deliver quality outputs and bring science and technology closer to markets and communities. In the Mindanao province of Zamboanga Sibugay, in the Philippines, communities have benefited from the ACIAR-DOST-PCAARRD cooperation to improve livelihoods in conflict-affected regions. Photo: ACIAR | 2020



## Partnerships with regional science organisations

**In addition to forging enduring science partnerships between Australian and developing country scientists, ACIAR has built strong and mutually beneficial relationships with in-country science agencies and industry and regional organisations.**

These partnerships are strategic and built on shared aspirations of contributing to poverty reduction and improved livelihoods. The partnerships are underpinned by agreements or memorandums of understanding, and articulate goals that have a much wider reach than the scope of specific research projects.

Partnerships with science and development organisations ensure greater synergy between the ACIAR research and development program and the objectives of a partner-country organisation, maximising the agility and effectiveness of ACIAR as an agricultural research-for-development agency.

The partnerships also reflect and embrace the growing capacity of partner countries in terms of technical and policy capability to determine and support their agricultural development programs.

Partnerships with regional science organisations contribute to Australia's deep engagement in the Indo-Pacific region and its reputation as a global contributor.

The ACIAR Country Network provides a vital link between Australia and the organisations and institutions that have formal and informal partnering arrangements with ACIAR.

**Benefits for  
smallholder  
farmers**



### Saving forest, river and community

**ACIAR blog, *Agroforestry gives new lifeline to Nadroumai*, May 2021**

An ACIAR-supported project in Fiji has empowered women to improve community livelihoods and protect their environment through agroforestry. Increasing degradation of the Nadroumai catchment is on the rise due to unsustainable agriculture and resource exploitation. The Nadroumai Women's Club was keen to learn about agroforestry to mitigate environmental effects. 'When the project started, our club consisted of 10 members, and ACIAR, through SPC, supported us to set up a village nursery. By 2019, we were able to rehabilitate the Nadroumai catchment successfully,' said club treasurer, Mrs Amele Duguivalu. As the nursery developed and the community witnessed its success, more women joined in. The club doubled in size, and seedling profits increased from A\$650 in 2018 to around A\$3,000 in 2020. The club started with 300 seedlings, and today they are working with 1,500.

'Apart from selling our seedlings, women have also taken up smallholder farming thanks to this project. Every week, we harvest fruits and vegetables and take them to nearby markets, and each member earns about A\$80–200. This has truly changed our lives. This project has not only saved their forests and river but brought the whole community together.'



## Flexibility and support yield benefits for all partners

The island nations of the Pacific region, Australia's closest neighbours, were among the early partner countries of ACIAR. Given Australia's geographical, historical and diplomatic relationship with the Pacific region, it was a natural step for ACIAR to start developing links and formulating a research program with Pacific island nations.

The Pacific region has a long history of agriculture and it was envisaged this would continue irrespective of the success of some countries diversifying their economies. In the 1980s, all national development plans of Pacific island countries identified the agriculture sector as a major development priority. The sector was being asked to provide food for increasing populations, provide substitutes for imported food, earn foreign exchange, provide increased cash income for farmers and generate employment.

The challenge for ACIAR was to identify agricultural research activities that would contribute to durable agricultural and economic development. The vital role of ACIAR in linking Pacific countries with science institutions in Australia to address agricultural research problems was recognised early by the South Pacific Commission – an international development organisation, which later became The Pacific Community but maintained SPC as its abbreviated name.

ACIAR and SPC share 30 years of collaboration to foster sustainable management of land-based and marine natural resources. Both organisations are committed to an ongoing partnership that strengthens a shared strategic vision for sustainable agriculture, forestry and fisheries development throughout the Pacific. The current 5-year agreement is in place until 2026.

Under the agreement, ACIAR provides both core and project funding to the Land Resources and the Fisheries, Aquaculture and Marine Ecosystems divisions of SPC. The core funding supports SPC to fulfill its mandate to provide regionally strategic public goods in agriculture, fisheries and forestry. The project funding enables research activities in agriculture, fisheries and forestry that add value to the development of Pacific island countries and territories in these areas.

Dr Audrey Aumua, who was Deputy Director-General of SPC from 2016 to 2021, reflected on her interactions with ACIAR.

'When I first started working with ACIAR back in 2016, I was struck by how much time and energy the organisation invested into building trust and deep relationships with its partners. And for many development organisations in the Pacific region, trustworthy partnerships are key to long-term sustainable development.

'I joined the Policy Advisory Council in 2019, representing SPC and the Pacific region, which gave me an even closer view of the organisation. I have learnt during my time of service on the council that one of ACIAR's unique attributes is its small size and its ability to respond quickly to the development research space.

'There are many development funding organisations and researchers working in the Pacific, but ACIAR has always stood out from the crowd, its team of scientists constantly working hard to ensure all stakeholders in any partnership benefit from the arrangement. It shares data and research findings, and devises and supports research agendas in consultation with its partners.

'One of the things I think that ACIAR does particularly well is identifying a potential partnership and then working carefully and methodically to build a partnership arrangement that suits both ACIAR and its partner.'



Dr Audrey Aumua is the Chief Executive Officer of The Fred Hollows Foundation New Zealand, and the first Pacific woman to head the Foundation. Previously, Dr Aumua led The Pacific Community (SPC) as Deputy Director-General (2016–2020), where she was responsible for executive leadership and management of the Suva office (Fiji) and operations focused on small islands and developing states development issues. Prior to SPC she served as the World Health Organization country representative in Solomon Islands, Director of an AusAid-funded knowledge and innovation hub at the University of Queensland, and Chief Adviser for the Pacific within the New Zealand Ministry of Health.

Dr Aumua is a member of the Policy Advisory Council (2019–current), which advises Australia's Minister for Foreign Affairs on issues of agricultural research for development.



### The Pacific Community

The Pacific Community, also known as SPC, is an international development organisation and the principal scientific and technical organisation in the Pacific region. The abbreviation 'SPC' comes from South Pacific Commission, which was the name of the organisation until 1997.

SPC was founded in 1947 in Canberra, Australia, and operates as an international organisation under the Canberra Agreement. Australia is a founding member of SPC and its largest core funder.

SPC works in seven key areas of interest to the Pacific region:

- » climate change
- » disasters
- » non-communicable diseases
- » gender equality
- » youth employment
- » food and water security
- » biosecurity for trade.

Over the past 30 years, SPC has been a key partner for ACIAR. Through the provision of both core and project funding, the ACIAR partnership with SPC helps deliver strategies to benefit the region's fisheries, agriculture, forestry and biosecurity sectors.

For example, the SPC initiative 'A new song for coastal fisheries – pathways to change' is supported by funding from ACIAR. This regional strategy was developed to address declines in coastal fisheries resources and ecosystems. Feeding into this strategy are the outcomes over 15 years' worth of ACIAR-funded projects to develop community-based fisheries management in the region, including the use of scientific approaches and traditional knowledge and practices.

The initiative is improving the wellbeing of men, women and children in Pacific coastal communities through more productive and resilient fisheries and better food and nutrition security.

ACIAR and SPC continue to collaborate to deliver strategic regional initiatives, which in turn further builds strategic relationships with Australia's Pacific neighbours. SPC has 27 members, including 22 Pacific island countries and territories.



Plant doctor, Ms Maca Vakaloloma (left) and Fijian farmer, Mr Cheung Ho Fai, diagnose a suspected disease on dalo plants using the Pacific pests and pathogens app. The app is one of the innovative tools developed through a partnership between ACIAR, the University of Queensland and SPC Land and Resources Division. Photo: Dave Lavaki | 2020

## Respect and trust lead to decades-long partnership

Australian and Filipino researchers have worked together for almost 40 years on agricultural research brokered by ACIAR. The research has helped improve livelihoods and increase food security of many Filipino farmers, fishers and communities, as well as strengthen research capacity in the Philippines. With a total investment exceeding A\$150 million across 220 projects, the ACIAR–Philippines partnership is integral to the broader Australia–Philippines bilateral relationship, which has a strong focus on development cooperation – and marked its 75th anniversary in 2021.

Given the established bilateral partnership between the two countries, including agricultural research for development, the Philippines was one of the first country partners when ACIAR was established in 1982. With a long history of cooperation, the relationships between ACIAR and in-country agencies are strong, and none more so than the partnership between ACIAR and the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development of the Department of Science and Technology – generally known as DOST-PCAARRD.

Executive Director of DOST-PCAARRD, Dr Reynaldo V Ebor, has worked in agricultural research and management in the Philippines and internationally for almost four decades. He leads the formulation of frameworks, priorities and programs to develop the agriculture sector. According to Dr Ebor, flexibility, mutual respect and trust nurtured over a long period are the key strengths of the ACIAR partnership with the Philippines.

‘Our countries have been research partners since 1978 and the Philippines has shared resources and results with ACIAR from the organisation’s beginning in 1982.

‘Research for development is dynamic and evolving, so there must be room for partners to adjust their approaches to achieve the desired results and outcomes. DOST-PCAARRD has a very strong and open relationship with ACIAR and our projects directly complement the efforts of other funding agencies like the Department of Agriculture–Bureau of Agricultural Research and the Department of Environment and Natural Resources.’

In 2016, DOST-PCAARRD decided to contribute funding to ACIAR-supported projects to mobilise its researchers and staff more efficiently and streamline and strengthen the research process. Regional partners have responded positively to this move because they see it as adding value to the region. A new partnership agreement between the two agencies was signed in December 2018, committing the two agencies to shared goals and co-investment in research, capacity building and communication about ACIAR-supported partnerships in the Philippines.

‘The recent and significant contribution from the ACIAR partnership has been the sharing of results across the region from complementary programs in the Philippines, Fiji, Indonesia and Vietnam, for example, which enables us to develop strong networks and partnerships across the research community in our region.’

In 2023, the relationship between DOST-PCAARRD and ACIAR takes on an added dimension with the co-funding of five places in the John Allwright Fellowship program. The places are open to Filipino scientists associated with DOST-PCAARRD and ACIAR research projects wishing to undertake postgraduate study at an Australian university.



Dr Reynaldo V Ebor is Executive Director of the Department of Science and Technology – Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD), and has worked there since 2015. Previously, Dr Ebor served as Director of the National Institute of Molecular Biology and Biotechnology of the University of the Philippines Los Baños (UPLB-BIOTECH) and Executive Director of the Department of Science and Technology – Philippine Council for Advanced Science and Technology Research and Development (DOST-PCASTRD). He has also served on many councils and working groups.

Dr Ebor is a member of the Policy Advisory Council (2020–current), which advises Australia’s Minister for Foreign Affairs on issues of agricultural research for development.



## Common interests drive an evolving partnership



Professor Andrew Campbell, ACIAR Chief Executive Officer (third from left), stands with farmers in the salt-affected southern coastal zone of Bangladesh. ACIAR has funded research to develop more salt-tolerant and climate-resilient cropping systems since 2016. Photo: ACIAR | 2023

Australia was one of the first countries to recognise Bangladesh after it achieved independence in 1971 and established its High Commission office in Dhaka in 1972. Both countries share interests in a secure, prosperous and inclusive Indian Ocean region that supports independent, sovereign and resilient states. Accordingly, they work closely on a range of common strategic interests in regional and global forums.

Australia works in partnership with the Bangladesh Government, and other donors, to maximise impact through many avenues, including development, economic, diplomatic, trade and security capacities. Australia's development program supports Bangladesh's health security, stability and economic recovery, placing a strong emphasis on protecting the most vulnerable, especially women and girls and people with disabilities.

The ACIAR relationship with Bangladesh is typical of many relationships with partner countries. Over time, in-country capacity in science and policy has grown, as has the level of development. In response to these changes, the ACIAR mode of engagement and operation has moved from that of donor to co-investor.

ACIAR has supported agricultural research collaboration with Bangladesh since the mid-1990s, focused on productivity of dry-season (rabi) crops like pulses, wheat, maize and watermelon, grown in rotation with wet-season (kharif) crops like rice. In the 2020s, the program takes a farming systems approach, supporting broader food security aspects, improved production and diversification of rice-based farming systems, adaptation to climate change and policies to support a vibrant agribusiness sector for effective input supply systems (including seed supply). Within this context, Australia and Bangladesh share some common challenges and research capabilities. The two countries also share common interests in sustainable agricultural intensification and diversification, mechanisation and precision agriculture.

A partnership between ACIAR and the Krishi Gobeshona Foundation (KGF), was a natural step in addressing these shared agricultural research challenges and goals.

The KGF was established by the Bangladesh Government in 2007, under joint sponsorship of the World Bank, to promote partnerships and collaborations among the institutes of the National Agricultural Research System, technology dissemination departments, farmer organisations, private sector, international research centres and universities. The foundation acknowledged that international collaboration would be critical in finding solutions to problems related to agricultural productivity in Bangladesh.

In 2015, ACIAR and KGF signed a memorandum of understanding to co-design, fund and manage selected research projects. The agreement was refreshed and renewed in 2021. Given the common agricultural production challenges of many countries in South Asia, ACIAR has also played a key role in strengthening research linkages between Bangladesh and other countries in the region, particularly India (Bihar and West Bengal states) and Nepal (eastern Terai region), which have similar biophysical and agroecological characteristics.

The shared commitment between ACIAR and Bangladesh to a long-term research partnership was affirmed with a strategy for collaboration (2021–2030). The 10-year strategy recognises the need for longer-term and flexible programs to respond to complex challenges such as climate change, which require sustained research collaboration and transdisciplinary approaches. The strategy acknowledges the evolving relationship between ACIAR and Bangladesh and the catalysing role ACIAR plays in regional collaboration.





..... In areas with good transport infrastructure in the Papua New Guinea Highlands, smallholders are moving from subsistence farming to market-oriented production. Sweetpotato has a key role in this process and the Transformative Agriculture and Enterprise Development Program (TADEP) supported farmers to improve crop production and meet market and customer needs. Photo: ACIAR | 2018



## Team Australia working together for scale and impact

**Although different in mandate and size, but both sitting within the Australian Government portfolio of Foreign Affairs and Trade, ACIAR and the Department of Foreign Affairs and Trade (DFAT) often work together towards common goals.**

ACIAR and DFAT have a long history of partnership and cooperation, building on each other's strengths to deliver benefits to smallholder farmers in the Indo-Pacific region.

Australia's investment in research for agricultural development and peer-to-peer knowledge sharing, through ACIAR, is an important contribution to Australia's development assistance in the region. ACIAR projects enrich diplomatic relationships and have the potential to be adopted or scaled up by partner institutions or DFAT development programs.

Former Australian Ambassador to Vietnam (2019–2022), Ms Robyn Mudie, worked closely with ACIAR throughout her time in Vietnam. Ms Mudie described the DFAT relationship with ACIAR as one of close partnership and mutual benefits.

'DFAT's long standing development partnership with countries such as Vietnam supports South-East Asia's prosperity, stability and resilience. ACIAR is an important contributor to Australia's development assistance, by providing highly-valued technical assistance and improving the productivity and sustainability of partners' agricultural systems – a sector which is critical to Vietnam's economic growth,' said Ms Mudie.

The impact of ACIAR in many countries, including Vietnam, over four decades, illustrates the value that comes from Australian agencies engaging in a practical and sustained way with their regional counterparts. By working closely with government, scientists and academic researchers, ACIAR has built trusted relationships and become an important contributor to Vietnam's success story.

'ACIAR allows us to walk the talk in terms of Australia's economic support for economic development in countries like Vietnam. Its tangible research and advice help partner countries adapt their agriculture sector to the changing world.

'For example, ACIAR support of research for the development of sustainable rice production methods, in partnership with SunRice, will connect smallholder rice producers with the international market and give farmers economic incentives to grow higher value rice, sustainably.'



ACIAR Vietnam Country Manager Ms Nguyen Thi Thanh An (right) was presented her Australian Public Service Medal by Australian Ambassador Ms Robyn Mudie at a ceremony in Hanoi on 17 July 2020. Photo: Australian Embassy, Vietnam



## ACIAR adds expertise to Australian investment in South Asia

The Sustainable Development Investment Portfolio (SDIP) was an Australian Government initiative funded by DFAT between 2012 and 2021. It brought together partners in Australia and South Asia to improve integrated management of water, energy and food in the river basins of three major Himalayan rivers.

ACIAR co-funded and coordinated the component of SDIP focused on food and agriculture, comprising 20 long-term and short-term projects, which were delivered with numerous science partners from Australia, CGIAR and country partners in Bangladesh, India and Nepal.

Focused on the Eastern Gangetic Plains, a region of 450 million people, the ACIAR-SDIP program investigated the potential impacts of conservation agriculture, patterns of groundwater use, and the intensification of agriculture at the farm, district, national and regional level. Strategies to increase food security were considered in conjunction with environmental impacts, along with national and regional government policies.

More than 75,000 households participated in the program, testing conservation agriculture and sustainable intensification (CASI) on more than 15,000 hectares. Project partners, coordinated by CIMMYT, developed activities in five nodes (communities) in each of eight districts in the Eastern Gangetic Plains to train farmers and extension agents to facilitate up-scaling of project methodologies and out-scaling of technologies. Farmers in two nodes in Bangladesh were so impressed by their experiences with zero-till establishment methods that they now plant all their maize this way. The project also provided specialised training to more than 10,000 farmers and local service providers on a range of topics, including CASI technologies, local service provision and business skills. A further 1,800 scientists and project staff participated in technical training sessions.

ACIAR-SDIP Program Manager, Dr Tamara Jackson, formerly with Charles Sturt University and now with the University of Adelaide, said that participating in the program opened opportunities to drive change through engaging key stakeholders and exploring future scenarios and transformative pathways.

'Phase 2 of the program enabled strategic longer-term thinking about regional development, and helped address policy and institutional barriers to sustainable food systems, particularly in relation to intensification, water management, mechanisation services, market access and full participation of women. ACIAR, together with implementing partners built on the technical and socioeconomic knowledge base developed in Phase 1 to create an enabling environment for widespread adoption of sustainable food systems across the region, of which CASI technologies are a positive and practical example.

'Working with diverse stakeholders meant SDIP could identify key local food system drivers and connect them to "big picture" issues such as policy settings and labour requirements. One example was understanding how the new federal system in Nepal impacted agriculture. Foresight processes identified a lack of coordination between different levels of government as a barrier to agricultural development. Two projects were subsequently funded to work on different approaches to coordination, focusing on both mechanisation and knowledge sharing.'

To continue this work addressing food security and sustainable development in a region with the world's highest concentration of rural poverty, and capitalise on what was learned through SDIP, ACIAR committed to further investment in 2022.

Dr Jackson is leading a new body of work that builds on existing work and partnership networks to provide a link between research outputs and development goals, through the demonstration of inclusive diversification pathways, definition of processes for effective scaling to the millions of smallholder farmers in the region, and generation of a better understanding of the policies that support diversification.



The ACIAR-SDIP program, focused on the Eastern Gangetic Plains, investigated the potential impacts of conservation agriculture and irrigation, particularly with groundwater, and the intensification of agriculture at the farm, district, national and regional level. Photo: ACIAR | 2019



## Scaling out innovation from ACIAR-funded research

DFAT also co-invests with ACIAR to scale out findings from long-term ACIAR-funded research. In Laos, ACIAR has been supporting research since 2010 to help rebuild inland fish populations by developing fish passages, also known as fish ladders or fishways. Fish passages are built into low-level irrigation dams and weirs that otherwise block freshwater fish from travelling upstream to breeding grounds.

The research has been led by Australian researchers at Charles Sturt University who developed fish passages to improve river connectivity in the Murray–Darling Basin. In a project in Laos led by Professor Lee Baumgartner of Charles Sturt University, researchers from Australia and Laos identified priority species and locations for fish ladders to achieve the most effective results for healthy fish populations. They quantified the biological, ecological and socioeconomic benefits of floodplain rehabilitation using fish passage technology, to help increase awareness and facilitate uptake of low-cost mitigation measures.

The researchers mapped over 7,500 barriers to fish migration in the lower Mekong study area, documented detailed characteristics about each one and entered the data into a geographic information systems database. A prioritised list of potential locations for fish ladders was created using this new knowledge, to guide future investment decisions on catchment management in the study area.

The first fish ladder installed in the study area, designed and built by the project team, has allowed passage for 177 fish species. Subsequent surveys of fish utilising the fish ladder have provided important data that will help to manage fish species in the lower Mekong region. For example, the surveys found that three International Union for Conservation of Nature (IUCN) red-listed species used the ladder, and that some larger catfish use the ladder at night, hinting towards the migratory habits of those catfish species.

In 2022, DFAT and ACIAR co-funded a 3-year A\$5 million expansion of the fish passage work, through the Mekong-Australia Partnership – Water, Energy, Climate program. This investment will support the adoption of fish passages in Laos and Cambodia. It will also help build technical skills and capacity in Vietnam and Thailand.

Increasing population growth in South-East Asia means there is more pressure on the rivers and wetlands that flow through the region. There is also a challenge in balancing economic development against the inevitable environmental and social impacts that occur with urbanisation and commercialisation. For example, in Laos, economic development will, in part, require the use of hydropower and irrigation development, all of which can have negative impacts on riverine fauna and fisheries livelihoods.

The project will allow ACIAR to scale out the technical innovation and the supportive governance needed across the broader Mekong Delta. DFAT's diplomatic role in direct government-to-government discussions will also help to encourage national policies that support 'fish friendly' infrastructure in partner countries across the Mekong Delta.



The success of fish passages in Laos, such as this one established beside a dam in Bolikhamxay Province, has led to DFAT support to scale up the technology across the Mekong Delta. Photo: ACIAR | 2012

## ACIAR facilitates private-sector involvement in Papua New Guinea

In some instances, DFAT directly engages ACIAR to develop research projects responding to a specific need. For example, a request from the Australian Government to increase investment in agricultural development in Papua New Guinea led to the Transformative Agriculture and Enterprise Development Program (TADEP).

The program, established in 2015, allowed the two agencies to promote agricultural development in Papua New Guinea, scaling up successful innovations from previous ACIAR-funded projects in Papua New Guinea on cocoa, galip nut and sweetpotato. An additional project developed extension methodology through the Family Farm Teams approach.

TADEP was also an opportunity to build private-sector involvement, helping projects to reach more people over larger areas and generate their own market-based momentum. Linking the projects into a single program helped to provide operational efficiencies and shared benefits across the projects.

One of the projects in TADEP, focused on commercialising galip nuts, was led by Professor Helen Wallace of the University of the Sunshine Coast (at the time of the project) and supported by the Papua New Guinea National Agriculture and Research Institute, the University of Adelaide and Southern Cross University. The nuts have huge potential to improve the livelihood of the rural poor in developing countries and meet the United Nations Millennium Development Goal to eradicate poverty and hunger. The nuts also have excellent nutritional value, can be stored for long periods and can be sold for cash, processed and exported to distant markets.



TADEP supported the development of a pilot factory to process galip nuts for sale at local markets and in supermarkets in Port Moresby.  
Photo: ACIAR | 2018

A whole of value-chain approach was used to find markets, provide technical advice, build capacity, mentor businesses, and give private and public-sector stakeholders access to infrastructure. A pilot factory was built in Kerevat with ACIAR funding, enabling the processing of the nuts. The nuts are sold at local markets and to a factory, which processes and packages the nuts for sale to supermarkets in Port Moresby. Galip nut is the first indigenous wild-grown nut ever commercialised in Papua New Guinea.

The market is expected to expand to between 1,000 and 2,000 t/year, positioning the Papua New Guinea galip nut industry as a niche player in the global export market within the next 5 to 10 years. The industry also provides farming and employment opportunities for women in Papua New Guinea, who cultivate, harvest, process and sell the nuts.



A subsequent ACIAR-funded project led by Professor Helen Wallace from Griffith University, with the National Agriculture and Research Institute and the University of Adelaide, aims to address barriers to private-sector investment in the galip nut industry, further enhance efficiencies in the production and processing systems, and continue to develop domestic and export markets for processed galip nuts.

Partnerships between DFAT and ACIAR can be crucial to responding to changing priorities and new opportunities in partner countries, such as emerging agricultural industries in Papua New Guinea. They can also help resolve issues identified in longer-term collaborations.

Many benefits also accrue for Australia from the ACIAR partnership with DFAT, including 'public good' outcomes such as supporting improved livelihoods in neighbouring countries and promoting regional stability.

In addition, joint projects help to find solutions for shared issues with partner countries, building long-term relationships with governments and the research and development community through the sharing of scientific expertise.

### Australian aid programs

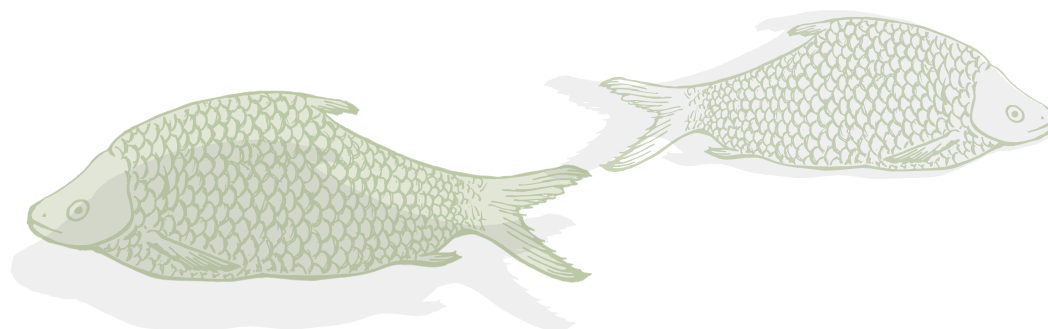
ACIAR receives almost all of its operational funding from the Australian Official Development Assistance (ODA) budget. Official development assistance, also known as foreign aid, is a globally accepted term for monies used by governments to promote the economic development and welfare of developing countries. The Organisation for Economic Co-operation and Development (OECD) maintains a list of countries and territories to which aid provided to these countries qualifies as ODA.

The Australian Government allocates ODA (A\$4.5 billion in 2020–2021) through government agencies to manage, fund and/or coordinate a wide variety of programs to address development activities in seven sectors, including 'Agriculture, Trade and other Production'. Since 2020, ACIAR has received 2–3% of Australian ODA. The Department of Foreign Affairs and Trade (DFAT) receives a little over 90% of total ODA. Other agencies that receive ODA for funding development programs include the Department of Health, Department of Agriculture and Australian Federal Police.

ACIAR works closely with DFAT in common and complementary areas of development assistance for agriculture, fisheries and forestry. From 1974 until 2014, the Australian Government has dedicated agencies to implement development assistance programs. These were:

- » Australian Development Assistance Agency (ADAA, 1974–1977)
- » Australian Development Assistance Bureau (ADAB, 1977–1987)
- » Australian International Development Assistance Bureau (AIDAB, 1987–1995)
- » Australian Agency for International Development (AusAID, 1995–2014).

In 2014, AusAID was abolished and development assistance functions of AusAID were integrated into the operations of DFAT.







### Conclusion

- Lower Minkang Basin significant for the future future in future
- Engaged solution: different solutions for different settings
- Monitoring important to ensure solutions are effective
- Full range of stakeholders need to be involved to demonstrate solutions and benefits

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- Lower Minkang Basin significant
- Many barriers to farm modernisation
- Engineered solutions: different solutions for different settings
- Monitoring important to ensure solutions are effective
- Full range of stakeholders need to be involved to demonstrate solutions and benefits

..... The Crawford Fund hosts Australia's highest profile annual food security conference at Parliament House in Canberra each year. The conference draws its audience from science, agriculture, politics, business and civil society to help focus attention on the way forward. Photo: ACIAR | 2019



## A partner in promotion, communication and training

**The Crawford Fund is a not-for-profit organisation that highlights, promotes and supports Australia's engagement in international agricultural research and development. The Fund is named in honour of Sir John Crawford, a passionate supporter of international agricultural research for development and acknowledged as the architect of ACIAR.**

The mission of the Crawford Fund is to raise awareness of the benefits to developing countries and to Australia from agriculture for development. Working in partnership with ACIAR since its inception has been a natural course in the organisation's evolution.

The Fund's main activities in achieving this mission are creating communication initiatives; supporting scientists and farmers from developing countries to undertake training and career development programs that draw on Australian experience; and encouraging and supporting young Australians in their careers, studies and volunteering in agriculture for development.

The Fund has committees of dedicated scientists in every state and territory, and operates with the financial support of the Australian Government, with overseas development assistance monies allocated through ACIAR. The Fund also relies on in-kind support for its training programs from Australian and international universities, research institutions, the private sector and many individual experts.

### Doing well by doing good

**Emeritus Professor Derek Tribe AO OBE FSTE (1926–2003)**



The Crawford Fund was the inspiration of Professor Derek Tribe. Professor Tribe was an agricultural scientist, British born and trained, who migrated to Australia to take up a position in animal physiology and production at the University of Melbourne in 1956, and then went on to be Dean of the Faculty of Agriculture from 1969 to 1973.

During his tenure at the University of Melbourne he undertook international assignments and consultancies in developing countries, particularly Africa. In this time he was instrumental in the creation of the International Livestock Centre for Africa, which later became the International Livestock Research Institute – part of CGIAR. In this process, Tribe came to know and work with Sir John Crawford.

Professor Tribe retired from the University of Melbourne and took on a range of roles, including the first Executive Director of the International Development Program of Australian Universities and Colleges (1980–1986).

Using his considerable skills and networks throughout the 1980s, Tribe developed the concept and secured support and funding for the Crawford Foundation for International Agricultural Research (now known as the Crawford Fund). The Fund was launched in 1987 – under the auspices of the Australian Academy of Technological Sciences and Engineering (ATSE) – to help develop national and international training and research programs to assist agricultural productivity throughout the world. The Fund was named after Tribe's friend and mentor, Sir John Crawford.

Professor Tribe was the foundation Executive Director of the Fund (1987–1996). In 2001, the Crawford Fund Derek Tribe Award was inaugurated to honour his outstanding promotion of international agricultural research.

Derek Tribe coined the phrase, 'doing well by doing good', which was used in the title of his 1991 book, *Doing well by doing good: agricultural research: feeding and greening the world*. The phrase captured Tribe's belief that by providing aid, particularly to agricultural research, we assist other countries to develop, with mutual benefits to Australia and partner countries.

## Long and productive partnership

The Crawford Fund operates under a memorandum of understanding with the Australian Government via ACIAR, which is their key funder. However, the relationship extends well beyond that of funder and recipient.

'The Crawford Fund has had a long and productive relationship with ACIAR, which has been manifest in partnerships around training programs including Master Classes, support of our annual Parliamentary Conference and outreach activities, and our shared focus on encouraging the next generation of Australian researchers,' said Dr Colin Chartres, Chief Executive Officer of the Crawford Fund.

