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PARTNERSHIPS  
EDITION

# partners

IN RESEARCH FOR DEVELOPMENT



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## About Partners

*Partners in Research for Development* is the quarterly publication of the Australian Centre for International Agricultural Research (ACIAR). *Partners* presents articles that summarise results from ACIAR-brokered research projects and puts ACIAR research initiatives into perspective.

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**Front cover:** Foraging and farming galip nuts is the focus of an emerging industry in Papua New Guinea (page 20). Photo: Conor Ashleigh

**Back cover:** Food loss research is focusing on getting more fresh produce from farmers to consumers. Photo: ACIAR





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## From the CEO

Andrew Campbell

### Partnerships are central to the ACIAR model of research for development.

The beauty of a good partnership is the compounding value it creates. The longer it evolves, the more valuable it becomes as the level of trust and the level of knowledge grow about each other and our common goals.

Broadly speaking, ACIAR has three partnership models: bilateral, multilateral and co-investment with development partners.

The largest share of our research investment is allocated to bilateral partnerships, working directly with relevant government agencies and research organisations in around 30 partner countries across the Indo-Pacific region. The value of this work has proven itself over 40 years as evidenced by our impact assessment studies.

The relationships that form through collaborative work between individual researchers, research organisations and within scientific disciplines are important strands in the fabric of long-term trust that develops between nations. Science partnerships are a crucial aspect of Australian 'soft diplomacy', especially in the Indo-Pacific region. These partnerships are about neighbours working together on shared challenges.

Over 40 years, ACIAR has led collaborative approaches to finding solutions for the big challenges of improving food security, reducing poverty, improving land and water

ACIAR CEO Professor Andrew Campbell with Minister for Foreign Affairs Senator the Hon Penny Wong during a visit to ACIAR House in Canberra. Photo: ACIAR



management, managing biosecurity risks, empowering women and girls, and adapting to and mitigating climate change. The lessons we have learned, our experience and our expertise are strategic assets for Australia. The direct benefits of this work for partner countries have been estimated to be worth at least A\$60 billion.

Multilateral collaborations involving many countries complement our bilateral work. ACIAR manages Australia's investment in the CGIAR, the world's largest agricultural innovation network. We also provide core funding to the Pacific Community (SPC) and the Asia-Pacific Association of Agricultural Research Institutions (APAARI) to support their crucial work within their respective regions.

Our third partnership model is focused on scaling out research findings. Our partners in this effort include our portfolio 'big sister', the Department of Foreign Affairs and Trade (DFAT), the Canadian International Development Research Centre (IDRC) and the Syngenta Foundation for Sustainable Agriculture. We are also looking to expand our work with private sector partners, such as the Australian company SunRice, which is investing in rice projects in Vietnam.

These three partnership models are essential to the ACIAR 10-Year Strategy 2018-2027, both for research and the complementary objective of capacity building. Our portfolio works to boost the science and policy capabilities of partner countries.

During the 2 years of COVID-19 travel restrictions, many in-country partners stepped up into leadership roles to maintain momentum in ACIAR-funded research. The result was a valuable expansion of local capacity, and we are keen to maintain and build on this momentum.

Over time, as the capabilities of partner countries evolve, so do our partnerships, from co-design to co-investment and common evaluation frameworks, with a shared objective for continuous improvement in research systems and processes, for durable impact.

This edition of *Partners* contains some wonderful examples of ACIAR partnerships in action. 🌱

**Professor Andrew Campbell**  
Chief Executive Officer, ACIAR



# A new pathway to global food security

Understanding and improving opportunities for women in agriculture is critical to the CGIAR vision of research to transform livelihoods. Photo: Conor Ashleigh

**International food systems research is being revolutionised through the One CGIAR initiative to drive genetic innovation, system transformation and resilient agrifood systems globally.**

For more than half a century, CGIAR has been instrumental in the fight against global hunger. Formed in 1971, its original focus was to reduce poverty and increase food security. The research it delivered to develop high-yielding rice and wheat varieties launched the Green Revolution, changing the way the world ate and saving more than a billion people from starvation.

Fast-forward 50 years, and the world is facing another stark challenge, this time driven by the worsening impacts of climate change, COVID-19 and supply chain disruptions from conflict. Simply put, the world needs 60% more food by 2050. How do we grow more food, with fewer inputs, while also reducing emissions?

Global food systems will need to be transformed, and so too the research and innovation systems underpinning food production, to ensure an inclusive and holistic approach.

Since 2019, CGIAR has been on a mission to restructure its network of international research centres, through

## Key points

- 1 The CGIAR agricultural innovation network is reforming its operations to better meet current and emerging challenges.
- 2 The reforms take a systems-based approach so that the way that we produce, transport, trade and consume food mitigates the risk of global hunger and supports low-income producers and consumers while reducing negative impacts on the environment.
- 3 Australia, through ACIAR, is playing a constructive role in these reforms and governance of CGIAR.



Climate change and access to water are cross-cutting issues for food production that will benefit from a united research focus under the One CGIAR research portfolio. Photo: Conor Ashleigh

the One CGIAR initiative, moving from a loose network of essentially independent centres, to a more integrated organisation under unified governance.

### Australia and the move to One CGIAR

CGIAR was originally established as a partnership centred on 15 international research centres dedicated to different production systems – crops, livestock and fisheries – and the natural resources they depend on.

The Australian Government has provided funding for CGIAR since it began in 1971 and since 1982 that funding has been delivered through ACIAR. Australians have a long history of contributing to the leadership of CGIAR in a wide range of roles, including as director-generals, board directors and board chairs of many individual centres. ACIAR CEO Professor Andrew Campbell currently represents Australia on the CGIAR System Council.

ACIAR has been a strong advocate for the CGIAR reforms. Professor Campbell said the CGIAR System Council initiated the One CGIAR reforms with the goal of renewing and galvanising efforts to reduce world poverty and hunger in ways that improve ecosystem resilience and gender equity.

The aim, he said, is to better approach research in a more systems-focused way, rather than the traditional commodity-based or location-based approach. Big cross-cutting issues such as climate, nutrition, water and gender equity are fundamental challenges that he said were inefficient, duplicative and ineffective to address through commodity-based research models.

'We wanted a more joined-up way of working,' said Professor Campbell. 'The focus of the reforms is to shift the way partners in the network interact and share key resources and capabilities to tackle these big cross-cutting issues more cohesively and hopefully, more effectively.'

Heading CGIAR is Dr Claudia Sadoff, the newly appointed executive managing director.

'A holistic and inclusive approach to innovation will be a vital enabler of food systems transformation,' said Dr Sadoff. This means improving collaboration, involving vulnerable groups, creating partnerships and ecosystems, and making best use of data, as well as incorporating new and traditional knowledge and technologies.'

### New research portfolio

In 2021, CGIAR released its 2030 Research and Innovation Strategy.

This has involved restructuring research activities with all of its partners into three overarching action areas: genetic innovation, systems transformation and resilient agrifood systems.

All the resulting research initiatives must also deliver benefits in five areas: climate adaptation and mitigation; environmental health and biodiversity; gender equality, youth and social inclusion; nutrition, health and food security; and poverty reduction, livelihoods and jobs.

Dr Sadoff underscores the need for new ways of thinking and operating to respond effectively to the escalating food systems crisis.

'This is the moment to accelerate food system transformation. But to do these things you do need very different partnership styles to the ones we had in the past. There is no way that we can transform food systems if we operate alone,' said Dr Sadoff.



