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# partners

IN RESEARCH FOR DEVELOPMENT

Australia and  
CGIAR

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bridge water  
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double-win

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*Partners in Research for Development* is the flagship publication of the Australian Centre for International Agricultural Research (ACIAR). *Partners* presents articles that summarise results from ACIAR-brokered research projects and put ACIAR research initiatives into perspective. Technical enquiries will be passed on to the appropriate researchers for reply. Reprinting of articles, either whole or in part, is welcomed, provided that the source is acknowledged.

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**Front cover:** Ethiopian farmer Ermiyas Bonge with a productive legume crop (see page 20). Photo: Apollo Habtamu, International Maize and Wheat Improvement Center (CIMMYT)

**Back cover:** Maize drying in Tanzania.

## From the CEO

Professor Andrew Campbell

### Welcome to the final issue of *Partners* for 2019. Appropriately, we are having another look at climate change resilience.

Our previous issue focused on the challenges facing farmers, fishers and foresters in the Pacific. At the Pacific Week of Agriculture in Samoa in late September, ACIAR hosted a series of side events and consulted partners about our draft Pacific Strategy. We are now considering the feedback we received and undertaking a final round of consultation before finalising. Adapting to the impacts of climate change is a key theme, given its importance to our Pacific partners.

Responding effectively to the impact of climate change is a major challenge for ACIAR and our partners. We are playing a science leadership role in regional efforts to implement policies and actions that promote more sustainable and resilient agricultural systems.

While in Samoa, I had the opportunity to talk directly with Pacific agriculture ministers and senior officials. Many conversations were about coconuts and the dire situation with aging palms, declining productivity, diseases and pests. It was good to hear that ACIAR-supported work on 'the tree of life' is tackling a keenly felt need.

In Indonesia in October, I was elected Vice-Chair of the Global Research Alliance (GRA) for Agricultural Greenhouse Gases at the annual GRA Council meeting. The alliance of more than 60 countries was initiated in 2011 by New Zealand, which remains the largest funder, and Australia has been involved from the outset. The GRA works to create an enabling environment for research collaboration on the most promising ways to reduce agricultural emissions – for example from ruminants and cropping systems. Leading Australian researchers in these areas have played important roles in GRA, often supported by ACIAR. In 2020, it will be Australia's turn to host the meeting when we take over as Chair of this important global collaboration.

Many Australians work across the CGIAR, sharing scientific expertise throughout the worlds' largest agricultural innovation network, comprising 15 CGIAR research institutes. In this issue, we reflect

on our relationship with the CGIAR and get to know a few of its Australian leaders (page 4). This exchange works both ways, with CGIAR alumni among our ACIAR staff. Currently, four Research Program Managers: Social Sciences (Dr Jayne Curnow); Water and Climate (Dr Robyn Johnston); Soil and Land Management (Dr James Quilty); and Portfolio Planning and Impact Evaluation (Bethany Davies), joined us from CGIAR centres. We look forward to very constructive engagement with CGIAR as the current reform process will hopefully deliver a much more coherent and cohesive system, better tuned to the cross-cutting challenges of food and nutrition security in changing climates.

As 2019 draws to a close, it is good to read about some of the important work of ACIAR and its partners across the Indo-Pacific region in mitigating agricultural emissions, and building the resilience of agricultural systems and communities. This focus is likely to intensify in coming years.

I wish everyone warm season's greetings and all the best for 2020. 🌱




Professor Andrew Campbell speaking at Pacific Week of Agriculture.

## Events

### **2019 AUSTRALASIAN AID CONFERENCE**

17-19 FEBRUARY 2020

Canberra, Australia

The Australasian AID Conference is organised by the Development Policy Centre, Crawford School of Public Policy, ANU College of Asia & the Pacific in partnership with The Asia Foundation. The conference brings together researchers from Australia, the Pacific, Asia and beyond who are working on aid and international development policy to share insights, promote collaboration, and help develop the research community. [devpolicy.crawford.anu.edu.au/annual-australasian-aid-conference/2019](http://devpolicy.crawford.anu.edu.au/annual-australasian-aid-conference/2019)

### **INTERDROUGHT 2020**

9-13 MARCH 2020

Mexico City, Mexico

Interdrought 2020 aims to facilitate the development of concepts, methods and technologies associated with plant production in water-limited environments. It will cover both applied and basic research towards the development of solutions for improving crop production under drought-prone conditions. The congress is organised by the International Maize and Wheat Improvement Center (CIMMYT). [www.interdrought2020.com](http://www.interdrought2020.com)

### **8TH INTERNATIONAL CROP SCIENCE CONGRESS**

21-25 JUNE 2020

Saskatoon, Canada

This congress will address basic and applied aspects of plant and crop sciences as they relate to strategies to develop unique, sustainable, agricultural systems having the capacity to support animal and human health, on a global scale, while being mindful of our custodial responsibilities towards the well-being of our planet Earth. [www.icsc2020.com](http://www.icsc2020.com)

# A boost of US\$650 million for CGIAR to help farmers adapt to climate change

An alliance led by the Bill & Melinda Gates Foundation has rallied to increase funding for the CGIAR to the tune of more than US\$650 million to better support smallholder farmers in developing countries to adapt their farming practices and systems to changing climates.

'Most people have never heard of it but CGIAR has done more to feed the world's poorest people than any other organisation on earth,' said Bill Gates, Co-chair of the Bill & Melinda Gates Foundation and Co-chair of the Global Commission on Adaptation, speaking at the 2019 United Nations Climate Action Summit in New York.

Investments in CGIAR have proven to be highly cost-effective, generating returns ranging from \$2 to \$17 for every \$1 invested, with significant economic benefits for producers and consumers.

CGIAR's work is concentrated in areas of the developing world where most people work in agriculture, and where farming is the main source of food and income for hundreds of millions of households.

Climate change and climate shocks put the most vulnerable people at risk. Extreme heat, droughts, floods and volatile, unpredictable growing seasons harm farmers and production systems.



The 2019 United Nations Climate Action Summit in New York was the venue where additional funding of US\$650M was announced for CGIAR. Photo: Kiara Worth, International Institute for Sustainable Development.

'Ultimately we need to double funding for CGIAR research to fully equip this unique and valuable institution to confront a wide range of climate challenges. These commitments are a critical down payment toward reaching that goal,' Mr Gates said.

Joining the Bill & Melinda Gates Foundation in this funding commitment is the World Bank, the European Commission and five individual countries: the Netherlands, the United Kingdom, Switzerland, Sweden and Germany.

Climate change is already producing a surge in the frequency and intensity of droughts that is reducing production of Africa's most important crop, maize. At the same time, increased flooding in South Asia is threatening the rice harvests that sustain millions.

Climate change is also likely to reverse major reductions in poverty that have been achieved largely by boosting the productivity of smallholder farms in countries like Rwanda, Ghana and Ethiopia.