The Crawford Fund partners with a range of organisations involved in agricultural R&D and overseas development. This includes value-adding to ACIAR projects where possible via training and capacity building and public awareness activities. Our mentoring program is being shaped to align with ACIAR programs in specific countries.

'In 2022, the Crawford Fund published two significant reports demonstrating the significant monetary, capacity building and knowledge benefits accruing to recipient countries and Australia from investment in international agricultural research. These reports demonstrated that Australia is "doing well by doing good", a phrase coined by our founder, Professor Derek Tribe.

'Similarly, we work to ensure that Crawford Fund trainees and the ACIAR alumni networks are better connected. We further support ACIAR by public awareness and communication strategies that highlight the benefits to Australia from involvement in and support of international agricultural R&D and capacity building. We also endeavour to work with the federal departments of Foreign Affairs and Trade, and Agriculture and Water Resources to contribute expertise to key emerging problems and to facilitate interactions with key international visitors to Australia involved in agricultural development issues.'

There are three main areas of collaboration between the Crawford Fund and ACIAR:

- » ensuring that policymakers and the public understand the benefits accruing to Australia from Australia's involvement in international agricultural research and development (examples include access to improved cereal and other plant cultivars, improved biosecurity and a large cohort of individuals who look to Australia for further training and technological and scientific advice and services)
- » complementing the ACIAR capacity development program to provide training and support of young Australians and overseas scientists to develop careers in international agriculture and development
- » working with ACIAR to harness the knowledge and capabilities of senior specialists nearing the end of their careers to act as mentors to overseas agencies and counterpart staff.

'To this day, ACIAR and the Crawford Fund work together with other partners, including those in the private sector, to ensure that Australia is seen as a knowledgeable, reliable and cooperative partner in tackling regional and global agricultural, food and nutritional issues.'

The Crawford Fund partners with a number of overseas organisations. Principal among these are the research centres of CGIAR, non-CGIAR research centres, national agricultural and natural resources agencies, the Asia-Pacific Association of Agricultural Research Institutions (APAARI) and the Global Forum on Agricultural Research and Innovation (GFAR). The Fund also supports mentoring programs by placing volunteers from the Australian Volunteer Program, administered by Australian Volunteers International, with overseas mentors.



A group of young agricultural scientists attends the 2012 Crawford Fund Parliamentary Conference. The Crawford Fund supports young Australian and international scientists to develop careers in international agriculture and development by providing mentoring and networking opportunities. Photo: ACIAR | 2012



## Enhancing communication in agriculture for development

Raising awareness of the benefits to Australia and developing countries of Australia's engagement in international agricultural research and development is a key function of the Crawford Fund.

Public outreach is achieved through communication and engagement activities. Where possible, the Fund aims to synergistically support ACIAR objectives through complementary training, workshops and the development of alumni networks, and public awareness activities.

Since 1987, ACIAR and the Crawford Fund have worked together to support media engagement and enhance science communication in agriculture for development. This partnership has resulted in many initiatives, including media visits to ACIAR-supported project sites around the world, and working together on Australia's highest profile annual food security conference, the Crawford Fund annual conference held at Parliament House, and numerous state-based special events.

'We're very proud of the success we have had in attracting media attention for "good news" stories about the impact and benefit of the work underway by ACIAR and international agricultural research centres on food and nutrition security,' said Ms Cathy Reade, Director of Outreach for the Crawford Fund.

One of the most successful collaborations has been the visits that the Fund organises for Australian journalists to ACIAR project sites, which began in the early 1990s. In 2013 the Fund launched an annual competition – the Crawford Fund's Food Security Journalism Award – in which the winner receives a visit to ACIAR-funded project sites or to international research centres.

'Nothing beats the stories that come with the improved personal understanding that journalists gain by being in the field talking to researchers and farmers,' said Ms Reade.

The ACIAR–Crawford Fund partnership has helped ensure information about and support for ACIAR has been maintained over the years, and it has built goodwill and expertise among journalists and students alike.

'The Crawford Fund's focus has always been "doing well by doing good", and with ongoing collaboration and partnership with ACIAR, it will continue to be so,' said Ms Reade.



Mr Sean Murphy, an Australian Broadcasting Corporation (ABC) journalist (right), was the 2016 winner of the Crawford Fund Food Security Journalism Award. The Crawford Fund supported Mr Murphy to visit three ACIAR-supported projects in Nepal, to produce a feature for the ABC program *Landline*. Photo: Crawford Fund | 2017

## Developing the next generation of researchers

The training of agricultural scientists in developing countries was a principal objective of the Crawford Fund when it was established. The Fund was chartered with linking agricultural research projects funded by Australia (not just ACIAR) and partner-country scientists, and funding short-term and hands-on training, rather than training through degree or diploma courses at universities.

The Crawford Fund delivers training programs to developing country agricultural scientists, extension staff and farmers on a diverse range of topics. The first training course for technicians and scientists sponsored by the Crawford Fund took place at Chiang Mai University in Thailand in 1989. Thirty-two agricultural scientists from four countries in South-East Asia were trained in a new technique for measuring nitrogen fixation by legume crops. The 'ureide technique', developed in ACIAR-funded projects, involved a simpler sampling and analysis process than existing nitrogen fixation measurement methods. The course was run by the Australian research collaborators on the projects, Dr Mark Peoples (CSIRO) and Dr David Herridge (University of New England).

The style of training favoured by the Crawford Fund is targeted, hands-on and with flexible delivery modes, including class training in groups on topics in demand, or individual training for key people needing specific skills. Over the years, the Crawford Fund has contributed to the development of specialist and cross-disciplinary knowledge for more than 15,000 agricultural scientists, managers and farmers, from more than 98 countries. In many cases the training has been specifically tailored for ACIAR project team members and students.

In 1992, the Fund further developed the Master Classes program to provide capacity-building opportunities for mid- and senior-career scientists to grow their understanding of emerging issues, technological developments, new methodologies and innovative policy/regulatory approaches, as well as cross-cutting issues such as communication, and research leadership and management. The Master Classes are intensive programs, developed in partnership with other Australian and international research, government, industry and academic agencies. As at 2022, around 60 Master Classes have been held for more than 1,500 people in 70 countries across the Asia-Pacific region, Africa and Australia. The most recent Master Class focused on Agricultural Research Leadership and Management and has been run four times with about 120 graduates.

The Crawford Fund has also developed a set of programs to encourage passionate next-generation students, researchers and farmers in their studies and careers, and volunteering opportunities, in agriculture for development – known as the 'NextGen Project'.

The Fund's earliest NextGen activities included awards to enable university students to add an international element to their studies (often associated with ACIAR projects), and conference scholarships to attend the Fund's annual conference and undertake special fun, informative activities and be matched with personal mentors. More recently, with ACIAR support, the Fund has been able to bring an additional focus to agriculture for development as a career opportunity, through the development of high school teaching resources and a school competition for those who use them.

The NextGen Project, with support from ACIAR, also promotes the Researchers in Agriculture for International Development (RAID) network, which brings together early to mid-career scientists with an interest in agriculture and international development. RAID was founded by ACIAR in 2013 to create an opportunity for young researchers to connect with their peers and share knowledge, experiences and opportunities in working internationally. ACIAR believed that raising awareness about career pathways in international agricultural research would encourage more young Australians to engage in careers in agriculture and that the network could also undertake activities for career development.

In 2016, the hosting of RAID was handed over to the Crawford Fund, complementing the Fund's activities of engaging directly with the emerging generation of agricultural scientists interested in overseas opportunities, to better tailor training and development programs for them. Members of the RAID network have the opportunity to participate as hosts, presenters and reporters at Crawford Fund events.







Through the NextGen Project, the Crawford Fund, with support from ACIAR, promotes the Researchers in Agriculture for International Development (RAID) network, which brings together early to mid-career scientists with an interest in agriculture and international development. At a soil judging competition in northern Queensland are, left to right, Ms Sarita Manandhar (RAID President 2022–23), Ms Belinda Nielsen and Ms Binh Thi Nguyen. Photo: ACIAR | 2021





..... ACIAR-funded projects on Laos wood production work closely with local private sawmills to provide safety training and capacity building in the best drying techniques, and explore new products and markets.

Photo: ACIAR | 2019



## Private-sector engagement for greater impact

**Farmers who can differentiate their products and reliably supply agricultural produce can gain access to higher value markets, adding both security and value to their farming income. This opportunity is as relevant to a cocoa producer from Vanuatu as it is to a beef producer from Australia.**

One of the strategic objectives of the ACIAR 10-Year Strategy 2018–2027 emphasised engagement with the private sector where possible, to foster more inclusive agrifood and forestry value chains.

Since 1982 there has been private-sector engagement through partnerships brokered by ACIAR, primarily where the private partner has particular technical expertise to contribute. The ACIAR 10-Year Strategy 2018–2027 recognised that the private sector offers unique market and value-chain knowledge, new technologies and exciting innovations, and new investment opportunities, which generally are not available through partnerships with state-based research organisations.

Since 2018, ACIAR has increasingly worked further along supply chains and this new focus was supported by the introduction of a new research program dedicated to agribusiness. The ACIAR Agribusiness Program focuses on working with the private sector to identify inclusive opportunities for smallholder farmers (especially women), on providing healthy, nutritious and safe food, and developing more sustainable and resilient food systems.

Ultimately, public–private partnerships provide new avenues to support inclusive business models that connect smallholder farmers to trading opportunities and markets, leading to greater scale and impact of agricultural research for development.



**Benefits for smallholder farmers**

### New crops, new markets

*Partners in Research for Development, September 2004*

Cattle, buffaloes and pigs are central to farming life in rural Laos. However, livestock production rarely extended beyond one or two large animals per household because of disease and limited feed.

ACIAR-supported researchers are encouraging farmers to cultivate fodder crops to increase livestock production and livelihood security. These crops – tropical grasses and legumes – provide a daily source of feed that allows more intensive and secure livestock raising, laying the foundation for sustainable village economies.

Farmer Mr Va Yer Lao has become an entrepreneur since he and his neighbours set aside land for forage crops. Mr Va Yer Lao established a new income stream for his household by buying under-nourished buffaloes from the market, fattening them, putting them to work at the plough, and then selling the improved animals for substantially more than he paid for them. Mr Va Yer Lao says that by ‘buying skinny, selling fat’ he can make a profit of US\$70 per buffalo after just a couple of months, dramatically lifting his family’s agricultural prospects and living standards.

## Sharing expertise for mutual commercial benefit

Some of the very first projects that ACIAR implemented focused on problems associated with grain storage. In the 1970s, the United Nations Food and Agriculture Organization (FAO) identified post-harvest losses as a priority research area. Many developing countries were reporting significant losses of grain due to poor storage conditions, with the consequence of reduced food availability.

At the time, international agricultural research focused mainly on increasing the yields of the world's staple crops. However, as more and more grain was produced and harvested, the technology and capacity to safely store the additional grain had not developed at the same pace. Director of ACIAR (1989–1995) and entomologist, Dr George Rothschild, recalled the issue.

'You only had to drive around countries in South-East Asia at the time to see the problem. Farmers were drying grain on the side of the road on sheets of plastic. Then it would pour with rain and they would lose the grain,' said Dr Rothschild.

With a significant grain industry, experience in grain storage and an active program of stored grain research, Australia had expertise to share and extend. ACIAR brought together scientists from Australia and South-East Asia to develop a series of interrelated projects in a research program called Safe Storage of Grain in the Tropics. While relevant to all of South-East Asia, the projects focused on the Philippines, Malaysia, Thailand and Indonesia, from 1983 until 1994.

The research provided a better understanding of grain drying and improved processes for drying grain, for the Australian grain industry as well as the partner countries. Grain drying systems were also developed for small quantities of grain, such as bagged grain, which was common throughout South-East Asia.

Management of insect pests was a significant focus of the work. Integrated pest management principles were applied to develop management strategies, which included using combinations of pesticides in rotation and the monitoring of pest populations as a basis for grain protection decisions. In addition, the research identified the minimum levels of pesticide needed for effective control, delivering improved human and environmental health outcomes through both reduced pesticide exposure in grain storage facilities and reduced pesticide residues on grains. As well as introducing new technologies for grain handling businesses and smallholder farmers, the projects also increased research capability within partner countries to support ongoing research programs.

While the grain storage projects produced valuable outputs, post-harvest losses of grain, fruit and vegetables have proved intractable through the years. This was acknowledged with the development of a new research program by ACIAR, in collaboration with Canada's IDRC.

Launched in 2021, the Food Loss Research Program is exploring new ideas to address the ongoing challenge of food loss in developing countries.

ACIAR's grain storage projects are aimed at making use of Australia's experience, in collaborative research with developing country scientists. The projects deal with a number of serious problems in grain storage, such as use of pesticides in the humid tropics and long-term storage problems, in addition to the fundamental problem of how moisture moves in non-aerated stores of bulk and bagged commodities, which at present is not well understood. The projects are interrelated so as to provide the maximum information and the greatest possibility of fresh solutions.

ACIAR Newsletter No. 2, 1983



Grain Storage Research Program Co-ordinator, Dr Bruce Champ (centre left), explains the rationale of the program to media representatives in Malaysia. Dr Champ was the inaugural ACIAR Research Program Manager for Post-harvest Technology from 1983 to 1995. Photo: ACIAR Technical Report No. 1, 1985



## Connecting growers and markets through partnerships

One of the commercial partners in the stored grain research of the 1980s was the Australian company Ricegrowers' Co-operative Mills Ltd. As a commercial milling operation owned and run by Australian rice growers, the company was a key player in the research, providing expertise and helping to test new technologies.

The project, 'Drying in bulk storage of high moisture grains in tropical climates', was a partnership between the University of New South Wales, Ricegrowers' Co-operative and research institutes in the Philippines, Malaysia and Thailand. The project aimed to investigate and adapt techniques developed in Australia for drying paddy rice to grain drying in bulk storage in tropical climates.

As well as contributing to many aspects of the project at sites in Asia, the Ricegrowers' Co-operative hosted a pilot plant in the New South Wales Riverina, to determine the effects of different drying regimes on rice quality.

Almost 40 years later, the Ricegrowers' Co-operative is now trading as SunRice and is one of the largest branded food exporters in Australia, and ACIAR is again working with the Australian rice miller and marketer. SunRice not only has the expertise to address challenges faced by rice growers around the world, but also has a shared interest in finding solutions – particularly in Vietnam.

In 2022, ACIAR and SunRice embarked on the largest public-private partnership in the history of ACIAR. The 4-year project will connect smallholder rice-growing communities in the Mekong Delta region of Vietnam to high-value international markets, giving farmers an economic incentive to grow higher-value rice, and to grow it more sustainably.



Through a public-private partnership, a project starting in 2022 aims to connect smallholder rice-growing communities in the Mekong Delta region of Vietnam to high-value international markets, giving farmers an economic incentive to grow higher-value rice, and to grow it more sustainably. Photo: ACIAR | 2018

The project, 'Planning and establishing a sustainable smallholder rice value chain in the Mekong Delta', aims to establish a highly productive, sustainable, traceable, quality-assured value chain for tropical medium grain rice, benefiting rice-farming households and meeting SunRice quality requirements. The project also enables SunRice to diversify its supply area for rice and source grain from the Mekong region.

Project leader, Dr Jaquie Mitchell from the University of Queensland, believes that engaging with the private sector from the beginning of the project will ensure impact and value for money.

'Research for development on its own, without a market, doesn't have the success that it potentially could if it was market-led. We have a large and diverse team of researchers working on this project, including plant breeders, agronomists, agribusiness specialists, food scientists and social scientists. We are covering all aspects and actors along the value chain to improve the livelihoods of all involved.

'It's a fantastic opportunity for Australian and Vietnamese research partners to learn from each other and collaborate to build capacity. I think the outcomes of this project are going to be very significant for both for the Mekong and the wider rice industry.'

Developing strong private-sector partnerships requires an investment of effort and time to build the relationship and identify the research and associated adoption pathway for mutual benefit. Traditional research partnerships have smallholder farmers as the project beneficiaries and public sector and government partners as enablers. Increasingly, it is recognised that the private sector holds the means or solution to adoption, and the sector is willing and motivated to collaborate on public-funded research for development.

## Productive farmers and sustainable businesses

Member of the Commission for International Agricultural Research, Dr Sasha Courville (2018–current), is using her expertise in shared-value approaches to help ACIAR work with the private sector more effectively. A shared-value approach melds the economic return required by private industry with the development of solutions to social and environmental problems. Dr Courville is Chief Impact Officer with Bank Australia and believes the role of the private sector is evolving and changing as the business community takes on a greater role in addressing societal challenges.

‘We’re going through an exponential curve in terms of expectations of businesses in addressing society’s biggest challenges, such as climate change, gender equality, nutrition. Businesses are facing increasing regulatory pressures, but they are also finding that there is commercial opportunity in addressing these issues.’

‘Gone are the days when businesses just engage for reputation benefit. The real value is in building better relationships with the supply chain to optimise coordination and build efficiencies.’

While the emphasis on public–private partnerships is a developing component of the ACIAR partnership model, engagement with the private sector has already yielded positive results in several projects, as the following examples demonstrate.

Indonesian dairy farmers in West Java are being paid more for better-quality milk as a result of the ACIAR-supported IndoDairy project. Poor milk quality is a problem for Indonesia’s dairy sector, with high bacterial counts affecting shelf life and restricting other uses of the product. Quality can be improved by adopting some simple hygiene practices, such as using hot water and detergent to wash milking equipment.

Under the existing collection system, farmers were delivering milk to their village cooperative, where it was combined into a bulk load and transported to the processor. The processor would test the bulk load and pay accordingly, so there was no incentive to individually supply better-quality milk. In the village of Cisarua, the project worked with the milk processor Cimory to support the cooperative to test farmers’ milk individually. Those delivering higher quality milk received nearly a 50% premium. The incentive has encouraged most farmers to carry out the hygiene steps to improve the quality of their milk. The processor was keen to support the trial because receiving high-quality fresh milk means they can expand their product range, especially into liquid milk products.

In Vietnam, spice producer McCormick Global Ingredients Ltd and the Netherlands’ Jacobs Douwe Egberts (JDE) have invested US\$1 million in an ACIAR-funded project that aims to improve sustainability of farming systems and value chains, as well as resilience to climate change, for smallholder producers of black pepper and coffee in the Central Highlands of Vietnam. The McCormick and JDE investment reflects the increasing commitment of global companies to ensuring that their products are sourced sustainably and fairly. In this instance, they are contributing to research to find ways for their farmer suppliers to increase yield while maintaining good soil health and preventing pests and disease. Other private partners, including Nestle, Tchibo and Nedspice, are offering in-kind support and funding for PhD students over the course of the project.

Cocoa production directly supports about two-thirds of the population in Papua New Guinea’s Autonomous Region of Bougainville. Many cocoa farmers had formed cohesive communities with clear goals and objectives to increase the profitability of their crop and were seeking assistance to achieve these goals. ACIAR brokered a project, which ran from 2016 to 2022, to improve the profitability and vitality of smallholder cocoa farming families and communities. As well as increasing production, expanding the area of cultivation and improving the quality of the cocoa crop, the project supported market linkages between cocoa farmers in Bougainville and commercial chocolate makers in Australia and around the world. Led by the University of Sydney, the project team included the Cocoa and Coconut Research Institute of Papua New Guinea and Mars Australia to strengthen links between communities and the value chain. Variety improvement was one aspect of the project. The work of the project team was rewarded when a sample of cocoa beans from the project, grown at the Bougainville Department of Primary Industries research station, was recognised as one of the top 50 samples at the Cocoa of Excellence 2021 competition in Paris. The project was one of five projects that made up TADEP – an ACIAR–DFAT co-investment to improve the livelihoods of rural men and women in Papua New Guinea.

ACIAR has a long track record of engaging with the private sector and, with 40 years’ experience, the organisation recognises the benefit of identifying private-sector partners to contribute to projects providing smallholder farmers access to and participation in value chains. These types of partnerships continue to be an increasingly important aspect of ACIAR project design.





Indonesian dairy farmers in West Java are being paid more for better-quality milk as a result of the ACIAR-supported IndoDairy project. The project expanded the reach of dairy extension services and Indonesian researchers visited an Australian dairy to consolidate learnings on improving dairy production and profitability. Photo: ACIAR | 2019



# Benefits to Australia

People are astounded by what a small organisation has been able to achieve over such a long period of time and in so many different countries and contexts as well as the benefits brought back to Australia.

**Mrs Fiona Simson**

Chair, Commission for International Agricultural Research (2020–current)



**The Australian Centre for International Agricultural Research (ACIAR) was established to help solve challenges faced by farmers in Australia's neighbouring countries, and in the process, contribute to sustainable economic growth and enhanced regional stability. In fulfilling this role, ACIAR has also contributed to developing the knowledge base of Australian agricultural science.**

The improved practices and technologies that are developed through ACIAR-funded projects overseas also address challenges for agriculture, fisheries and forestry here in Australia.

Through building Australia's knowledge base and the capacity of researchers in Australia and partner countries, ACIAR is regarded as a trusted science partner across the region. It is hard to put a dollar value on the soft power benefit of the contribution that ACIAR makes as a broker of agricultural science collaborations. The benefits to Australia from co-investing in building scientific capacity in the region are evident in some issues at the forefront of social and political interest for the Australian public.

## Science diplomacy

ACIAR builds scientific collaborations and diplomatic ties between Australian researchers and their counterparts in partner countries. ACIAR has helped to generate knowledge and technologies that seek to develop agriculture, fisheries and forestry to support regional security, prosperity and sustainability.

## Nation building

In the early 2000s, when Timor-Leste secured its independence, ACIAR stepped up to support the country to improve its food security. Through a series of ACIAR-supported projects, Timor-Leste farmers gained access to improved varieties of high-yielding certified seed for food crops. The benefits of the Seeds of Life program are long lasting, providing food security as well as financial and social benefits to local communities. The project strengthened Australia's relationship with Timor-Leste, as acknowledged by President José Ramos-Horta in 2012. He wrote, 'Through Australian support we are moving beyond a focus on the most basic elements of food security ... Australia's role in this transition has been a small, strategic and consistent factor in the growth of our young nation.'

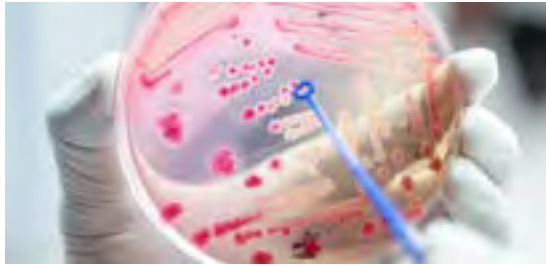
## Biosecurity

ACIAR supports biosecurity research projects to help understand and address threats to food security from animal and plant diseases and pests. ACIAR-funded research forms part of Australia's pre-border defence to international biosecurity threats.

## Protecting industry

Until May 2022, Australia was free of the world's most feared threat to the honey bee industry – the *Varroa destructor* mite. When the *Varroa* mite was detected, thousands of hives and feral bee colonies in New South Wales were destroyed in an effort to eradicate the pest and protect Australia's A\$147 million honey sector and A\$14.2 billion worth of pollination services. The eradication campaign is ongoing, but Australia was well prepared in terms of its surveillance, emergency response and management strategies should eradication fail. This is in part thanks to ACIAR-supported research over three decades, which has helped the Pacific region develop their honey bee industries to provide new livelihood opportunities. The research also informed Australia's National Bee Pest Surveillance Program, which has been credited with delaying the arrival of *Varroa* mite.





## One Health

ACIAR invests in research in One Health – a multidisciplinary approach to attain optimal health for people, animals and the environment. One Health research supported by ACIAR aims to strengthen the safety of agrifood systems.

### Building resilience

In 2018, ACIAR partnered with the Department of Foreign Affairs and Trade (DFAT) to form the Research for One Health Systems Strengthening Program. Its nine projects researched zoonoses, antimicrobial resistance and veterinary systems strengthening with country partners across Asia. ACIAR was ideally placed to provide support and coordination, linking leading Australian researchers, such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Menzies School of Health Research, with their counterparts overseas through the DFAT Indo-Pacific Centre for Health Security. While the systems strengthening program has finished, research embracing One Health principles continues and improves knowledge and systems to develop biosecurity measures to prevent diseases spreading through the environment and between animals and humans.

## Climate change

ACIAR plays a role in Australia's international engagement on climate change and agriculture and supports climate change-related projects to help countries confront the global challenge of adapting to a changing climate, while at the same time reducing emissions from agriculture.

### Strengthening capacity

Climate change is an increasingly important challenge for most ACIAR-funded research projects. While the impacts of climate change and the ability to adapt to climate change underlie much research funded by ACIAR, the ACIAR Climate Change Program established in 2020 focuses research on this strategic objective. The program sharpens focus on agricultural contributions to climate change and opportunities to reduce greenhouse gas emissions from the agriculture, fisheries and forestry sectors. ACIAR is also engaged in climate change multilaterally, including via CGIAR and the United Nations Conference of the Parties on Climate Change (COP). In 2020 ACIAR chaired the Global Research Alliance on Agricultural Greenhouse Gases (GRA).

## Innovation

ACIAR is a distinctive component of Australia's innovation system for agriculture, fisheries and forestry, building knowledge and technical capacity, and generating billions of dollars in value to both partner countries and Australia.

### Restoring coral

Coral restoration research undertaken in the Philippines and supported by ACIAR has provided new ways of accelerating coral restoration, not only on reefs of the Philippines, but also on Australia's Great Barrier Reef. Research led by Professor Peter Harrison of Southern Cross University developed restoration techniques to raise coral larvae either in aquaculture facilities or directly in the sea, with the successful restoration trials arousing interest among reef management agencies around the world, including in Australia. These techniques are now being applied and scaled out to help the Great Barrier Reef recover from devastating bleaching events. DFAT has funded an additional project to ensure scientific and institutional capacity are developed in partner countries to ensure ongoing protection of coral reefs and improvement to the health of reef ecosystems.



### **Australian jobs**

The project funding that ACIAR provides to Australia's university and research sector, in regional and metropolitan Australia, creates high-quality science jobs. ACIAR invests in science that supports researchers in the fields of agriculture, fisheries and forestry, as well as interrelated disciplines of natural resource management, adaptation to climate change, economics and agribusiness, and social sciences.

### **Investing in Australia's scientists**

The ACIAR model of development assistance, where Australian researchers collaborate with in-country partners to undertake research, helps to sustain capacity and develop expertise in Australian universities and research institutions. While Australian scientists benefit directly from gaining new knowledge and progressing their area of expertise, they also benefit from the interactions with scientists in partner countries and the opportunity to supervise and mentor emerging scientists through ACIAR fellowships and capacity-building programs.

### **Trade**

ACIAR investments primarily support Australia's commitment to development assistance. However, both reputation gained and new knowledge acquired through agriculture for development research strengthen Australia's trade reputation and Australia's policy efforts to support a transparent and predictable rules-based global trading system.

### **Supporting exports**

In 1995, fruit fly incursions into Australian horticulture industries threatened the mango export trade. The Queensland Government (Department of Primary Industries at the time) was able to quickly develop post-harvest treatment protocols for Australian mangoes because of a project the department had led for ACIAR in Malaysia and Thailand, where research was conducted on fruit fly taxonomy, hosts and levels of infestation, and on the abundance of fruit flies within the countries. The project involved researchers from the Queensland Department of Primary Industries and the University of Queensland, working with scientists from the national ministries of agriculture. The knowledge and experience gained resulted in Australian mango producers obtaining approval to restart exports in December 1996, at least six months sooner than would have been possible otherwise.







*The thing that strikes me most is that ACIAR has stayed true to the original objectives of basically supporting collaborative research projects between Australian and developing countries' scientists on problems of mutual interest, and that has remained the driving force of the organisation. And secondly, the continuous revitalisation has meant that ACIAR has expanded the scope of its programs. It has included more cross-cutting areas, such as climate change and the environment, gender and diversity, sustainable agriculture and the role of agribusiness in agriculture.*

**Professor Gabrielle Persley AM**

ACIAR Science Adviser and Research Program Coordinator (1982–1991)



# Projects

**From the outset, the Australian Centre for International Agricultural Research (ACIAR) established a distinctive approach to research for development. ACIAR-supported projects focused on finding a scientific solution to a problem, drawing on the best Australian expertise to lead the research.**

A unique feature of ACIAR projects was the benefit to Australian agriculture and Australian expertise. This enlightened and pragmatic approach has contributed to widespread respect for ACIAR and its work across the decades, not only in partner countries but within Australia as well. ACIAR has managed more than 1,500 projects across the Indo-Pacific region over 40 years. The original model, bringing Australian expertise to bear on challenges to agriculture in developing countries, has held true through the decades.

For every project supported, ACIAR has brokered a project scope and research team to address the issues at hand. Most commonly, ACIAR-supported projects have been led by scientists from Australian universities and agriculture departments, and the Commonwealth Scientific and Industrial Research Organisation (CSIRO). Sometimes, projects have been led by a scientist from an international research institute or organisation. The research teams have been made up of scientists, often across several disciplines, from one to many Australian-based and partner-country agencies and organisations.

The scope and nature of the projects has evolved over time, with growing attention to how issues affecting smallholder farmers are interrelated. In the early days, projects tended to focus on a tightly defined technical problem, such as a particular plant or animal disease, practices affecting harvested produce, or access to good genetic stock. However, the projects also considered the economic and social aspects of the problem, and the solution.

Recognising that most agricultural problems usually have multiple and complex causes, project design involved an increasingly diverse range of stakeholders throughout the project cycle. This multidisciplinary approach has increasingly included value-chain specialists, gender specialists, climate change experts and policy experts working alongside technical experts.

Smallholder farmers, fishers and foresters, who are the beneficiaries of ACIAR investments, are also actively involved in projects, from helping to identify problems, to developing and testing solutions that work for them. The private sector and other members of civil society often contribute essential perspective and help projects deliver robust outcomes.

Flexibility and responsiveness have been a trademark of ACIAR. The project cycle has included a critical focus on monitoring, evaluating and learning. This informs continuous improvement, grows the knowledge base built by earlier projects, and provides evidence that Australia's investment in agricultural research for development is making a difference.





..... Taro farmers on the island of Taveuni, Fiji, worked with researchers from Australia and the Fiji Ministry of Agriculture to improve soil health through cover crops, composting and fertilisers. Subsequently, taro roots grew to export size and quality. Mr Geoff Dean from the University of Tasmania (left) and a farmer inspect trial plots. Photo: ACIAR | 2014



## Sharing and building knowledge

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

ACIAR works towards this vision by sharing Australian expertise in agriculture, fisheries and forestry to build a knowledge base for partner countries to use and build on as they take on the challenges facing smallholder farmers in the Indo-Pacific region.