Shared research capabilities is an important outcome of the One CGIAR reforms. Photo: ACIAR



Combined approaches, such as growing rice in conjunction with fish farming in South-East Asia, will be needed to meet complex food security challenges. Photo: ACIAR

'We are very grateful to steadfast partners like Australia who have been instrumental in driving a new CGIAR agenda fit to tackle today's more complex challenges.'

With global food security deteriorating under the weight of disrupted supply chains and more expensive fuel and fertiliser, there is an urgent need to roll out these actions and it can only be done through global partnerships.

Those partnerships will be further consolidated when the CGIAR System Council next meets. For the first time, that meeting will take place in Australia, hosted by ACIAR in November 2022.

Parallel meetings of the Commission for International Agricultural Research (the Commission) and the Policy Advisory Council, which both advise Australia's foreign minister on food security issues, will also be hosted in Brisbane.

With so many international leaders in food and agriculture research and policy in one place, against a backdrop of a worsening global food security crisis, it will be an invaluable opportunity to explore short-term, medium-term and longer-term responses to improving food security. The Commission will be hosting a parallel dialogue series on food security and food systems transformation in the Indo-Pacific region, with a focus on the role for science. 🌱

**MORE INFORMATION:** CGIAR [cgiar.org](https://cgiar.org), TropAg Conference [tropagconference.org](https://tropagconference.org)

## Australia's commitment

Partnerships are key to how ACIAR delivers on its commitment to international agricultural research.

Professor Andrew Campbell, ACIAR CEO, said Australia plays an important role in the global agricultural innovation system, as an advanced economy with a significant agriculture sector extending from the wet tropics to the arid zone, long experienced with high levels of climate variability.

'CGIAR is the largest partner for ACIAR. CGIAR and ACIAR work together in many ways, including: core funding of CGIAR to ensure important CGIAR infrastructure and functions such as global gene banks are maintained; funding of the CGIAR research portfolio (designated funding) in ways that align with the Australian Official Development Assistance agenda; and project funding, where CGIAR is an implementing partner,' said Professor Campbell.

In 2021–22, ACIAR provided A\$20.4 million in core and designated funding to CGIAR to support the delivery of the new research portfolio.



# Edible insects collaboration: a hub for knowledge sharing

ACIAR is partnering with AgriFutures Australia and the International Centre for Insect Physiology and Ecology (*icipe*) to create a new centre for knowledge on insect production for livestock feed and other uses.

ACIAR-funded research from Africa has helped form the basis of a new research hub launched in Australia to share knowledge about and discuss emerging insect technology with industries using insects as human food, animal feed, fertiliser and other products such as oil.

The Emerging Insect Technology Hub (EIT-Hub) marks the first ACIAR partnership with AgriFutures Australia, one of Australia's statutory Research and Development Corporations (RDCs). Also partnering to found the hub is the Centre for Insect Physiology and Ecology (*icipe*), which is based in Nairobi, Kenya, and is a global leader in insect science.

The partnership between *icipe*, ACIAR and AgriFutures is enabling collaboration among research and industry partners, scientists and investors in Africa and Australia.

Dr Segenet Kelemu, director-general and CEO of *icipe*, is excited by the possibilities rearing insects can bring for Africa, and now Australia and the rest of the world, including the benefits to the environment.

Dr Kelemu said insects are catching global attention for their potential in the transition to a greener environment and to a circular economy.

'You can rear insects rapidly on biological waste – their conversion rate is much higher than any other animals,' said Dr Kelemu. 'Their environmental footprint is also much smaller – for one thing, you can rear insects with little or no water.'

'This makes them a more environmentally friendly alternative to other proteins used in animal and aquafeeds, such as soybeans or fishmeal.'

They are also a potential source of high-value products such as oils, chitin and chitosan, frass fertiliser,

antimicrobial products, enzymes and biodiesels. These products have diverse uses in the energy, industrial, pharmaceutical, cosmetics, food and crop protection sectors.

## The first steps

The Australia-based EIT-Hub was announced earlier this year, with a steering committee including representatives from Africa and Australia to be formed. Mr Duncan Rowland from the Insect Protein Association of Australia will chair the steering committee.

Dr Anna Okello, ACIAR research program manager, Livestock Systems, said ACIAR-funded research projects in eastern Africa led by *icipe* since 2014 have provided a foundation of information that the EIT-Hub will build on. The partnership with AgriFutures provides a new avenue for bringing knowledge gained from ACIAR-supported work internationally back to Australia, and the Indo-Pacific regions that ACIAR supports.

'We are able to see what this type of research can contribute to the global insect technology space, and how investments ACIAR makes offshore through the aid program can complement investments that our RDCs make here and move that industry forward.'

**Insects are catching global attention for their potential in the transition to a greener environment and to a circular economy.**

## Key points

- 1 Using insects as a protein source for livestock diets is a promising emerging industry worldwide.
- 2 A new knowledge hub is bringing together researchers from Africa and Australia.
- 3 The first proposed project is the production of a manual for producing and processing black soldier fly.





Black soldier fly larvae for animal feed will be the focus of a new research partnership with AgriFutures, ACIAR and *icipe*. Photo: ACIAR

Dr Okello said the contexts and uses of insect-based products are very different in Africa and Australia, but the hub focuses on the public good aspect of emerging insect technologies. These include quality assurance, legislation, knowledge exchange and research. These areas of common interest will be the focus of the EIT-Hub to support the growth of this new sector in Australia and elsewhere.

## An emerging industry

The first proposed project for the EIT-Hub is a 'gold standard manual for black soldier fly production, processing and use'. This will put the research already carried out on black soldier flies into a more accessible format and enable stakeholders to discuss issues across the globe.

AgriFutures Australia senior manager, Emerging Industries, Dr Olivia Reynolds believes this first project is a good representation of the overarching purpose of the EIT-Hub, and AgriFutures' involvement.

'There's a lot of learnings on black soldier flies that could come together into an instruction manual that would help industry to refine processes and develop technologies. That speaks to our fundamental reason for existing: knowledge sharing and a collaborative approach to scientific endeavours,' said Dr Reynolds.

Black soldier flies feed on organic waste and can be harvested within two weeks to be used as a highly

Australia will benefit from *icipe* projects in Africa, which have involved entrepreneur Talash Huijbers, who produces and packages dry black soldier fly larvae. Photo: ACIAR



nutritious animal feed. They have a short life cycle, which means they reproduce quickly and have the added benefit of producing insect frass (excrement) that can be used as a fertiliser.

The research in eastern Africa with *icipe* has shown that rearing insects, such as black soldier flies, for animal feed provides a high-protein feed for animals including fish, pigs and poultry. Emerging insect industries such as this have also been a point of interest for AgriFutures Australia.

'Insects are an area where AgriFutures currently invests within the Emerging Industries Program because we've identified insects as an industry with high growth potential in Australia,' said Dr Reynolds.

'The EIT-Hub is a mechanism through which we can bring the industry together like ACIAR and *icipe* to exchange knowledge and ideas and to aid the growth and development of the industry.

'And because there is a lot of common ground surrounding insects, we thought this is much bigger than Australia. And there was a clear opportunity to connect with Africa, so that is our starting point. But our goal for the EIT-Hub is to expand further across the globe.' 🌍

**MORE INFORMATION:** *icipe* [icipe.org](http://icipe.org),  
AgriFutures Australia [agrifutures.com.au](http://agrifutures.com.au)



# Shared priorities scale up outcomes

## Australia's investment in research for agricultural development in low-income and lower-middle-income countries is amplified by the strong working relationship between ACIAR and the Australian Department of Foreign Affairs and Trade (DFAT).