CGIAR researchers have previously delivered new climate-smart crop varieties, sustainable and resilient approaches to crop and livestock production, affordable insurance for livestock-keepers that uses satellite data to monitor grazing conditions, and a 'climate smart village' approach to improve whole-of-community resilience.

Executive Director of the CGIAR System Organization, Elwyn Grainger-Jones, says, 'Farmers need a host of new innovations to overcome a

growing array of climate threats. This new funding is an important start towards a global effort to substantially increase support for CGIAR activities.'

Mr Grainger-Jones says CGIAR has been working closely with smallholder farmers across the developing world for almost 50 years. 'We know a lot about the crops they grow, the livestock they keep and the challenges and opportunities they currently face. We are ready to put the full force of our insights and activities behind a major effort to confront the climate emergency they now face,' he adds.

The additional funding from the Bill & Melinda Gates Foundation, which will commence in 2020, will support a wide range of activities across the CGIAR System to deliver a steady stream of adaptation solutions to smallholder farmers. 🌱

## KEY POINTS

- 1 Climate change threatens to reduce the productivity of smallholder farms.**
- 2 Funding will support farmers in developing countries to adapt their farming to climate change.**



# An enduring partnership: **Australia and CGIAR**



**DR MATTHEW MORELL**  
Director General, International  
Rice Research Institute  
Photo: International Rice Research  
Institute



**DR BRENDAN BROWN**  
Agricultural Innovation  
Scientist, CIMMYT  
Photo: Conor Ashleigh



**MS HOLLY DAWSON**  
Stakeholder liaison and  
coordinator, CIFOR

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**One of Australia's most enduring and important agricultural research collaborations is with CGIAR—a global research partnership for a food-secure future.**

Established in 1971, CGIAR brings together 15 international agricultural research centres covering all aspects of primary production from crops to fish to livestock to forestry and spanning a wide range of scientific disciplines and agricultural sectors. All with the aim to help smallholder farmers in developing countries boost their productivity and improve their livelihoods and consequently global food security.

Australia is among the top ten investors in CGIAR, and many Australians work across the CGIAR system in leadership, governance and research roles. Many Australian scientists also cut their teeth in CGIAR centres, gaining valuable experiences and knowledge.

In this feature we showcase a CGIAR leader and two CGIAR early-career scientists, in a celebration of the partnership.

## **DR MATTHEW MORELL: IRRI**

In response to his curiosity in agriculture class, a young Matthew Morell's high school teacher told him, 'If you want to keep asking questions you really should go to university'.

In recounting the experience, the now Director General of the International Rice Research Institute (IRRI) says it was the first time he was encouraged to go beyond the textbook in his quest to understand things more deeply.

'I was always interested in science but it seemed to me that agriculture was the application of science to address real-world problems,' he says. This appealed to him. So, from his high school days in the rural town of Wagga Wagga in Australia, Dr Morell pursued a career in science that would take him first to The University of Sydney to do his



undergraduate and PhD degrees in agriculture, and then onwards to the United States to undertake post-doctoral studies.

He returned to Australia to take up an academic position at the Australian National University but was drawn to the opportunity to apply science to deliver practical solutions at Australia's national science agency—the Commonwealth Scientific and Industrial Research Organisation (CSIRO). There he established himself as a pre-eminent cereal chemist developing and commercialising cereal varieties with improved nutritional features. Then the opportunity to work at IRRI arose and he soon ascended to the position of Director General, based in the Philippines.

As the Director General, Dr Morell is responsible for the functioning of the institute of more than 1000 staff across 17 country offices, the performance of its research program and its strategic direction. But the part of the job that takes up most of his time is working with external stakeholders.

'We don't do anything alone, we don't deliver any of the benefit of what we do alone, so everything's through partnerships and relationships,' says Dr Morell.

'Scientific expertise buys you a ticket to the start of the race but it's not the thing that decides whether you win the race or not.

'The combination of the quality of the science, the quality of the partnerships and the relationships, being able to put yourself in the shoes of the beneficiaries and being able to work collaboratively and cooperatively, are very important skills. Being able to communicate what you do, being able to advocate for resources—these are all very important.'

### From the small...

Partnerships also form part of the history of IRRI, which was founded on a partnership between the Ford and Rockefeller foundations with support from the Philippine Government in 1960. IRRI cites itself as being the world's premier research organisation dedicated to reducing poverty and hunger through rice science; improving the health and welfare of rice farmers and consumers; and protecting the rice-growing environment for future generations. IRRI is also one of the founding centres of CGIAR.

One of the projects IRRI is currently undertaking with ACIAR and WorldFish—another CGIAR centre—is to help improve rice-fish systems in Myanmar. The project is exploring opportunities to improve the livelihood, income and nutrition of smallholder farmers in Myanmar by maximising the combined productivity of rice and fish farming.

Dr Morell says there are many benefits of the project. 'There's the opportunity for improved nutrition through consumption of fish. There's livelihood opportunity. There's a business opportunity—particularly for women farmers. And we see this kind of mixed model providing farmers with resilience in their enterprises in the face of climate change and other pressures.'

### ... to the big

While Australia plays a role in supporting individual bilateral research projects with centres like IRRI, funding and leadership at the CGIAR system level ensures that support is coordinated and strategic—and the impact of the research and investment is maximised across multiple countries and regions. Dr Morell is also a member of the CGIAR System Management Board, where he helps develop the strategic direction of the entire CGIAR system.

'Australia's investments are very important in enabling different kinds of science and delivery but we also need to engage with the Australian Government priorities in terms of types of areas of impact and regional focus,' he says. He adds that Australia's role in setting the regional environmental protection agenda and building scientific expertise is also critical.

'Australia is a powerhouse of agricultural science. There are many deep and enduring scientific connections, whether it's a connection around staff coming to IRRI, but also IRRI has contributed to the development of a lot of scientific staff who now work in Australia.

'That's built a strong connection for both for the future, providing opportunities for scientific contributions that flow both ways.'



## DR BRENDAN BROWN, CIMMYT

A trip across Africa during his university holidays changed Dr Brendan Brown's dreams of becoming a dairy farmer when he saw the unrealised potential of farming systems there.

'During that trip I saw the potential for agricultural research to positively impact the livelihoods of a huge proportion of the world's farmers who are underserved by the agricultural gains seen in many other locations,' says Dr Brown.

Now, at 31 and based in Nepal, Dr Brown is working for another CGIAR centre, CIMMYT—the International Maize and Wheat Improvement Center—where he leads a portfolio of ACIAR-funded projects that research and promote the sustainable intensification of agricultural systems across the Eastern Gangetic Plains of South Asia.

'I'm involved in designing and implementing participatory evaluations of sustainable intensification practices and holistic impact evaluations, facilitating policy dialogues, working on strategy, engagement and donor mobilisation plans, and implementing capacity development around monitoring, evaluation and impact pathway assessment,' he says.

Following his Bachelor of Science in agriculture at the University of Sydney, he completed his PhD in social science jointly under the University of Adelaide, CSIRO and CIMMYT. He also participated in both the ACIAR graduate and the Australian Youth Ambassadors for Development programs.