Since the earliest days of ACIAR, the approach has been to help solve problems in developing countries while at the same time improve the research capacity of collaborating institutions in both the partner country and Australia.

The ultimate objective has been to improve the stability and productivity of the agriculture sector in developing countries, and in doing so contribute to the wellbeing and economic development of their people.

Through strategic research investment and brokering of research partnerships, ACIAR also contributes to the continual development of the Australian agricultural innovation system, connecting Australian scientists to international collaborators and opportunities.

**Benefits for  
smallholder  
farmers**



### Farmers inspiring farmers

*Partners in Research for Development, Issue 4, 2017*

Mrs Thao farms in the Mekong Delta, in Vietnam. Using better management practices in her rice–shrimp farming system, she has increased yields dramatically. New practices include changing planting time, planting salt-tolerant rice varieties and using waste from shrimp farming instead of fertiliser.

At Tan Bang Commune in Camau Province, where the new practices have been tested, rice yields on trial farms are up to five times higher than nearby farms using traditional methods. Farmers are noticing the results and are eager to adopt the new practices. With the help of the Department of Agriculture and Rural Development (in Vietnam), the project team, led by University of New South Wales, is promoting the improved practices across four provinces.

The project's success lies with its research partnership model, capacity building activities and regular engagement with stakeholders. Six research agencies are working together, and farmers contribute knowledge and participate in the trials. Some of the farmers involved, like Mrs Thao, are taking a lead role, inspiring other farmers to become involved.

## New knowledge and environments for Australian trees

Australian trees are farmed extensively throughout the world, especially in developing countries where some Australian plantation species are preferred to local forest species for fuelwood and manufacturing owing to their rapid growth and adaptability to harsh environments. ACIAR has long invested in the forestry sector of developing countries, brokering research that improves the domestication of Australian trees as a significant component of sustainable forest production systems in Asian economies.

Plantations of fast-growing eucalypt and acacia species meet a substantial part of the world's growing demand for wood. On recent estimates, eucalypts alone will provide half the global demand for commercial hardwood timber by 2030.

A series of ACIAR-funded forestry projects in the 1980s helped build the eucalypt industry in China, to provide the huge amounts of wood needed by the large and developing nation. Today, China is the second-largest producer of eucalypts in the world, and the scale and success of the industry can be partly attributed to the role of ACIAR in the research.

ACIAR involvement in China started in 1984 when a delegation of ACIAR staff visited China at the invitation of the Chinese Minister for Agriculture, Mr He Kang, and were hosted by the Chinese Academy for Agricultural Science. The aim of the visit was to explore possible collaborative research programs.

The resulting program was developed with the expectations that the ACIAR contribution would be relatively small but with a well-defined focus, and that the research should be catalytic in nature so that the results could have a 'ripple' effect with implications for farming systems throughout China.



From left, Mr Stephen Midgely, CSIRO Australian Tree Centre and Dr John Turnbull, ACIAR Program Coordinator, Forestry, on a fact-finding tour in Laos in February 1991. Pictured with Ms Latsamay Sylavong (front), Dr Geoff Kent and Mr Thong Leaua (right). The trip resulted in the first forestry project with Laos. Photo: ACIAR Newsletter No. 22, 1992

A high priority for China, which Australia had the capacity to support, was a forestry program to develop access to genetic resources and technology to provide better species for plantations and agroforestry. As a result, ACIAR established two forestry projects:

- » trials to determine the most appropriate Australian tree species (mainly eucalypts, acacias and casuarinas) to grow in China
- » studies of acacia silviculture, and of purifying tannin extracts from acacias.

The project leaders were from the CSIRO Division of Forestry, and the projects ran from 1985 to 1992 with the support of Chinese research agencies, Australian state agencies, such as the former Queensland Department of Forestry, and Australian universities.

The projects introduced over 100 species, and established 40 hectares of seed orchards and 1,400 hectares of eucalypt research plantations.

Some of the eucalypt varieties and hybrids were suitable for Chinese conditions, and complemented policies of the Chinese government to encourage tree planting and investment in the plantation industry. New eucalypt plantations provided substantial new sources of income for individual farmers and new local employment opportunities. Local infrastructure and facilities also benefited from the expanded industry, through local taxes on eucalypt wood sales or direct company support. Additionally, the projects trained researchers in China and plantation managers to manage the scale, productivity and sustainability of eucalypt plantations.



## Research program expands

These initial projects led to a larger ACIAR-funded forestry research program in China, South-East Asia and several countries in Africa built around two projects: 'Seeds of Australian trees', from 1993 to 1999, and 'Domestication of Australian trees for reforestation and agroforestry systems in developing countries', from 2000 to 2004. The projects were led by the CSIRO Australian Tree Seed Centre, and for a time cooperated in the establishment of the China Eucalypt Research Centre, part of the Chinese Academy of Forestry, based in Zhanjiang, southern Guangdong Province.

The challenge was to help in-country tree breeders set up genetically diverse breeding populations for long-term tree improvement and seed orchards to mass-produce planting stock for growers. CSIRO teams travelled to remote regions of northern Australia, Papua New Guinea and eastern Indonesia to assemble the seed collections that formed the starting point for breeding and progeny trials for testing hundreds of seed families in many countries.

Capacity building was a vital component of the projects, with frequent advisory visits to countries to provide training in seed collection, handling and seed orchard technology, tree breeding and co-supervision of postgraduate research. In addition, over 200 trainees attended short-term courses on the science of tree domestication. At least 20 former trainees now hold key positions in national agencies concerned with forest genetics and tree breeding. The research collaboration established by the two projects continues through the personal relationships established during the projects.

The progeny trials set up in the 1990s in countries such as India, Thailand, Sri Lanka and Vietnam, form the backbone of today's advanced breeding programs. Some countries are now in their third generation of breeding these important tree species. Breeding trials identify the best trees, which are then used in seed orchards, and also for controlled pollination to produce inter-specific hybrid varieties. These hybrids must be clonally propagated to produce planting stock for plantations.

With ever-growing attention to disease tolerance, Vietnam's Academy of Forest Sciences has developed outstanding acacia and eucalypt hybrid varieties as well as the technical infrastructure that gives growers throughout the country access to clonal planting stock at low cost. As with food crop breeding, tree breeding never stops and must continually address new challenges.

Forestry consultant with Salwood Asia Pacific, Mr Stephen Midgley, was project leader for the latter two projects, and is passionate about the legacy of the work.

'The projects provided the genetic foundations for thriving modern plantation industries which now offer livelihoods and employment to millions of people and products needed by today's changing society. I am fortunate to enjoy a great many friendships within the global plantation sector based upon a mutual, long-term interest in the role of Australian species. I derive a great deal of pride from the useful contribution eucalypts, acacias and casuarinas make to local livelihoods and industry. This represents a uniquely Australian contribution to local development and a lasting, meaningful legacy for projects such as the ACIAR Australian tree projects.'

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return on ACIAR investment

## Benefits included:

- better-quality genetic material
- source material for subsequent research
- assistance to establish research trials, seed-production areas and seed orchards
- significant capacity building, in terms of skills and knowledge.

Source: ACIAR Impact Assessment No. 47, 2007  
– Improved Australian tree species for Vietnam

'The last 40 years has seen a fascinating evolution in the way people view forests and trees and the way in which wood is used. And that's going to continue – contemporary societies need wood as much as ever. Wood production needs to have the same scientific backup as food production. So, there's going to be a very, very strong rationale for ongoing ACIAR-supported input.'



## Protecting giant clams and livelihoods

Giant clams are an important and rich source of protein in the diets of people throughout the Indo-Pacific region, and potentially a source of income in export and tourism markets. Giant clams also play an important role in the health of the marine ecosystem. In the 1980s, increasing human population pressure and pollution, habitat destruction and poaching had severely reduced giant clam stocks.

Giant clams were the focus of the first fisheries projects commissioned by ACIAR. In 1984, James Cook University led the first project 'Culture of the giant clam (*Tridacna* sp.) for food and restocking of tropical reefs', with research partners from the Philippines and Fiji, and other Australian organisations. For 25 years, ACIAR invested A\$4 million in eight projects and worked with fisheries scientists in Fiji and the Philippines, as well as Cook Islands, Kiribati, Papua New Guinea, Solomon Islands, Tonga and Tuvalu.

A risk of agricultural research for development, where the impacts may take many years or even decades to be realised, is that the original context of the research will change, potentially making the aims and objectives of the research unachievable.

Economic studies in the early 1990s showed that the production of giant clams for the meat market was unlikely to be economically viable. The aquarium market, which sought smaller, brighter and faster-growing species, was developing and providing producers with a shorter time frame for production and returns.

While the economic impacts of the research were not realised, there were ongoing benefits in terms of new knowledge and increased capacity of in-country scientists. The skills acquired by in-country scientists were easily and fruitfully transferred to other mariculture enterprises.

### Changes to government policy

In the Philippines, the effect of changing market conditions was compounded by a change in government policy. The research encountered a major setback when the Philippines Government banned export of all giant clams in 1996. Initially, the research had focused on *Tridacna derasa*, a species well suited to the aquaculture market. In the mid-1990s, the researchers switched their focus to the almost extinct species, *Tridacna gigas*, and to restocking the reefs around the country with the species.

While the export ban was viewed as a setback, time and opportunity proved otherwise. In the early 2000s, Professor Edgardo Gomez, the Philippines project leader in the early projects of the program, was awarded a fellowship by the Pew Foundation that came with a generous grant. He immediately deployed his grant to assist the aquaculture and restocking program at the University of the Philippines. By 2006 more than 70,000 giant clams had been restored to the reefs around the country.

The ACIAR project helped lay the groundwork for the establishment of one of the leading coral reef research centres in the Pacific region – the Marine Science Institute of the University of the Philippines, and its Marine Laboratory at Bolinao, where a new generation of marine biologists were taught and mentored by Professor Gomez. Young giant clams remained in high demand across the country by coastal communities, who attest to healthier marine ecosystems where giant clams live, and by resorts, where clams are a tourist drawcard.

Given the near-extinct status of the species before ACIAR projects, the sustained populations of this species demonstrate an impressive conservation achievement by Philippines staff, and ACIAR projects can be attributed an early catalytic role in this achievement.

### Civil unrest disrupts science

In Solomon Islands, farmer training and uptake of the village-based grow-out trials of clams for the aquarium market were disrupted by the escalation of political tensions in the country during the late 1990s. This hindered long-term economic opportunities due to the abrupt closure of the Honiara hatchery, making seed inaccessible to farmers. Coupled with displacement, insecurity and lack of buyers at the time, the giant clam industry stopped for approximately five years in the country.

Despite the lack of long-term economic benefits in Solomon Islands, capacity and skills development in local staff were high, and ongoing working relationships were established. The story of Mr Cletus Oengpepa is testament to the ongoing benefits of ACIAR project partnerships. Mr Oengpepa started his career as an aquaculture technical assistant at the WorldFish Center (previously the International Center for Living Aquatic Resources Management) near Honiara. Supported by ACIAR he attained a Master of Aquaculture at Deakin University in 1999. As his career progressed, he became station manager at the Nusatupe WorldFish research station in the Western Province of Solomon Islands.

When the Honiara hatchery was taken over by rebels in the late 1990s, Mr Oengpepa, at extreme personal risk, saved much of the equipment and some giant clam broodstock by arranging their transfer to the Western Province. Over several decades Mr Oengpepa has mentored and developed the skills of farmers and WorldFish staff and advised on regional developments on giant clam and other marine conservation and production efforts.



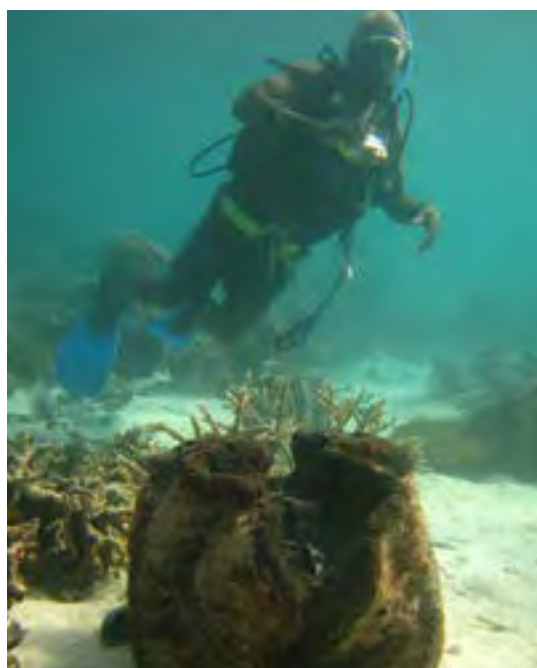
### Unintended benefits

An impact assessment of four of the giant clam projects, which focused on benefits in the Philippines and Solomon Islands, showed little economic benefit from the ACIAR investment in giant clam. However, the projects were a great success in terms of conservation, and scientific and technical advances. Giant clams have been labelled 'iconic' in both countries and the research contributed to a cultural legacy.

Through the projects, ACIAR supported the development of key institutions and individuals in partner countries. The knowledge generated throughout the projects continues to be used and remains a foundational base for giant clam biology and mariculture decades later.

Knowledge from the project was extended through the publication of eight highly acclaimed books and manuals, 30 journal articles and five master and PhD theses – as well as many conference papers, reports and book chapters.

As the first major fisheries investments for ACIAR, the giant clam projects can claim a legacy in the Indo-Pacific region. The knowledge and capacity built in regional institutions were able to be adapted to new conservation objectives, marine-based research or commodities. As research and market interest grew in sea cucumbers and pearl oysters, those skilled in giant clam mariculture transferred their techniques and experience and diversified their opportunities. There continues to be a place for the credible and salient information that ACIAR produced.



Mr Cletus Oengpepa of WorldFish, pictured with a giant clam off Gizo in Solomon Islands, was a committed team member on ACIAR-supported projects on giant clam biology and production, for more than a decade. Photo: Frederique Olivier

## A new species

Project scientists confirmed a previously undescribed giant clam species – now known as *Tridacna mbalavuana*.

Villagers in the eastern islands of Fiji knew of the species, which grows in deeper water than other giant clams. They had named it 'tevoru' – the devil clam.

Source: ACIAR Working Paper No. 33, 1990



A gathering of the giant clam project leaders at Bolinao Marine Laboratory. Philippines project leader, Professor Edgardo Gomez, is standing top right, and ACIAR Fisheries Research Program Manager, Mr Barney Smith, is sitting far left. Photo: John Lucas | 1980s



..... An ACIAR-supported project led by Dr Grant Singleton and Dr Romeo Labios of the International Rice Research Institute (IRRI) aimed to increase and sustain the productivity of both rice-rice and rice-pulse cropping systems in the Ayeyarwady Delta region of Myanmar, from 2012 to 2017. The project also supported agricultural researchers to gain skills and knowledge in rice production systems and natural resource management. Photo: ACIAR | 2018



## Safe and secure food production systems

**Protecting Australian agriculture from new pests and diseases has long been recognised as critically important to sustain production, limit dependence on pesticides and maintain access to domestic and export markets.**

Research that contributes to Australia's biosecurity was a natural fit for ACIAR from the start. It has helped prevent the introduction of several new pests and diseases, and provided the knowledge and tools to limit their spread when other pests or diseases have been inadvertently introduced.

Supporting neighbouring countries to manage damaging pests and diseases clearly contributes to protecting Australia from those same threats, and the research builds the global knowledge base on serious pests and diseases, and their management and/or prevention.

ACIAR-funded projects on Newcastle disease in chickens and Panama disease in bananas are excellent examples of biosecurity research that continues to deliver benefits for the food production systems of partner countries and Australia, and increases the capacity of the scientific and regulatory organisations that work to minimise the potential and impact of pests and diseases. ACIAR support of biosecurity research and implementation programs remains important in 2022 as new or ongoing threats continue to arise, such as fruit fly, wheat blast, faba bean gall, fall armyworm and African swine fever.



## Vaccine innovation secures food supply and income source

Newcastle disease is caused by a virus that is deadly for chickens and some other poultry. It spreads rapidly within and between flocks, and commonly sweeps through villages throughout Asia and Africa. The disease kills many of the scavenging chickens that are important to these communities. Village chickens are often the only source of protein and micronutrients for smallholder farmers and also provide vital income. Up until the 1980s, it was impossible to control Newcastle disease in village chickens because the available vaccines needed refrigeration.

In 1984, Professor Peter Spradbrow of the University of Queensland and Professor Latif Ibrahim (1938–2022) of the Universiti Pertanian Malaysia were funded by ACIAR to research a vaccine that could provide protection from Newcastle disease in village environments. They developed a heat-tolerant vaccine (HRV4) that could be coated onto chicken feed. The research first focused on the vaccine's use in villages in Malaysia, and then extended to other countries in South-East Asia.

The HRV4 vaccine was commercialised by an Australian company, which was later taken over by an American firm. However, affordability of the vaccine and distribution problems limited the initial uptake of the technology in the target countries. Recognising these problems, Professor Spradbrow gained support from ACIAR to develop a new avirulent vaccine, known as I-2, in 1995. From this seed vaccine the heat-tolerant vaccine can be made locally at low cost and administered to chickens in drinking water or by eye drops. This project also developed training methods for people in partner countries to produce the I-2 vaccine from seed stocks supplied free from Australia. The technology and training were also extended to Vietnam and a number of countries in eastern, southern and western Africa.

Research and vaccine development to combat Newcastle disease in eastern and southern Africa was consolidated under new ACIAR-supported projects from 1995 to 2001. Led by the University of Queensland, the projects in Africa resulted in development of comprehensive vaccine production, distribution and administration systems for the I-2 vaccine.

The ACIAR-funded research was followed by a series of projects funded by the Australian Agency for International Development (AusAID) that continued the Newcastle disease control activities in Mozambique and expanded them into Ethiopia, Tanzania, Malawi and Zambia.

An impact assessment in 2013 concluded that total net benefits to the four African partner countries was estimated at around A\$479 million, with A\$80.6 million of those benefits attributed to ACIAR.

Dr Robyn Alders, now Honorary Professor at the Australian National University and a Senior Consulting Fellow with the Chatham House Global Health Programme, worked on the ACIAR-funded project in Mozambique. Dr Alders was involved in taking the thermotolerant vaccine from Asia and adapting its use for Africa. The project actively involved men and women chicken farmers, and a novel cost-recovery program involving community vaccinators for Newcastle disease was developed.



An impact assessment in 2013 of research and development investment to control Newcastle disease concluded that total net benefits to four African partner countries was estimated at around A\$479 million, with A\$80.6 million of those benefits attributed to ACIAR investment. Pictured are residents of Singida, Tanzania. Photo: ACIAR | 2012





ACIAR-supported research for a vaccine for Newcastle disease in poultry resulted in the development of an effective thermo-tolerant vaccine and the scaling out of vaccine production, distribution and administration systems on South-East Asia and Africa. Project leader for the work in Mozambique, Dr Robyn Alders (front, left) visited the Singida district in Tanzania to see residents who have been successfully vaccinating their poultry, including lead vaccinator, Asha (back, centre, in yellow cap). Photo: ACIAR | 2012

This made the vaccination program sustainable, without needing international resources. The cost-sharing model with village farmers has been adopted in many countries in Africa and Asia, including Timor-Leste, helping to increase biosecurity against poultry diseases in those regions as well.

In addition to economic and social benefits of the project in Africa and South-East Asia, the development of the new vaccine strengthened Australia's management of poultry diseases.

'In terms of clinical signs, you can't tell the difference between virulent Newcastle disease and highly pathogenic avian influenza. This makes it difficult to rapidly identify outbreaks of avian influenza in regions where farmers are accustomed to seeing chickens die regularly from Newcastle disease,' explained Dr Alders.

'When farmers believe that the vaccine will prevent Newcastle disease, they are willing to pay a fair price for the vaccine and its administration by community vaccinators. Because of this investment, should vaccinated birds then die, those farmers are more likely to report that death. That then provides a more sensitive surveillance system for highly pathogenic avian influenza.'

**60 : 1**

return on Australian Government investment

**Benefits:**

**Vaccination of village chickens in Africa has reduced poultry mortality rates and allowed households to expand their flocks and increase production for sale and consumption.**

Source: ACIAR Impact Assessment No. 87, 2014



## Overseas research protects Australian banana industry

Panama disease in bananas is caused by the soil-borne *Fusarium* fungus – the disease is also called *Fusarium* wilt. Spread by people, animals and machinery through the movement of infected banana plants, soil, water or planting material, Panama disease can survive in the soil for decades. The disease is one of the greatest threats to global banana production and control of the fungus is centred around slowing the spread of the disease and planting resistant varieties of bananas.

In the 1950s, Panama disease was responsible for widespread destruction of banana plantations in Central and South America, resulting in the abandonment of the susceptible Gros Michel variety from commercial plantations.

Banana producers then adopted the Cavendish cultivar, which was resistant to the type or race of *Fusarium* that had destroyed the Gros Michel industry. However, in the 1990s, a new strain of *Fusarium* wilt was discovered to be infecting the Cavendish banana – Tropical Race 4 (TR4). The new strain was first detected in Taiwan and spread rapidly through South-East Asia, wiping out the Cavendish-based banana industry in Malaysia and appearing in Indonesia in 1994.

TR4 made its way to Australia in 1997 and was first detected in the Northern Territory. Just six years later, the territory's burgeoning banana industry was wiped out. However, due to strict quarantine measures, Australia's major banana production hub in Queensland remained disease-free.

The disease reached the Philippines, one of the largest banana-exporting nations in the world, in 2005.

ACIAR funded research to evaluate *Fusarium* wilt resistant hybrids and cultivars in Tonga and Queensland in 1995. In the mid-2000s, with the ongoing threat and spread of TR4, two projects were established in Indonesia and led by Bioversity International to develop science-based disease management approaches.

Knowledge gained in Indonesia formed the basis of a research program between the Philippines government and ACIAR to develop a series of projects to help smallholder banana farmers fight TR4. Led by the Queensland Department of Agriculture and Fisheries, research started in 2012 to increase knowledge of on-farm biosecurity, minimise *Fusarium* wilt incursions, develop long-term management strategies to slow the spread of the disease and develop options to allow smallholder producers to return to economic production.

Dr Tony Pattison, Principal Nematologist with the Queensland Department of Agriculture and Fisheries, was involved in the ACIAR-supported projects in Indonesia and the Philippines since the late 2000s, and he led the Philippines-based research from 2015.

'Many smallholder farmers were growing the highly susceptible Cavendish banana "Grand Nain" because it was preferred by consumers in the Philippines and provided a good livelihood for banana growers.

'Different varieties of banana are not always accepted by the market, so the ACIAR-funded work concentrated on building the capacity of Philippine growers, local universities and provincial agricultural officers to help banana growers manage Panama disease.



Mr Patrick Leahy (centre), a Queensland banana grower and member of Australian Banana Growers' Council, discusses the challenges of Panama disease TR4 on his plantation with ACIAR Research Program Manager, Horticulture, Dr Richard Markham (left) and Principal Nematologist with the Queensland Department of Agriculture and Fisheries, Dr Tony Pattison (right). Photo: ACIAR | 2017



'The ACIAR-funded work generated much greater awareness of the severity of the disease and how easily it is transferred. The research also reinforced the importance of on-farm biosecurity practices.'

Generating a better understanding of soil biology and how this can be used more productively to prevent Panama disease, rather than relying on chemical interventions, underpinned a lot of the extension work associated with the project. Simple technologies that were tested and implemented by the farmers included growing vegetative disease-suppressive groundcovers under the banana canopy and planting more disease-resistant cultivars. These practices helped reduce the susceptibility of banana plants to the disease.

Experience with *Fusarium* wilt of banana through ACIAR-supported projects was vital in assisting the Australian banana industry to manage the disease when it was detected on a Queensland farm in 2015. Biosecurity Queensland was quick to quarantine the plantation at the centre of the outbreak and set up biosecurity restrictions to stop the spread of the fungus.

The expertise developed by the research team throughout the ACIAR-funded project, and the knowledge shared with Australian agencies and producers, ensured that the Australian banana industry was vigilant and quick to respond to incursions of the disease.



A banana grower in the Philippines inspects healthy fruit in her plantation. ACIAR-supported projects introduced simple technologies to reduce the impact of Panama disease. These were tested and implemented by farmers and included growing vegetative disease-suppressive groundcovers under the banana canopy and planting more disease-resistant cultivars. Photo: ACIAR | 2017

From 2015 to 2022, only 157 trees in northern Queensland have been diagnosed with Panama disease and had to be destroyed. Unfortunately, the area of land infected with *Fusarium* wilt in districts growing bananas for export production in Mindanao, the Philippines, continues to grow.

ACIAR support of efforts to manage Panama disease in partner countries, or to prevent its incursion, is ongoing. A 5-year project that started in 2020 in Indonesia, the Philippines and Laos is examining different farm management practices to increase the soil microbiome and make it harder for *Fusarium* to grow in the soil.

In 2022, a new ACIAR-supported project, led by Mr Stewart Lindsay from the Queensland Department of Agriculture and Fisheries, was implemented in Mozambique and Tanzania to investigate banana farming systems, the cultivars grown and production practices for susceptibility to Panama disease. The project also seeks to work with country partners and landholders to identify practical biosecurity measures to reduce risks and mitigate potential damage from the disease on small farms.





..... The introduction of sustainable intensification and conservation agriculture techniques to farmers of the Eastern Gangetic Plains initiated additional income streams for farmers. Machines such as the mechanical rice transplanter (pictured here in Cooch Behar district of Bangladesh) required the production of rice mats, which provided a new income for farmer groups, particularly women. Photo: ACIAR | 2019



## A systems approach for sustainability and adaptation

**In fulfilling its mandate of solving agricultural problems, ACIAR-supported projects frequently recognise that solutions depend on more than agricultural technology and practice. Project design and implementation must also take into consideration capacity, social, market and policy changes needed to ensure adoption of the new technology and practices, to facilitate impact.**

Almost from the outset of ACIAR, a 'farming systems' approach was identified by the Policy Advisory Council and ACIAR Board of Management as a program area for development in the ACIAR research portfolio. By May 1985, ACIAR had implemented four farming systems research projects, focused on farming systems in the South Pacific, crop and forage production in the semi-arid tropics of Africa, and technologies and environmental constraints in rice production in the Philippines and Sri Lanka.

Also in 1985, ACIAR convened a workshop of Australian and global experts to identify areas of farming systems research where Australia had a comparative advantage, and from there, developed a strategy for future collaborative research between Australian and developing country partners.

The workshop described a farming systems approach as applied agricultural research that begins and ends with the smallholder farmer, research conducted by multidisciplinary teams, and research that considers the stability and sustainability of project outputs and the equity implications of the anticipated changes to the farming system.

As the decades have progressed, the need for a 'systems approach' is ever more compelling. In the context of farming, fisheries and forestry systems, ACIAR is supporting more complex research, conducted by multidisciplinary research teams, to understand the intersections and interactions between food, water, climate and energy, and the interconnectedness of these elements with associated ecosystems and value chains. The outcomes of ACIAR programs will contribute to global development goals. Positive changes to food production systems and livelihoods underpin the future of global public health and global action on climate change.

**Benefits for smallholder farmers**



### Right crop in the right place

**ACIAR blog, *More crop per drop*, December 2018**

More than 75% of Cambodia's agricultural land is dedicated to growing rice but in many places, the soil is too sandy and the local rainfall is too low to achieve good yields. ACIAR is supporting research to increase farmers' knowledge of soils and the best crops to grow, to increase the profitability of their farming system, which also includes livestock production.

Mrs Sar Samoel is participating in an experiment that planted forage crops at 12 farms in southern Cambodia.

'We grew rice here in this field but we now have grass for the cows. The grass grows well and it is good for the cows – it has more vitamins, it fattens the cows and makes it easier for them to carry calves. Now the cows look healthier and it also saves me time, because I have the fodder for the cows next to my home, where before I would have to take the cows out in the fields to graze,' she said.

The project demonstrated that growing fodder crops after the wet season rice crop increased feed availability in the dry season.

## Improving Pacific farming systems starts with understanding

The Commission [SPC] is especially pleased that a project to study the smallholder farming systems and their constraints is finally underway. We regard this project as of utmost importance as this after all is the predominant farming system in the region and will likely continue to be so in the future. There is no doubt the failure of many agricultural projects in the past has resulted from a lack of understanding and appreciation of the system and its constraints. A great deal of time and effort was spent in trying to replace the system rather than trying to improve it. Real improvement after all can begin only after we understand the system.

**Dr Kato Tama**

*South Pacific agriculture: challenges and opportunities for ACIAR and its research partners, ACIAR Technical Report No. 5, 1985*

Leading up to the 1980s, local attempts to raise farm production levels in Tonga were disappointing. However, stakeholders within and outside of Tonga believed that if the agriculture sector, and smallholders in particular, were provided with the right technologies, infrastructure and incentives, there could be substantial agricultural and economic growth.

In 1984, ACIAR funded the 'South Pacific Smallholder Project', led by the University of New England, to identify the constraints and opportunities for the development of smallholder agriculture, with studies in Solomon Islands and Tonga.

The project aimed to develop constructive recommendations for feasible changes in agricultural policies and programs and to make specific suggestions for agricultural research and technology testing. The project, and in particular the systems approach, was welcomed by regional experts, such as Dr Kato Tama, Tropical Agriculturalist with The Pacific Community (SPC).

Presenting at a seminar organised by ACIAR, on occasion of the Policy Advisory Council meeting in Samoa in 1985, Dr Tama also urged ACIAR 'to consider the training of researchers in the region as an integral part of its projects in order to ensure that the impact created by the project is not lost after a few years'. Dr Tama's words in 1985 capture the heart of the longstanding and successful research partnership model that ACIAR established.

The research showed that there was substantial scope for raising both farm production and rural income, in the two countries studied, through the development of agriculture. While there was potential to increase productivity, there would be little benefit doing so without improving access to markets and the performance of agricultural markets and statutory authorities.

Studies during the project revealed wide differences in productivity between the best and worst farmers, suggesting good knowledge already existed in farming communities and the challenge lay with extension services. Addressing the challenge presented difficulties in Solomon Islands where most of the farmers were women yet the extension officers were men. This had inhibited the introduction of better farming techniques in some areas.



A Tongan smallholder at work in his garden. The project showed that there was substantial scope for raising farm production and rural incomes through improved practices. Photo: *Partners* magazine No. 3, 1990





Project leader, Dr Brian Hardaker, University of New England (second from right), talks with colleagues during field studies in Tonga.  
Photo: *Partners* magazine No. 3, 1990

Among their key conclusions, the researchers noted that farmers were too often blamed for past failures of development of the agriculture sector. However, the study showed clearly that progress depended on better government policies and programs. In turn, better agricultural planning required better information. The improvement of the agricultural database for the South Pacific became a central part of the project and subsequent to that, the dissemination of the results and implications.