Although different in mandate and size, ACIAR and DFAT often work together towards common goals.

Both DFAT and ACIAR sit within the Foreign Affairs and Trade portfolio, with a long history of partnership and cooperation, building on each other's strengths to deliver greater benefits to smallholder farmers in partner countries.

Australia's Official Development Assistance (ODA) budget of around \$4 billion is largely managed by DFAT, across a wide range of activities and countries in the Indo-Pacific region, South Asia and Africa regions. The ODA portfolio has the broad objective of improving lives, strengthening economies and managing the effects of poverty and inequality.

### Key points

- 1 Collaboration between ACIAR and DFAT plays to the strengths of both agencies, delivering substantial impacts from research findings to the rural populations in low-income and lower-middle-income countries.
- 2 Research and development across the Indo-Pacific region, South Asia and Africa can inform agriculture, fisheries and forestry initiatives to protect livelihoods and natural resources as well as developing new industry opportunities.

ACIAR receives a smaller portion of the annual ODA budget (approximately \$100 million) to fulfil its mandate to develop sustainable agricultural systems and increase food production through agricultural research.

Within DFAT, Ms Robyn Mudie has held senior roles that have allowed her to create close working relationships with ACIAR, notably her recent position as Australia's ambassador to Vietnam. She is currently the first assistant secretary leading DFAT's Office of Southeast Asia Regional and Mainland Division.

'DFAT's relationship with ACIAR has been one of close partnership and mutual benefits,' said Ms Mudie. While DFAT works towards a bigger picture to support the development, prosperity and peace of the region, ACIAR illustrates the value and outcomes that come from the broader foreign policy relationships with Australia.

'ACIAR allows us to walk the talk in terms of what we're providing to a country like Vietnam,' Ms Mudie said. 'It has given us extremely strong ties into the agricultural and scientific communities, which gives great depth to the way we can engage with partner countries.'

'ACIAR has given us really strong insights into the needs of these countries and allowed us to develop programs in cooperation with Asia that are extremely effective.'

Ms Mudie said successful collaborations with ACIAR provided DFAT with evidence-based content for contributions to international forums, such as the United Nations Food System Summit and UN Climate Change Conference (COP).

'We have examples of what can be applied elsewhere, and what can be achieved after scaling up projects within individual countries, or more broadly across the region. It gives us great credibility when we share lessons learned with others.'

### Staple food crops

One of the most successful ACIAR-DFAT co-investments is the Seeds of Life program in Timor-Leste. Seeds of Life comprised 3 projects over 16 years and began in 2000 with a small ACIAR-funded project to reintroduce germplasm of staple food varieties (rice, maize, peanuts, sweetpotato and cassava) to Timor-Leste after disruptions to village farming during the country's journey to independence.



The Seeds of Life team have created a long-term legacy through relationships and capacity building in Timor-Leste. Photo: ACIAR

The promise of improved yields for those varieties led to a second ACIAR-funded project to prove the acceptability and benefits of new or improved varieties with several thousand farmers.

Dr Harry Nesbitt was the ACIAR-funded Seeds of Life project coordinator for many years (now an Adjunct Professor at the University of Western Australia). He said DFAT could see the benefits of the early ACIAR proof-of-concept trial.

Through AusAID (now incorporated into DFAT), ACIAR greatly expanded the number of activities the project could undertake and helped to develop supporting mechanisms to sustain benefits in the longer term.

At the end of the program in 2016, 19 improved varieties had been released and an estimated 65,000 farming households had access to improved seed and planting material. Certified seed infrastructure was established with over 1,200 community seed production groups, 65 community seed houses and 3 seed laboratories. Almost half the households in surveyed districts were using improved varieties for food production at scale.

'The impact is both economic and social,' said Dr Nesbitt. 'Farmers have benefited from the research program and researchers have progressed their capabilities. And as long as you have trained personnel who have the capacity to continue to do the research and seek modification if required, then you have a long-term legacy.'

ACIAR and DFAT continue to identify opportunities for this type of collaboration to maximise the benefits of Australia's ODA investments.

A more recent co-funded project is the Sustainable Development Investment Portfolio (SDIP), which aimed to improve food, energy and water security for sustainable food systems in India, Bangladesh and Nepal. It was part of DFAT's wider regional portfolio in South Asia that focuses on integrated food, energy and water management.

SDIP specifically 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. Strategies to increase food security were considered in conjunction with environmental impacts along with national and regional government policies.

### Co-funding fish ladders

DFAT also co-invests with ACIAR to scale-out findings from long-term ACIAR-funded research.

In Laos, ACIAR has been supporting research for more than a decade 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 can otherwise block freshwater fish from travelling upstream to breeding grounds.



The design of fish passages in Laos is part of ACIAR-funded research being scaled up in collaboration with DFAT. Photo: ACIAR

The research has been led by Australian researchers at Charles Sturt University (CSU) who developed fish passages to improve river connectivity in the Murray-Darling Basin. In their Laos project, the CSU researchers have also identified priority species and locations for fish ladders to achieve the most effective results for healthy fish populations.

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

‘It will allow us to scale up the technical innovation and the supportive governance needed across the broader Mekong Delta,’ said Professor Ann Fleming, ACIAR research program manager, Fisheries. 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, she added.

### Capacity building

Building scientific and policy capacity in partner countries is a shared objective for ACIAR and DFAT, recognising education as essential to prosperity, resilience and stability at all levels.

DFAT administers the Australia Awards offering scholarships for tertiary education awarded to participants from partner countries as part of the ODA program. The Australia Awards provide funding for the ACIAR John Allwright Fellowships, part of the ACIAR Capacity Building Program.

These fellowships support scientists from partner countries currently or recently involved in ACIAR-funded research projects to obtain postgraduate qualifications – either a master degree or a PhD – at an Australian tertiary institution. While individual scientists benefit from the scheme, the primary aim is to build research capacity among ACIAR partner countries.

Dr Wahida Maghraby, who was awarded a John Allwright Fellowship in 2009, typifies the significant advancement and contributions scholarship recipients make. Six months after obtaining her PhD from the University of Adelaide through the fellowship, she was selected as an agriculture attaché to represent Indonesia’s Ministry of Agriculture in Europe. Dr Maghraby took up the position, moving to Brussels for 4 years between 2017 and 2020.

She credits her success to the John Allwright Fellowship. ‘Experience from the fellowship increased my confidence in engaging with stakeholders in Europe and in particular managing access to Indonesian agricultural commodities and working with different sectors to mitigate barriers that may limit market access,’ said Dr Maghraby.

### Shared resources

DFAT engages with and provides office space for the ACIAR Country Network within embassies and posts overseas. This allows ACIAR and DFAT staff to work closely together at post, which has mutual benefits for in-country partnerships and networks.

The 2 organisations also share the expertise of staff. This is particularly the case in emerging areas of policy development and research such as ‘One Health’

Sweetpotato has been the focus of one of 5 projects as part of the Transformative Agriculture and Enterprise Development Program (TADEP) in Papua New Guinea co-funded by ACIAR and DFAT. Photo: Conor Ashleigh





Assessing the local and regional environmental impacts of more intense agricultural production in Bangladesh, India and Nepal is part of SDIP, a joint ACIAR–DFAT initiative. Photo: Conor Ashleigh

initiatives focused on the interconnected health of people, animals and the environment, and also on nutrition-sensitive agriculture.