His work at CIMMYT started after he presented his research at the centre's headquarters, and was invited to transfer his methodologies in Africa to South Asia.

'The opportunity to extend my methods and theoretical frameworks for participatory impact pathway development in a new context and experience a new part of the world was irresistible,' says Dr Brown.

And the move has clearly paid off, with Dr Brown describing his work with CIMMYT as a very positive experience. 'For a younger scientist with new ideas, CIMMYT provides an ideal platform for experimental research for impact,' he says.

## MS HOLLY DAWSON, CIFOR

Holly Dawson's first job was as a chef. From there her interest in sourcing food ethically started her on a path to her current work in stakeholder management with CIFOR—the Center for International Forestry Research, based in Bogor, Indonesia.

'I was working with food and started moving into organic restaurants with strong farm-to-food practices,' says Ms Dawson. 'I was also worried about climate change; I was seeing the changes and impacts in Australia and abroad and the impacts of our current food sourcing systems.'

This led her to study international relations and public policy at the University of Western Australia and then to work in a range of social and environmental advocacy NGOs, including Greenpeace.

But even then she still had not even heard of CGIAR, let alone CIFOR—a CGIAR centre.

It wasn't until she landed in Bonn, Germany, after she moved there with her partner who had taken up a position with the United Nations Framework Convention on Climate Change (UNFCCC) that she discovered the organisation.

'I had actually never heard of CIFOR and never imagined how big it was or how many places it worked in,' she says. But it was right next door to the UNFCCC, and it was looking for switched-on English speakers to work in the climate space and who had an external focus. 'I fitted the bill with my previous experience,' she says.

Now Ms Dawson works as a stakeholder liaison and coordinator for the Global Landscapes Forum (GLF)—the world's largest knowledge-led platform on sustainable land use, dedicated to achieving the Sustainable Development Goals and Paris Climate Agreement.

She describes the GLF as a sharing platform, both online and offline, with a holistic approach to land-use restoration.

Ms Dawson's food-focused journey shows how CGIAR is looking not just for skilled agricultural researchers but for people with diverse backgrounds and skills. She sums it up: 'We need to transform our relationship to how we produce our food and manage land. Agriculture research and communicating that research is a massive part of addressing climate change.'





### Australia's investment in CGIAR

Australia has funded CGIAR since its inception in 1971 and, as one of the top 15 funders, has held a seat on its highest governing body, the System Council.

Since its establishment in 1982, ACIAR has managed Australia's investment, as a key function under the ACIAR Act. CGIAR is the world's largest global agricultural innovation network, spending around US\$1 billion/year. It undertakes agricultural research for development, through 15 research centres that together employ around 9000 scientists, most of whom are located in developing countries.

CGIAR works closely with national and regional research institutes, civil society organisations, academia, development organisations and the private sector.

### CGIAR centres

- Africa Rice Center (AfricaRice), Côte d'Ivoire
- Bioversity International, Italy
- Center for International Forestry Research (CIFOR), Indonesia
- International Center for Tropical Agriculture (CIAT), Colombia
- International Center for Agricultural Research in the Dry Areas (ICARDA), Lebanon
- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India
- International Food Policy Research Institute (IFPRI), United States
- International Institute of Tropical Agriculture (IITA), Nigeria
- International Livestock Research Institute (ILRI), Kenya
- International Maize and Wheat Improvement Center (CIMMYT), Mexico
- International Potato Center (CIP), Peru

- International Rice Research Institute (IRRI), Philippines
- International Water Management Institute (IWMI), Sri Lanka
- World Agroforestry Centre (ICRAF), Kenya
- WorldFish Center, Malaysia

### Australians in leadership positions across CGIAR

Many Australians work across the CGIAR system—as scientists, students and in other professions. Of particular note are the Australians working in senior leadership positions as members and chairs of CGIAR centre boards and as director generals of CGIAR centres, and on the CGIAR Systems Council:

- Professor Kaye E Basford, Professor in Biometry at University of Queensland, is the Vice Chair of the Board of Trustees for IRRI
- Nicole Birrell, Director of Victorian Plantation Corporation, is the Chair of the Board of Trustees for CIMMYT
- Derek Byerlee, Adjunct Professor in the Global Human Development Program in the School of Foreign Services at Georgetown University, is a Board Member for IFPRI
- Professor Andrew Campbell, ACIAR CEO, represents Australia on the CGIAR Systems Council
- Dr Peter Carberry, Director General of ICRISAT
- Professor Lindsay Falvey, Professor at University of Melbourne, is the Chair of the Board of Trustees for ILRI
- Professor Tony Haymet, Vice Chair of the Board for WorldFish Center
- Matthew Morell, Director General of IRRI and member of the CGIAR System Management Board
- Professor Wendy Umberger, Executive Director of Centre for Global Food and Resources at University of Adelaide, is a Board Member for ICRISAT



# Pacific Week of Agriculture draws leaders, advances ideas

The second Pacific Week of Agriculture (PWA) drew together national leaders from the region to discuss and progress agricultural issues.

Hosted by the Samoan Ministry of Agriculture and Fisheries in September/October 2019 in Apia, Samoa, with the theme 'enhanced partnerships for sustainable agriculture and forestry systems in the Pacific', the event included meetings, workshops and displays.

'PWA was an excellent opportunity for ACIAR to exchange knowledge and consult with national and regional research and development agencies to refine our strategic direction in the region,' says ACIAR CEO Professor Andrew Campbell.

The Pacific faces unique agricultural development challenges, from potential economic shocks such as sudden changes to already-high food and fuel prices, through to ongoing exposure to natural disasters and the impacts of climate change.

'While there are significant challenges facing the Pacific community, there are also opportunities for each country to produce more and healthier food locally, to reduce reliance on imports and to improve livelihoods for local producers.'

Concurrent with PWA, the Pacific Community (SPC) hosted meetings of the Heads of Agriculture and Forestry Services (HoAFS), and the Ministers of Agriculture and Forestry Services (MoAFS) from countries in the Pacific region.

At the HoAFS meeting, ACIAR presented its draft strategy for collaboration with the Pacific Islands (2020-29): 'Securing a brighter future for Pacific

islanders through international agricultural research collaboration'.

The HoAFS endorsed the strategy, which will guide research collaboration with individual countries and regionally under five strategic themes: improving food security and reducing poverty; managing food production and natural resources in the context of climate change; improving gender equity; improving food and forestry value chains; and building scientific and policy capacity.

Under the strategy, ACIAR intends to direct about one-third of its funding for research and capacity development to the Pacific and Papua New Guinea. ACIAR will now liaise with each head to seek additional comments and formal endorsement.

ACIAR supported four side events at PWA. This included two workshops: one to discuss the threats and challenges facing coconuts in the region and potential ways of addressing them through partnerships and collaboration, and one on plant biosecurity to share updates on ACIAR-supported plant biosecurity research and capacity building in the region. There was also a journalism masterclass to advance the science reporting of regional journalists, and a leadership development program for ACIAR alumni in the Pacific designed to build management and leadership skills.