ACIAR published the proceedings for a workshop held in Tonga in May 1988, where the findings of the South Pacific Smallholder Project were presented. The project, which included four case studies of villages in various parts of Tonga, established a useful baseline for determining appropriate strategies needed to increase productivity and improve farmers' terms of trade.

### Same but different approach

Four decades later, farming and the capacity to support livelihoods in the Pacific region remains challenging – with the evolution of new economic, social and environmental constraints.

The impacts of climate change are becoming manifest through rising sea levels and salinity intrusion, more severe tropical cyclones, more periods of drought and increased unpredictability of rainfall. These changes are expected to affect the production of staple food crops (such as taro, rice and sweetpotato) and high-value cash crops (such as tomato, mango and papaya). Climate change is also expected to affect livestock production systems, with varying impact between types and breeds of animals.

There is consensus throughout the Pacific region that 'climate-smart agriculture' is a sensible way to improve the sustainability of agriculture in the context of climate change. At its core, climate-smart agriculture must include biophysical changes on farm that improve sustainability, assist with adaptation to current and future climates, improve development and livelihoods, and reduce greenhouse gas emissions. Achieving these multiple goals almost certainly requires a package of interventions – a farming systems change approach. An approach to systems change that has been successful in other parts of the world is 'sustainable intensification of agriculture'.

In 2023, ACIAR will support scientists from the University of Melbourne and partner-country scientists in a project to undertake a combination of university-based and farmer field trials of integrated sustainable intensification practices tailored to Pacific farming systems. The researchers will evaluate the benefits and practicality of this approach, in Samoa and Tonga. It is anticipated that the research will foster national conversations about the potential for new types of farming systems changes to support climate-resilient food systems in the Pacific.



## Sustainable grasslands needed changes to management and policy

ACIAR has provided the opportunity for Australian expertise in a range of areas to guide and mentor Chinese scientists in fields of R&D [research and development] where they have no or limited experience, to address one of the major and most widespread problems in China. The work we have done demonstrates the value of supporting technical collaboration so that Australian scientists can work with Chinese groups to improve the quality of the work done and deliver gains to herders, linked to sustainable national policies. It is clearly evident from many conversations with Chinese groups that this collaboration is highly valued and they all wish to continue the connections.

**Professor David Kemp**

Charles Sturt University

(formerly The University of Sydney)

Response to Independent Review of ACIAR 2013

Dust storms had long been a part of life in China, with Beijing often blanketed by layers of dirt and grit up to 2 centimetres thick during spring, as winds deposited hundreds of thousands of tonnes of eroded soil across the city. The dust sometimes travelled to neighbouring countries, Japan and Korea.

The vast grasslands of China cover approximately 400 million hectares and support the livelihoods of 16 million herders and their pastoral households. Since 1990, several social and political changes resulted in a fourfold increase in animal numbers leading to severe over-grazing of the grasslands and increased soil erosion. This affected air and water quality far beyond the grassland region, as well as contributing to declining household incomes and deteriorating ecosystems.

In 2001, the condition of the grasslands was the focus of an international conference organised by the China Agricultural Science Society and the Chinese Grassland Society. Professor David Kemp, who was at the University of Sydney at the time, was invited to give a paper on Australian approaches for managing grassland sustainably and to tour northern China to discuss ideas for research.

Professor Kemp observed that many ecological and agronomic aspects of the grasslands were being researched and documented by scientists from universities and institutes in China, but work was needed to bring the results together to develop practical and effective solutions.

This led to the establishment of an ACIAR-supported applied research program aimed at restoring degraded grasslands through better management, while improving the income of herder households, one of the poorest groups in China. Professor Kemp and ACIAR worked with key grassland groups across northern and western China to develop a program with a broad systems approach.

The program drew on experience and expertise from six different research institutions in China who worked with Australian partners from the universities of Sydney, Charles Sturt and Queensland, and the New South Wales Department of Primary Industries. Initially, herders from four villages along a 1,500 kilometre transect, linked to different grassland environments, participated in the program to identify areas of farm management that could be improved.



At the time of the research, the total grazing pressure in many areas of the Inner Mongolia Autonomous Region was high. These sheep on the desert steppe were in good condition at the end of summer, but there was no more grass growing for the next nine cold months to sustain them under traditional management practices. Photo: David Kemp





Sheep on desert steppe farm in mid-summer on grassland, after three years at the low stocking rate. Photo: David Kemp

Modelling, farm demonstrations and field experiments by the scientists showed that productivity and incomes could be increased by reducing herd sizes by as much as half. A system where animals grazed pastures only in the summer months and then were kept in sheds and hand fed for the remainder of the year, protected livestock from harsh weather ( $-40\text{ }^{\circ}\text{C}$  in winter) and increased productivity of meat, milk, wool and cashmere. The reduction in stocking rates increased herder incomes and reduced pressure on the grasslands, enabling rehabilitation. However, further work was needed to understand the system changes that would consistently achieve sustainable outcomes.

The project had important social implications. It encouraged a far more cooperative approach among herders, not only in the way they cared for and managed their animals, but also the way they marketed them, giving the herders greater bargaining power to achieve premium prices for their produce.

Most significantly, a change in cultural attitudes was required. Traditionally, a herder's wealth was measured by herd size but by participating in the project, the farmers recognised that the health and quality of their animals were more important than the number of animals they owned.

A change in management systems is also bringing about benefits to address national and regional issues, such as reducing the soil erosion that contributed to some of Asia's worst dust storms and siltation in major watercourses, such as the Yellow River, and reducing greenhouse gas (methane) production through the reduction in herd size.

Various stages of the program involved Australian researchers providing leadership, mentoring, coordinating, modelling and analyses for a large number of Chinese-funded projects. The Australian team from Charles Sturt University's Gulbali Institute joined with groups from China Agricultural University, Inner Mongolia Agricultural University, Institute of Grassland Research (China Academy of Agricultural Sciences), Gansu Agricultural University/Gansu Academy of Agricultural Sciences and Lanzhou University, to ensure the learnings of the program were soundly extended to herders and their advisers, as well as to scientists and policymakers involved in the management of the vast grasslands.



Dr David Kemp (centre, red shirt) and Hou Fujiang of the Gansu Grassland Ecological Research Institute (second from right), with farmers and local Animal Husbandry Bureau officials in the mixed cropping and grazing farms at Huanxian in eastern Gansu. Photo: supplied by David Kemp





..... A labourer sorts freshly picked oranges at a market in the Samdrup Jongkhar district of Bhutan. ACIAR-supported projects contributed to improved production practices and grower knowledge in Bhutan, as well as giving Australian scientists firsthand experience of the citrus greening disease, huanglongbing. Photo: Talukdar David | Shutterstock.com | 2019



## A research program to build industries

**ACIAR-funded projects address industry development at many levels – preserving and introducing new genetics and varieties, introducing new technologies and upskilling in-country researchers and extension personnel, and increasing farm profitability.**

A feature of the work of ACIAR over the years has been its flexible and encompassing approach to project design. ACIAR has worked with science partners and stakeholders to not only address the research issue at hand, but also facilitate the uptake or delivery of benefits to communities and industries, and if there was potential, extend the benefits to additional countries.

A series of projects focused on citrus demonstrates the flexible and evolving nature of the ACIAR partnership and research model over the decades. This series started with work in China in the early 1990s, and then extended to Australia, Vietnam and Indonesia. As well as developing and delivering improved scion varieties and rootstock types in Australia and partner countries, partner-country researchers gained important knowledge and skills for ongoing variety identification and development.

Other programs of citrus-focused research and extension ran in Bhutan (2007–2017) and in Pakistan (2007–2016), with wider outcomes in upskilling the knowledge of both Department of Agriculture personnel and citrus growers, and in nursery and citrus production techniques, pest and diseases management, pruning and irrigation management, and variety and rootstock development.

The work also had significant biosecurity benefits to Australia, through an increased understanding of the citrus diseases present in Asian countries. Supplemental funding or in-kind support from the Australian industry, including the research and development corporation for Australia's horticulture industry, now known as Hort Innovation, helped maximise benefits to both Australian growers and overseas partners.

The investment in a suite of citrus-related research and development projects across Asia has resulted in stronger industries for all partners.

**Benefits for  
smallholder  
farmers**



### Budding opportunity for women

*Partners in Research for Development, Issue 2, 2016*

A citrus project in Pakistan is taking a broad, whole-orchard and value-chain approach to identify the key issues affecting the income-earning potential of orchards. One of the key achievements of the project team has been the improved inclusion of women.

Women in Pakistan do not work in citrus orchards or packing sheds, for cultural, safety and logistical reasons, which excludes half the population from a significant and growing sector of the economy. The opportunity to provide women with new skills and business opportunities came when researchers noticed that women were actively budding trees in informal nurseries in their backyards, with the trees then being sold by male household members.

Recognising the value of this work, researchers provided additional training and tools to propagate and maintain healthy, high-quality citrus nursery trees for supply to local industry. A small number of nurserywomen were also selected to undertake advanced training in Thailand and Australia. Since returning to Pakistan, these skilled nurserywomen have become industry leaders, trained other women in their region, and increased their profit margins by up to 100 additional rupees per tree.

## Better varieties for better incomes

One of the earliest ACIAR research partnerships was with China, a centre of origin for many types of citrus fruits. Building on established scientific and diplomatic linkages, China and Australia agreed to exchange citrus germplasm material – such as seeds, rootstock and scion varieties – for assessment and to develop new and better varieties for citrus production.

An Australian International Development Assistance Bureau (AIDAB) citrus project completed in Hunan Province, China, in the early 1980s, concluded that further investment in citrus would be beneficial to both China and Australia. Subsequently, citrus rootstock improvement was identified as a priority area for further collaborative research, following a visit to China by Mrs Patricia Barkley, New South Wales Department of Primary Industries (NSW DPI) and Dr Gabrielle Persley, ACIAR, in 1986. A feasibility study in 1988 by Dr Ken Bevington, NSW DPI, Dr Steve Sykes, CSIRO, and Mr Robert Moore, ACIAR, recommended that a citrus rootstock improvement project should proceed.

In 1992, ACIAR funded what would become a decades-long program to screen citrus germplasm for disease resistance, salinity tolerance, uniformity and graft union compatibility. The program aimed to supply growers in China and Vietnam with high-quality, disease-free and virus-free planting material that, once established and in production, would generate income for local communities. The first projects were led by Mrs Barkley and Dr Bevington of NSW DPI.

Dr Tahir Khurshid is a research physiologist with the NSW DPI. He has been involved with the ACIAR-supported citrus projects since 1999. He evaluated 56 varieties of rootstock from China and Vietnam, with six promising rootstocks commercially released in Australia in 2017, offering increased productivity for Australian growers.

'This result would not have been possible without the support of ACIAR. Australian scientists had a good relationship with their counterparts in China. With project arrangements in place and ACIAR support, Australia gained access to Chinese rootstocks and we were able to identify new rootstock for Australian growers.'

As a result of the science partnership, China's citrus industry added Australian citrus varieties – such as the Lane Late navel – to the mix of varieties it grows. As a later-maturing variety, Lane Late allows growers to harvest and supply the market over a longer period and is worth about A\$38.4 million a year to the Chinese industry.

The Australia-Pakistan Agriculture Sector Linkages Program (ASLP) was established in 2006 to improve livelihood systems for the rural poor in Pakistan and build links between the agriculture sectors of Australia and Pakistan. Research and extension on citrus focused on improving orchard and management practices for Kinnow mandarins, as a major crop for local and export markets. The project also introduced new germplasm.

Over almost a decade, and two projects, more than 5,000 growers were trained in new practices, seven new varieties and six rootstocks of citrus were introduced to extend and expand the marketing period, and greater understanding of value chains was attained to improve fruit quality to achieve higher market prices and reduce wastage through improved harvesting and post-harvest practices.

### Researcher honoured

In 2017, citrus breeders from Queensland Department of Agriculture and Fisheries selected and developed a new rootstock, based on one of the Chinese citrus rootstocks. The new rootstock was distinctly different from currently available rootstocks in Australia. It was named 'Barkley' after NSW DPI pathologist Patricia Barkley, who was regarded as one of Australia's most distinguished citrus researchers.

Dr Khurshid also led one of the two projects in Pakistan for a decade, which resulted in the commercialisation of Daisy mandarin (*Citrus reticulata*) and Arnold Blood orange, extending the citrus production season in Pakistan. In Khyber Pakhtunkhwa province the rootstock *Troyer citrange* has been introduced to replace sour orange (*Citrus aurantium*) rootstock.

Testing and ongoing registration of new varieties and rootstocks more than a decade after the project finished indicates the building of in-country capacity during the project phase. Additionally, Pakistani women and men were trained in nursery skills to produce high-quality citrus trees at home, boosting their incomes.



## Better protection of the industry in Australia and overseas

This series of projects gave Australian researchers the opportunity to study diseases in the Asia region and to contribute to biosecurity preparation and planning in Australia. The projects bolstered Australian knowledge about exotic citrus diseases such as huanglongbing (citrus greening disease) and its vector, the Asiatic citrus psyllid.

'Learning about huanglongbing was a crucial takeaway from ACIAR-funded citrus projects in Bhutan,' said Ms Sandra Hardy, project leader and former NSW DPI Citrus Program Leader.

'By going to Bhutan, we really got firsthand experience of how devastating huanglongbing can be, how difficult it is to eradicate and how important it is for Australia to have a facility that contains all our germplasm in protected sites.

'One of the biggest benefits to Australia from these projects, was their contribution to biosecurity.'

Australian researchers developed additional knowledge on exotic pest detection and management. As a result, the Australian industry is better informed and better prepared for serious disease incursions, as well as having new rootstock and integrated pest management options.

In China, Vietnam and Bhutan, a new understanding of the importance of disease-free budwood and grafted rootstock was developed. Training was completed in molecular analysis techniques for germplasm and disease assessment in China and Vietnam. The construction of insect-proof screen houses in China, Vietnam and Bhutan made maintenance of disease-free mother trees possible.

### Skills and lifelong involvement

Importantly, ACIAR-funded research equipped smallholder farmers in partner countries with knowledge, skills and highly trained local expertise to transform their capacity and future wellbeing.

In Bhutan, the projects had a focus on capacity building. Citrus growers and local Department of Agriculture staff in Bhutan learned about citrus management and production techniques, such as pruning, nursery production, and fertiliser and irrigation management in demonstration orchards, workshops and overseas training visits to Australia. The techniques were identified to have the potential to improve productivity of orchards in Bhutan.

The world's first mandarin production manual was developed by the NSW DPI with support from ACIAR, based on the work in Bhutan. The manual included content on everything from orchard basics to post-harvest handling and pest and disease management. The manual is still in use today, by both Bhutanese and Australian citrus growers.

Dr Andrew Beattie, Adjunct Professor at Western Sydney University, led three ACIAR-funded citrus projects and supported many PhD and master students from China, Vietnam, Bhutan and Indonesia.



Dr Tahir Khurshid assessing the graft union compatibility on the Chinese rootstocks with imperial mandarin. The exchange of rootstock between China, Vietnam and Australia advanced variety development and production in all three countries. Photo: Steven Falivene



‘We were there to do research, and one of the best ways was having students involved. All the work we did has been ongoing and, even though I’m retired now, I’m still involved and so are the students. I think that’s testament to the way ACIAR structured the program at the time.’

One of Dr Beattie’s PhD students and John Allwright Fellowship recipient, Ms Namgay Om, completed her PhD in 2017 and returned to Bhutan to her senior role at the National Plant Protection Centre. Her PhD was based on huanglongbing and its transmission by psyllids. Dr Om’s new expertise has been a valued resource for the management of huanglongbing in Bhutan.

The translation of knowledge into impact is a key to the success in ACIAR project development and increasing farm profitability. Across East and South-East Asia, an ACIAR-commissioned impact assessment concluded that projects in China, Vietnam and Bhutan achieved:

- » an extension of the Chinese citrus season into the festival and off-season market
- » an increase in Vietnam’s citrus production from 11,000 tonnes in 1991 to 440,000 tonnes in 2000
- » an increase in Bhutan’s citrus production capacity, with progress towards improved production practices and grower knowledge
- » new rootstocks for the Australian citrus industry.

In Pakistan, the impact of ACIAR-supported citrus-focused projects included:

- » improved farm and nursery management practices
- » new varieties and rootstocks to extend the production season
- » identification of issues to address in the value chain.

**3 : 1**

return on ACIAR investment

**Benefits included:**

- preserving citrus genetics
- developing technologies to develop disease-free planting material
- building science capacity
- introducing more profitable varieties.

Source: ACIAR Impact Assessment No. 98, 2019







Mr Dorjee (left), National Citrus Coordinator with the Bhutan Department of Agriculture and project leader in Bhutan for the ACIAR-supported mandarin improvement project, visited Australian citrus industry operations in 2011. He is pictured with Ms Sandra Hardy (centre), the Australian leader for the project and Industry Leader–Citrus for NSW Department of Primary Industries, and Mr Gary Eyles, citrus nurseryman and owner of Eyles Citrus, Kenthurst, New South Wales. Photo: Kevin Chamberlain | 2011





..... The Seeds of Life of program identified suitable crop varieties and established seed certification systems to give farmers the ongoing ability to grow productive crops. The program also provided an opportunity for the professional development and training of locally based researchers and agronomists. Photo: ACIAR



## Securing seed, skills and food for a nation

**More than 65,000 families benefited from the Seeds of Life program, which ran in Timor-Leste from 2000 to 2016.**

Seeds of Life started as a one-year project to improve food security by introducing higher-yielding crop varieties.

It finished as a suite of three projects that introduced 19 new varieties of major staple food crops and established a national seed system, so village farmers could maintain access to high-quality seed and continue to improve crop production beyond the life of the project.

In 2000, after many years of disruption to village life and farming during Timor-Leste's journey to independence, an ACIAR-funded project reintroduced germplasm of staple food crops such as rice, maize, peanuts, sweetpotato and cassava.

The yields of the new varieties were promising and led to a second project to confirm the acceptability and benefits of the new or improved varieties in farmers' fields. Several thousand farmers across the country participated in this work. AusAID (now incorporated into the Australian Department of Foreign Affairs and Trade [DFAT]) invested in this project, in partnership with ACIAR, to expand the activities of the previous project and develop processes to sustain its benefits.

The first two projects showed that the benefits of the new varieties in terms of increased production and increased food security were clear.

Over 16 years, the University of Western Australia led the project and worked in close partnership with the Timor-Leste Ministry of Agriculture, Forestry and Fisheries.



Seeds of Life Project Director, Dr Harry Nesbitt (left), with research station staff in Timor-Leste. Photo: ACIAR | early 2000s

### Increased farm yields

- » **130%** for sweetpotato
- » **54%** for peanut
- » **50%** for maize
- » **40%** for cassava
- » **24%** for rice

### Rapid adoption of improved mung beans and climbing beans

### 19 improved varieties

### 65,000 farm households with access to improved seed and planting materials

### Certified seed

#### infrastructure established

- » **1,200** seed-production groups
- » **65** community seed houses
- » **3** seed laboratories

## Drawing on global resources



New varieties of crops were grown to identify the most productive varieties for farmers, as well as the most suitable varieties for consumers. Pictured is a comparison of different varieties, after harvest. Photo: ACIAR | 2004

ACIAR recognised the need to improve our staple crop production and designed a research program to help identify those crop varieties ... One of the reasons for the widespread success of Seeds of Life is its commitment to educating our agricultural scientists so that we are not dependent on foreign expertise.

**José Ramos-Horta**  
Timor-Leste President (2008–2012)  
*Partners in Research for Development,*  
30th Anniversary edition, 2012

In the 1990s, a lack of good varieties of staple food crops was limiting crop production in Timor-Leste, to the extent that it was threatening national food security. The Seeds of Life program, overseen by ACIAR Research Program Manager Dr Colin Piggin, changed from a humanitarian operation to an agricultural extension program with the development of commercial crops as the ultimate goal.

Seeds of Life had its genesis in the aftermath of the violent reprisals after the population of Timor-Leste voted for independence in September 1999. Seed for the next harvest was either burned or stolen. ACIAR contacted the world's five leading crop research centres for suitable supplies and by December 2000 the first test crops were being sown.

The program established trials of irrigated rice, maize, peanuts, sweetpotato, cassava, mung bean and climbing bean. The program also identified varieties that were more tolerant to prevailing insect pests and diseases, and able to withstand periodic drought and reduced soil fertility. The yields of introduced and adopted crop varieties were remarkably higher than yields of local varieties in all 13 of the nation's districts where trials were established.

Many international agricultural research centres within CGIAR were key partners in the program, including the International Maize and Wheat Improvement Center (CIMMYT), the International Center for Tropical Agriculture (CIAT), the International Rice Research Institute (IRRI), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the International Potato Center. The centres host gene banks for the staple food crops and provide material for breeding programs.

Dr Harry Nesbitt, Adjunct Professor at the University of Western Australia and Project Director for Seeds of Life, described the wide-ranging benefits of the project.

'From an increase in human capacity to improved scientific infrastructure and increased agricultural production by farmers, the Seeds of Life legacy is everywhere. I'm happy to see how much Seeds of Life continues to help people.'

'Importantly, the agronomic research, seed multiplication and distribution system [that were developed are] sustainable, ensuring the legacy of the program lives on.'



## Genuine collaboration with farmers



The Seeds of Life program was a significant international effort to improve food security in Timor-Leste. It was led by researchers from the University of Western Australia in collaboration with the Timor-Leste Ministry of Agriculture, Forestry and Fisheries. Many of the CGIAR centres were also partners in the project. Mr Rob Williams, second from right, and staff from Timor-Leste Ministry of Agriculture, Forestry and Fisheries visit a project site at Aileu, with ACIAR Research Program Managers, Dr Tony Fischer, second from left, and Dr Colin Piggin, centre. Photo: ACIAR | 2005

Through thousands of on-farm trials, new varieties of the crops were developed, which were adapted to Timor-Leste's different production environments. Over the 16 years of the project, 19 improved varieties were released, and certified seed was provided to more than 65,000 farming families.

A significant legacy of the program was the establishment of a national seed-production system, which eliminated Timor-Leste's longstanding dependency on imported seed. The seed-production system comprised both commercial and community-based seed producers, giving Timor-Leste the capacity to produce quality seed in response to farmer demands.

Mr Rob Williams, agriculture researcher based in Timor-Leste, Adjunct Senior Research Fellow at the University of Western Australia and a research leader with the Seeds of Life program, observed ongoing benefits.

'Today [2022], around 75% of farmers in Timor-Leste use one or more of the crop varieties generated from Seeds of Life – this is up from 48% of farmers when the project concluded in 2016. In every village I've gone to in Timor-Leste, I've been able to find Seeds of Life sweetpotatoes growing which weren't there before we started in 2000.

'And now there are farmers who never used to sell sweetpotatoes, selling produce because they are growing sweetpotato varieties that yield twice as much in half the time. This supplies enough for their households plus extra to sell.'

A participatory research process based on genuine collaboration with farmers is identified as a key factor of success of the program. Between 2006 and 2015, Seeds of Life trained 2,600 people, including farmers, non-government organisation staff, employees from the Ministry of Agriculture and Fisheries, and others. That way the local government had the capacity to continue to multiply and distribute seeds even after the project ended.

'This approach has been embedded really well into the research department of the Ministry of Agriculture and Fisheries. They know that having researchers who work with farmers as equals – testing things with the farmers, hearing the farmers' feedback – is going to pay huge dividends in the future,' said Mr Williams.

### Building local expertise and careers

Embedded in many ACIAR-supported programs, and in step with the ACIAR mandate, is an element of capacity building. According to Dr Nesbitt, trained local personnel with the capacity to continue the research are key to a long-term legacy.

Over the 16 years of the Seeds of Life projects, many local researchers worked alongside Australian scientists. Seeds of Life helped to develop six functional agriculture research stations in Timor-Leste that continue to be heavily used by researchers funded by the Timor-Leste Government and the United Nations Food and Agriculture Organization (FAO).

Seeds of Life sponsored 10 program staff to pursue master degrees, all of whom continue to work in agriculture or education in Timor-Leste. One staff member, Mr Luis de Almeida, went on to work on other ACIAR-supported projects when Seeds of Life concluded, including a project focused on agricultural innovation for farming communities in Timor-Leste.

'Through Seeds of Life I learned research skills and connection with other partners as well as organisation and management skills, which I continue to apply to my work today.

'I have a dream and a commitment to contribute to the agricultural development sector, which is vital for small and poor farmers in rural areas, especially in developing countries like my home, Timor-Leste.'

In May 2022, Mr de Almeida was appointed as the first ACIAR Country Manager for Timor-Leste. The Seeds of Life project continues to benefit participants – from the farmers who can grow better and more food, through to the research staff who received training and career opportunities.





..... The inclusion and empowerment of women, youth and other groups plays a major role in ensuring more equitable distribution of project outcomes, improving livelihoods and economic security. ACIAR has taken increasing steps to incorporate equity considerations into its research planning and delivery at all levels. ACIAR-supported projects in Papua New Guinea and Bougainville have focused on improving access to markets for galip nuts, particularly for women farmers. Photo: ACIAR | 2018



## Inclusion and empowerment for all of the community

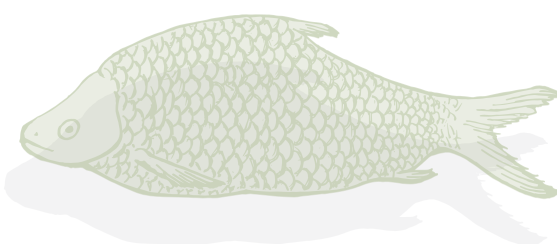
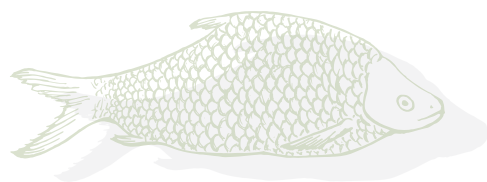
**Recognising the importance of equity and empowerment in improving the lives of women, children and other minority groups, ACIAR articulated empowering women and girls as a strategic objective in the ACIAR 10-Year Strategy 2018–2027. Recognition of the role of capacity building to take equity a step further was also expressed as a strategic objective.**

In addressing the challenges of productive and sustainable agriculture, fisheries and forestry, research-for-development outcomes may not always be accessible to all members of the communities where the work is carried out. In semi-subsistence farming, the potential of women and youth to contribute to farm management and earn household income is often under-recognised. Additionally, because of societal structures, minority groups and landless people are also at risk of not being able to benefit from ACIAR-supported research.

The inclusion and empowerment of women, youth and other groups plays a major role in ensuring more equitable distribution of project outcomes, improving livelihoods and economic security.

ACIAR has taken increasing steps to incorporate equity considerations into its research planning and delivery at all levels, supporting its strategic objective to improve gender equity and empowerment of women and girls. The ACIAR Gender Equity Policy and Strategy 2017–2022 formally articulates the organisation's commitment to gender-inclusive research. A new strategy and action plan will be implemented in 2023 to focus and guide work in this important area.

With the goals of inclusivity and empowerment embedded in ACIAR-supported research programs and projects, all members of a family, community and society are able to benefit from the outputs of agricultural research for development.



**Benefits for smallholder farmers**



### Fish farming breaks crime cycle

*Partners in Research for Development, Issue 2, 2012*

A novel prisoner rehabilitation project is teaching inmates and correctional officers basic fish farming and having a positive social impact in Papua New Guinea. Reduction in crime and antisocial behaviour, increases in self-esteem, and cooperation between former adversaries are just a few of the project's effects.

The program, introduced in 2008, has trained many officers and inmates. Eight ex-inmates have since returned to their villages and established fish farms to supply fingerlings and table fish to their local communities. Since fish farming is a new activity, the knowledge of these ex-inmates is in high demand, with fellow villagers keen to learn and to be supplied with fingerlings. Moxy, who served time at Bihute Prison, has returned to his village, where he farms genetically improved farmed tilapia. Moxy has eight ponds with a total production capacity of 2 tonnes.

'Had it not been for fish farming, I would have revisited the circumstances under which I was jailed. When I am angry or depressed, I go to the fish ponds and either feed the fish or just watch to take my mind away,' he said.

## Peace building through landcare

In Australia, the empowerment of neighbourhood groups through landcare was a grassroots revolution in environmental management and agricultural extension. Since the late 1980s, landcare has evolved into a strong framework to support community groups to improve the sustainability of Australian landscapes and food production systems. Landcare initiatives are based primarily on trust. The landcare approach brings together communities of farmers to collectively act to bring improvement to their environment and their farming endeavours. This relies on farmer participation, capacity building, self-help and social capital to succeed, and gives rise to social benefits as well as improving the condition of the land.

Extension methods based on the landcare model exist worldwide, including methods that have arisen from ACIAR projects.

The ACIAR Mindanao Agricultural Extension Project is one such project, with farmers becoming a key stakeholder group rather than passive 'end users' of project outputs. The project was focused on conflict-vulnerable areas in the southern Philippines and was designed with sensitivity to help build cooperation and trust in the region.

Based on more than 20 years of research, the project started in 2013 and ran for almost eight years in the provinces of Zamboanga Sibugay, Maguindanao and South Cotabato. Australian and Philippine researchers developed an enhanced landcare model with a strong emphasis on livelihoods. The LIFE approach – Livelihood Improvement through Facilitated Extension – develops farmer groups and appoints trusted and well-connected members of the local community to become their facilitators.

The facilitators and farmer groups then work together to identify and launch initiatives that can improve and diversify their income, moving away from the standard local practices of monocropping and environmentally destructive practices such as charcoal production. Support is also drawn from local governments, non-profit organisations, university researchers and others to help the farmer groups when needed.

Dr Mary Johnson, Mr Noel Vock and Dr Ken Menz, all research fellows at RMIT University, were co-leaders of the project.

'Key to LIFE is farmer-centred decision-making, where they frame the issues and test innovations, and are supported along the way. Formerly, extension processes have come from a position of "Here's a problem; here's a solution; this is what you do" but this is not the approach we took. We focused on working with farmer groups and communities – people as the solution, not the problem,' said Dr Johnson.

LIFE was a huge success. Participating farmers' incomes increased by up to 80%, while trust and cooperation greatly improved between previously disparate Christian, Muslim and Indigenous communities. The LIFE approach was adopted by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development of the Department of Science and Technology (DOST-PCAARRD) in 2016, and the agency continues to develop and apply the approach in conflict-vulnerable areas. In 2022, DFAT launched a separate pilot LIFE study, building on the ACIAR research to broaden its reach.

The distinctive Australian expertise of landcare has informed several ACIAR projects over the last 30 years, and many other projects have emerged across more than 20 countries. In 2022, ACIAR partnered with Global Landcare to publish a book, *Building global sustainability through local self-reliance: Lessons from landcare*, in which researchers and practitioners from 11 countries share their expertise and experience of landcare around the world.