Ms Jessica Raneri joined ACIAR part-time in 2020 as a senior nutrition-sensitive agriculture adviser helping to incorporate nutritional considerations into the programs ACIAR manages as an essential component of food security. She has a similar part-time role with DFAT with a more outward-focused investment monitoring and policy development role. Ms Raneri said there is a shared recognition of the gap between growing enough food and healthy diets. Working with both organisations helps to facilitate conversions and policy and project development.

## Responsive research

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 allowed the 2 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 5 projects into a single program helped to provide operational efficiencies and shared benefits across the projects.

Dr Daniel Walker, ACIAR chief scientist, said DFAT support can prove crucial in helping ACIAR respond to changing priorities and new opportunities in partner countries such as the emerging agricultural industries in Papua New Guinea. It can also help resolve issues identified in longer-term collaborations.

Additional DFAT funding also allowed ACIAR to quickly introduce several short-term projects in Nepal when government changes there inadvertently introduced barriers to agricultural development in the country. This was part of the larger SDIP initiative in South Asia.

Dr Walker said many benefits also accrue for Australia from the partnership with DFAT. These include ‘public good’ outcomes such as supporting improved livelihoods in neighbouring countries and promoting regional stability.

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.

‘Our researchers also learn from their involvement in international projects and bring that knowledge back home to support industry in Australia,’ said Dr Walker. 



# Demand-led breeding puts farmers in the driving seat

An alliance between 2 of Australia's key players in international agricultural development, and a foundation backed by a global agtech company demonstrates the increased impact of specialist organisations joining forces.

The 5-year extension of the Alliance for Agricultural Research and Development for Food Security (the Alliance) at the end of 2020 is a testament to its success in amplifying the impacts of its research collaborations and knowledge sharing.

The Alliance is an Australia-international collaboration between ACIAR, the Syngenta Foundation for Sustainable Agriculture (SFSA), which is a non-profit organisation established by the international agricultural company Syngenta, and The Crawford Fund.

The Alliance has proven to be an effective way to align effort and purpose, and tackle the challenges posed by food insecurity.

Organisations in the Alliance bring together unique skills and capabilities, diverse approaches and geographic footprints to take advantage of the opportunities created by such a collaboration.

By joining forces, the 3 partners are able to achieve their own goals, while also broadening their impact and sharing their knowledge.

'Together we can co-create innovation and research and development that addresses difficult food security challenges and ensures the emerging solutions reach farmers,' said Dr Vivienne Anthony, SFSA senior science adviser.

ACIAR has expertise in the generation of knowledge and innovation. This is complemented by the SFSA expertise in technology distribution and application, and The Crawford Fund's capabilities in training and capacity building.

The Alliance is proving to be a sound mechanism through which we can increase contacts with key staff on the ground and engage them in train-the-trainer type activities,' said Dr Colin Chartres, CEO of The Crawford Fund.

'It also provides a forum in which we can discuss emerging agricultural issues and innovations and thus strategically target future training programs.'

## Demand-led plant breeding

Since its inception in 2013, the Alliance's main activity has been its demand-led plant breeding program rolled out in locations across Sub-Saharan Africa.

Dr Eric Huttner, ACIAR research program manager for crops, manages the demand-led breeding program, which is now in its second phase. He explained that there is strong evidence that plant breeding for genetic gain is an effective way to improve food security and reduce poverty.

The program has proven to be an extremely worthwhile endeavour for the Alliance as it has helped to develop new breeds of crops, including tomatoes and beans.

Dr Huttner said another significant success had been getting plant breeders to more carefully consider the needs of the end user – the farmer and consumer – when setting out to develop a new crop variety.

'The key in the demand-led story is the transition in the minds of breeders from a research to a product development mindset,' said Dr Huttner.

'The project has trained and influenced hundreds of young plant breeders who will go on to operate for the next 20 years.'

## Focus on consumers

The project trains plant breeders to develop a product profile, which is essentially a description of what a farmer wants. This includes considerations such as yield, disease resistance and resilience to extreme conditions, as well as the look and taste of the end product.

Local farmer hubs already established by the SFSA have provided a way for the demand-led breeding program to engage with farmers to collect the information used to develop product profiles. Further down the line, these farmer hubs can be used to share information and technology with farmers.

**The project has trained and influenced hundreds of young plant breeders who will go on to operate for the next 20 years**



Plant breeders Dr Claire Mukankusi and Dr Reuben Otsyula are part of the demand-led breeding program in Africa, supported by ACIAR through its membership of the Alliance. Photo: Pan-Africa Bean Research Alliance

This completes what Dr Huttner identifies as 2 crucial steps: 'The critical first step is to get a good product that someone wants. The second is a market-based system to deliver it,' said Dr Huttner.

ACIAR recently supported research in Bangladesh to better understand how the farmer hubs deliver added value in this way.

'This synergy of skills, knowledge and engagement with farmers through SFSA farmer hubs means we can achieve more than each of our organisations independently,' said Dr Anthony.

## Sharing resources

Meanwhile, the demand-led breeding program demonstrates ongoing benefits. The program has published a reference book, *The business of plant breeding: market-led approaches to plant variety design in Africa*, and online materials for universities.

The Crawford Fund has used key learnings from the work by the Alliance in recent master classes on the sustainable intensification of agriculture, held in South Asia and South-East Asia.


## Key points

- 1 The Alliance for Agricultural Research and Development for Food Security aligns effort and purpose to improve food security.
- 2 Demand-led breeding allows farmers' needs to guide crop development.
- 3 The Alliance provides a strategy forum for emerging agricultural issues and innovations.

## Future of the Alliance

Dr Julianne Biddle, ACIAR director of multilateral engagement, said the extension of the Alliance for a further 5 years recognised that the strong relationships forged will continue to reap benefits.

'What is coming out of the work is a deeper connection and trust with other players in this space,' said Dr Biddle.

The Alliance partners will continue to work to grow its portfolio of new activities beyond demand-led breeding, with the next planned collaboration to be on soil health. 

**ACIAR PROJECT:** 'Demand-led plant variety design for emerging markets in Africa' (FSC/2013/019)



In Cambodia, forage and food grow alongside forests, which are also an important source of wild foods. The new One Health program will investigate how the management of one affects the other. Photo: ACIAR

# Program probes environment, human health links

**Local projects that demonstrate solutions to larger issues are the focus of research co-funded through a partnership between Canada's International Development Research Centre (IDRC) and ACIAR.**

In the 1980s, only about 7% of Cambodian farmers used pesticides. Twenty years later, that had jumped to 67%. Although more recent data is not available, pesticides and chemical fertilisers are now used widely across the country.

Despite this, only a few studies have researched what effects these chemicals have on humans, animals and the environment in Cambodia. Research to better understand these impacts will be funded as part of a longstanding research collaboration between ACIAR and IDRC.

The Cambodian research is part of a new One Health program that ACIAR and IDRC have initiated in South-East Asia. Collaborations between the two international partners have taken a broader systems approach.

The One Health program will form a portfolio of interconnected projects across South-East Asia to promote approaches that provide combined benefits for people, animals and the environment. The first phase will have a combined initial investment of A\$4.3 million.