According to Dr Peter Horne, ACIAR General Manager of Country Programs, there is consensus among the Pacific countries and international partners that the next Pacific Week of Agriculture, to be hosted by Fiji in November 2021, will be transformed into the premier recurring event for the region profiling Pacific agriculture. A five-country working group has formed to steer this transition, with Australia one of the members.

Professor Campbell adds, 'We're looking forward to continuing to work together with our partner organisations to ensure agricultural research supports a more resilient Pacific family.'



The Pacific Week of Agriculture brought together leaders from across the Pacific region to discuss and progress agricultural issues. Photo: pwasamoa2019.ws



# Pakistan builds partnership bridges over water issues

Connecting Pakistan's key users of water—including farmers—with water researchers and water decision-makers in government is seeing the country address its water scarcity and salinity challenge in a more integrated and effective way.

It is a solution that is intended to address the effects of water scarcity and salinity that farmers are facing, including having less land available for cultivation, needing to change to crops that require less water, and dealing with salt-affected soils, all of which result in lower production and a reduced income.

'I have just 15 acres [six hectares] but due to a shortage of water half of my land is fallow land, especially during *kharif* [monsoon season],' says Ghulam Nabi, a Pakistani farmer whose property is at the tail-end of a canal distributary in Sindh province. 'We have an acute shortage of water and our land is highly affected by brackish water if we use groundwater. We cannot continuously irrigate our land with tube well [ground] water because it deteriorates the quality of our soils.'

Moreover, he adds, he has to source drinking water from elsewhere because the groundwater is simply not potable.

## WATER SCARCITY

According to the Global Climate Risk Index, Pakistan is among the 10 countries most affected by extreme weather events. The Pakistan Council of Research in Water Resources predicts the country will approach 'absolute scarcity' of water by 2025.

The population of more than 200 million people is growing rapidly, increasing the demand on water. Pakistan is heavily reliant on agriculture, which contributes about one-fifth of the economy and provides employment for more than 40% of citizens. At the same time, agriculture accounts for a staggering 95% of total water consumption.

Pakistan is heavily dependent on a single source of water: the Indus River basin. The immediate challenge is inequities in surface water distribution



Mr Ghulam Nabi, a Pakistani farmer dealing with water shortages, is participating in a project that is drawing farmers, researchers and government departments together to find integrated solutions to improve groundwater management.

resulting in less water being available at the tail-end of canals and distributaries, which increases the shift to groundwater for both agriculture and domestic use. The consequences of the increased water use are severe depletion and salinity.

It is estimated that in the Indus Basin about 14–15 million tonnes of salt leaches into irrigation water each year, says Dr Jay Punthakey, hydrologist and adjunct professor at Charles Sturt University (CSU). Dr Punthakey is also Director of Groundwater and Environment for Ecoseal Developments, a company that provides services in groundwater and seawater intrusion modelling and water resource management.

He says that in the Punjab region of eastern Pakistan groundwater depletion occurs in parts of the lower reaches of irrigation systems due to insufficient surface water supplies. 'The areas we are working in are highly complex groundwater systems where large amounts of groundwater are being used for agriculture,' he says.



The situation in the Balochistan province, in the south of Pakistan, is worse as it is almost entirely dependent on groundwater, compounded by excessive extraction over decades. In addition, there is now an increase in the incidence of drought, and water is scarce and costly to access.

The country is now at a crossroad, needing to manage risks better. New water policies are being developed that could provide a guiding framework on actions required by federal and provincial governments.

## TAKING ACTION

Farmers are keen to find better solutions. In a video produced by Dr Tehmina Mangan, Professor of Economics in the Faculty of Agricultural

The current project focuses on how to build capacity of responsible government agencies in Pakistan and to extend our experience with the provincial irrigation department in Punjab to engage with other irrigation departments in Sindh and Balochistan,' says Dr Michael Mitchell, collaborator with Dr Punthakey and a social scientist at Charles Sturt University (CSU).

Building bridges and partnerships between the different parties is core to the work, according to Dr Robyn Johnston, ACIAR Water and Climate Research Program Manager.

'In this project there is a very strong focus on working with local agencies and universities to

### KEY POINTS

- 1 Water scarcity and salinity is threatening the livelihoods of Pakistani farmers struggling to access enough good-quality water to irrigate their crops.**
- 2 Building and sharing knowledge between farmers, researchers and policymakers is helping Pakistan to take an integrated approach that is improving water management.**

Social Sciences at Sindh Agriculture University in Tandojam, Pakistan, Mr Nabi and other Pakistani farmers expressed their plight and resulting interest in understanding and applying new water saving technologies. The university is participating in an ACIAR-supported project established to build Pakistan's capacity to improve groundwater management in ways that enhance farming family livelihoods.

Led by Dr Punthakey, the project builds on earlier work that established the means for modelling groundwater, using a case study in Punjab. Central to the project is active collaboration among researchers, research institutes, farmers, farming communities and relevant government and non-government agencies.



Pakistani researchers and irrigation managers are working together to help introduce improved groundwater management to reduce water scarcity. Photo: Kanza Javed.



develop skills and capability,' says Dr Johnston. 'There is an emphasis on partnerships with Pakistani researchers; and the project plays a role in brokering cooperation between the universities and the irrigation departments. It brings experience from Australia with working with farming communities to understand their information needs.'

Faizan ul Hasan, a water resources research engineer based at the Pakistan Council of Research in Water Resources and the project's National Coordinator explained that there are three provinces in the purview of this project with all relevant partners facing a diversity of groundwater management issues and a consumption paradigm driven by users. The project brings researchers and irrigation system managers together with farmers to aim for more holistic water resources management.

Mr Hasan adds that the relationship between freshwater availability and the total national water resource is becoming so complex, with rising governance issues, that the only way forward is to have informed stakeholder participation.

According to Dr Punthakey, the project participants now better understand and appreciate the data on groundwater in addition to their previous knowledge of surface water. Another important change is the increasing interaction between researchers at universities and Pakistani irrigation departments.

'Previously in Pakistan, university researchers often worked on their own; the only interaction with irrigation departments was in the form of obtaining data. Working together with researchers provides an avenue for innovation by researchers and irrigation departments developing in a co-learning environment and provides a mechanism for introducing research findings into the irrigation departments,' Dr Punthakey says.

Dr Punthakey says that through the project's case studies there is now evidence 'that capacities are being built within irrigation departments, especially through their interactions with groundwater modellers at universities and with a range of other stakeholders at a local scale'.

Case studies were selected following participatory rural appraisals which saw teams of Pakistan-based project members—from universities, irrigation departments, the Pakistan Council of Research in Water Resources and NGOs—listen to village



**Integrated management of water in the Indus River Basin—Pakistan's primary water source—is helping the country address water scarcity and salinity.**

farmers speak about their issues, hopes and opportunities. The project team learned about not only the groundwater issues but how those issues affected the daily lives of farming families.