Residents work in their community garden in Koronadal City in the province of South Cotabato, Mindanao, in the Philippines. Inspired by the landcare philosophy, an 8-year project in three provinces developed and implemented the Livelihood Improvement through Facilitated Extension (LIFE) model. Incomes of participating farmers increased by up to 80% and trust and cooperation between previously disparate community groups greatly improved. Photo: Jeffrey Maitem | 2020



## Inclusive dairy farming empowers women

Smallholder dairy farms are a vital component of Pakistan's mixed crop–livestock farming systems and the national economy. Although milk is the primary product, male calves and cows past milking age are a key source of meat.

Demand for high-quality meat and milk is rapidly increasing in Pakistan's urban and regional centres, creating significant opportunities for smallholder dairy farming families, of which only a small proportion currently make any profit from dairy. Increasing profit from the meat component of dairy farms is critical to address the economic viability and competitive advantage of smallholder dairy farms.

The outcomes of ACIAR dairy projects in Pakistan highlight a key advance in community outlook – a deeper understanding of the importance of involving the whole family in farming practices, and new ways of working that ensure all groups in society have an opportunity to participate in projects and research. In this project in Pakistan, both women and men were meaningfully involved, with female and male advisers brought in to facilitate and ensure that all perspectives were considered.

ACIAR supported three projects over 15 years, which focused on transforming the local dairy farming industry and empowering Pakistani farmers. Starting in 2007, the country had 9 million smallholder farmers who were struggling to make any profit. Pakistan ranks among the world's top milk producers, with 95% of all local milk generated by smallholder farmers, but many of those farmers barely make a living, largely due to a lack of basic information on how to raise and manage healthy cattle.

The first two projects centred on understanding the smallholder farming system and helping farmers increase milk production and subsequently improve their livelihoods. The third project, which ran from 2017 to 2022, was led by Dr David McGill of the University of Melbourne and focused on the local farmer advisory system.

To help increase broader understanding of the overall farming system, the researchers developed a 'whole-family extension approach'.

'Traditionally, Pakistani dairy advisers are male veterinarians and conduct extension activities with male farmers,' explained Dr McGill.

'In the project, female advisers were trained alongside male advisers, and they then hold discussion sessions with the women in the villages. Both male and female farmer advisers share and discuss similar information, but they tailor it to the unique needs of each gender.

'For example, male farmer advisers might address off-farm activities that men often engage with, such as growing agricultural produce, while female farmer advisers might focus on feeding or watering the animals, tasks often carried out by women and children.

'There is more to do in the whole farming system, starting with the essential on-farm building blocks of animal nutrition, housing and calf rearing. The veterinary components can then complement the system.'

To continue this valuable extension approach beyond the project's timeline, the project researchers have partnered with a wide range of organisations, including government, private and non-government organisations, to continue applying the learnings of the project.



To help increase broader understanding of the overall farming system, researchers working in Pakistan developed a 'whole-family extension approach'. Traditionally, Pakistani dairy advisers are male and work with male farmers. The project trained female advisers alongside male advisers, and they then held discussion sessions with women farmers. Photo: ACIAR | 2017

## Getting more from farming with a team approach

For generations, smallholder farming families in Papua New Guinea have produced food for their families through subsistence farming. Rural women farmers provide most of the labour for farming activities by growing essential crops, while also attending to social roles such as being the main caregiver in a family. Most women farmers hope to improve their family livelihoods, but very few have the necessary agricultural and business acumen. Many are also educationally disadvantaged.

A major change to these established roles occurred by viewing each family's agricultural work as a farm business and each family member as being part of a team. The 'Family Farm Teams' approach not only produced better farming outcomes but also resulted in a more equitable sharing of workloads.

The Family Farm Teams program offered one female and one male family head from a household the opportunity to participate in a series of experiential learning workshops with follow-up family activities that enabled them to work as a family team. Training was given in financial literacy, banking and savings, and agricultural planning techniques, so each family could plan the further development of their agricultural activities together.

The program, developed by the University of Canberra Centre for Sustainable Communities, and working with the National Agriculture Research Institute, Pacific Adventist University and other institutions, across five different provinces in Papua New Guinea, has gained increased traction across the country.

Through the research, Professor Barbara Pamphilon, project leader from the University of Canberra, found that women and men did not really know what the other did in a day, although they all agreed that women had a double burden of farm work and family responsibilities.

The Family Farm Teams program gives families understanding and skills to become more effective and profitable in their farming activities and make farm work more equitable for all members in the family. The research shows that when men and women work together across generations, with more gender-equitable and effective farming practices, livelihoods can be improved.

For families participating in the program, outcomes were tangible. Many went from bush huts to having permanent houses within 18 months. Children were able to stay in school. Most importantly, families developed plans to build their 'gardens' into a small family business that would give them a sustainable family future. This approach has been integrated into a major project of US\$48 million awarded in 2017 to the Fresh Produce Development Agency by the International Fund for Agricultural Development and the Papua New Guinea Government, which aims to reach 25,000 farming households in four provinces.

Engaging young people in farming was another focus. Professor Pamphilon said the project team explored other options for participation in the agricultural value chain, such as raising seedlings to sell to other farmers.

The Family Farm Teams project also responded to the women's interest in literacy through the development of bilingual early reading books, each of which had an agricultural storyline drawn from the project research.

'Women farmers told us they want to learn to read and write. The set of "Maria" books was developed in the first phase of the project to begin the process of meeting that need, as women shared the simple text with their children and together learnt about good farming practices. The books are now used in schools, churches and community agencies across PNG.'

Despite some initial reservations about the program, many men were quickly won over. Not only did they see tangible outcomes for their families – permanent homes, education, clothes, increased incomes – but they felt less pressured when they were able to make decisions as a team with their wives and the young adults in their families.

The project reaped impressive outcomes. Following a pilot in East New Britain and the Western Highlands in 2012, the program has been rolled out across the country to eight provinces, including Bougainville and New Ireland. In 2020, the Family Farm Teams approach was the framework adopted for a new ACIAR project in Solomon Islands, to facilitate opportunities for equitable and effective agricultural development for female smallholder farmers and their families.





Mr Clarence Kina (left) from Halia Village, on Buka island, Bougainville, shows his cabbages to other community members who also completed the Family Farm Teams training. Since participating in the training, Mr Kina and his family have started growing a less-common cabbage and he can charge more for them at the local market. Photo: ACIAR | 2018





..... Mr Malkeet Singh, farmer, with his Happy Seeder, in northern India. The seeder sows wheat seed directly into rice stubble. The implement was developed in Australia with ACIAR support, and further refined in collaboration with partners in India. The Happy Seeder has resulted in reduced crop residue burning and improved crop water use, boosting the sustainable production of wheat for human consumption. Photo: Coretext | Melissa Marino | 2016



## Innovation through problem-solving

**ACIAR has a 40-year history of agricultural innovation and solutions, driven by research collaborations. Over the years, ACIAR-supported projects have contributed to the international knowledge bank of agriculture, fisheries and forestry. While knowledge is a lasting legacy, knowledge in itself is not always enough to drive innovation and development.**

Key to successful uptake of new tools and technology – a popular definition of innovation – is the innovator having intimate knowledge of in-country issues and strong connections with the people who will be using these new tools and technologies. There is little point investing in and developing new technology that is not understood, or trusted, by the very people who will benefit the most from its development.

ACIAR has a strong track record of brokering and investing in projects that lead to innovation. The ACIAR partnership model is not just based on technical expertise. When required, the partnership also encompasses organisations across the innovation chain. This flexible approach to building project teams has resulted in some landmark tools and technologies to deal with particular problems or issues faced by smallholder farmers, fishers and foresters in the Indo-Pacific region.

In the Indo-Gangetic Plain, direct sowing of wheat into rice crop residue using the Happy Seeder has resulted in reduced crop residue burning and improved water use by the following crop,

boosting the sustainable production of wheat for human consumption. Air pollution in the region has been reduced because the stubble is no longer burned, and soil health and quality have improved.

The Chameleon soil water sensor has maximised irrigation efficiency in rural communities across eastern and southern Africa and more recently into Asia. The simple-to-use sensor, which uses coloured indicators to let farmers know when to water, is now being manufactured locally in South Africa, providing employment and economic activity in the region as well as conserving water resources.

The spindleless rotary veneer lathe proved that high-quality veneer could be recovered from senile coconut palms (and other under-utilised forest resources), producing a veneer that can be used for the manufacture of engineered wood products, and providing a means to add value to nonproductive palm trees in the Pacific region.

The new technologies and tools have provided direct benefits to the farmers who use them, but there have been regional and national benefits as well. Successful technologies developed through ACIAR-funded projects and partnerships are potentially manufactured in country, providing economic benefits for local manufacturers and communities.

**Benefits for  
smallholder  
farmers**



### New technology improving lives

*Partners in Research for Development, Issue 3, 2013*

Transforming farming techniques in rural Bangladesh is helping farmers to cut their costs and increase production, while offering others a way out of poverty. A small, versatile multi-crop planter developed by an ACIAR-supported project team can perform zero and strip tillage, form and plant beds, and more.

The planter is now being produced in Bangladesh for use locally and for export. Some of the biggest beneficiaries of the project are people like Mr Sree Shanaton Kumar Biswas, who have become machinery contractors and are providing services to farm families. Becoming a contractor has turned around the fortunes of the Biswas family.

'I used to be a farm labourer, then sold clay pots to make money. We were very poor ... I went to one of the meetings about the planter and decided to buy one. There was a huge demand for the planter from the farmers. I had to have three drivers, and we were working day and night to meet demand. I made 80,000 taka (A\$950) that year ... this machine is helping to improve our lives,' said Mr Biswas.

More than 3,000 small contractors like Mr Biswas now provide services to 150,000 farmers in Bangladesh.

## A solution for farmers and communities in rice-growing areas

More than 4 million hectares of the Indo-Gangetic Plain of north-western India is farmed as a rice-wheat cropping system. The rice-growing season is timed to benefit from monsoon rains, due to concerns of over-extracting groundwater. The wheat crop is planted almost immediately after the rice crop has been harvested. This system creates a short period (about 10 to 20 days) to harvest rice, manage rice crop residue and plant wheat.

Many of the 2.5 million farmers in north-western India will burn rice crop residue in preparation for wheat planting, as do rice growers the world over. Burning the residue to remove many tonnes per hectare of plant stalks and leaf material remaining after harvest has been considered the only practical option available, despite growing concern about the smoke and pollutants created by burning residue. Annually, more than 60,000 deaths in India are attributed to the pollution from agricultural burning.

In the 1990s and early 2000s, agricultural engineer Mr John Blackwell, now Professor Blackwell, was based at the Griffith laboratory of CSIRO Land and Water, in the heart of Australia's rice-growing region. He was well aware of the issue in his hometown as well as hearing about the problem from fellow scientists working with rice growers in India.

Mr Blackwell also understood the constraints of the cropping systems in both countries. Farmers were faced with very heavy residues from the rice crop, 6–8 t/ha in India and up to 14 t/ha in Australia. Rice straw contains high levels of silica and does not break down or decompose quickly. Consequently, direct drill implements that were developed as part of the evolution of conservation farming practices could not effectively sow seed into rice residue.

In the early 2000s ACIAR Research Program Manager for Land and Water Resources and South Asia Program Adviser, Dr Tony Fischer, asked Mr Blackwell to think about how you could sow wheat into heavy rice stubbles. Mr Blackwell's first response was that it was impossible, but that night a Eureka moment resulted in the application for two provisional patents. Both were tractor-drawn implements that cut and lifted the straw and deposited it as a mulch behind the direct drill tynes.

The prototype built by Mr Blackwell, together with technician Armanath at Punjab Agricultural University, worked amazingly well and it successfully sowed through 10 t/ha of rice straw. Mr Blackwell named this machine the 'Happy Seeder'. However, there was room for improvement, and ACIAR funded CSIRO and Punjab Agricultural University to further develop the idea.

Public-sector researchers, especially Dr Harinder Singh from Punjab Agricultural University, and private-sector developers in India continued to refine the implement.

Professor Blackwell particularly credits Dasmesh Mechanical Works, in Punjab, for the innovation that culminated in the development of the Turbo Happy Seeder, which uses a rotor to cut and brush away the rice straw, clearing the way for the machine's sowing tyne.

Almost two decades later, science, development and environment organisations continue to identify the Happy Seeder as the best prospect to provide an alternative to burning crop stubble in India.

In a paper published in the *International Journal of Agricultural Sustainability* in 2021, scientists from organisations including CIMMYT, the National Agricultural Science Centre (India), the Borlaug Institute of South Asia and The Nature Conservancy reported the benefits of the Happy Seeder for farmers. Leaving crop residue as surface mulch helps reduce the evaporation of soil moisture, suppresses weed growth, buffers soil temperature and facilitates a more efficient uptake of water and nutrients by plant roots. Labour requirements for establishing the wheat crop are reduced by as much as 80%, irrigation requirements are reduced by 20–25% and herbicide use reduced by up to 50%. The authors concluded that the benefits of the Happy Seeder for farmers and for society warrants policy support for its wider adoption, along with stronger enforcement on bans on stubble burning.

The Happy Seeder was given strong endorsement in a 2021 article by the global organisation, The Nature Conservancy. Dr Annapurna Vancheswaran, Managing Director of Nature Conservancy programs in India, is quoted, 'We aim to come up with protocols that ensure a win-win for environment and farmers. Presently, the Happy Seeder is the most scalable solution which singly resolves the twin challenges of addressing air pollution and improving soil health.'





## Spindleless lathe adds value to non-productive palms

Coconut palm is an important source of food and livelihoods for many Pacific island families and communities; however, it is no longer the main economic crop for most countries. As a result, a large percentage of coconut plantings have lost their vitality and productivity. These nonproductive trees are referred to as senile palms. In addition to no longer being productive, senile palms are at risk of becoming breeding grounds for rhinoceros beetles.

If the senile palms could be turned into high-value products, farmers would have an incentive to regenerate their coconut plantations by removing the senile palms and replanting with younger and more productive palms.

Research into potential use of senile palms for the production of wood and wood products had been underway since the late 1970s. In 2005, ACIAR supported a research partnership between SPC and the Queensland Department of Agriculture and Fisheries, as well as a number of Pacific island stakeholders, which revisited the properties of coconut wood and identified the technology and processes for the manufacture of high-value flooring, targeting the tropical hardwood flooring markets in Europe.

This first project produced high-quality flooring products from coconut palms, but the timber presented a challenge for traditional sawmilling equipment because of the structure of the wood.

Unlike trees, which grow up and outwards, increasing their diameter and adding a new layer of wood each year, coconut palms grow upwards like grass and never achieve diameters more than about 300 millimetres. While the outside of a 60-year-old palm can be as dense as 1,000 kg/m<sup>3</sup>, the middle is a very soft 250 kg/m<sup>3</sup>.



In Fiji, stems of senile coconut palms are loaded onto a trailer to be taken to a mill. Research led by the University of Queensland resulted in modifications to the spindleless lathe, which means around 70% of a coconut stem can be recovered to produce high-quality engineered wood products. Photo: Department of Employment, Economic Development and Innovation, Queensland | 2010

The researchers turned their attention to relatively new spindleless lathe technology, used for the production of rotary veneers, as a possible solution to the problem.

A new ACIAR-supported project was established, from 2012 to 2016, and project leader, Dr Rob McGavin of the Queensland Department of Agriculture and Fisheries explained the challenge ahead.

'Traditional approaches to producing rotary veneer use spindles to hold the centre of the log and rotate the log allowing veneer to be recovered. The problem is that these spindles just don't work with the soft centre of coconut stems.'

After the completion of a comprehensive laboratory-scale research program, the project took a major step forward with the acquisition and modification of a lathe to 'peel' coconut stems.

Sourced from Malaysia, the spindleless lathe was modified by scientists at the Queensland Department of Agriculture and Fisheries, then shipped to Fiji and installed at the Timber Utilization Division of the Ministry of Forestry in Suva.

'The modified spindleless lathes have drive rollers that run on the log periphery for the length of the log and combine with a parallel blade to "unroll" or peel the log in a 3–5 millimetre sheet, leaving a residual core of about 40 millimetres. This means we can recover around 70% of the stem from a senile coconut palm, compared to 20% or less using other options. The result is a high-quality veneer that can be used for the manufacture of structural and appearance engineered wood products.

'Spindleless lathes can be purchased for a fraction of the cost of traditional veneer lathes, so this has great potential for widespread adoption in many developing countries.'

## Simple practical device saves time and water

Farmers are really benefiting from this technology as it is saving their labour and saving their water. The potential for this scheme is 25 hectares. They used to cultivate 17 hectares, but now they have managed to cultivate 22 hectares.

**Mr Happy Nyirenda**

Extension officer and participant in the Virtual Irrigation Academy, Malawi

The Chameleon soil water sensor is one of the most novel and transformative pieces of technology to arise from ACIAR-supported research. The brainchild of Dr Richard Stirzaker, a Principal Research Scientist at CSIRO, the sensor has been designed to make soil moisture measurement simple for smallholder irrigators – not only to aid adoption but to also to enable irrigators to manage water, fertiliser and time more efficiently, and ultimately, improve crop yields.

The Chameleon measures soil moisture levels by embedding sensors into the rootzone at three depths to show where plant roots are actively taking up water. Rather than the results being a set of complex numbers, Dr Stirzaker and his team married the science of moisture detection with practicality. There are three LED indicators on the tool, and based on the moisture levels measured, the lights show crop water requirements: blue means ‘irrigation not required’, green means ‘monitor and prepare to irrigate’ and red means ‘irrigation required’.

The Chameleon sensors are ID-chipped and the reader is wi-fi enabled, which allows the data to be shared. In addition to farmers monitoring the sensors in the field via the coloured indicators, the information can also be sent to the cloud via mobile phones so that extension workers and researchers can learn from farmers’ experiences, and managers of irrigation schemes can better plan water supply.

To support the adoption and development of the Chameleon, Dr Stirzaker created the Virtual Irrigation Academy to connect the global community of people discovering how to use the Chameleon and related technology to manage water to grow more food.

Launched in 2015, with the support of ACIAR, the academy established pilot schemes in Malawi and Tanzania using technologies to promote efficient and cost-effective irrigation, including its flagship tool, the Chameleon. By 2018 the combined technologies had substantial positive impacts for irrigators:

- » Water use in pilot schemes in Malawi and Tanzania was reduced by 50% by extending the intervals between irrigation. Instead of irrigating four to five times a month, smallholders are now irrigating only once or twice a month.
- » Unused land in irrigation schemes brought back into production using the ‘saved’ water increased irrigated areas by up to 30%.
- » Less-frequent irrigation means smallholders have more time to devote to grazing livestock, cultivating other crops and, for some women, building off-farm businesses to generate more family income.

In 2022, the Virtual Irrigation Academy has been adopted by other ACIAR-supported projects and the Chameleon is being sold in 20 countries, with smallholder farmers experiencing up to 30% increases in yields and 30% reductions in water use.

ACIAR funding for the project ends in 2023, so Dr Stirzaker has turned his research project into a non-profit organisation. The organisation will likely adopt a hybrid business model so that the large swathes of data collected by the Virtual Irrigation Academy can be sold to water investors working in development, while inexpensive monitoring tools can be purchased directly by smallholder irrigators.

‘The context of smallholder irrigation and the opportunities are different in each country where we work. Local organisations are best placed to meet the needs of farmers in their area, so we want to facilitate that. At the same time the academy will provide ongoing training and support, so local organisations can continue to build their expertise.’

‘Ultimately, we want partners to succeed with the sensor and Virtual Irrigation Academy. That means not just selling equipment for money but forming a true partnership in terms of knowledge sharing, capacity building and ownership. A real partnership is giving away control.’







Ms Anatalia Kilienyi, a farmer from Kiwere Irrigation Scheme in Tanzania, sets up the Chameleon soil moisture monitoring device in her tomato crop. In pilot schemes in Malawi and Tanzania, irrigators using the device to manage irrigation timing reduced water use by 50% by extending the intervals between irrigation. Photo: ACIAR | 2021

# Building resilience

**Rebuilding livelihoods is never simple, but projects supported by the Australian Centre for International Agricultural Research (ACIAR) have contributed to resilience and rebuilding of communities and their production systems in the face of sudden shocks, whether it be natural disasters, civil unrest, economic downturns or a pandemic.**

After the deadliest earthquake in 81 years struck Nepal in 2015, followed by hundreds of aftershocks and another severe earthquake days later, an ACIAR-funded forestry project led by the University of Adelaide was instrumental for recovery in some communities. The project, 'Enhancing livelihoods and food security from agroforestry and community forestry in Nepal', which had started in 2011, had already imparted knowledge and skills so that local agencies and landholders were able to work quickly to stabilise soil erosion and use timber grown by the project to build temporary housing for displaced people.

Smallholder cattle farmers in Lombok, Indonesia, an area devastated by earthquakes in 2018, were able to recover more quickly because ACIAR-funded projects under the IndoBeef program had facilitated a profitable shift from traditional household-based farming to collective farm management, a model that imparted more resilience to affected communities.

ACIAR-brokered projects have also helped farmers and communities recover from challenging circumstances as a result of civil unrest. For example, after ethnic conflict in Solomon Islands in 1998, ACIAR and other international agencies supported the WorldFish Center to develop small-scale aquatic enterprises to help coastal communities lift themselves from poverty. From 2012, ACIAR supported a 5-year project in Afghanistan, led by the International Maize and Wheat Improvement Center (CIMMYT) to restart wheat farming and local seed production.

## A niche disaster recovery response

In 40 years of supporting agricultural development, ACIAR has been involved in the rebuilding phase of many communities after major catastrophes. The 2004 Indian Ocean earthquake and tsunami was one of the deadliest natural disasters in recorded history. It caused a series of massive ocean waves up to 30 metres high to flood inland, killing an estimated 228,000 people in 14 countries.

Worst hit was the Indonesian province of Banda Aceh, where ACIAR and Indonesian researchers had been working to establish and improve the quality of aquaculture in coastal ponds around reclaimed mangroves since the early 1990s.

Mr Barney Smith, inaugural ACIAR Fisheries Research Program Manager (1991–2009), remembered this time.

'By 2004 ACIAR had a long history of working in partnership with Indonesian fisheries and research institutions and we could provide relevant advice to help them to rebuild. ACIAR looked at ways for the local people to reclaim their livelihoods and develop opportunities for income and food production.'

With the help of Indonesian ministries and agencies, the Australian Agency for International Development (AusAID) and ACIAR put in place a portfolio of projects to underpin the long-term reconstruction of agriculture and fisheries in Aceh.







An intensifying imperative within the ACIAR operating region is addressing challenges that don't adhere to borders, such as a changing climate and increasingly variable weather conditions.

Over 2.5 billion people worldwide rely on agriculture for their livelihoods. Climate change and extreme weather events already have a devastating impact on agricultural production, and the number of extreme weather events is predicted to increase due to climate change. Agriculture also has a major role to play in slowing climate change, as agriculture contributes a quarter of the world's greenhouse gas emissions.

For more than a decade, projects across the entire ACIAR research portfolio have included aspects of managing the impacts and adapting to climate change. The ACIAR Climate Change Program was formed in 2020 to intensify the focus on the science and practice of how to transform food systems and livelihoods that are under the most pressure to adapt or to reduce greenhouse gas emissions.

Demonstrating its growing expertise and capacity in this area, ACIAR is a founding member of the Adaptation Research Alliance (ARA), a global organisation that facilitates researchers working with farmers and being guided by their needs. ACIAR also participated in forums at the United Nations Conference of the Parties on Climate Change (COP), in 2022, as part of the official Australian Government delegation to the conference.

### Technology aids emergency response

Following a massive volcano eruption and tsunami in 2022, Tonga began the recovery of its agriculture-based economy. In order to provide the most effective and efficient assistance, Tonga needed information about the agricultural landscape as it existed before the devastation occurred. This information was already available, in an open-source application that was developed as part of an ACIAR-supported project that started in 2018.

Working closely with partners in Tonga's Ministry of Agriculture, Food, Forests and Fisheries and Fiji's Ministry of Agriculture, a project co-led by geographers at the University of Sydney and the University of Western Australia had been developing tools to automate and streamline data collection. The initial data collection initiative had mapped the entire country's crop holdings and this information was used to generate valuable insights following the disaster.

The platform enables an almost-immediate analysis of patterns and trends in Tonga's cropping systems, so the ministry was able to calculate the number and types of crops impacted by ash or destroyed by the tsunami. This provided information about what food crops were affected and enabled accurate assessments of shortfalls in food stuffs to guide targeted aid.



The 2022 disaster was not the first time the platform had come to the aid of Tonga. It had already been used to help identify and address food security challenges during the early stages of the COVID-19 pandemic in 2020. More specifically, the data collected was used to calculate fuel subsidies needed to encourage the conversion of fallow land into active production to support communities during COVID-19 lockdowns.

Ultimately, the project is aiming to develop a collaborative geospatial platform that will identify responses to climate-smart landscape adaptation in the Pacific region. But in the meantime, it has proved invaluable in supporting government planning in the face of a pandemic and natural disasters.

The COVID-19 pandemic highlighted existing vulnerabilities in food systems and amplified these vulnerabilities since the start of 2020.

Women and children were some of the hardest-hit groups through loss of employment, income and food stocks. Import dependence for food staples and seed supplies increased across many countries in the Indo-Pacific region, and value chains became fragmented. For example, where communities previously may have been able to purchase local improved seed for planting, they became dependent on outside supply of seeds. Similarly, the breakdown of supply chains meant that fertiliser wasn't available for farmers at critical times in their crop cycles.

The COVID-19 pandemic marked a new level of cooperation and transition where in-country partners were supported remotely by ACIAR and empowered to act in new ways. ACIAR supported a rapid assessment of food system security, resilience and emerging risks in the Indo-Pacific region in the context of COVID-19. This assessment identified possible actions that could be taken by governments and other food systems stakeholders to boost food systems resilience in the face of future shocks.

### The pandemic that shut down the world

With travel between and within countries severely restricted during the COVID-19 pandemic, digital communication via text and tablets was the solution for coordinating research remotely in Samoa and Kiribati for Dr Libby Swanepoel from the University of the Sunshine Coast.

For Dr Swanepoel, who was leading her first ACIAR-funded project to develop gender-inclusive seaweed production for long-term health, income and wellbeing in coastal communities, the relationships developed between ACIAR and in-country researchers were critical.

'A lot of the work we do is participatory – working with communities from the bottom up – which is more difficult remotely, so we relied on the in-country teams a lot.

'We looked at the project's original aim and method, then worked together to adapt the project and co-create solutions. We developed interactive online training modules that could be applied to other research projects. We've been able to train more people, because when you're teaching online, numbers are less of an issue.'

Tablets sent from Australia proved invaluable in collecting data on local diets. Samoan researchers responded to the technology enthusiastically, by learning online how to do surveys and interviews in communities and collecting data from 200 households rather than the original 100 target.

'We created an online app for the in-country teams with intuitive prompts to guide them through the interview and survey process. We synced the app with the Pacific island food composition tables and we workshopped to determine the foods commonly eaten in Samoa and Kiribati to help collect accurate dietary intake data.'

The success in Samoa unfortunately was not repeated in Kiribati where remoteness and poor internet services made the adaptation to digital tools very difficult.

A man wraps seaweed for sale. An ACIAR-supported research team is supporting inclusive development of seaweed industries in Samoa and Kiribati and pivoted in response to the COVID-19 pandemic to support in-country leadership and delivery of the project when project leaders were unable to travel from Australia.  
Photo: University of the Sunshine Coast | 2020









*It was a special privilege to be the second director of ACIAR, after Professor Jim McWilliam established the Centre. I have had a long career in research, and I still work in overseas assistance in a variety of ways. I regard my 6-plus years at ACIAR as the best years of my professional life.*

*I really liked the flat structure within ACIAR, where all staff were treated equally, which was unique in the Canberra bureaucracy at the time. They were trusted and given responsibility, regardless of their position. And they always seemed to go above and beyond – it led to great teamwork.*

**Emeritus Professor George Rothschild**

ACIAR Director (1989–1995)



# People

**Everything that the Australian Centre for International Agricultural Research (ACIAR) has achieved during 40 years – its partnerships and projects, and the outcomes and impacts of both – comes down to the many, many people who have contributed to the work of the organisation.**

ACIAR has always been a people-driven organisation – from the people who had the vision to share Australian expertise to aid the development of agriculture, fisheries and forestry in countries of the Indo-Pacific region, through to the thousands of scientists from partner countries who worked on ACIAR-supported projects to address challenges in their own countries as well as develop their own skills and advance their qualifications.

The original staff who turned a vision into a functioning agency have given way to a new generation of dedicated research leaders brokering science partnerships, in-country managers fostering partner-country relationships, and specialist technical and administrative staff in the Canberra office ensuring the smooth and efficient running of the agency. All ACIAR staff – past and present – deserve to be proud of their part in the history of ACIAR.

With more than 1,500 projects supported by ACIAR since 1982, each and every project leader and project team member can also stake a claim in the formidable achievements of ACIAR.

Some 800 early and mid-career researchers from partner countries have advanced their careers through ACIAR fellowships. They are ACIAR outreach in action, sharing knowledge and connecting diverse partners across countries and regions. Their stories illustrate the immense value of ACIAR capacity-building efforts and its dividends.

The roles and affiliations that make up the ACIAR family are many and varied. While ACIAR staff are at the core of the operations of ACIAR, the reputation, value and impact of ACIAR is equally due to the researchers on project teams, the emerging scientists on ACIAR fellowships, and all the associates of ACIAR who have maintained enduring links with the world of agricultural research for development.







## The people who have nurtured ACIAR

**An organisation is only as successful as its staff, and ACIAR has had highly skilled, committed and effective people from the beginning.**

Hundreds of people have worked for ACIAR in its 40 years. A common thread of the stories of ACIAR employees is the pride that people feel to be associated with ACIAR. Many say that they have benefited and grown – both professionally and personally. When all is said and done, ACIAR is its people.

The people leading ACIAR have provided a stable foundation for the work of the organisation throughout its 40-year history, with only six people holding the role of Director or Chief Executive Officer since 1982. This is testament to the passion and commitment of these people, as well as to the judicious process of selection, which culminates in an appointment to the position by Australia's Governor-General.

Professor Gabrielle Persley AM, who was the first appointed staff member in 1982, described all ACIAR Directors and Chief Executive Officers as having 'a strong commitment to improving the livelihoods of rural communities in the developing world'.

'They came from a range of backgrounds in agricultural science or economics, with extensive knowledge of Australian agriculture and the challenges of sustainable food and agricultural production in challenging environments.