## Whole-of-system health

Explaining the focus of One Health, Dr Anna Okello, ACIAR research program manager, Livestock Systems, said it recognises that the health of humans, animals and the broader environment in which we all coexist are inherently linked.

'From a public health perspective, the approach acknowledges that you are never going to see optimal health in the global human population if, for example, agrifoods systems are broken. Or if our environment is polluted. Or if our veterinary systems and services are





not adequately resourced to ensure the health and safety of products that come from animals,' said Dr Okello.

The research proposal on 'The role of agricultural and forest landscapes on human and environmental health in Cambodia' is expected to be one of the first to proceed under the One Health program. It will be run by Cambodia's Royal University of Agriculture (RUA) and will consider how forest foods and forest conservation affect the nutritional status and health of local people, particularly children.

Dr Kimchhin Sok, dean of the Faculty of Agricultural Economics and Rural Development at RUA, will lead investigations into the links between forests and agriculture. He said that understanding the way forests are used may also help establish agrichemical use standards.

'Forests and wild foods have been part and parcel of smallholder production systems in Cambodia for millennia. The research strives to see whether communities with easy access to forests enjoy healthier diets, which, in turn, might be reflected in the growth and development of young Cambodians, and improve forest conservation,' said Dr Sok.

'Establishing a correlation between forests, clean foods and child development may help establish more stringent standards on agrichemical usage and clean agriculture.'

The One Health program will also benefit researchers and research students at RUA, helping them to get involved and more deeply understand this topic, noted Dr Sok.

Dr Victor Mbao, IDRC senior program specialist engaged in One Health programming with ACIAR, said the program goes beyond stimulating basic research. 'It asks research partners to go a step further and demonstrate how the concepts apply to real-world problems,' said Dr Mbao.

Other collaborations underway with the IDRC include another recently launched initiative, the Food Loss Research Program, and the long-running Cultivate Africa's Future Fund (CultiAF).

## Key points

- 1 A new One Health program is investigating local solutions to improve the health of people, animals and the environment.
- 2 It is part of a systems-wide approach that underpins ACIAR and IDRC co-funded collaborations.
- 3 New partnership projects investing in local solutions for food loss and future food systems build on the successful CultiAF program in Africa.

## Shared purpose

Dr Okello said the relationship with IDRC was very important to ACIAR. Working together has allowed the research commissioned to focus on broad-scale issues, with targeted projects that take account of local conditions and cultural factors.

In addition, the local projects also demonstrate approaches and solutions that could be adapted to help overcome what are often common issues.

In a similar way that ACIAR sits within the Australian Government's Foreign Affairs and Trade portfolio, IDRC is part of Canada's foreign affairs and development efforts. Both champion and fund research and innovation within and alongside developing regions to drive global change.

They engage with partner countries to broker scientific expertise they need and build in-country capacity that supports ongoing development.

'We both have a mandate for research for development. So, in that way, we think quite similarly and that sets a great foundation for co-funding research,' said Dr Okello.

Mr Santiago Alba-Corral, IDRC director of the Climate-Resilient Food Systems program, said collaborating with a network of partners in focus countries and areas is crucial to achieving long-lasting impact.

'Engaging with in-country partners is also important for success and ACIAR and IDRC focus on doing just that, giving responsibility to the field,' said Mr Alba-Corral.

Dr Kevin Tiessen, IDRC program leader, Animal Health, said IDRC values ACIAR greatly and that its exclusive focus on agriculture allowed ACIAR to enhance the partnership with the IDRC.

'ACIAR is also embedded in South-East Asia with incredibly strong networks. This enables the research projects we support together to have greater impact than if we were working independently,' said Dr Tiessen.

The One Health program is being driven by strong leadership from partner countries across the global south. It will help to empower local leaders and develop opportunities for cross-country collaboration. Through the IDRC partnership, it is also creating new ways for ACIAR to work.

## African partnership

CultiAF was the first formal co-funded collaboration that ACIAR had with IDRC, with an investment of A\$37 million between 2013 and 2023.

The overarching objectives of CultiAF are to improve food and nutrition security across Eastern and Southern Africa, with an emphasis on helping more women to use new technologies, and get involved in product development and business.



Getting more of the crop harvested, such as these green vegetables grown in Zambia, into the hands of consumers will be the focus of new food loss research, part of the ongoing partnership between IDRC and ACIAR. Photo: ACIAR

CultiAF has successfully led to 19 innovations in African food systems. These include soil moisture monitoring for irrigation, solar tents for fish drying and increased production of bean varieties suited to higher-value pre-cooked consumer products.

## Targeting food loss

ACIAR and IDRC have recently launched the Food Loss Research Program with projects in the Pacific region, South-East Asia and Africa.

While global estimates suggest that 30% of food is lost in the supply chain, this can be as high as 80% in developing countries.

One of the first projects as part of this program will investigate ways to prevent losses in horticultural produce value chains in the Pacific region. The Scientific Research Organisation of Samoa will lead this research.

Project leader Dr Seesei Molimau-Samasoni, manager for the Plants and Postharvest Technologies Division in the Scientific Research Organisation of Samoa, said that getting the fresh food system operating efficiently is critically important to address non-communicable diseases in the region.

Previous research has estimated that smallholder farmers in the Pacific region can experience food losses of 5% to 20% of their total production.

'Lost productivity also disincentivises farmers from participating in commercial value chains, has adverse

gender impacts in terms of women market vendor economic loss, and increases the region's reliance on imported produce,' said Dr Molimau-Samasoni.

'Food loss means income loss for farmers, and nutrition loss for consumers.'

As such, addressing food loss in the region could improve monetary returns for farmers, as well as food availability and affordability for consumers.

Ms Irene Kernot, ACIAR research program manager, Horticulture, said food loss can occur at any point in the value chain.

'Losses can be caused by pests and disease, drought, or poor post-harvest management. But in some local markets in the Pacific, losses are minimal,' said Ms Kernot. 'In short chains, growers may harvest for that day's market, just taking what they know they will sell. And once they've sold out, they'll pack up and head home.'

'Perversely, this might impact food availability and price, reducing the availability of healthy fresh vegetables with follow-on impacts for nutrition. Most of us do not eat enough fresh fruit and vegetables, and that is a real problem in terms of human health.'

Ms Kernot said being aware of possible interventions to address food loss fits in well with the project's foresight component, included as a part of the joint program. This will explore what in-country partners believe their future food system could look like.

Other projects in the Food Loss Research Program will look at mango and tomato value chains in Sri Lanka and Pakistan, and catfish production in Vietnam and Laos. Food loss affecting vulnerable urban communities in Zambia and Malawi will also be investigated.

**Food loss means income loss for farmers, and nutrition loss for consumers**



# Bringing Pacific communities together

Building national capacity and solving shared problems across the Pacific islands underpins the long-standing research-for-development partnership ACIAR has with the Pacific community.

For more than 30 years, the Pacific Community (SPC) and ACIAR have worked together to support the sustainable management of the Pacific region's agriculture, fishery, forestry and biosecurity sectors.

It is an indispensable partner in the region, according to Dr Daniel Walker, ACIAR chief scientist. The Pacific island nations and territories that are its members rely on SPC for scientific and technical expertise to supplement their existing resources. And they work together through SPC to develop regional strategies and policies to support their development needs and aspirations.

'Working in partnerships with SPC, ACIAR supports and extends their work, building strategic relationships with Australia's Pacific neighbours,' said Dr Walker.