Dr Catherine Allan, another social scientist at CSU on the team, says each area visited had different sets of issues and opportunities. For example, one village in District Sahiwal in Punjab had many poor farmers using saline groundwater but they had fertile soil and good access to markets, while another village in the same district had fewer poor farmers and slightly better groundwater but this was more expensive to access because it was deeper, and they were a long way from markets.

In 2020, the final year of the project, the team will continue working with farming families at the case-study level.

'Action plans for each case study area have been, or are being, developed,' says Dr Mitchell. The result will hopefully be a coordinated response that more comprehensively addresses the complex and pressing water management challenge Pakistan faces. 🌱

**ACIAR PROJECT:** Improving groundwater management to enhance agriculture and farming livelihoods in Pakistan, LWR/2015/036



Many activities that reduce emissions from the livestock sector can also increase livestock productivity, offering benefits for both the Kenyan Government and farmers. Photo: Peter Casier, CGIAR.

## Eastern Africa focus on cutting emissions, boosting productivity

While the emissions of African countries are low compared with industrialised countries, livestock generate a significant proportion of those emissions. However, there are significant uncertainties around the calculation of those emissions which ACIAR is working with partners to reduce.



Agriculture contributes on average one third of the gross domestic product (GDP) to eastern Africa's economy. About 70% of people in the region rely on agriculture for employment in an industry mainly dominated by smallholder mixed farming of food crops, livestock, cash crops, fishing and aquaculture, according to ACIAR's Africa Regional Manager Dr Leah Ndungu.

'Livestock in Kenya, Ethiopia and Uganda plays an important role in food security, livelihoods, income and GDP. With growing populations and incomes in much of this region there is an increasing demand for livestock products that is driving sector growth,' she says.

Dr Ndungu, who is based in Nairobi, Kenya, says at the same time most of the regional agriculture sector's emissions emanate from livestock and livestock-related activities.

'For example, in Ethiopia livestock GHG emissions—enteric fermentation, direct and indirect nitrous oxide and methane emissions from manure management—for 2013 were estimated to account for 47% of the nation's net GHG emissions,' says Dr Ndungu.

Dr Dawit Solomon, who leads the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in eastern Africa, says agriculture and climate change exhibit a feedback relationship.

'Agriculture is not only impacted by climate change, it also contributes to climate change, necessitating both adaptation and mitigation strategies by eastern African countries,' he says.

'In the region, there is a general understanding that achieving food and nutrition security as well as related economic, social and environmental targets requires decoupling agricultural growth from GHG emissions.

'It is also acknowledged that GHG emissions from the agriculture sector—both from crop and livestock—must, where possible, be reduced and opportunities to increase carbon storage in agricultural systems in soils and vegetation must be encouraged, in order to mitigate climate change and safeguard long-term agricultural productivity and human wellbeing.'

Dr Ndungu says Kenya, Ethiopia and Uganda have strong policy guidance and strategies for livestock sector adaptation but robust strategies of mitigation in the livestock sector have been limited.

ACIAR is supporting two projects that aim to improve the measurement, reporting and verification of GHG emissions from livestock, ultimately to support decision-making, planning and management by these countries' governments and private sectors. These projects are 'Introducing livestock modelling to the System for Land-based Emissions Estimation in Kenya (SLEEK)' and 'Building capacity for an integrated land use and livestock monitoring, reporting and verification system' in Ethiopia.

## INTRODUCING LIVESTOCK EMISSIONS MODELLING

SLEEK is a Kenyan Government program to develop a robust measurement, reporting and verification system.

The Australian Government provides funding for SLEEK as an Australian Aid program, funded by the Department of Foreign Affairs and Trade. The program is being implemented by the Kenyan Ministry of Environment and Forestry.

SLEEK's primary aim is to allow Kenya to accurately estimate and track its carbon emissions in the land sector, including forestry, agriculture and other land uses. SLEEK will also help put better information into the hands of farmers and communities.

Simon Roberts, a Senior Policy Officer with the Australian Government Department of the Environment and Energy, says the inclusion of livestock modelling will expand Kenya's ability to report on emissions beyond the initial focus of forests, croplands and grasslands.

Mr Roberts has spent years working with the Kenyan Government to develop the broader SLEEK model for land-based emissions modelling.

'Including livestock modelling provides a more complete picture of the emissions profile but also provides the Kenyan Government with the possibility of modelling different land management scenarios and assessing their impact from an emissions perspective,' says Mr Roberts.

'SLEEK is a program that aims to provide not only a means for Kenya to meet its international reporting commitments in relation to climate change, but also an opportunity to centralise environmental information and data to underpin land use planning policy objectives. The ultimate development goal of the program is to enhance



Livestock in Kenya, Ethiopia and Uganda plays an important role in food security, livelihoods, income and GDP. Understanding livestock GHG emissions is helping support in-country decision-making, planning and management in the livestock sector. Photo: Apollo Habtamu, ILRI.

national socio-economic development for the women and men of Kenya through sustainable land and natural resources management.'

ACIAR is currently funding a small area of research to design and test options to incorporate livestock emissions into the existing SLEEK model.

This project is a collaboration involving the New Zealand Agricultural Greenhouse Gas Research Centre; the University of Melbourne; the Kenyan Ministry of Agriculture Livestock, Fisheries and Irrigation; the Kenyan State Department of Livestock; and the Mullion Group, an Australian software and consulting company with expertise in greenhouse gas inventory systems for the land sector.

Mr Geoff Roberts, Mullion Group, is leading the project which will help move Kenya in its measuring and reporting of livestock emissions from the Intergovernmental Panel on Climate Change (IPCC) Tier 1 method towards a Tier 2 method.

A Tier 1 method requires the least information and is considered a base level way to estimate GHG emissions. Progressing to Tier 2 generally means an increase in certainty on the estimated GHG emissions, but the transition also involves more complex measuring and analysis.

'Livestock represent one of the largest sources of emissions in Kenya. At the moment they are using the Tier 1 method, which is basically the number of livestock multiplied by an emissions factor,' Mr Geoff Roberts says.

## KEY POINTS

- 1 East Africa's livestock sector plays an important role in food security, but it also contributes to greenhouse gas emissions.**
- 2 Many activities that reduce emissions from the livestock sector can also increase livestock productivity.**
- 3 With a better understanding of livestock sector greenhouse gas emissions, strategic choices can be made about livestock management to reduce emissions.**





'This means that if Kenya is going to reduce its livestock emissions, in simple terms, it has to reduce the number of livestock. This is a very blunt instrument for a country looking to develop its agriculture industry as well as reduce its emissions profile.

'By moving to the Tier 2 method it can access other policy and technical levers for reducing the emissions from livestock without necessarily reducing the number of livestock. Through having better information on land sector emissions, be it from agriculture or forests, we create more opportunities for national government, businesses and individuals to manage their impacts on the land sector.'