Canberra-based ACIAR staff at ACIAR House on 3 June 2022, on the 40th anniversary of the establishment of ACIAR.  
Photo: ACIAR | 2022

'Each has brought a different style of leadership to the organisation. All have used their skills to guide ACIAR through the challenges of their time, including several changes of Australian governments of different political persuasions, changes in ministers, budget pressures, as well as the changing international environment, and sometimes unforeseen changes within partner countries due to natural disasters, civil unrest or financial crises.

'The fact that ACIAR is celebrating its 40th year of operations in 2022 is testimony to their success.'

### ACIAR Directors and Chief Executive Officers since 1982

- » Professor Jim McWilliam  
Director 1982–1989
- » Dr George Rothschild  
Director 1989–1995
- » Dr Bob Clements  
Director 1995–2002
- » Mr Peter Core  
Director 2002–2007  
Chief Executive Officer 2007–2009
- » Dr Nick Austin  
Chief Executive Officer 2009–2016
- » Professor Andrew Campbell  
Chief Executive Officer 2016–2023



## Developing and guiding the research portfolio



Attending a workshop in September 1983 were, from left, Dr Dennis Greenland, Deputy Director-General of IRRRI, and ACIAR Program Coordinators, Dr Gabrielle Persley and Dr Eric Craswell. The workshop focused on research to resolve problems of soils in the tropics. Photo: ACIAR Annual Report 1983-84

Research Program Managers with scientific expertise and rich knowledge about international agriculture are a defining feature of ACIAR. They drive the processes of determining where to invest and identify the best partners and programs for impact.

Professor Gabrielle Persley (Dr Persley in those days) was appointed as Science Adviser for ACIAR in 1982. Her directive was to develop the science strategy and initiate the first portfolio of collaborative projects, across the range of research programs. Soon after, she was appointed Coordinator for the new Crop Sciences Program.

‘When ACIAR was established, it was envisaged that the scientific staff would be experienced research scientists coming from Australian research organisations or international agricultural research centres,’ said Professor Persley.

‘In similar international aid organisations in other countries, administrative and managerial staff fill these roles. For ACIAR, the founders believed having respected senior scientists leading research programs would be key to its success. The program managers would work with science partners to formulate project ideas and then support compelling cases to get approval for funding. The program managers would also oversee implementation of the successful projects.

‘It was considered desirable that the senior research staff leading the research programs would join ACIAR for up to seven years as a part of their career, or on a fixed-term secondment from their home organisation. This would give the new organisation both continuity and flexibility in its staffing arrangements and the ability to bring in new skills over time, as ACIAR program areas and partnerships evolved. This model has served ACIAR well.’

In fact, the model has worked so well that it has fundamentally remained the same since 1982. While the topic or focus of research programs has evolved, the core role of the Research Program Manager remains in place and at the heart of ACIAR operations.

Forty years later, the ACIAR Research Program Managers remain the technical interface between ACIAR and the Australian and international agricultural innovation systems. As the nature of projects has evolved and the research programs diversified, so has the skillset that ACIAR looks for in a Research Program Manager.

ACIAR Chief Scientist (2017–current), Dr Daniel Walker, observed that the success and flexibility of the system of Research Program Managers leading and brokering research partnerships is attracting a new generation of people to the role.

‘Initially, most ACIAR projects focused on providing a technical solution to a technically defined problem but there was also an economic and social overlay applied to project design, to ensure solutions were feasible for smallholder farmers, fishers and foresters,’ said Dr Walker.

‘Over 40 years, science has changed, development requirements have changed and ACIAR has changed. Now we find projects are increasingly multi-faceted, incorporating social, environmental and value chain dimensions in ways they did not in the past.

‘What we expect of Research Program Managers gets broader all the time. Technical expertise is still fundamental, but our requirements are increasingly diverse. This includes people with knowledge of markets and value chains, agribusiness, gender, different cultural and political perspectives, and evaluation of impact – and those who can tackle the cross-sectoral picture that may illuminate opportunities to partner in new ways to increase impact.’

Critical to the success of the research program has been a small army of Program Support Officers who work with the Research Program Managers to manage the administration and compliance of active projects, as well as the processes associated with projects in development and completed projects.





ACIAR Research Program Manager for Livestock Systems, Dr Anna Okello (right), participated in a discussion panel following a presentation on linking livestock, nutrition and climate at the 2020 Australasian Aid Conference in Canberra. Photo: ACIAR | 2020



The research team gathers for a mid-project review of 'Salinity management in south-eastern Australia, north-eastern Thailand and Laos'. Presenting to the meeting is Dr Nigel Hall, Hall Resource Economic Modelling. Sitting in the back row, from left, are Mr Rohan Last, University of Technology Sydney, Dr Ian Willett, ACIAR Research Program Manager for Land and Water Resources, and project leader, Dr William Milne-Home, University of Technology Sydney. Photo: ACIAR | 2002

### Many paths to a Research Program Manager role

Dr Anna Okello joined ACIAR in 2017 as Associate Research Program Manager for One Health and then became Research Program Manager for Livestock Systems (2018–current). As a qualified veterinarian and armed with a PhD in political science from the University of Edinburgh's Centre for African Studies, Anna has spent most of her career working in international livestock development and public health programs in Africa and South-East Asia. She has worked in various project management and technical advisory roles for international non-government organisations, the University of Edinburgh, the Australian Centre for Disease Preparedness, the World Health Organization and the Australian Government Department of Agriculture, Fisheries and Forestry.

Her interdisciplinary background is invaluable in her role as Research Program Manager, not only to give her perspective in terms of making positive and lasting change for smallholder farmers and their production systems, but also to facilitate change that may not sit comfortably with global views of agriculture.

'An excellent case in point is raising awareness of the vital role of livestock to the health, nutrition and incomes of the world's poor, which is often ignored or omitted from current global narratives about the impact of the livestock sector on the environment or human health,' explained Dr Okello.

'Blanket narratives overlook the significant opportunities that smallholder and pastoralist livestock keepers have to improve human health and nutrition in their communities through better quality and safety of animal-source foods. Good governance of smallholder livestock sectors that promotes the social, economic and nutritional benefits of livestock keeping, while minimising environmental, welfare and public health impacts of livestock intensification, is an important balancing act.'

## Managing partnerships beyond the life of projects

A successful and credible international program needs strong connections and relationships with in-country partners and good local intelligence of on-the-ground issues. Recognising this, the founders of ACIAR quickly established cooperative working relationships with Australia's overseas diplomatic missions. In the early years of ACIAR, the advisory and project facilitation contributions made by development assistance specialists at Australia's embassies and high commissions were particularly important to ACIAR operations.

As ACIAR consolidated its research program throughout the Indo-Pacific region, a dedicated in-country liaison officer role was established. The liaison officer provided direct assistance to local research institutions in the development, establishment and administration of collaborative projects. Liaison officers also provided an important link between ACIAR staff in Canberra and in-country partners by identifying research contacts, assisting with the organisation of itineraries and providing early warnings on coordination and administrative problems. In 1986, ACIAR had liaison officers established in Thailand, Malaysia, the Philippines and Indonesia.

In 1991, the position of in-country representatives changed to Country Manager, reflecting the increasingly executive nature of the role with the country and region.

'Managing country partnerships beyond the timespan of individual projects and through political cycles is a core strength of ACIAR, and this is widely recognised by global development agencies and appreciated by partner countries,' said Dr Peter Horne, who was ACIAR General Manager, Country Partnerships from 2014 to 2023, and previously Research Program Manager for Livestock Production Systems from 2009 to 2013.

'The capacity of our in-country staff has developed incredibly since 1982. In that time their role has changed from providing administrative support in the partner country to increasingly becoming experienced stakeholder relationship managers.

'Some of the most enduring ACIAR country partnerships are evolving rapidly towards co-investment partnerships for international research collaboration for mutual benefit. The frontline people of ACIAR, the in-country teams who are collectively known as the Country Network, have responded to these changes by steering many of our partnerships away from being based just on lists of project priorities and towards partnering agreements based on "how" and "why" we work together. This maturing of relationships is an essential foundation for ACIAR in the next decades.'

The transition of the network into its current form has been part of a 10-year plan, put in place after an external review of ACIAR in 2013, which included a recommendation that ACIAR 'examine the role of country managers with a view to making enhanced use of their in-country knowledge and experience'.

In 2018, the Country Network further extended its role to realise the vision of Country Offices becoming fully resourced, proactive and experienced knowledge and information brokers for ACIAR. Regional and Country Managers were given training in leadership, partnership and knowledge brokering, and how to link research to policy.

'In addition, ACIAR has made "huge strides" in cross-mentoring between countries, rising to the challenges of working across cultures, institutions and disciplines. A decade ago, researchers in Australia were mostly mentoring researchers in partner countries, but now researchers in Kenya are mentoring counterparts in Laos, Lao researchers are mentoring those in Vietnam, and more. The Country Network is critical in identifying the opportunities and linkages for cross-mentoring between researchers in our partner countries.'



In the first decades of ACIAR, the Corporate Services Program managed operations both in Australia and in the Country Offices. At the annual ACIAR Country Manager meeting, held in the Philippines, are, from left, Mr Chris Thurlow (ACIAR Centre Secretary), Mr Allan Barden (Manager Corporate Services), Mr Ian Anderson (Counsellor, Technical Cooperation, Australian Embassy) and country managers, Mr Andrew Elm (Indonesia), Ms Cecilia Honrado (Philippines), Mr Trevor King (China), Ms Chiraporn Sunpakit (Thailand) and Mrs Jean Sambhi (Malaysia). Photo: ACIAR Annual Report 1990-91





In 2007, Ms Mirah Nuryati was honoured for being an excellent ambassador for the Australia–Indonesia collaboration in agricultural research for development. Ms Nuryati (second from left) is pictured at the presentation of her medal with, from left, Mr Bill Farmer, Australian Ambassador to Indonesia; Mr Peter Core, ACIAR Chief Executive Officer; and Mr Julien de Meyer, ACIAR Country Manager, Indonesia. Photo: ACIAR | 2007



ACIAR Country Network – regional managers, country managers, and assistant and communication staff – meeting at ACIAR House in Canberra in 2019. Photo: ACIAR | 2019

### Growing in her role at ACIAR

Ms Mirah Nuryati was appointed as an administration officer to the ACIAR office in Jakarta, Indonesia in 1991. Her story reflects how, as time went on, partner countries increasingly developed their agricultural science capacity and as a result the nature of their relationship with ACIAR changed. Since Ms Nuryati's appointment, her role and duties have shifted, with the most significant change coming after the 2013 external review of ACIAR.

'When I started working for ACIAR I had no scientific background, just secretarial and administrative skills,' said Ms Nuryati.

'In the 1990s, our role was to offer administrative support, coordinate meetings and act as a travel agent for Australian researchers visiting or working in Indonesia.

'With increasing recognition of the value of national staff – including their local relationships, cultural knowledge and interest and capacity to stay with ACIAR for the longer term – the organisation changed its approach.'

After eight years as Assistant Country Manager and five years as the Stakeholder Relationship Manager, Ms Nuryati was appointed as the Country Manager for Indonesia in 2015. Ms Nuryati is the longest-serving ACIAR staff member – in 2022 she had been with ACIAR for 31 years.

In her role as Country Manager, Ms Nuryati provides critical and strategic in-country knowledge, and maintains a network of local connections that help ACIAR operate and increase its impact.

Ms Nuryati was awarded the Australian Public Service Medal in 2007 for outstanding service in the development of collaborative agricultural research projects between Australia and Indonesia. Mirah was honoured for being an excellent ambassador for the Australia–Indonesia collaboration in agricultural research for development, promoting and representing ACIAR and the Australian agricultural research fraternity throughout Indonesia.

## Supporting the functions of ACIAR

Working alongside the people who ensure ACIAR fulfills its mandated purpose of research, capacity building and communication is corporate services – the backbone of the agency, providing financial, procurement, human resources, and information and communication technology (ICT) support.

For the first few years of operation, ACIAR staff comprised a Director, a group of scientific professionals, a centre secretary, and a small management group. Administrative support for this staff was provided by the Department of Foreign Affairs through the Australian International Development Assistance Bureau (AIDAB), and consultants were engaged as required.

During the 1986–87 financial year, ACIAR undertook a review of its corporate services to address the increasing workload as commissioned projects approached 100 in number, financial constraints resulting from an unexpected 21% reduction of appropriated funds, and new responsibilities when AIDAB handed over accounting functions to ACIAR.

The review supported the introduction of corporate planning and program budgeting processes and resulted in the acquisition of an integrated mini-computer system to support administrative processes and link ACIAR to major international agricultural research and development centres through electronic mail.

In the following decades, there was ongoing consolidation of a corporate services team as project investments grew and staff numbers increased, as well as a growing need for processes to oversee expenditure of government money and ensure compliance with the legislation and rules under which ACIAR operated.

In her time with ACIAR, as Director of Finance (2017–2018) and Chief Finance Officer (2018–current), Ms Audrey Gormley has been part of intensive efforts to ensure ACIAR is compliant with all the legislation and rules that government agencies have to comply with.

‘There has been a lot of change in both the software programs and government regulations for the way we do our accounting and budgeting. There was a time at ACIAR when budgets for the research program were finalised using printouts of Excel spreadsheets joined together with sticky tape!’

‘While that may have worked fine a decade or two ago, government agencies are now far more accountable to the taxpayer, and rightly so! Our financial systems have to be efficient and responsive, and ACIAR has invested in and developed systems to support our operations, as well as our accountability for taxpayers’ dollars.’

Another significant change that Ms Gormley has seen in her time at ACIAR is the development of information and communication technology.

‘While there have been information management systems in place since the late 1980s, the importance and value of these systems, to any business, is now critical. We now have a Chief Information Officer and a business systems team of six people to ensure that all ACIAR staff have the hardware and software to perform their role, and to ensure our systems comply with best practice and are cybersafe. ICT used to be a team of two people!’

‘Communication technology is also an essential part of business in the 21st century. ACIAR was well down the path of investing in the latest technologies to enhance communication between the Canberra office and people working remotely – especially our Country Network located in 11 offices throughout the Indo-Pacific region. When the COVID-19 pandemic hit in 2020, we were very quickly able to move staff to working from home, and conduct meetings and workshops over video.’

Corporate and administrative support often goes unnoticed, which Ms Gormley believes is the sign of a good operation.

‘Ensuring staff are paid every fortnight and projects receive timely payments may seem like a simple action. But for those things to happen correctly and happen on time, it takes a well-resourced and seamlessly operating financial system. And these are the same systems that we depend on to report to the Minister and the public about how we spend taxpayers’ money.’

Many of the people who have worked for ACIAR over four decades are quick to acknowledge the commitment and professionalism of their colleagues in administrative roles in the agency, as well as their contribution to the diverse personalities of the ACIAR family.



As ACIAR consolidated its research functions, in-house corporate services were established to support growing staff numbers and implement financial and administrative management systems. Pictured are Mr Allan Barden, Corporate Services Manager, and Ms Kay Murtha, receptionist. Photo: ACIAR | early 2000s





Among many positions with ACIAR, Ms Helen Laughlin (left) worked as a Program Support Officer for the Soil Management and Crop Nutrition Program. Also pictured is Research Program Manager, Dr Gamini Keerthisinghe. Photo: ACIAR | 2007



Communication technology has been an important part of business for ACIAR over the decades. When the COVID-19 pandemic hit in 2020, ICT systems were sufficiently developed for staff to conduct meetings and workshops over video. Photo: ACIAR | 2022

### Forging a non-science career at ACIAR

Ms Helen Laughlin has been with ACIAR for more than half of its history. The first observation she makes about ACIAR is that while many people have moved on to other agencies and organisations to advance their careers, nearly all of them say ACIAR was the best place they have worked.

'ACIAR is an organisation where people feel strongly about the work that we do and that creates an immediate sense of connection. There has been a lot of hard work done, but ACIAR has had a strong sense of family and fun, as well. You know you are working in a special place when people bring their dogs, rabbits, mice and lambs to work!'

Ms Laughlin worked as a Program Support Officer (PSO) across several research programs including Land and Water Resources, Soil Management and Crop Nutrition, Forestry and Crops, before starting a new journey into corporate functions.

'I was one of a very small group of people at the time who didn't have a science background. But within ACIAR I found a career path to pursue my professional interests in records management and IT support. That started with moving from the Research Program to Corporate Services to work on records management.

'Up until the early 2000s, records management was a wall of filing cabinets full of paper. With the introduction of Meridio, a computer-based records management system, a new filing system had to be designed and staff had to be trained in using the system. I became very involved in that process, including digitising 350 boxes of records, from paper to CDs [compact discs] and then into Meridio.'

With a keen interest and natural affinity for new technology, her enthusiasm led to the creation of a regular newsletter called 'Tips and Traps' to help staff learn the new systems in the 2010s. She then pursued formal training qualifications in order to continue and develop staff training in business system applications. As ACIAR passes its 40th anniversary, Ms Laughlin now working in the Business Support Unit, remains committed to supporting colleagues in their learning and use of software, records management systems and communications technology.

## Connecting ACIAR to its stakeholders

Communication was soundly embedded in ACIAR operations from the start, with one of the functions set out in the founding legislation being 'to communicate to persons and institutions the results of such agricultural research'.

In 1983 ACIAR engaged a consultant, Mr David Spurgeon, to develop a communication program. Mr Spurgeon came to ACIAR with excellent credentials. He was formerly Director of the Publications Division of the International Development Research Centre (IDRC), former President of the Canadian Science Writer's Association and founding editor of the Canadian journal *Science Forum*.

The first staff member for communications, Mr Brian Lee, was appointed in 1984. An experienced science communicator, his track record included being the founding writer and editor of CSIRO's *Ecos* magazine. Brian was the founding editor of *Partners in Research for Development* magazine and one of the driving forces behind building up the Country Manager positions to be an effective means of in-country communication.

An early ACIAR policy determined the need to publish material about subjects important in the developing world that would not necessarily attract the attention of mainstream science.

Scientific publishing became a key tool to connect with stakeholders. The publishing program and the publication series were devised by Mr Reg MacIntyre, who was seconded for the assignment from IDRC, where he was Director of Scientific Publishing.

Since the early 1980s, the Communications Program has evolved from producing newsletters and publications and editing project final reports, with up to three scientific writers/editors employed, to an Outreach Program, with a few other names and functions in the intervening years, including Communications and Public Affairs, and Communications and Stakeholder Engagement.

ACIAR Outreach is now responsible for the creation of news and feature articles in written and video form, curation of content for the ACIAR website, participation in events and conferences as well as management of several social media channels promoting the organisation, its partners and its impact.

Over 40 years, many people have passed through the communications unit, bringing an evolving skillset to match the functions, responsibilities and technical demands required to communicate the work of ACIAR to stakeholders, end users and the general public.

With the launch of its 10-Year Strategy 2018–2027, ACIAR significantly increased investment in communication and outreach, and a new executive position was created to develop the functions of Outreach and Capacity Building.

Ms Eleanor Dean is General Manager, Outreach and Capacity Building (2017–current) and has led the process of broadening and modernising the ways in which ACIAR communicates and connects with stakeholders.

'When I joined ACIAR in 2017 there was a very clear directive from the Minister, the Commission for International Agricultural Research, and the Chief Executive Officer that ACIAR should more actively communicate with audiences in Australia to raise the profile of the organisation.

'This resulted in an active campaign to build our social media networks and website with high-quality digital content. Staff with video, photography and digital media skills were recruited to drive this effort.

'Over time the Outreach Team has strengthened our domestic communication efforts to focus on stakeholders, including the agricultural community, research partners and decision-makers.'



A farmer participating in an ACIAR-funded project improving soil health and agricultural production in Aceh, Indonesia, speaks with journalists from the Australian Broadcasting Corporation as part of ACIAR-led efforts to communicate ACIAR research impact to Australian audiences. Photo: ACIAR | 2018



## ACIAR Newsletter

The ACIAR Newsletter was first published in July 1983, and the second issue of the newsletter, published in November of that year, reported a readership of 5,000. Forty-four editions of the newsletter were produced, the last in January 2004. From then aspects of the newsletter were incorporated into the new-look *Partners in Research for Development* magazine in 2004.

The main purpose of the ACIAR Newsletter is to inform to the international agricultural research community and others interested in the field about ACIAR's activities. In addition, it will aim to provide information on activities outside ACIAR, for example research for development programs being supported by ADAB and Australian involvement in the Consultative Group for International Agricultural Research (CGIAR).

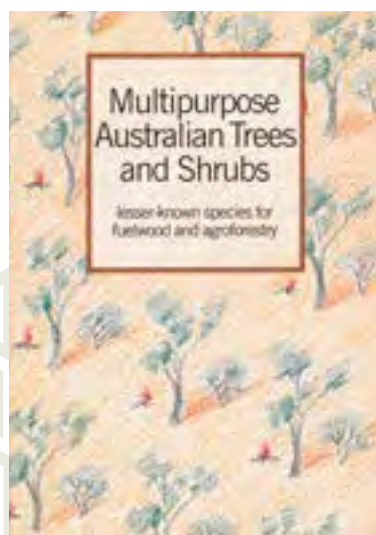
### ACIAR Newsletter No. 1, 1983



## Scientific publications

*Multipurpose Australian trees and shrubs* was the first ACIAR monograph. Published in 1986, the book was produced by Dr John Turnbull, ACIAR Forestry Program Coordinator, to support the anticipated direction of work of the ACIAR Forestry Program. The book was produced in response to the World Bank and United Nations Food and Agriculture Organization (FAO) appraisal that the main thrust of forestry in the next decade would be afforestation with fast-growing trees, to address acute food and fuelwood supply problems. It was launched by Australian Minister for Foreign Affairs the Honourable Mr Bill Hayden, at the February 1987 meeting of the Policy Advisory Council.

The scientific publications program was a key component of the Communications Program to 'communicate ... results of agricultural research'. Within a few years of commencement, three series of publications were established – Proceedings, Technical Reports and Monographs – which have endured for 40 years. Three additional series were established subsequently to publish reports on impact evaluation.



ACIAR Publications

**150**

Proceedings

**100**

Technical Reports

**219**

Monographs

**104**

Impact Assessments

**15**

Adoption Studies

**3**

Outcome Evaluations

# Magazine



## Partners magazine

Initial reactions to ACIAR's new magazine have been very encouraging. Personal copies were sent to all Australian Federal Members of Parliament, and also state government ministers concerned with agriculture. We have been gratified to receive many very complimentary letters from them.

The magazine ... aims to summarise research results coming out of ACIAR projects in greater depth than is possible in the ACIAR Newsletter, and to put the Centre's research thrusts into a broader perspective.

### ACIAR Newsletter No. 14, 1988

The first edition of *Partners in Research for Development* was released in April 1988. The magazine was developed for technical and non-technical readers.

A new look and new format *Partners in Research for Development* magazine was released in June 2004, combining the best of the old-style *Partners* with the corporate ACIAR Newsletter. There was increased focus on project teams and the people who benefit from better policies, increased productivity and more sustainable agriculture, as a result of ACIAR-supported research.

*Partners* magazine is still in production, in hard copy and online formats, as ACIAR celebrates 40 years.

## Social media

ACIAR stepped into the world of social media in 2009, opening a Twitter account to connect with stakeholders.

From 2011, ACIAR expanded its social media platforms to include Flickr, YouTube, LinkedIn and SlideShare. The first social media strategy and guidelines were launched in November 2011, as well as monitoring and evaluation systems to determine the effectiveness of the platforms in augmenting the established traditional channels of communication.

New platforms, such as Facebook and Instagram, have been adopted as they emerge to enhance reach and influence in the ever-expanding scene of social and online media.

The social media strategy was renewed in 2021, to reflect and embrace changing audience behaviour and new technologies, to increase engagement, and to maintain effective monitoring methods.





## Social media



10,668



12,925



61,225



2,029



3,730

followers Nov 2022

## Website

ACIAR launched its first website in 1997. Embarking on the 'world wide web' may have seemed like a brave new world in 1997 but by 2003 the role and potential of a website in government business was recognised.

The website underwent significant redevelopment between 2018 and 2021 in terms of architecture, content and technologies to improve user experience and engagement.

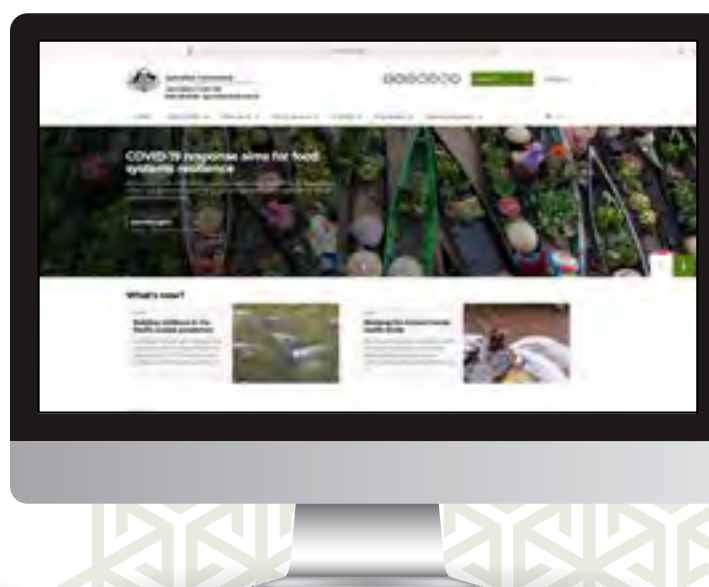
The ACIAR website continues to be a hub to communicate with stakeholders and the general public, providing news, project information, publications, and a range of operational documents, such as mandatory public reporting and employment opportunities.

New functionalities are added to the website, as technology develops. This includes more dynamic page structures, hosting of videos and podcasts, and state-of-the-art search facilities. Bringing more readers to the website is managed through search engine optimisation and accessibility is guided by the international standards, Web Content Accessibility Guidelines (WCAG).

ACIAR's remodelled and extended website is now open for business. Its creation marks a change in emphasis on the way in which information is made available to the Centre's clients and the public.

'We decided to make the website the hub of our operational and administrative activities,' said Director Peter Core. 'This decision is in line with recent moves within the Australian Public Service, but it is also a recognition that it is a smart way to inform our stakeholders and for them to readily obtain information from us.'

ACIAR Newsletter No. 43, 2003





Attendees of the inaugural Seeds of Change: Gender Equality Through Agricultural Research for Development conference gather in the Canberra sunshine. The international conference was convened by ACIAR and hosted by the University of Canberra. Photo: ACIAR | 2019

### Communicating in the 2020s

Communicating the results of ACIAR work is still as important as it was when it was mandated in 1982. The commitment to extending research findings is a pillar of delivery on our mission, as articulated in the ACIAR 10-Year Strategy 2018–2027.

The original communication approach of a stakeholder magazine and a suite of corporate and scientific publications remains in place, however the function of communications at ACIAR has broadened to an outreach program and embraces a wide range of formats using new technologies and undertakes targeted activity to engage with specific stakeholder groups.

Ms Eleanor Dean, General Manager, Outreach and Capacity Building, described the features of the modern ACIAR Outreach Program.

‘As we celebrate 40 years of achievement and learning, we use the latest digital technologies to tell the stories of ACIAR and we have many platforms and forums in which to engage with stakeholders.

‘Establishing a presence on digital platforms has given ACIAR massive reach into a wide range of audiences, with more than 100,000 engagements each month through social media and our website. The Outreach Program has a multi-skilled team that can create compelling content through photography, videography and short and long format stories. We have many ways to tell the same story to different audiences.

‘We also look for opportunities to work with other media organisations to create mass media content to profile the work of ACIAR. We have worked with Australia’s national broadcaster, the ABC, to take impressive projects, such as research on coral reef restoration and the contribution of ACIAR-supported research to recovery after the Boxing Day tsunami in Aceh, Indonesia, to a national audience through the *Landline* program. We worked with the SBS Food Network to create the *Good cooks* television series where high-profile Australian chefs travelled to our partner countries, visiting communities where ACIAR-funded research has improved food production systems. The chefs then cooked with the locals, linking the food crops to traditional dishes.

‘Organising and supporting an ACIAR presence at leading global and national events is a way to provide targeted engagement with our stakeholders. This facet of outreach can be as simple as providing sponsorship, speakers and a display at a scientific conference, such as the annual Australian Agricultural and Resource Economics Conference, through to providing committee personnel, sponsoring attendees and organising international conferences, like the inaugural Seeds of Change: Gender Equality Through Agricultural Research for Development, which was convened by ACIAR and hosted by the University of Canberra in February 2019, with 280 delegates from 45 countries.

‘Another development of the ACIAR Outreach Program, that truly extends our reach and impact, has been the establishment of the In-Country Communication Officer Network. The network is made up of communication specialists who are placed strategically throughout our region, within the Country Network. Referred to as ICCONs, these communicators are our eyes and ears on the ground in our partner countries. In 2022, ACIAR had communicators in seven of our 11 Country Offices.’



## The ACIAR hexagon



The first ACIAR logo appeared on the 1982–83 Annual Report and from 1984 it was applied to the ACIAR Newsletter, publications and stationery.

In 1984, ACIAR Director, Professor Jim McWilliam, provided the following explanation:

The individual hexagons are derived from an ancient Persian architectural symbol depicting an optical illusion of interacting rhomboids. Each hexagonal figure, with its interactive design, is symbolic of the collaborative research programs that ACIAR supports. The association of the three hexagons that make up the ACIAR logo represents the tripartite relationship between Australian scientists, their overseas counterparts, and the catalytic role of ACIAR in bringing them together. Simple, isn't it!

**ACIAR Newsletter No. 4, 1984**



**Australian Government**  
**Australian Centre for**  
**International Agricultural Research**

During 2003, the Australian Government directed all federal departments and agencies to adopt a standardised logo, incorporating the government crest.



**ACIAR**  
[www.aciar.gov.au](http://www.aciar.gov.au)

**C. 2008**

After almost 20 years in the public eye, the hexagon was well recognised and associated with ACIAR. The hexagon was adopted as a design element for ACIAR publications and merchandise, and as a secondary logo, with just one hexagon.



**ACIAR**

**C. 2018**

The depiction of the hexagon has changed over time to maintain a contemporary style.

## Consolidating reputation and impact in the field

The reputation, value and impact of ACIAR over 40 years has been built, not only by ACIAR staff, but equally by the researchers and technicians on project teams, the emerging scientists on ACIAR fellowships and all the associates of ACIAR who have maintained enduring links with the world of agricultural research for development.

Project teams, especially the partner-country members, have been at the heart of project implementation and management, as well as engagement with local stakeholders – from regional and national governments through to the ultimate ACIAR stakeholders, smallholder farmers, fishers and foresters of the Indo-Pacific region.