ACIAR works primarily with the SPC's land resources division and its fisheries, aquaculture and marine ecosystem division. ACIAR provides program funding to support SPC's own priorities, as well as project funding for specific research activities.

Ms Karen Mapusua, director of SPC's land resources division, said an overarching partnership agreement with ACIAR frames the program funding and the way SPC and ACIAR work together. 'It gives us the flexibility to respond to needs, to invest in our organisational backbone and systems,' said Ms Mapusua.

'The ACIAR partnership allows us to dive a little bit deeper on some of the issues that are of priority to our

**Community-based fisheries management draws on strong traditional knowledge and practices**



Regional strategies to protect the sustainability of coastal fisheries are important in the Pacific region, as a contributor to food security, nutrition and livelihoods. Photo: Lorima Vueti, The Pacific Way, SPC

members. And it gives our researchers the opportunity to connect with researchers in Australia on different things, and this further builds capacity at our end.'

One current issue ACIAR-funded projects with SPC are focusing on is the preservation of plant genetic resources for crops such as coconut – a widespread and vital crop across the Pacific region.

Through SPC's scientific and technical services, ACIAR funding contributes to the International Coconut Genetic Resources Network, which aims to coordinate efforts to conserve and use coconut genetic resources.

Other ACIAR funding supports a project to protect coconut germplasm (living genetic diversity) collections that are threatened by disease.

On the fisheries front, ACIAR funding supports the SPC's 'a new song for coastal fisheries – pathways to change' initiative. This is a regional strategy developed in response to declines in coastal fisheries resources and ecosystems. Feeding into this strategy are the outcomes of ACIAR-funded projects conducted over more than 15 years to develop community-based fisheries management in the region.

Community-based fisheries management draws on strong traditional knowledge and practices, combining them with scientific approaches to manage fisheries. This approach recognises that government resources to gather national datasets, monitor stock and ensure compliance are limited, so building capacity among the community is vital.

The ultimate aim, at both a local and regional level, is to develop independent programs at scale, to ensure coastal fisheries are sustainable and provide secure livelihoods. 🌿



# Vegetables in the nutrition and health spotlight

**With vegetables a top priority in improving global nutrition, the partnership between World Vegetable Center (WorldVeg) and ACIAR is vital.**

Although vegetables are necessary for a healthy diet, very few countries grow enough of them to supply their people. Availability and cost contribute to both poor demand and consumption – yet increasing vegetable intake could vastly boost global nutrition and health.

This is why the role of WorldVeg is important.

WorldVeg is an international non-profit institute with a unique vegetable research and development mandate and a vision to contribute to healthier lives and more resilient livelihoods through greater diversity in what people grow and eat.

‘Our goal is to unleash the nutritional and economic potential of vegetables in low-income and middle-income countries, inclusively and sustainably,’ said Dr Marco Wopereis, WorldVeg director-general.

**WorldVeg supports research on improved vegetable farming systems in low-income and lower-middle-income countries.**  
Photo: WorldVeg



WorldVeg has an established presence in Asia and Africa, and an extensive network of partners around the world, including ACIAR. These partnerships allow WorldVeg to maintain a global perspective while grounding efforts in local contexts.

Dr Wopereis explained that core funding from ACIAR provides WorldVeg with the flexibility to conduct strategic research in diversity in vegetable seeds, production systems and vegetables in diets. The funding also provides resources for impact assessment studies to guide future research efforts.

Dr Julianne Biddle, ACIAR director of multilateral engagement, said WorldVeg played an important role in producing and maintaining global public goods, such as providing stewardship to the largest public vegetable germplasm collections in the world.

‘This kind of global intellectual and physical architecture is not very well supported by individually funded projects,’ said Dr Biddle. ‘Core funding means staff capacity is enhanced, with career prospects on the horizon. Long-term research occurs and germplasm and other important resources are well maintained and effectively mobilised. This has many other benefits for food systems.’

Core funding also allows ACIAR to work alongside larger funding partners, enhancing the investment impact. Dr Biddle added that these efforts are important not just for smallholder farmers in low-income and lower-middle-income countries but also for Australian breeding programs. These include mungbean breeding, with WorldVeg germplasm being the foundation for the varieties grown across much of northern Australia for many years.

The WorldVeg gene bank also holds germplasm of tomato breeds with genetic resistance to tomato yellow leaf curl virus, which poses an ongoing threat to the Australian tomato industry.

ACIAR supports the valuable ‘Push-Pull-Policy’ framework of WorldVeg. This emphasises the need to focus simultaneously on improving production, building consumers’ appetite for more vegetables, and engaging with policy actors to create an enabling environment for vegetable diversity.

WorldVeg recently took a leading role in the design of the new Fruit and Vegetables for Sustainable Healthy Diets (FRESH) One CGIAR Initiative. This strategic partnership between WorldVeg and One CGIAR signals a strong commitment across food and agricultural research organisations to collaborate towards global food and nutrition security. 



# Increasing value chain and pest control knowledge

Supply chain improvements have boosted on-farm finances for farmers in Pakistan. These improvements are one of the many ways Australia's investment in CABI has helped improve agricultural outcomes for low-income and lower-middle-income countries.

Visiting markets to experience the journey their onions take, from the farm to end consumers, has helped strengthen the value chain between Pakistani growers and the other participants in the supply chain.

This kind of value-chain research and extension with smallholder farmers is an important part of the broader food systems research that CABI undertakes in partnership with ACIAR.

This ACIAR-funded project has also included tomato and potato supply chains in Pakistan. It includes identifying ways to reduce food losses and increase financial gain for growers, wholesalers and retailers, with a focus on value-chain models that are inclusive and provide equitable access for women. This value-chain project will wind up at the end of 2022. But, like an onion, it is just one of many layers in the partnership between CABI and ACIAR, where CABI is an implementing partner of research for development in-country.

## Pest control partnership

ACIAR provides core funding to CABI that contributes to improved agricultural outcomes for low-income and lower-middle-income countries around the world, including in South-East Asia, South America, eastern Africa and northern Africa. A large part of this work focuses on weed, pest and disease management, which also delivers benefits to Australian agriculture and research.

Dr Julianne Biddle, ACIAR director of multilateral engagement, said core funding helps CABI promote better chemical pesticide management and develop much-needed alternatives.

'Chemical pesticide use is a growing issue for human and environmental health, market access and input costs,' said Dr Biddle. 'CABI is working on alternatives, such as biocontrols, integrated pest management, swift pathogen identification, on-farm management and market testing for chemical residues. Core funding helps ensure staff capacity is maintained, and long-term research is supported.'



A Plantwise plant doctor promotes the benefits of natural biopesticides to a farmer in Cambodia. Photo: CABI

Ms Sally Stone, head of strategic partnerships for CABI, said core funding from ACIAR is highly valued for supporting the CABI Development Fund and Plantwise program. The fund allows CABI to develop novel technologies or approaches, respond rapidly to member country needs, and to continuously monitor and evaluate its programs.

'We were able to pilot the initial Plantwise program using the development fund,' said Ms Stone. 'The program established a network of plant clinics, and other extension approaches, to provide practical advice to farmers. It has reached more than 54 million smallholders in 35 countries over 10 years, with gender-focused studies helping to ensure inclusivity.'