The team will build a module based on the IPCC Tier 2 methods for modelling enteric fermentation. This will be able to link the spatial data that is known about livestock numbers with statistical data to generate estimates of livestock emissions.

'By it being a database-driven module, we expect to reduce the effort needed to enter data and allow for a flexible system,' Mr Geoff Roberts says.

'We will also look at if and how a spatially explicit modelling framework could be built into the SLEEK system. This would allow remotely sensed data on feed availability to be directly incorporated into the model, which would greatly expand the utility of the modelling framework.'

The software will be released as open-source through moja global so others can use it.

Mr Geoff Roberts says the overall design is completed and the team is working on the software development and data collation. They aim to have the module developed and data collected by the end of this year and then train users on how to enter data and look at an improvement plan for the modelling framework as well as data. Mr Geoff Roberts says this approach means that as the data improves it can quickly be added into the model and run again.

'It will be a tool that supports continuous improvement, as SLEEK does.'

He says because many activities to reduce emissions from the livestock sector can also increase livestock productivity, there is a great opportunity for this project to benefit both the Kenyan Government and farmers.

## A CLOSER LOOK AT ETHIOPIA'S LIVESTOCK SECTOR EMISSIONS


With ACIAR support, the project 'Building capacities for an integrated land use and livestock measuring, reporting and verification system in Ethiopia' focuses on tracking Ethiopia's livestock emissions to identify low-carbon development pathways.

A unified and simple monitoring, reporting and verification system that integrates data management for livestock, agriculture, forestry and other land use is key for Ethiopia in enabling it to meet both national policy and international reporting requirements, says Dr Ndungu.

The project is drawing together the Ethiopian Government and other partners to develop robust systems for the measurement, reporting and verification of emissions from Ethiopia's livestock sector.

Tracking these emissions will streamline the livestock sector's reporting processes for Ethiopia's Climate Resilient Green Economy Strategy, which informs the country's commitments to the United Nations Framework Convention on Climate Change. This project will also provide input for Ethiopia as it moves its national GHG inventory towards a Tier 2 method.

CCAFS eastern Africa's Dr Solomon is leading this work. Partner organisations include the Ethiopian Ministry of Agriculture; the University of New England in Australia; Ethiopia's Environment, Forest and Climate Change Commission; the Global Research Alliance on Agricultural Greenhouse Gases; and international consultancy UNIQUE forestry and land use.

Through the project, the partners aim to identify opportunities for substantial emissions reductions and develop a roadmap for achieving an increasingly low-carbon livestock sector. 

**ACIAR PROJECTS:** Introducing livestock modelling to the System for Land-based Emissions Estimation for Kenya (SLEEK), LS/2018/202, and Building capacity for an integrated land use and livestock monitoring, reporting and verification system, LS/2018/205.

# Internships capture project opportunities

A new capacity-building program is recruiting PhD and masters students studying at Australian universities and business schools to tackle issues and opportunities emerging from ACIAR projects and to promote new career options.

'Through the internships we are trying to interest students studying in Australia in international agricultural research as a career, particularly in areas where people may not think about this as an option—the traditional MBA [Masters in Business Administration] student, for example,' says Eleanor Dean, General Manager Outreach and Capacity Building at ACIAR.

'Already we've seen new career options open up for our interns.'

Each three-month internship must address a new research question that does not duplicate current activities in the ACIAR host project. The outcomes of the internship should complement and assist that project. Each internship includes a four- to six-week period in-country, offering real-world experience to graduates. Opportunities for the student to work with local partners and the community are strongly encouraged.

Originally designed to attract students with business, marketing and finance skills to work with ACIAR agribusiness projects, the program has now been extended to any ACIAR project that can make a case for an internship based on the need for new or additional skills. Gender-related issues are also included in the scope. Following a successful trial in 2017, nine internships are complete or near completion, and up to eight further internships will be offered in 2019–20.

'The internships are not for someone just starting their academic career—they are aimed at post-graduates looking to do a really unique piece of professional development,' says program coordinator Anwen Lovett.

To date, the internships have attracted very high-quality students so it's a real opportunity for ACIAR

project leaders. We are fitting new talents and new skillsets into ACIAR projects that would not otherwise have been there.'

In 2018–19 the internships addressed issues in women's engagement in agriculture in Pakistan, integrated pest management in Cambodia, and agribusiness in Vietnam, Myanmar and the Pacific islands.

A budget of up to \$19,000 is available for each internship, administered through the student's institute.

'We encourage our Australian commissioned organisations to reach out to ACIAR project leaders to investigate opportunities for their students,' says Ms Dean.

'And we encourage ACIAR project leaders to think about how a highly talented and skilled intern could add value to their project.'

## KEY POINTS

- 1** New career opportunities are opening up for students studying in Australia who undertake an internship in international agricultural research.
- 2** Students from different backgrounds—not just traditional areas of agricultural research—are being encouraged to participate, such as those studying Masters in Business Administration.



1. MBA student Hsu Tun completed her ACIAR internship with Yoma Bank, Myanmar, focusing on developing finance for different player along the sesame and peanut value chain. 2 & 3. Ms Tun interviewing sesame and peanut wholesalers and retailers in Myanmar.

## BUILDING LINKAGES WITH MYANMAR'S FINANCE SECTOR

Originally from Myanmar and with experience in microfinance for farmers, Hsu Mon Tun is completing her MBA at the Melbourne Business School. Her ACIAR internship took place in her home country with Yoma Bank, a commercial bank at the cutting edge of expanding access to finance for agriculture in Myanmar. Looking specifically at the sesame and peanut industries, Ms Tun's project

focused on developing finance for different players along the value chain.

After interviewing farmers, input dealers, traders, wholesalers, processors and exporters—and conducting her own value chain analysis—Ms Tun developed recommendations for Yoma Bank on specific features of loans for all members of the oilseed value chain.

'Providing finance to smaller players in the value chain, such as input suppliers, can result in a

higher profit margin for everyone, including the smallholder farmers,' says Ms Tun.

'Groundnut and sesame are the major oilseed crops in Myanmar, with oilseed making up about 20% of Myanmar's agriculture sector, so raising profits for the smaller businesses can have a big impact.'

Ms Tun's recommendations were received positively and the bank has indicated it will trial her proposed product later this year.

'Working with people from across the value chain has allowed me to see the bigger picture of agriculture in Myanmar,' says Ms Tun.

'Exposure to the finance sector, the strong networks I have built and Yoma Bank's positive reaction to my recommendations have increased my confidence and, I hope, my future career prospects.'

The internship is part of the ACIAR project 'Inclusive Agricultural Value Chain Financing'. Dr Russell Toth, a senior lecturer in the School of Economics at the University of Sydney, is the co-Chief Investigator and Leader of Activities in Myanmar.

'Business schools are very keen to offer students real learning experiences outside the classroom,' says Dr Toth.

'Through her project, Hsu had the opportunity to tackle a pretty ambitious project. She has gained valuable experience—it's not often that interns would be responsible for developing new loan products for a bank.'