Many stories in this book feature the project leader from the commissioned organisation of the ACIAR-supported project.

Along with a commissioned organisation, each ACIAR-supported project has several collaborating partners, most of which are organisations and institutions from the partner country.

The researchers from the partner-country collaborators are the 'heartbeat' of every single project. The success and reputation of ACIAR is as much due to these quiet achievers, as it is the commissioned organisation and ACIAR staff.





### Working towards equal opportunity and benefit

The success of improving the productivity of agriculture, fisheries and forestry, to reduce poverty and increase opportunity, has always been underpinned by several imperatives – one being equity and inclusiveness.

Over 40 years, ACIAR has continuously refined its project design and implementation to ensure that the benefits of improved productivity are accessible to all who participate in agriculture – after all, almost half of the world's farmers are women.

Empowerment of women has been intrinsic in some projects and in step with Australian Government foreign policy. For example, in the early 2000s, ACIAR supported a project led by Dr Thelma Paris, a social scientist with the International Rice Research Institute (IRRI), to collect data and information to assess the impact of off-farm employment on agricultural productivity, farm efficiency, welfare and the role of women at the household, farm and local levels in Thailand, Vietnam and Australia.

In *Partners in Research for Development*, Winter edition, 2006, Dr Paris concluded that 'while remittances are useful in helping families left behind, women must maintain productivity levels and deal with increased burdens and responsibilities ... our research provides early warning of rapid changes that may be undermining the national and regional food security that we've worked so hard to achieve over the past several decades'.

Motivated by the empirical evidence that women around the world are disproportionately affected by poverty, ACIAR recognised it could not credibly pursue its objectives of food security, poverty reduction, improved human health and nutrition, unless it promoted gender equity internally and externally. The ACIAR Gender Equity Policy and Strategy 2017–2022 was launched to articulate and guide this intent.

The strategy guided ACIAR to make important organisational changes and honed its ambitions to drive change internally and externally through its research, capacity-building and outreach activities. Gender parity was achieved with almost 60% of senior managers being women – in 2022.

The strategy guided improved inclusion of women in research for development leadership, both in Australia and in partner countries. It also underpinned expansion of women's access to capacity-building programs and fellowships with gender parity set as a requirement in established ACIAR fellowship programs and the establishment of the Meryl Williams Fellowship for women researchers.

Building on the success of the 2017 strategy, ACIAR has strengthened its resolve and increased its ambitions in regard to equity and inclusiveness with the development of a new Strategy and Action Plan to be launched in 2023.



Social scientist with IRRI, Dr Thelma Paris, studied the impact of off-farm employment on agricultural productivity, farm efficiency, welfare and the role of women at the household, farm and local levels in Thailand, Vietnam and Australia. Photo: *Partners* magazine, Winter, 2006





..... Smallholder farmers of the Indo-Pacific region are the ultimate beneficiaries of the investment in agricultural research for development made by ACIAR.  
Image: Coretext | *Partners in Research for Development*, ACIAR 30th Anniversary edition, 2012





## The people ACIAR has nurtured

**The ultimate beneficiaries of the investment of the Australian Government in agricultural research for development, through ACIAR, are smallholder farmers, fishers and foresters of the Indo-Pacific region. By brokering and funding science partnerships to improve the productivity, sustainability and equity of agricultural systems, ACIAR has provided scientists of Australia and partner countries with unique opportunities to develop their careers and forge strong networks and long-lasting relationships.**

Capacity development by ACIAR varies from strengthening partner organisations to strengthening individual capability. This can occur informally through on-the-job learning and training, including mentoring, while working on projects, through to formal programs to gain individual postgraduate qualifications or skills for career progression.

In 1982, the enabling legislation for ACIAR did not mandate the funding of training and capacity-building programs. However, capacity building was quickly recognised as an intrinsic outcome and benefit of research projects, and informal capacity building was taking place from the very first ACIAR-funded projects.

The 1992 review to determine if the ACIAR Act of 1982 should be extended beyond June 1994 not only recommended that ACIAR continue but also that its mandate be extended.

One recommendation was to amend the ACIAR Act to direct ACIAR to 'conduct project-related training (both informal and post-graduate); and that responsibility for the administration of ACIAR's training scheme together with the concomitant resources, should be transferred from AIDAB to ACIAR'.

Central to the ACIAR Capacity Building Program has been an ongoing and evolving set of fellowship programs. The nature of the fellowships and the type of people participating has developed to respond to new needs, expectations and opportunities since the 1990s. Along with the fellowship programs, short-course and issue-specific programs have been devised as needs are identified.

Investment in staff to support capacity building has also grown with the program. When management of the first fellowship program was transferred to ACIAR from AIDAB, one officer was employed to manage formal activities, with oversight by a training committee comprised of Research Program Managers.

In 2022, the Capacity Building Program is headed by an executive manager and managed by a team of four. A steering committee with members from across all functions of ACIAR advises on the implementation and development of the program.



## From serendipitous benefit to a strategic objective



The collaborative nature of ACIAR-supported research inherently provides capacity-building opportunities for project staff. Since 1992, ACIAR has offered a comprehensive program of fellowships and formal training to complement informal capacity building. The series of projects focused on bivalve production in northern Vietnam and Australia, led by Dr Wayne O'Connor of NSW Department of Primary Industries, enhanced both practical and academic skills of staff from Vietnam's Research Institute for Aquaculture No. 1. Photo: ACIAR

Participation in ACIAR-funded projects has always been a career-building experience for scientists and researchers from Australia and partner countries. The collaborative nature of ACIAR research projects has naturally led to on-the-job training and exchange of knowledge and skills.

The 1992 amendment to the ACIAR Act was the first step in elevating the role and benefits of capacity building. With a few more decades experience, the intrinsic link between the ACIAR mission of achieving more productive and sustainable agricultural systems, and the technical capacity of partner countries across the domains of research, management, policy and governance, was clear and obvious.

The emphasis and investment in capacity building was raised significantly in 2018, with the implementation of the ACIAR 10-Year Strategy 2018–2027. Capacity building was enshrined as a strategic objective to build 'scientific and policy capability within our partner countries' and the ACIAR Capacity Building Program was formalised and resourced to support the objective.

Ms Eleanor Dean is the ACIAR General Manager, Outreach and Capacity Building (2017–current). She reflected on how ACIAR has responded to capacity-building needs and opportunities over the years.

'Capacity building has evolved over time in response to reviews and strategies and to improve program effectiveness and engagement. Since 2017 ACIAR has enhanced its Capacity Building Program by changing how and where we invest, helping to improve our efficiency. This shift was informed by the findings of independent reviews undertaken between 1992 and 2017.'

While the ACIAR Capacity Building Program is designed around gaining skills and knowledge, the value and importance of personal benefits and connections cannot be underestimated.

'Building connectivity between researchers around the world to support collaboration and the sharing of expertise is the lasting legacy of all ACIAR capacity-building activities.

'With around 800 alumni around the world, who connect ACIAR to each new generation of researchers in their home countries and then share new expertise with Australia, the various fellowships have proven their worth.

'The fellowships provide an ever-increasing return on investment for each year an alumnus continues their research, builds their networks and contributes to new efforts to improve agricultural development in their home countries.

'Many of the personal relationships and professional networks developed through ACIAR-supported capacity-building activities can last decades and support alumni across their careers.'



## ACIAR fellowships and training



The 2011 cohort of John Allwright fellows gathered in Canberra at the start of their program. They are pictured here with ACIAR Research Program Managers. Photo: ACIAR | 2011

Australia has invested in building the capacity of people in developing countries since the 1950s, when it was one of seven nations that established the Colombo Plan. The plan facilitated the economic and social advancement of the people of the Asia-Pacific region through skills development and training in policy development and governance. The establishment of the Australia Awards program is an ongoing commitment to support emerging leaders from developing countries in study, research and professional development in Australia.

Training opportunities were available to partner-country scientists through fellowships managed by AIDAB, but by 1988 a scheme to meet the particular requirements of scientists working on ACIAR-funded projects was developed. The scheme came to be known as the AIDAB-ACIAR Associated Fellowship Scheme, with the objective to 'enhance technical capacity of ACIAR research partners in the region through postgraduate studies at Australian tertiary institutions'.

The ACIAR Capacity Building Program has evolved and broadened from one fellowship program to support partner-country scientists to complete postgraduate studies, through to a suite of programs that provide organisational and institutional capacity building in ACIAR partner countries, in addition to fellowships that provide formal qualifications.

An estimated 800 scientists and science leaders throughout the Indo-Pacific region currently go about their work using skills and knowledge acquired with the support of ACIAR. In addition, the graduates of ACIAR fellowships form lasting relationships with their supervisors, trainers and mentors, with project teams and ACIAR staff, and with each other. Many become active members of ACIAR partner networks and informal ambassadors for agricultural research for development, and for ACIAR.

### John Allwright Fellowship 1986–2022

Fellows 689

### JAF Executive Leadership Program 2019–2022

Fellows 58

### John Dillon Fellowship 2002–2022

Fellows 179

### Meryl Williams Fellowship 2019–2021

Fellows 41

### Pacific Scholarship 2008–2022

Fellows 100

### Alumni Research Support Facility 2020–2022

Projects 65

### Alumni events 2018–2021

Events 72

### Alumni active 2021–2022

Alumni 630

## John Allwright Fellowship



Ms Rojare Netsangtip of Chang Mai University, a collaborator in the ACIAR project on discovering the extent of boron deficiency in Thailand, discusses experimental work with Professor JF Loneragan, Murdoch University (left) and Dr Yooktu Sariaphuti, Director General of the Thai Department of Agriculture. Ms Netsangtip was one of eight scientists awarded an AIDAB-ACIAR Fellowship in 1986-87. Photo: ACIAR | 1986

The John Allwright Fellowship program grew from the AIDAB-ACIAR Associated Fellowship Scheme, which was transferred from AIDAB to ACIAR in 1992 with the amendment of the ACIAR Act.

The scheme was renamed the John Allwright Fellowship in 1994, to honour the highly regarded Mr John Allwright AO – farmer and former President of the National Farmers Federation.

Mr Allwright served on the ACIAR Board of Management and the Policy Advisory Council from 1989 to 1994. He possessed extensive knowledge and experience of farming, agricultural research and development, and world trade.

Although renamed, the purpose and operation of the scheme remained unchanged. The fellowship continues to be co-financed by the Department of Foreign Affairs and Trade (DFAT), and administration of the program is supported through the Australia Awards program.

The John Allwright Fellowship supports scientists from partner countries to obtain postgraduate qualifications at an Australian tertiary institution. The fellowship has launched successful careers and built strong relationships between scientists and organisations.

A 2020 tracer study of graduates of the John Allwright Fellowship showed very positive results for graduates and ACIAR. Skills and knowledge gained in Australia were, and remain, highly relevant, and almost all alumni still use those skills and knowledge today.

# 272

Graduates from 2010 to 2019

### Benefits included:

- 85% remain active agricultural researchers
- 60% attribute their qualification to promotion – especially women
- 76% maintain relationships with Australian research organisations
- 61% maintain active links with ACIAR staff
- Skills and knowledge gained in Australia remain highly relevant.

Source: John Allwright Fellowship tracer study, ACIAR, 2020



Mr John Allwright AO was a farmer and former President of the National Farmers Federation. He served on the ACIAR Board of Management and the Policy Advisory Council from 1989 to 1994. Photo: ACIAR



### A global path to fulfill a dream to work in rural Mozambique

John Allwright fellow, Dr Nascimento Nhantumbo, grew up in rural Mozambique where his childhood was disrupted by the horrors of civil war. Regardless, his parents, who worked as a doctor and a nurse, had high expectations for Dr Nhantumbo and his siblings, in terms of education and qualifications.

As a child, Dr Nhantumbo loved spending time with his father at the Manjacaze Rural Hospital and dreamed of following in his father's footsteps as a doctor. After two unsuccessful attempts to enter medical school, he made a successful application to study agronomy and found a new way to combine his passion for working with people and his love of rural Mozambique.

Dr Nhantumbo's first jobs were a maize breeder at the Mozambique Agricultural Research Institute and a teaching assistant at the new Instituto Superior Politécnico do Manica. Being part of a new institution – the first tertiary-level technical and vocational education institution in Mozambique – offered many opportunities for teaching and agricultural development research.

In 2008, Dr Nhantumbo secured a scholarship to undertake a master degree at Wageningen University in the Netherlands. Shortly after returning to Mozambique in 2010, he helped a colleague translate a document for a project-launch workshop.

It was an ACIAR project, titled 'Sustainable intensification of maize-legume cropping systems for food security in eastern and southern Africa' (SIMLESA) and Dr Nhantumbo joined the project as an agronomist.

Dr Daniel Rodriguez, Head of the Farming System Research group at the Queensland Alliance for Agriculture and Food Innovation Institute from the University of Queensland, was the project leader. As a fellow Wageningen alumnus, Dr Rodriguez welcomed the experience in conservation agriculture that Dr Nhantumbo brought to the team and encouraged him to apply for a John Allwright Fellowship to complete his PhD at the University of Queensland.

Returning home in 2015, Dr Nhantumbo became a Lecturer in the Faculty of Agriculture at the Instituto Superior Politécnico de Manica (DivAG-ISPM) and ISPM Coordinator of the master program in agro-systems management, for which he also helped develop the curriculum. He is also Head of the Institutional Quality Assurance Board and is involved in an ACIAR-IDRC funded project in the Cultivate Africa's Future program.

Dr Nhantumbo is now becoming involved in food security and nutrition issues, with 43% of children younger than five years in Mozambique suffering malnutrition. He and his colleagues are examining how to design climate-resilient and 'nutrition-smart' agricultural systems that work in the field.

They are also working to support and encourage more young people to enter the agriculture sector, with youth farming clubs and increased networking between his institute, and the public and private extension systems. Working with agricultural extension and local organisations enables Dr Nhantumbo to have the close connections with rural people that have always been so important to him.

Strong ongoing links with ACIAR and other institutions in Australia continue to contribute to Dr Nhantumbo's work to improve food security, and the design and management of agricultural systems in Mozambique.



John Allwright fellow, Dr Nascimento Nhantumbo (right), collecting soil samples with a colleague. The site is in an irrigation scheme participating in the project, 'Farmer-led small-scale irrigation in Mozambique', which is part of the ACIAR-IDRC CultiAF program. Photo: ACIAR | 2020

Excerpt from John Allwright Fellowship tracer study, ACIAR, 2020

## John Dillon Fellowship

The John Dillon Fellowship aims to develop the leadership and management skills of mid-career scientists, researchers and economists working in agricultural research for development in ACIAR partner countries.

The program was introduced in 2002, and continues to this day. It is delivered as short intensive courses and study tours. The fellows are introduced to a range of good-practice Australian agricultural organisations involved in research, extension and/or policymaking. They are also provided with training in practical topics such as project management and stakeholder analysis to lead and manage more effective research.

The program provides fellows with opportunities to meet and establish relationships with scientists and other experts that they may not have been able to interact with otherwise.

The fellowship is named in recognition of the late Emeritus Professor John Dillon AO, who was one of Australia's leading agricultural economists and a strong advocate of international agricultural research and collaboration. Professor Dillon was President of the Policy Advisory Council and Chair of the ACIAR Board of Management from 1985 to 1994. He is recognised for his governance of ACIAR through its formative years and preparing ACIAR for its parliamentary review in 1992, to determine if the agency should continue.

Professor Dillon also served on the boards of five CGIAR centres, was Chair of three, and twice served as the Chair of the committee of the CGIAR Board.

In response to restrictions to international travel in 2020 due to the COVID-19 pandemic, ACIAR redesigned the program so it could be delivered in country to individual country cohorts of up to 15 participants. The program strengthened its focus on cross-organisational collaboration and strengthening ties with Australian collaborators.



A group of John Dillon Fellowship recipients at their award presentation in 2016. The fellows were photographed with the Minister for Foreign Affairs, the Honourable Julie Bishop MP (front row, centre), and ACIAR Chief Executive Officer, Dr Nick Austin (back row, second from right). **Photo:** ACIAR | 2016



Professor John Dillon was one of Australia's leading agricultural economists. He was President of the Policy Advisory Council and Chair of the ACIAR Board of Management from 1985 to 1994. **Photo:** ACIAR



### Passion for research takes Anna from graduate to professor

Dr Agustina Asri Rahmianna's passion for research was noticed almost straight away by Australian scientists who were seconded to an ACIAR groundnut (peanut) project in Indonesia in the early 1990s.

Then an agronomy graduate from Gadjah Mada University, Dr Rahmianna (or Anna as she is known among the farmers she works with in Indonesia) was encouraged by Queensland peanut researchers Dr Graeme Wright and Dr Mike Bell to apply for a John Allwright Fellowship to undertake a PhD in Australia, which she duly did and completed in 1998.

Dr Rahmianna's work since then is a clear demonstration of the capacity-building value of ACIAR scholarships such as the John Allwright and John Dillon fellowships. Dr Rahmianna is a leading researcher with the Indonesian Legume and Tuber Crops Research Institute, focusing on lifting groundnut production through improved agronomy and water use efficiency. Peanuts are grown in rotation with rice and give farmers an extra crop that can use the soil moisture remaining in paddies.

Her work also involves educating farmers on the correct use of fungicides to control aflatoxin. The long-term objective is to lift production, plus raise overall quality to an export standard.

Published in *Partners in Research for Development*, Issue 3, 2015

This would go a long way to lifting smallholder communities from traditional subsistence farming to having a more productive and sustainable agricultural economy.

While it was painful to leave behind a young family during her PhD at the University of Queensland, Dr Rahmianna says the experience was life changing.

'Everything about research still excites me,' she said. 'Research gives you a freedom for thinking and problem-solving.'

But she adds that change cannot be achieved by research alone.

'It needs extension support and the participation of industry; in the case of our groundnuts, the buyers and processors [are needed] to ensure the new knowledge is maintained after the researchers have gone.'

#### Postscript

At the time of publication, Dr Rahmianna is Research Professor in Cultivation and Crop Production – Technology Indonesia, supervises students from several universities and remains actively involved in international agricultural research for development.



Farmers ask researcher Dr Agustina Asri Rahmianna for advice on crop samples they have brought with them to a field day.  
Photo: Coretext | Brad Collis | 2015



## Meryl Williams Fellowship

The Meryl Williams Fellowship was created in 2019, to support women agricultural researchers. The development of the fellowship was a specific goal of the ACIAR Gender Equity Policy and Strategy 2017–2022, to establish a new fellowship program that provides opportunities for women to access agricultural education and training.

The program was adapted from the highly successful AWARD program established in Africa by the Bill and Melinda Gates Foundation. A critical component of the fellowship is the mentoring support program, where each fellow is paired with an experienced mentor in their home country to provide support and guidance as fellows develop their management, leadership and professional skills. In addition to providing executive leadership training and professional development opportunities to the individual women, the Meryl Williams Fellowship supports the institutions employing the fellows to identify and address systemic barriers to women's advancement.

Between 2019 and 2022, 41 women from ACIAR partner countries have been awarded the Meryl Williams Fellowship.

The fellowship is named in honour of Dr Meryl Williams, an eminent Australian fisheries, aquaculture and agricultural research-for-development leader. Dr Williams has held several senior positions in international and Australian organisations, including Director-General of WorldFish, one of 15 international agricultural research centres of CGIAR, from 1994 to 2004. Previously she was Director of the Australian Institute of Marine Science and Executive Director of the Australian Government Bureau of Rural Sciences.

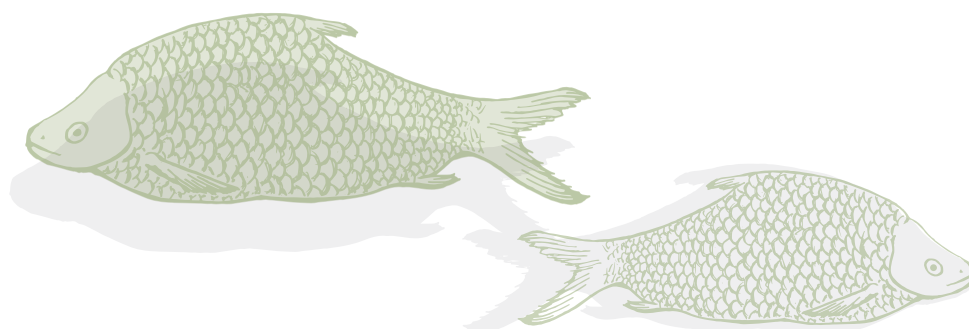
Dr Williams has been a member of many international boards and committees, and held lead positions that include inaugural Chair of the Gender in Aquaculture and Fisheries Section of the Asian Fisheries Society, and Chair of the Advisory Board of the CGIAR Gender and Diversity Program. From 2004 to 2007, Dr Williams was Chair of the ACIAR Board of Management and President of the Policy Advisory Council; and from 2007 to 2010, Chair of the Commission for International Agricultural Research.



Dr Meryl Williams is an eminent Australian fisheries, aquaculture and agricultural research-for-development leader. Photo: University of New England | Addison Ormer | 2019



A Meryl Williams Fellowship has provided Ms Agnes Mone Sumareke with skills she is applying in her role leading and coordinating a diverse team conducting galip resource surveys. Photo: ACIAR | 2022





### Fellowship consolidates talent and experience for a natural-born leader

A willingness to embrace new opportunities is now paying dividends for forest scientist, and Meryl Williams fellow, Ms Agnes Mone Sumareke – for herself, her family and her community.

Ms Sumareke grew up in the small village of Kerenda, Upper Mendi, in Papua New Guinea (PNG). She was the eldest of six children and her teacher father defied cultural norms by encouraging his daughters to attend university.

She completed her secondary education at a Queensland boarding school, courtesy of an Australian Agency for International Development (AusAID) scholarship and returned home to complete an undergraduate degree in science and forestry. A few years later, Ms Sumareke had the opportunity to study for a master degree at the ITC Faculty of Geo-Information Science and Earth Observation at the University of Twente, in the Netherlands.

'This was thanks to a Joint Japan/World Bank scholarship, but it meant leaving my two young children with my parents for 18 months. It was very hard, but I had to do it for their sake. If I developed my career, maybe I could move on in life and provide more for them.'

By this time, Ms Sumareke was also driven by a passion for forestry and a dedication to making landscape-wide change that might improve the lives of the many who drew their livelihoods from PNG's forests.

'I really loved forestry but at that stage in PNG it was seen as either planting trees or cutting them down. I saw forestry as everything – the soil, the insects, the plants, the trees, climate ... everything. In 2005 I had been fortunate to go to Japan to do a 3-month course on remote sensing for forest management and that developed my interest in GIS (geographic information systems). That's what inspired me to do my masters.'

'Each of those international trips was like I was building on a foundation. There was so much talk about PNG's forests (which cover some 80% of the country) and sustainable management and deforestation, but we were not even monitoring our forests. I thought I could integrate remote sensing techniques with forestry to bring some changes and make a difference, especially in research and development. My mind was opened up – there were so many ideas in me that I wanted to implement.'

Inspiration and opportunity visited again when Ms Sumareke was awarded a Meryl Williams Fellowship in the inaugural round of the program in 2020.

'I applied for the fellowship because I wanted to develop the leadership and management skills that I needed to apply for the management positions.'

'I have gained skills, know-how and networks. It has taught me how to be a leader at any level, that you can make a difference wherever you are. I now believe in myself and I am positive that I can be a good leader or manager.'

Following her fellowship, Ms Sumareke returned to her position of forestry and remote sensing specialist with the PNG Forest Research Institute in Lae. She began a survey to support the emerging galip nut industry. The survey was disrupted by the COVID-19 pandemic, however Ms Sumareke successfully gained funding through the ACIAR Alumni Research Support Facility to continue her work.

In July 2021, the International Food Industry, under the Market for Village Farmers Project, provided a substantial grant to support a major capacity-building effort. Ms Sumareke will coordinate a team of scientific and research officers, technical assistants and botanists to continue the galip tree resource surveys across several provinces and the results of her ACIAR-funded project will be used as baseline information.

'It's the first time I will lead such a big team but I am very excited. I want to improve the livelihoods of others and protect the natural environment. The National Agricultural Research Institute has been working on the galip nut for some years with ACIAR funding but there was an information gap regarding how many galip trees grow and where, and how many nuts are being produced. That's where I came in – using remote sensing to study the distribution and abundance of trees to help develop the value chain.'

Excerpt from 'No limits for natural-born leader Agnes Sumareke', GEARed (Gender Equity in Agriculture Research for Development) website, August 2021, accessed February 2023. [www.geared.global](http://www.geared.global)

## More opportunities for career development

### Pacific scholarships program

Since 2007 ACIAR has supported postgraduate scholarships through the University of the South Pacific. The scholarship assists postgraduate students undertaking research master degrees or PhDs that are aligned to an ACIAR research project. Residents from Fiji, Vanuatu, Tonga, Tuvalu, Kiribati, Samoa and Solomon Islands are eligible to apply to pursue their studies in agricultural research. From 2007 to 2023 ACIAR has supported 112 such scholarships at the University of the South Pacific.

In 2021 the program was renamed the Pacific Agricultural Scholarship Support and Climate Resilience program (PASS-CR). It aims to support new generations of agricultural researchers to tackle and address current and future challenges facing Pacific agriculture. The program was extended to include scholars who chose to study at Fiji National University. The program aligns scholars with ACIAR-supported research projects in agriculture, fisheries or forestry and an Australian supervisor who works with a supervisor from the participating university.

96%

Graduates of Pacific Scholarships program employed in agriculture

Source: The ACIAR-University of the South Pacific Postgraduate Scholarship Scheme, Survey Report 2016

A postgraduate scholarship program also operated with the University of Technology (UNITECH), in Papua New Guinea, from 2005 to 2011.

Reviews of the Pacific Scholarships program have attributed significant results in terms of building capacity in both the students and the academics, and ultimately strengthening the agricultural innovation system in the Pacific region. A tracer study of participants in 2016 showed that 96% of graduates who received scholarships to study at the University of the South Pacific under the program are employed in agriculture.

### Training

Since 1992, with the mandate to 'establish and fund training schemes', ACIAR has facilitated workshops and seminars on a specific topic of interest to a project or a group of projects within a program, to support the building of scientific, policy, managerial and governance skills in researchers working on ACIAR-funded projects.

Many of the short courses are designed to complement the ACIAR fellowships, and provide those undertaking postgraduate studies with additional skills for the workplace and the agricultural research-for-development sector. For example, in 2019, the John Allwright Fellowship Executive Leadership program was introduced as a complementary study program that fellows undertake while in Australia. The program provides fellows with an opportunity to develop their leadership and management skills, to support their transition from full-time study back to their workplaces after their time in Australia.

Short-course training is also conducted in collaboration with the Crawford Fund and other research partners. The Crawford Fund facilitates annual Master Classes that highlight major new developments in a science or related disciplines, such as biotechnology, intellectual property, breeding techniques and research management. The classes aim to educate mid-career, high-achieving scientists or decision-makers in agriculture about the major features of such new developments. The programs may be several weeks in length and involve researchers from ACIAR-funded projects. The topics of the courses are developed in collaboration between ACIAR and the Crawford Fund.



The 2023 cohort of the ACIAR-supported Pacific Agricultural Scholarship Support and Climate Resilience Program (PASS-CR). At far right is ACIAR Regional Manager, Pacific and Papua New Guinea, Ms Mai Alagcan. Photo: ACIAR | 2023



## Institutional capacity

The historical approach to capacity building (pre-2017) was to fund the development of the individual through the John Allwright Fellowship, the John Dillon Fellowship and Crawford Fund short courses. The benefits of these programs for individual scientists are clear; however, achieving long-term outcomes from research also requires institutional capacity building of the science and research organisations in partner countries where the fellows work.

Since 2017, ACIAR has developed discreet programs targeted at strengthening institutional capability to undertake effective agricultural research for development such as the Pacific Plant Biosecurity Partnership and a graduate diploma program in conjunction with the Papua New Guinea Fisheries Agency. Additionally, in response to a 2020 review of the role of ACIAR in institutional strengthening, the John Dillon Fellowship was redesigned to address organisational effectiveness, and the Meryl Williams Fellowship was designed to address organisational impediments to gender equality.

Institutional strengthening is a long-term, cumulative process that is most effective when supported by trust and partnership. Continued investment in individuals through ACIAR fellowships and other capacity-building opportunities has laid the foundations for future programs targeted at institutional strengthening.

## ACIAR Learn

In response to the COVID-19 pandemic, ACIAR partnered with the University of Queensland and Catalpa International, to develop and pilot an online microlearning platform to enable continued professional development for scientists, despite restrictions on travel and in-person learning. ACIAR Learn was launched in April 2022.

The platform provides bespoke online learning for ACIAR-funded researchers. Content and lessons are developed based on consultation with researchers and alumni, to ensure the content is relevant and engaging. Short courses have been created for topics such as research project management, research methods, data analysis, experimental design, and monitoring and evaluation.

Two core principles underpin ACIAR Learn – microlearning and mobile-first. Learning is done in dynamic bite-sized lessons that can be completed in 20 minutes or less. The program is available on mobile devices, as well as on computers, so learning can be done anywhere, at any time, and at any pace. Online learning is complemented by live interactive sessions where participants can have valuable discussions with other researchers in their field, no matter where in the world they are located.

## Alumni programs

The ACIAR 10-Year Strategy 2018–2027 committed to increased engagement with the alumni of ACIAR fellowships and programs, to maintain the relationships established during the programs, and to build a network of peers and increase opportunities for ongoing learning and mentoring. A strategy was implemented to develop the skills, knowledge and networks of alumni to contribute to positive development outcomes in the agricultural research-for-development sector.

Alumni engagement programs have been developed and are coordinated from many of the ACIAR country or regional offices in the Indo-Pacific region. The programs are supported by an engagement plan that has identified priorities and interests for each country or regional group.

Alumni groups have formed in most ACIAR countries where members meet regularly to share their experiences and to build their networks. Alumni events organised by ACIAR country and regional offices provide opportunities for early to mid-career alumni to engage with senior colleagues within their own countries, leading to mentoring opportunities.

International conferences, such as the biennial TropAg International Agriculture Conference in Brisbane or the Pacific Week of Agriculture and Forestry, also provide the perfect opportunity to host alumni events. Industry events such as these are frequently attended by ACIAR alumni, and the ACIAR Capacity Building Program organises specific activities in addition to the conference to ensure alumni can maintain their connections with each other and ACIAR. Most importantly, strong connections between alumni build a committed network of international scientists to support and lead ongoing ACIAR-funded research, for the benefit of smallholder farmers in the Indo-Pacific region.