The follow-on PlantwisePlus program was launched in 2021 to enable participating countries to predict, prevent and prepare for plant health threats, and to help farmers be productive in a changing climate. 🌱

**ACIAR PROJECT:** 'Strengthening vegetable value chains in Pakistan for greater community livelihood benefits' (HORT/2016/012)



# PNG health nuts ready for the world

Partnerships with the private sector often play an important role in research projects and driving development, as the galip nut project in Papua New Guinea shows.

As the world grows ever more fixated on the concept of health foods, PNG is tapping into the booming global nut market with its native galip nut.

Local businesses are proving to be key partners in the research and development underway to commercialise galip nut production. These local businesses are essential to the success of a sustainable and enduring industry contributing to the improvement of rural household livelihoods.

## Value-chain research

As a species indigenous to the region, galip nut (*Canarium indicum*) has been used by the people of PNG for thousands of years. Now research into how to establish the nut as a high-end, value-added product has kickstarted an emerging galip nut industry.

Through ACIAR support for over 10 years, Professor Helen Wallace from the Centre for Planetary Health and Food Security (Griffith University) is leading a diverse team of science, agribusiness and social research experts from both Australia and PNG.

Team members from Griffith University, The University of Adelaide and PNG's National Agriculture Research Institute (NARI) are expanding research into the processes needed to get the galip nut industry off the ground.

Professor Wallace said more than 80% of galip nut suppliers in PNG are smallholder farmers relying on family labour and living in very remote locations with limited access to distant markets.

'In PNG, looking after galip nut is traditionally women's work and women have really benefited from this growing industry,' said Professor Wallace.

'They are involved across the supply chain, from cultivation and harvesting to processing and selling. By scaling up the market, we will empower even more women to participate.'

Since the first project started more than 10 years ago, the galip nut project has made considerable progress. ACIAR-funded research has led Griffith University, The University of Adelaide and NARI to set up The Galip Nut Company, with a pilot processing facility in East New Britain, PNG's Islands Region. The facility demonstrates the profitability and demand for galip nut and that galip nut can be processed and produced commercially for export.

Both galip nut farmers and foragers can sell nuts to the processing facility, rather than processing the nuts themselves and selling into limited local markets.

This is already providing benefits and helping to improve the livelihoods of these farming households. Recent surveys of smallholders participating in the galip nut industry indicate that 70-90% of them are able to save money as a buffer against future household expenses.

## Private sector partners

As the industry gains traction, the research partners are keen to see private sector partners take over the processing and distribution of galip nut.

'Other investors have used our research to set up their own operation and started buying from farmers. This means more income for thousands of farmers in PNG, and also encourages people to keep native galip trees in their gardens and forests,' said Professor Wallace.

Among those already involved is Frangipani Foods. The company's founder and CEO is Dr John Moxon CBE, a former senior scientist at NARI. Through Frangipani

### Key points

- 1 Private sector partnerships are helping to commercialise PNG's galip nut and contribute to improving livelihoods of those involved.
- 2 A pilot processing factory is providing farmers with a direct local market.
- 3 The galip nut has nutritional qualities that make it ideal for global health food markets.



Galip nut foraging and farming is offering new livelihood opportunities in Papua New Guinea, with ACIAR-funded researchers and business partners working together to establish nut processing, new products and markets.  
Photo: Conor Ashleigh

Foods, Dr Moxon is working with the galip nut project to get the industry off the ground and launched internationally, targeting global health food markets.

'Galip nut is packed with vitamins, antioxidants and omega oils, and it contains 7 of the 9 essential amino acids,' said Dr Moxon.

'We want to lead the way with others to introduce it to the world as a major export commodity that benefits our rural households and national economy,' said Dr Moxon.

'We started developing the supply chains about a year ago in partnerships with our rural households, farmer associations and cooperatives to provide reliable and sustainable markets for their produce. We also work closely with NARI and are very appreciative of the support they give us'.

### In store now

Other private sector partners include the PNG supermarket chain City Pharmacy Limited. At the behest of its CEO, Mr Mahesh Patel, it already carries The Galip Nut Company products. He is a strong supporter of the project, has given prominent shelf space to the galip nut in his stores and is committed to assisting sustainable development in PNG.

The founder and managing director of DMS Organics, Ms Dorothy Luana, is another private sector figure having a big impact on the galip nut project. DMS Organics is an agribusiness and retailer operating out of East New Britain.

Ms Luana works closely with the project team and NARI as a processor of galip nuts, and reports any problems or issues she's having, which the project then looks at

resolving. This then helps her to improve her own products, which are stocked in City Pharmacy Limited supermarkets.

### Market development

Associate Professor Craig Johns, who is the associate director of agribusiness innovation at The University of Adelaide, has led the latest value-chain research for the galip nut project. He is an advocate for involving private sector businesses in the project.

'To have sustainable development and long-lasting impact, the private sector needs to take ownership,' he said. The current project to enhance private sector development of the industry is due to end in 2023 and Associate Professor Johns is eager to help move the sector forward.

Private sector partners are receiving help with accreditation in Hazard Analysis Critical Control Points, which is needed to export products. The research team is helping to barcode products and connect PNG businesses with others interested in testing and buying different nut products, including galip nut oil for cosmetics, galip nuts in snack nut mixes, and ground galip meal for cooking.

Associate Professor Johns is confident that the proactive private sector partners already involved in the industry's development will give the industry legs, allowing it to stand – and run – on its own, giving smallholders long-term opportunities for improved livelihoods. 🌱

**ACIAR PROJECT:** 'Enhancing private sector-led development of the *Canarium* nut industry in Papua New Guinea (Phase 2)' (FST/2017/038)



# Climate change – the challenge without borders

The knowledge being gathered to help farmers adapt to climate change is also bringing people and communities closer together.

Meet Dr Veronica Doerr, climate change tactician, knowledge broker, optimist. As the ACIAR research program manager for climate change, Dr Doerr guides some of the ACIAR-supported research that seeks to transform food systems and livelihoods, including research projects that are under the most pressure to either adapt to or reduce climate impacts.

It is a complex scientific, social, cultural and economic endeavour – one that could be overwhelming given the unstoppable force that climate change presents. But it is a challenge Dr Doerr embraces. 'It's about taking a step-by-step approach to system change. It's about accepting that no-one can do this alone,' said Dr Doerr.

That is the tactician and knowledge broker speaking. The optimist is a long-time researcher working at the forefront of sustainable landscapes and climate change adaptation. She has built a collaborative network among climate researchers and farming communities around the world.

'I've come to know many wonderful people working on this global challenge,' she said. 'They recognise the hard realities, but remain positive. They – we – see the potential for a sustainable world, for social justice and for people working together. We are able to hold that vision

in our heads and not be overwhelmed by the perception of crisis. Crisis is not a constructive mindset.'

Dr Doerr refers to several influences that sustain this professional and personal energy. They include the networking and support structures fostered by the United Nations climate change conference series, the Conference of the Parties on Climate Change (COP), the Adaptation Research Alliance that has evolved out of COP-related networking, and the farmers and their communities in countries most vulnerable to climate change impacts.

'What makes climate change different to sectoral challenges is that it is not just about improving existing livestock, crop or fisheries production. Climate change is a cross-sectoral challenge. That's why ACIAR has a climate change program dedicated to systems change,' said Dr Doerr.

Dr Doerr points out that most people know the risks posed by climate change. 'Farmers will tell you they are observing clear trends, not just occasional disruptive weather events. But farmers, especially subsistence farmers, have limited capacity to respond on their own. That's why we have to find whole-system solutions. We need to include buyers and suppliers and everyone their livelihoods are linked to.'