Dr Toth also supervised Mr Mark Middleton, a previous ACIAR intern from the University of Queensland Business School who completed a project with Yoma Bank in 2017. According to Dr Toth, both internships brought significant value to the ACIAR host project, in terms of building relationships and goodwill with private-sector partners.

'There are not a lot of natural connections between ACIAR and the finance sector. The internships created understanding and opened up the bank to opportunities arising from research and testing.'

'I was very impressed by the quality of the candidates that ACIAR was able to recruit to both internships I have been involved with. They brought substantial work experience to the project, along with their business school training, so were able to operate very independently.'

'I think it's a real value-add of the program that ACIAR can source interns from across a number of business schools in Australia, as that allows for the best possible matching of talent to opportunity.'

## WINS FOR FARMERS AND INSECTS IN CAMBODIA

University of Sydney PhD candidate Lucinda Dunn is undertaking an ACIAR internship on the development of sustainable insect pest management methods for Cambodian rice farms. Ms Dunn is a biologist with a strong interest in ecology and entomology.

Ms Dunn's internship involves carrying out field research to identify and measure pest insects and their natural enemies, and surveying smallholder farmers in the Battambang province about pest management. She is working in collaboration with the International Rice Research Institute (IRRI), the University of Battambang and the Provincial Department of Agriculture.

'The surveys have uncovered some really valuable information,' says Ms Dunn.

'For instance, farmers think all insects are bad and don't understand that some 'natural enemies' actually eat the insect pests which damage the rice crop. This means farmers may be using insecticides unnecessarily which can damage the ecosystem, add input costs and increase health risks to themselves and their families.'



ACIAR intern and PhD candidate Lucinda Dunn is helping develop sustainable insect pest management methods for Cambodian rice farms.



'Sharing knowledge about the good insects will inform farmers' decision-making on pest management. The farmers are very interested and want to get the best results for their crops.'

In terms of personal and professional development, Ms Dunn says she could probably 'list a thousand' things she had learned as a result of the internship.

'I am learning a lot about communications, especially when there is a language barrier,' she says.

'I've also learned about experimental design, planning and teamwork—and patience. Plans often need to be changed when you are doing field work.'

Networking opportunities have also been very good, she says. Ms Dunn has met with senior researchers from a number of institutes, and bureaucrats from the Cambodian government and NGOs.

'I'm also getting some really nice data that can help the ACIAR host project, and can contribute to science,' says Ms Dunn.

'I would recommend anyone considering a career in science take up an opportunity like this.'

Associate Professor Daniel Tan leads the ACIAR host project which focuses on sustainable intensification and diversification in the lowland rice system in north-west Cambodia.

'Lucinda's project provides an excellent case study on how we can work with smallholder farmers,' said Associate Professor Tan.

### 2018-19 interns

- **Susannah Harvey-Jamieson, University of Queensland:** Evaluating business cases for pro-poor value chain development through cassava value chain actors in Dak Lak and Son La provinces of Vietnam
- **Deigh Oakes, University of Canberra:** Assessment of women's empowerment through new adult learning models in Pakistan
- **Manoj Kumar, University of Adelaide:** Understanding and mitigating risks for Pacific Islands Agribusiness
- **Lucinda Dunn, University of Sydney:** Development of sustainable insect pest management methods for Cambodian rice farms
- **Hsu Mon Tun, Melbourne Business School:** Inclusive agricultural value chain financing (IFS4Ag), Yoma Bank Myanmar
- **Amarachi Nnah-Ogbonda, Melbourne Business School:** Sustainable funding models for farmer organisations in the Pacific islands
- **Praveen Karunambaran, University of Queensland:** Business development planning for community pearl culture enterprises in Fiji



A seed dressing workshop for farmers in Svay Cheat village, Cambodia—part of Ms Dunn's internship research. Photo: Lucinda Dunn

'It demonstrates how we can engage with farmers to understand their practices, find out what they need, and share information that will improve their livelihoods.'

'Through the internship, Lucinda is making an impact. She is delivering useful science as well as helping people and the environment. It's win-win.'

For more information, contact program coordinator Ms Lovett at [anwen.lovett@gmail.com](mailto:anwen.lovett@gmail.com). 🌱



# Maize-legume project a double win in Africa

Instead of carrying out the back-breaking work of hoeing a field by hand in preparation for sowing, an estimated 484,000 farmers across seven countries in eastern and southern Africa have adopted reduced tillage, cutting their time spent in manual labour by half while increasing farm labour productivity, food production and household income.

These are tangible outcomes of the nine-year, \$40 million 'Sustainable intensification of maize-legume cropping systems for food security in eastern and southern Africa' (SIMLESA) project that concluded in October 2019.

The wide-ranging project sought to help create more productive, resilient, profitable and sustainable maize-legume farming systems in Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania and Uganda. It aimed to increase food security and farm incomes and help reverse soil fertility decline, particularly in the context of climate variability and change.

Maize and beans are the staple crops of Africa, providing the main source of carbohydrates and protein, respectively. However, yields are typically low and farmers producing these crops operate in highly variable climates with high rainfall seasonality.

'They have medium to high levels of climate variability, and they are extremely vulnerable to that variability,' says Dr Daniel Rodriguez, an Australian contributor to SIMLESA and Professor of Agronomy and Farming Systems, University of Queensland. 'They are also highly risk-averse because they have very few assets, they are



Yield increases of up to 37% in maize and legume crops were achieved by African farmers through SIMLESA's focus on conservation agriculture-based sustainable intensification practices. Photo: Apollo Habtamu, CIMMYT.



cash constrained and they have very limited or no formal support from central governments or local institutions.'

To help, the project set the ambitious goal of increasing yields by 30% and reducing seasonal downside production risks by 30% for farmers in the target countries. To do this it sought to understand, test, adapt and support the adoption of conservation agriculture-based sustainable intensification practices for maize–legume systems, such as minimum tillage and mulching. It also supported the uptake of improved maize and legume varieties bred to perform well under conservation agriculture management. Combined with work to create enabling extension, research, market and policy environments, the project was highly participatory and involved multiple disciplines and collaborations in a farming systems research approach.

## AN INTEGRATED SOLUTION

'SIMLESA was a complex project, not only because of the complexity of the problem we undertook; it was also complex because we addressed multiple challenges in close collaboration with participating farmers and NARES [national agricultural research and extension systems], in multidisciplinary international teams, chasing system level outcomes,' says Dr Rodriguez.

'We need to move away from research for development projects that deal with small problems or single disciplines or commodities. Addressing small disciplinary problems in isolation

from other components in the system, and institutional or structural constraints will never achieve large impacts. This has been one of the most important lessons for policy and donors from SIMLESA.

SIMLESA had a team of socio-economists, plant breeders, soil scientists, systems researchers, agronomists, gender specialists and innovation platform scientists. Dr Rodriguez says this created an integrated approach that supported innovation and making connections between farmers, markets and institutions. The approach seems to have paid off.