## ACIAR Graduate Program

The ACIAR Graduate Program started in 2007 to provide a career development opportunity for Australian graduates wanting to pursue a career in agricultural research for development. Generally, two positions are offered by the program each year, giving passionate young scientists an opportunity to gain experience and insight into developing, monitoring and evaluating research projects within a research program or participating in programs of multilateral engagement or impact evaluation. The graduate program also builds capacity to be future research managers and leaders. Graduates are recruited from a wide range of disciplines, including agricultural, veterinary, environmental and social sciences, and agricultural economics.

Unlike other Australian Public Service graduate programs, the graduate spends a short time with ACIAR and then finds a new position within the agricultural research-for-development sector. For this reason, the program is focused on the participant building a network and a skillset valuable to agricultural research institutions.

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**young scientists  
awarded a place in the  
ACIAR Graduate Program  
since 2007**

### Launching pad for a global career

A position in the ACIAR Graduate Program, from 2011 to 2012, was a natural career step for Brendan Brown. Armed with a first-class honours degree in agricultural science and motivated by his experience as an agricultural volunteer in eastern Africa, he was ready to leap into the world of agricultural research for development.

'I have no doubt that the ACIAR Graduate Program provided me a fast-tracked pathway into research for development. It led me to work with the FAO in West Africa for a year, complete my PhD on the ACIAR-funded SIMLESA program in eastern and southern Africa, and then lead two ACIAR projects in South Asia by the age of 30.

'The Graduate Program exposed me to the full life cycle of research projects, something I was not aware of as a fresh university graduate. Working with a Research Program Manager, I was able to observe and contribute to the scoping and development stage of projects, as well as participate in the mid-term and final reviews of projects.'

As with the ACIAR fellowship programs, the ACIAR Graduate Program provides invaluable networking opportunities, enabling graduates to build their own personal and professional networks.

'I attended the annual Crawford Fund conference and met leading scientists and industry stalwarts. It was daunting but I was also aware of the great connections that events like these offered.'

Dr Brown recalls that, as a graduate, visiting project sites in Cambodia and observing the interactions between Australian and in-country scientists was an excellent lesson in the importance of cultural awareness.

'I could see the way Australian experts and Cambodian experts worked together was quite different to how Australians worked together; and I learned that it was really important as visiting scientists to understand and be sensitive to the social and professional culture of the country you were working in.'

Throughout his graduate year, as well as experiences from backpacking in Africa as an undergraduate, he observed that although science had the answers for increasing productivity and improving livelihoods, farmers in Africa and Asia were not achieving the same gains on their own land as was being achieved on research stations.

### Making good science work

This set a course for Dr Brown's PhD studies and subsequent career. For his PhD, he focused on socially inclusive agricultural development, where he looked to blend the physical and social sciences in an attempt to connect research breakthroughs with the realities of farming in the developing world. His work on the SIMLESA project, a major funding investment for ACIAR through the 2010s, was the basis for his studies. After completing his PhD, Dr Brown worked for the International Maize and Wheat Improvement Center (CIMMYT) and led several projects in which ACIAR was a major funder, including the third phase of the 'Sustainable and resilient farming systems intensification in the Eastern Gangetic Plains' (SRFSI) project.





A position in the ACIAR Graduate Program in 2011 was a career-shaping opportunity for Dr Brendan Brown (left), pictured with wheat growers on the Eastern Gangetic Plains, South Asia, where Dr Brown led the third phase of the 'Sustainable and resilient farming systems intensification in the Eastern Gangetic Plains' (SRFSI) project. Photo: ACIAR | 2014

Much of the work Dr Brown undertook in South Asia involved working with in-country partners and agencies to influence policy change. Capacity building was also required to facilitate adoption. To this end the SRFSI project established regional training centres for farmers, advisers and extension agencies. These centres operate beyond the life of the project, ensuring its legacy. These approaches recognise that good science needs to be supported by policies and facilities that have ongoing capacity to encourage and demonstrate new technologies and practices.

Dr Brown is now a Research Scientist with the Commonwealth Scientific and Industrial Research Organisation (CSIRO), based in Adelaide. His work focuses on building climate resilience for farmers in both Australia and globally. He works on projects in Australia that focus on building a better system of monitoring practice change across grain-growing regions and better articulation and management of risk in agricultural production systems, as well as continuing work with CGIAR on pathways to climate adaptation and resilience for grain growers in developing countries.

### A place in global agriculture

Dr Brown has reflected on the organisation that has been part of his working life in many ways.

'Over the past 40 years, ACIAR has achieved many things and now finds itself a renowned agency leading the charge for more productive and sustainable smallholder farming systems. As someone who has observed, participated in, led and evaluated ACIAR investments across Asia, Africa and the Middle East for more than a decade, ACIAR holds a special place in my heart. Working across other development funders such as the Bill and Melinda Gates Foundation and USAID [US Agency for International Development] has also given me a perspective of and pride in Australia's special place in the global agricultural research sphere.'



# 40 years of impact

**Over 40 years, the Australian Centre for International Agricultural Research (ACIAR) has made a significant contribution to meeting the complex challenges of growing more food, reducing poverty and improving biosecurity. Confidence in making such a claim is underpinned by a longstanding program of impact evaluation.**

From the first economic evaluations of project outputs in the early 1990s, through to a well-established program of impact assessment and outcome evaluation in the 2020s, ACIAR has always demonstrated the effectiveness of its work in terms of economic, knowledge and capacity benefits to smallholder farmers and science institutions in partner countries. A rigorous impact evaluation program also enables accountability to the Australian Government and the Australian public for the use of public funds on agricultural research for development.

Leading up to the Sunset Review of ACIAR that was scheduled to take place in 1994, as directed by the founding legislation, an external panel was appointed to undertake a 'mid-term review' of ACIAR in 1989. In its report to ACIAR, the panel provided 24 recommendations. One was 'that ACIAR initiate a process of defining the criteria on which its own success should be judged, and that studies to this end should be related to the wider implications of impact assessment in the context of international agricultural research generally.'

A series of studies was commissioned to assess the impact of research results stemming from selected ACIAR projects and a report was published in 1991, 9 years after the establishment of ACIAR. The benefits of agricultural research can take many years to be realised – improvements in productivity may be incremental, and are frequently dependent on behavioural, social and regulatory change.

While the studies were considered 'early days' in terms of measuring impact, they did provide a solid indication that benefits well in excess of research costs were starting to emerge in partner countries.

It was also anticipated that the studies would show projects that did not yield the expected economic benefits. Such cases would provide an opportunity to identify and analyse the underlying factors influencing project outcomes, providing crucially important 'lessons learned', which can be drawn upon for planning and developing new projects.

In 1998, it was decided that studies of impact assessment would be published as a publicly available series – the Impact Assessment Series. The first impact assessment report published was 'Control of Newcastle disease in village chickens', based on three projects funded between 1983 and 1996. From the outset, it was acknowledged that not all benefits would be quantifiable, as the conclusions of the assessment report highlighted.

Australia's reputation in the international scientific community has been enhanced and there has been considerable international cooperation as a result of this work. Supply of the I-2 virus seed stock to developing countries free of charge is undoubtedly appreciated by recipient countries. Through this work there are also opportunities to strengthen the role of women in poor village communities.

**ACIAR Impact Assessment No. 1, 1998**

In recent years, in line with global concerns about the impact of development assistance on such issues, it [ACIAR] has broadened its impact assessment studies to investigate the impacts of its projects on poverty and on the environment. ACIAR has been proactive in pushing for improvements in the methodology and in extending its scope. In all of this work, ACIAR can be justly proud of being a world leader.

**Independent Review of ACIAR 2013  
by Mr Bill Farmer, Prof Ron Duncan,  
Mr Terry Enright and Dr Wendy Jarvie**

The processes of assessment and evaluation of ACIAR investments have changed with time, as organisational learning and experience in impact assessment grew and new methods of evaluation developed.

Leading up to its 40th year, ACIAR commissioned both a quantitative and qualitative assessment of the impact of selected research since 1982. The 40-year milestone was an ideal opportunity to understand what ACIAR-supported research has achieved and to reflect on what has been learned from the organisation's lifetime of brokering and funding agricultural research partnerships in the Indo-Pacific region.

The study was published, in two volumes, as the 100th report in the Impact Assessment Series, 'The impact of ACIAR work in agricultural research for development 1982–2022'.



## The total benefit of projects examined in the study was estimated at A\$64.4 billion

The quantitative analysis of projects represented approximately 10% of ACIAR investment in research partnerships over 40 years.

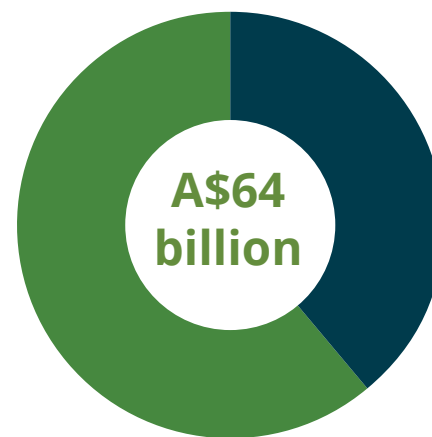
- » The total benefit of projects examined in the study was estimated at A\$64.4 billion.
- » A\$25.2 billion of benefit can be attributed to ACIAR, based on the ACIAR share of total project funding; the remainder was attributed to partner funding.
- » The benefit:cost ratio of the research in which ACIAR is a partner, on average, is 41.8:1.
- » For outcomes specifically attributed to ACIAR, the benefit:cost ratio is 43.3:1.

The qualitative analysis was based on a large cross-case analysis of past projects. Recognising that not all impacts can be crystallised in production numbers or financial returns, the study applied qualitative comparative analysis to identify the key research design, management and practice principles that have supported the effective translation of research knowledge into development outcomes.

The analyses identified 24 unique pathways towards successful project outcomes, which were grouped into five distinct clusters. Each cluster highlights the unique point of difference of ACIAR within the aid program and profiles the contribution ACIAR has made in certain areas. The clusters identified were:

- » Theory and practice of change
- » Classic agricultural research-for-development project
- » Scaling out
- » Scaling up
- » Pure or basic science.

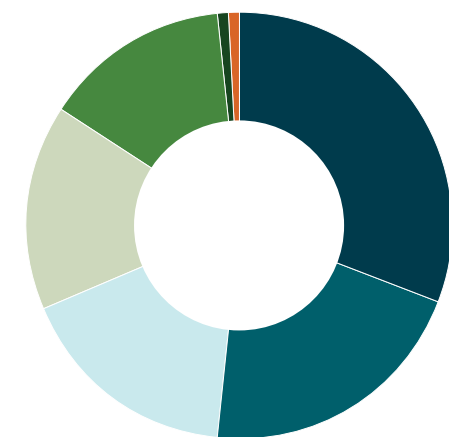
### Total benefit of ACIAR-supported projects



- Benefits attributed to ACIAR **\$25.2 billion**
- Benefits attributed to partners **\$39.2 billion**

**Projects in this study represent approximately 10% of ACIAR investment since 1982**

### Net benefit by impact pathway



- New varieties **\$19.4 billion**
- Pest and disease **\$13.1 billion**
- Capacity building **\$10.8 billion**
- Systems management **\$9.8 billion**
- Input management **\$8.8 billion**
- Post-harvest **\$0.6 billion**
- Policy **\$0.4 billion**

# 43 : 1

return on ACIAR investment

**For projects examined in this study with outcomes specifically attributed to ACIAR**

(All financial values in this section are expressed as 2022 dollars.)

*ACIAR is primed and ready to go to a new level in helping to project Australian soft power strategically across the Indo-Pacific region. ACIAR can co-design and broker partnerships in which Australian scientists play leading roles in regional and global collaborations to transform agrifood systems. Australian researchers and postgraduate students should be embedded in such collaborations, building relationships, networks and expertise.*

**Professor Andrew Campbell**

Chief Executive Officer, ACIAR (2017–2023)



# Looking forward

**The visionaries who conceived the Australian Centre for International Agricultural Research (ACIAR) and convinced the Australian Government, led by Prime Minister Fraser, to establish a specialist statutory authority within the Foreign Affairs portfolio, could see that the skills and insights of Australian researchers would be equally valuable on a wider stage, helping to solve the agricultural problems of developing countries in our region.**

This book illustrates vividly how right they were. The ACIAR legacy in facilitating science partnerships for reducing poverty and improving food security in our region is one of which all Australians can be rightly proud.

If the world is your farm, then Australia is not your best paddock! Long before anthropogenic global warming, Australia had the most variable climate of all the continents. Now its extremes are more extreme, and catastrophic climatic events are more frequent.

Geologically ancient and stable, its soils are long-weathered and generally depleted of nutrients. Less than 5% of the continent is arable. The biggest global markets are distant, and Australian farmers don't receive comparable subsidies to their counterparts in the United States, Europe, Japan and Korea.

So Australian agriculture, rural industries and farm businesses have long had to be resilient, resourceful and innovative, to adapt, survive and prosper.



## Growing and complex challenges



Professor Andrew Campbell, ACIAR Chief Executive Officer (2017–2023), reflected on how the nature and characteristics of Australian agriculture have led to Australia developing a world-leading agricultural innovation system. In this section, Professor Campbell described how the ACIAR mandate remains relevant, as the challenges facing all farmers, fishers and foresters in the Indo-Pacific region, including Australia, become more complex and interrelated.

Professor Campbell has played influential roles in sustainable agriculture and natural resource management in Australia for over 30 years, including as the first National Landcare Facilitator and Chief Executive of Land and Water Australia. He farms (from a distance) his property in western Victoria, where his family has been since the 1860s.

A world-leading agricultural innovation system has assisted Australian agriculture, rural industries and farm businesses to adapt, survive and prosper. A distinguishing feature of this system is high levels of partnership (including shared funding) between government and industry, and high levels of collaboration between scientists and farmers.

Innovative research funding and management models like the Rural Research and Development Corporations and Cooperative Research Centres have served Australian rural industries very well. The system has fostered generations of researchers accustomed to working closely with farmers, and leading Australian farmers have high levels of involvement in research in their industries, often on their own farms.

Now Australian agriculture and the horticulture, fisheries and forestry sectors face additional challenges that were less acute, or less well understood, when ACIAR was established in 1982.

These 'converging insecurities' are the challenges of food security, water security, energy security, biosecurity and health security. These all interact with each other, and all are amplified by climate change. In turn, this complex suite of interacting challenges threatens regional and national security and is catalysing increasing levels of forced human migration.

All countries of the Indo-Pacific region grapple with these same challenges.

In this challenging contemporary context, the traditional commodity focus of much agricultural research that served Australia so well in the twentieth century is no longer fit for purpose.

Australian science is having to adapt, to develop better approaches to research and innovation across industries, landscapes, regions and value chains. These generally make greater use of multi-, inter- and trans-disciplinary research methods, with even higher levels of collaboration between science and industry, and science and policy.

Australian science and innovation is a strategic national asset that will need to be deployed as never before, to help us reach our own objectives to produce more and healthier food, equitably shared, using less land, water, nutrients and energy, while reducing emissions, restoring habitats and decarbonising. This is among the greatest challenges facing humanity this century.

ACIAR is a strategically valuable soft-power asset for Australia. It is a mature, uniquely capable specialist statutory authority, well known and respected across the region. It is a distinctive asset for both Australia's diplomatic outreach and our domestic innovation system.

ACIAR is a keeper of the long view, old enough to have a long memory and durable friendships, focused enough to sustain deep expertise, and small enough to be nimble and responsive.

In part helped by ACIAR, science and policy capabilities in partner countries across our region have developed enormously over the last four decades. Most of the scientists who have received scientific, leadership and management training in Australia (650 of whom are active ACIAR alumni members) are in science and policy leadership roles across the region. This engaged network of senior scientists and policymakers across the region with positive, active and enduring links to Australia, is a wonderful platform for greater ambition in strategic partnerships between Australia and the region.



## Relevant and vital into the future

The ACIAR partnership model is even more relevant and vital today than it was in 1982.

The ACIAR mission is pertinent to 12 of the 17 United Nations Sustainable Development Goals, and increasingly important for regional and national security. This form of strategic investment from the Official Development Assistance (ODA) budget delivers for partner countries, the wider region and Australia.

The challenges faced by partner countries are in many ways analogous to those facing Australian industries and regions, but more acute, with more severe resource constraints. Australian scientists working on ACIAR projects overseas typically find it to be a career-defining experience, and they often bring new expertise back to Australian industries. There is much to be gained for the Australian agricultural innovation system in working closely with ACIAR to build the capabilities that we need here, as much as overseas.

The ACIAR 10-Year Strategy 2018–2027 set out an ambitious agenda across three partnership and investment models: bilateral, multilateral and co-investment. It consolidated research programs while initiating a new climate change program, and it sharpened the focus on gender equity across the whole portfolio and within ACIAR. It expanded and transformed the network of country and regional offices into more strategic partnership brokering. It overhauled capacity-building programs, introducing several new scholarship and fellowship opportunities including a new leadership program for women, and it substantially boosted outreach, especially online and in partner countries.

The independent mid-term review of the strategy undertaken in 2022 concluded that, notwithstanding the profound disruptions of the COVID-19 pandemic, the strategy remains fit for purpose. However, the review recommended accelerating elements of the strategy over the next five years. Notably, the expert review panel argued for more ambitious, more transformational research initiatives, and more strategic high-level partnerships with both partner countries and within the Australian Government.

Looking forward, ACIAR is primed and ready to go to a new level in helping to project Australian soft power strategically across the Indo-Pacific region. ACIAR can co-design and broker partnerships in which Australian scientists play leading roles in regional and global collaborations to transform agrifood systems. Australian researchers and postgraduate students should be embedded in such collaborations, building relationships, networks and expertise.

Australian industry partners could also be working closely alongside researchers, as they do in Australia, through complementary Farmer to Farmer (F2F) and Business to Business (B2B) programs. ACIAR-funded research partnerships can be more directly informing wider Australian Government investment – for example the Department of Foreign Affairs and Trade (DFAT) programming of development investments through the wider aid program; the Department of Agriculture, Fisheries and Forestry (DAFF) biosecurity work across the region; and Department of Climate Change, Energy, the Environment and Water (DCCEEW) partnerships around climate change and water.

The Parliamentary Joint Committee on Foreign Affairs, Defence and Trade recommended in 1992 that the ACIAR share of the Australian foreign aid budget should grow to 3.5% by 1997 (for several years leading up to 2022 it was around 2%). Given the complexity and urgency of current challenges, such an increase seems modest and sensible. It would enable more ambition and faster progress in implementing the recommendations of the independent mid-term review of the ACIAR 10-Year Strategy 2018–2027, along the lines sketched above.

Reflecting on the last 40 years of ACIAR, and in particular on my seven years as Chief Executive Officer, there have been many lessons learned and much to be celebrated (the *raison d'être* for this book). But this is no time for self-congratulation. The need for ACIAR is more acute than ever, and the ACIAR business model needs to continue to adapt, to provide a vital knowledge platform for sustainable development in our region.

We need to be planning for the next 40 years and how best to take ACIAR to new levels of impact.

Given the calibre and commitment of people working within ACIAR and our partner agencies and research institutions, in Australia and overseas, I have every confidence that this mighty little organisation can continue to make a big difference in developing solutions for the biggest problems of our time.

### ACIAR 10-year strategy

The strategic direction and priorities to implement new areas of research and refine research management were set out in the ACIAR 10-Year Strategy 2018–2027.

The strategy acknowledged that ACIAR was a trusted research broker and hands-on investor in science partnerships between Australia and developing countries in the Indo-Pacific region, and sought to strengthen and build on that established and well-regarded business model.



At the launch of the strategy in 2018, then Minister for Foreign Affairs, the Honourable Julie Bishop, said that the strategy ‘reinforces ACIAR’s crucial role in building a scientific platform for tackling some of the biggest issues facing our region. ACIAR’s work over the next 10 years will be vital to improving nutrition and supporting economic growth in many communities throughout our region.’

The strategy provided a clear direction for ACIAR into the future and closely aligned with the key objectives of the Australian Government’s aid policy and the 2030 Agenda for Sustainable Development.

In January 2022, the Commission for International Agricultural Research initiated a mid-term review of the strategy. Independently chaired by Dr Wendy Craik and supported by six external expert panel members, the review considered written submissions and conducted face-to-face consultations with ACIAR partners and stakeholders.

In June 2022, the panel submitted a report that was congratulatory of ACIAR on the development and implementation of the strategy to date, particularly in the face of the many significant changes in its operating environment since 2018. The report included 14 recommendations to enhance delivery of the strategy over its second 5-year period, to 2027.



After consideration of the recommendations, the original strategy was updated to reflect new approaches and elements for implementation. The Minister for Foreign Affairs, Senator the Honourable Penny Wong, said that the revised strategy was ‘emblematic of the Australian Government’s commitment to building a more stable, prosperous and resilient region’.







About 30% of the forested land of the Middle Hills region of Nepal has been handed over to community forest user groups. Starting in 2013, Dr Ian Nuberg of the University of Adelaide led a project (dubbed EnLiFT) that improved management of agroforestry and community forestry systems, for the benefit of livelihoods and food security. The Australian Government has invested in Nepal's forests since 1966, and continues to do so through ACIAR with the Government of Nepal inviting a second phase of the EnLiFT project. Photo: ACIAR | 2017

## Acknowledgements

This book presents a brief account of the establishment of ACIAR and a selection of stories about partnerships, projects and people over 40 years. It has not been possible to tell the stories, show the photographs or name all the people of ACIAR but their contribution to the ongoing success, impact and learning of ACIAR is acknowledged.

Many people were contacted and interviewed to collect the stories in this book. All the information gleaned from these interactions was valuable and appreciated, and in some way has informed the content of this book. Unfortunately, not every insight, anecdote or experience made the final cut. To everyone who gave time to share their experiences of ACIAR, thank you.

Some people provided significant accounts of their experience with ACIAR and others were readily available to clarify details for the finer points of stories or assist with reviewing draft content. In particular, we thank Dr Denis Blight, Dr Bob Clements, Professor Andrew Campbell, Ms Catherine Hanley, Dr Tony Fischer, Professor David Kemp, Professor Jim McWilliam, Dr Joanne Meers, Mr Stephen Midgley, Professor Gabrielle Persley, Professor George Rothschild and Dr Meryl Williams.

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### Cover photograph

An aerial view of a large galip nut (canarium) tree in East New Britain Province of Papua New Guinea. Photo: ACIAR | 2018

### Inside cover photograph

George Tonai collects harvested cocoa pods in the Central Province of the Autonomous Region of Bougainville. George participates in a cocoa-focused project, one of five projects under ACIAR-DFAT initiative, the Transformative Agriculture and Enterprise Development Program in Papua New Guinea. Photo: ACIAR | 2018

### Read about and listen to the stories of ACIAR

Additional stories of ACIAR associates have been compiled in articles and blogs, and some have been recorded as podcasts. Visit [aciar.gov.au/aci40](http://aciar.gov.au/aci40)





# Abbreviations and acronyms

<b>ABC</b>	Australian Broadcasting Corporation	<b>IBSRAM</b>	International Board for Soil Research and Management
<b>ACIAR</b>	Australian Centre for International Agricultural Research	<b>ICCON</b>	In-Country Communication Officer Network
<b>ADAA</b>	Australian Development Assistance Agency	<b>ICIMOD</b>	International Center for Integrated Mountain Development
<b>ADAB</b>	Australian Development Assistance Bureau	<b>ICRISAT</b>	International Crops Research Institute for the Semi-Arid Tropics
<b>AIDAB</b>	Australian International Development Assistance Bureau	<b>ICT</b>	information communications technology
<b>APAARI</b>	Asia-Pacific Association of Agricultural Research Institutions	<b>IDRC</b>	International Development Research Centre
<b>APSIM</b>	Agricultural Production Systems sIMulator	<b>IFPRI</b>	International Food Policy Research Institute
<b>ARA</b>	Adaptation Research Alliance	<b>IRRI</b>	International Rice Research Institute
<b>ASLP</b>	Australia-Pakistan Agriculture Sector Linkages Program	<b>IT</b>	information technology
<b>ATSE</b>	Australian Academy of Technological Sciences and Engineering	<b>IUCN</b>	International Union for Conservation of Nature
<b>AusAID</b>	Australian Agency for International Development	<b>JDE</b>	Jacobs Douwe Egberts
<b>CABI</b>	Centre for Agriculture and Bioscience International	<b>KGF</b>	Krishi Gobeshona Foundation
<b>CASI</b>	conservation agriculture and sustainable intensification	<b>LIFE</b>	Livelihood Improvement through Facilitated Extension
<b>CCRD</b>	Consultative Committee on Research for Development	<b>NSW DPI</b>	New South Wales Department of Primary Industries
<b>CD</b>	compact disc	<b>ODA</b>	Official Development Assistance
<b>CGIAR</b>	a global research partnership for a food-secure future dedicated to transforming food, land and water systems in a climate crisis; formerly the Consultative Group for International Agricultural Research	<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>CHOGM</b>	Commonwealth Heads of Government Meeting	<b>PASS-CR</b>	Pacific Agricultural Scholarship Support and Climate Resilience program
<b>CIFOR</b>	Center for International Forestry Research	<b>PNG</b>	Papua New Guinea
<b>CIMMYT</b>	International Maize and Wheat Improvement Center	<b>PSO</b>	Program Support Officer
<b>COP</b>	United Nations Conference of the Parties on Climate Change	<b>QAAFI</b>	Queensland Alliance for Agriculture and Food Innovation
<b>CSIRO</b>	Commonwealth Scientific and Industrial Research Organisation	<b>R&amp;D</b>	research and development
<b>CultiAF</b>	Cultivate Africa's Future	<b>RAID</b>	Researchers in Agriculture for International Development
<b>DCCEEW</b>	Department of Climate Change, Energy, the Environment and Water	<b>SDIP</b>	Sustainable Development Investment Portfolio
<b>DAFF</b>	Department of Agriculture, Fisheries and Forestry	<b>SIMLESA</b>	'Sustainable intensification of maize-legume cropping systems for food security in eastern and southern Africa' project
<b>DFAT</b>	Australian Government Department of Foreign Affairs and Trade	<b>SPC</b>	The Pacific Community
<b>DOST-PCAARRD</b>	Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development of the Department of Science and Technology	<b>SRFSI</b>	'Sustainable and resilient farming systems intensification in the Eastern Gangetic Plains' project
<b>DOST-PCASTRD</b>	Department of Science and Technology – Philippine Council for Advanced Science and Technology Research and Development	<b>TADEP</b>	Transformative Agriculture and Enterprise Development Program
<b>FACASI</b>	'Farm mechanization and conservation agriculture for sustainable intensification' project	<b>UPLB-BIOTECH</b>	National Institute of Molecular Biology and Biotechnology of the University of the Philippines Los Baños
<b>FAO</b>	Food and Agriculture Organization of the United Nations	<b>USAID</b>	US Agency for International Development
<b>GFAR</b>	Global Forum on Agricultural Research and Innovation	<b>WCAG</b>	Web Content Accessibility Guidelines
<b>GIS</b>	geographic information system	<b>WorldVeg</b>	World Vegetable Center
<b>GRA</b>	Global Research Alliance on Agricultural Greenhouse Gases		

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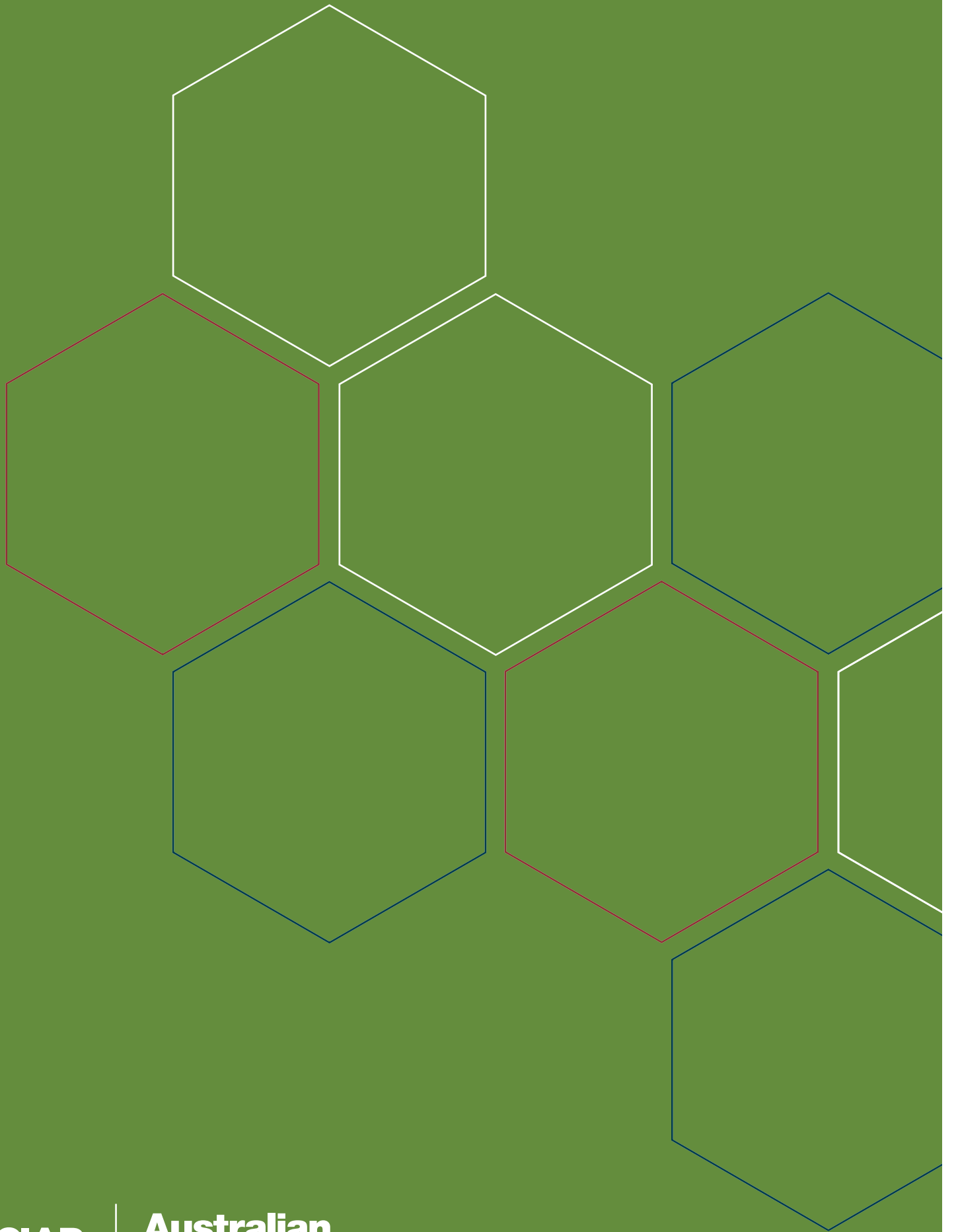
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