Dr Veronica Doerr (centre) with project partners from Can Tho University and CSIRO visiting shrimp harvesting operations in mangroves in the Mekong Delta, to consider the potential expansion of mangroves for their multiple climate benefits. Photo: ACIAR

## Key points

- 1 Climate change has no borders and needs global collaborations.
- 2 Making farming resilient to climate change requires a whole-system approach.
- 3 The key to this is 'adaptation research', which involves farmers and their communities in decision-making.





## The system challenge

Dr Doerr said the term ‘system’ often sounded abstract. She breaks it down to people and their linkages. ‘It’s about farmers, suppliers, buyers, exporters, governments and the links and relationships that form this network’.

The system challenge is when these elements respond individually, either to risks or to opportunities like carbon markets and climate finance for mitigation measures. What may seem the easiest or most achievable pathway for individuals can be at the expense of a greater achievement by a whole network working together.

‘For example, an exporter might respond to trading risks by sourcing “the right supply” from other farmers in the world rather than work with existing suppliers. That individual response to climate change pulls an existing network, or system, apart. Conversely, greater opportunity can exist if the advantages of working together are clearer. This is where the science is needed,’ said Dr Doerr.

The brokering and facilitation required to achieve a cohesive systems approach has a direct research component. What are the social processes? What are the

**We see the potential for a sustainable world, for social justice and for people working together**

facilitation techniques? What will bring people together to develop a shared vision that works? What helps to change decision-making processes? It’s about the science of the processes and the science of how to accelerate action.’

Dr Doerr said it was the opportunity to help shape

this crucial agenda that attracted her to ACIAR after 15 years at CSIRO. There she researched multifunctional landscapes and methods to support collaboration and learning in climate adaptation.

For Dr Doerr, research collaborations and partnerships are the only way to achieve a global response to climate change impacts. Collaboration facilitates the development of both adaptation and mitigation measures for food-producing systems as a whole.

## Global brainstorming

‘Big system challenges that require system solutions is also where I see the real value of the COP climate change conferences,’ she said. ‘They attract 25,000 to 30,000 participants to what is effectively a giant information and insights-sharing meeting.’

‘It’s a practitioners’ conference and it short-circuits the conventional process of people reading each other’s published papers, building on those and so forth, and by



Dr Veronica Doerr (7th from left) attending the G20 Meeting of Agricultural Chief Scientists’ Technical Workshop on Climate Change, focusing on lessons learned from the G20 countries on climate-resilient agriculture. Photo: ACIAR

the time you’ve got research ready to apply, 20 years have passed and conditions have changed.’

‘Now we have the chance to reassess priorities and opportunities and the global body of knowledge together and every year.’

Dr Doerr said the COP had also allowed lower-income and middle-income countries to use them as a platform. It provided a place to build strategic alliances and have their voices heard.

COP26, held last year in Glasgow, Scotland, was the first time that agriculture featured significantly on the program. One emphasis was on all countries committing to developing more nature-based farming systems. Dr Doerr is hoping to see this trend progress even further at COP27, hosted by Egypt this November.

‘I’m hoping agriculture continues to become more centre-stage to accelerate climate change adaptation and mitigation,’ said Dr Doerr.

‘COP27 is already being informally called the “adaptation COP”. This follows the recognition at COP26 that there needs to be more attention given to adaptation, not just mitigation.’

Dr Doerr is part of the push behind locally led adaptation and the Adaptation Research Alliance, a new global organisation, of which ACIAR is a founding member. It facilitates researchers working with farmers and being guided by their needs. ‘Lasting change can only be locally led,’ said Dr Doerr. 🌱



Australian delegates visiting a Fiji agri-tourism business. Photo: ACIAR

### Leaders and changemakers visit Fiji tilapia enterprise

In July, Australian members of Parliament, senators, media representatives and participants from the Australian Regional Leadership Initiative – Save the Children program visited several ACIAR-funded projects, including Kaybee Tilapia Farm in Fiji. The business is the first and only female-owned and operated tilapia hatchery in Fiji and is part of an ACIAR-supported Pacific Agribusiness Research in Development Initiative, designed to build confidence and support opportunities for local farmers to become agri-entrepreneurs.



International researchers selected as 2022 Meryl Williams Fellows. Photo: ACIAR

### Meryl Williams Fellows begin Australian journey

Nineteen new Meryl Williams Fellows (MWFs) from Timor-Leste, Philippines, Solomon Islands, Nepal, Samoa, Tonga, Vanuatu and Mongolia have begun their journey, arriving in Australia in August. This second cohort of MWFs has undertaken intensive training at the University of New England in Armidale in New South Wales, and then travelled to Sydney with their mentors. The fellowship program aims to support female agricultural researchers across the Indo-Pacific region to improve their leadership and management skills and learn how to integrate gender equity and social inclusion into their research.



Foreign Minister Penny Wong (centre) learned about ACIAR projects during a visit to Timor-Leste. Photo: ACIAR

### Foreign Minister in Timor-Leste

In September, Australian Minister for Foreign Affairs, Senator the Hon Penny Wong, met with ACIAR and WorldFish at the Ministry of Agriculture and Fisheries in Dili, Timor-Leste. The WorldFish project team gave a presentation on 2 ACIAR-funded fisheries projects, and the minister met with several women who have directly benefited from the research through improved household nutrition. The Minister also sampled some simple fish recipes highlighted in a book published by ACIAR, in English and Tetum, *Cooking fish and seafood in Timor-Leste: recipes and stories of traditions and livelihoods* (COP031).



ACIAR-funded John Dillon Fellows from Bangladesh begin their training in Australia. Photo: ACIAR

### John Dillon Fellows arrive from Bangladesh

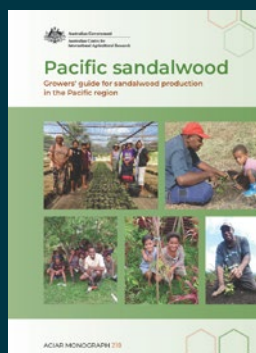
The first John Dillon Fellowship intake from Bangladesh arrived in Armidale, New South Wales, in August to begin their training in Australia. The group started with an 8-day workshop covering leadership and management, modern communication, partnership skills and collaboration, gender equity, diversity and social inclusion, and project leadership and management. The fellows then visited key Australian organisations and spent some time interacting with staff at ACIAR House in Canberra. 🌱

# Explore our recent publications

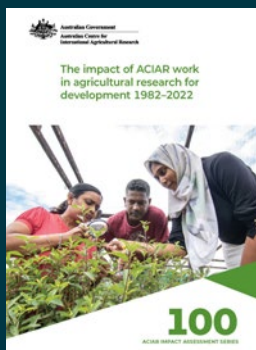
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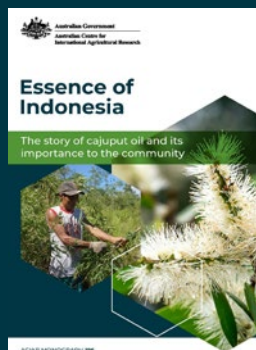
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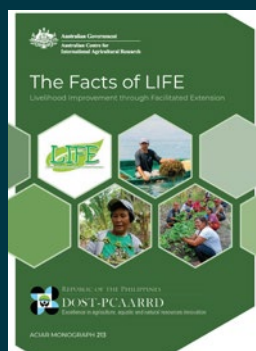
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