After successful implementation of the first phase (2010–13), the program was extended for four years (2014–18) to increase the number of people adopting sustainable intensification technologies, which the first phase initiated and tested, and to advocate to government changes that could support adoption. The second phase also covered crop–livestock interactions to deal with some of the trade-offs between cropping and livestock activities in the use of crop stubble.

In 2019, the final year of the project, work focused on consolidating the project's research, communicating results and capturing lessons learnt. An impressive suite of achievements across research, seed systems, adoption, scaling and capacity-building has been reported.

Forty new maize and 64 new legume varieties have been released, 58 innovation platforms have been established, 65 post-graduate students have been supported, 19 partners have been selected to drive scaling-out initiatives, 57 policy briefs and 135 journal articles have been published, and a regional policy summit has been held.

At the farm level, the results have been positive, too. Over the eight years of the project the adoption of at least two conservation agriculture practices (within a 20km range of SIMLESA sites) increased an average of 3% per year—roughly this means that each year an additional 14,050 new farmers adopted these technologies. The impact of this adoption rates could be related to yield increases of 4–6% per year across the region, which compares to recently reported Australian increases in crop productivity of about 1.2%.

For project leader Dr Paswel Marenya at CIMMYT (the International Maize and Wheat Improvement Centre), these on-farm results are possible only

### KEY POINTS

- 1** 484,000 farmers in eastern and southern Africa have adopted at least one conservation agriculture practice as a result of the SIMLESA project.
- 2** The SIMLESA team has made recommendations for ongoing work in conservation agriculture in Africa to build on the project's impact.



Dailless Kasawaka, a farmer at Kasungu, Malawi, credits the conservation agriculture practices she has adopted with producing her higher maize yields. Photo: Peter Lowe, CIMMYT.



Forty new maize varieties were released through SIMLESA, helping farmers get access to resilient and productive varieties suited to conservation agriculture. Photo: Apollo Habtamu, CIMMYT.

when an integrated approach is taken. The many challenges and obstacles facing African farmers can't be solved with a single solution or approach, he says.

'You need the system itself to move,' says Dr Marenya. 'And you can't have systemic change if you only pick one element and run with it, because then you're blind to the other aspects. So that integrative view of the challenge has been a key factor that has contributed to SIMLESA's impact.'

The impact of the project on one farmer in particular stays with Dr Marenya: the case of 71-year-old Dailless Kasawaka at Kasungu, Malawi.

'I like her story so much,' says Dr Marenya. 'Without any social security support as would be typical in advanced economies, she adopted new farming practices which she credits for allowing her to stay on her farm and continue farming.'

Mrs Kasawka's experience is captured along with those of 12 other farmers in the book about SIMLESA's impact titled *Lead Farmers*. In it she is cited as saying, 'Now I harvest even more maize than I did then. I also grow soybean, which I use for making porridge and sell for a good profit to earn money for other household needs. Soybean is a very profitable crop.'

'I also don't need to do as much heavy work with the hoe—that's good for me, since in the past farming was a painful job—so I don't get as tired as I used to and can continue working on my farm. I wouldn't be able to manage to farm like I do today if I was still using the old methods.'

## REACHING POLICY LEADERS

Achieving results for farmers and ensuring an enduring system that supports them means affecting change at the policy level, too. As part of the project's strategy to engage with national leaders and provide policy support, the team coordinated a series of policy events in participating countries.

'In each country we had a more local policy event at the district level, then later on a policy event at the national level,' says Dr Marenya. The events involved ministerial-level representatives and director generals of national research institutes discussing SIMLESA's work and sharing knowledge.

These national meetings culminated in a regional meeting of ministers of agriculture from Burundi, the Republic of the Congo, the Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, South Sudan, Sudan, Tanzania, Uganda, Malawi and Mozambique.

The meeting concluded with the ministers signing the 'Joint Communique: Repositioning ASARECA for Accelerated African Agricultural Transformation' in which they agreed on the key principles for conservation agriculture sustainable intensification that came out of SIMLESA. 'We thought this was an apex achievement,' says Dr Marenya.

Moreover, there are moves for the communique to be tabled at the African Union. 'The fact it has reached that level to be nominated for discussion, I think, is an achievement,' he adds.





## TAKING LESSONS FORWARD

One book has already been published as a result of the project 'Understanding household diversity', and another is in production. Also, when finalised, the final report from the project will be published on the ACIAR website. In it will be summarised a series of recommendations to build extension services, support community-based groups and learning hubs, foster development of the private sector, support rural market development innovators, and consider farmers' collective action at various points along the value chain.


'Farmers need to be linked to markets in a cost-effective manner. That's one lesson,' Dr Marenja says. 'If farmers are going to improve their production, they need to see clear incentives for doing so.'

'Also, the successes that we had were linked to the fact extension departments participated in the project. Getting extension systems to really be there for farmers delivering information is very important.'

Other recommendations—identified through broad consultation with NARES and governments—include strengthening research and knowledge management systems of sustainable intensification, supporting effective ways to facilitate social learning, using digital tools, engaging with the private sector and carrying out ongoing capacity building. Both weed management without pesticides and integrating livestock and crop diversification were also identified for inclusion on the future research agenda.

So, while there are more opportunities left to pursue to transform Africa's crop-livestock farming

systems, SIMLESA has already forged some important pathways to impact. From farmers in Malawi in the south to Ethiopia in the north, and to Africa's leaders, SIMLESA's reach has been deep and far, demonstrating the value of people working together in an integrated farming systems approach. Dr Marenja sums it up: 'It is doable—through collaboration, pooling resources and sharing lessons from SIMLESA.'

For more information visit [simlesa.cimmyt.org](http://simlesa.cimmyt.org) and for the comprehensive final report on the project visit [aciarc.gov.au](http://aciarc.gov.au). 

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

### Achievements

- 40 new maize varieties released
- 64 legume varieties released
- 58 innovation platforms established
- 19 partners selected to drive scaling-out initiative
- 1 regional policy summit held
- 57 policy briefs published
- 484,000 farmers adopted maize-legume sustainable intensification technologies



Regional leaders and national representatives from 14 African countries met in April 2019 in Uganda and agreed on the key principles for conservation agriculture sustainable intensification that came out of SIMLESA in support of accelerated agricultural transformation in the region. Photo: CIMMYT.



## Regional Roundup

### BANGLADESH

ACIAR is nearing the final stage of completing the ‘ACIAR-Bangladesh Research Collaboration Strategy 2019-2028’, with the final consultation meeting held in Dhaka in November. The meeting was attended by participants from the government, national research institutions, universities, NGOs, private sector, CGIAR centres and other international agriculture organisations working in Bangladesh who are developing the strategy to set the priorities for ACIAR and Bangladesh research collaborations.



Consultation for the development of the ‘ACIAR-Bangladesh Research Collaboration Strategy 2019-2028’.

### PHILIPPINES

In October, the ACIAR Country Office in the Philippines launched the storybook ‘G’day Mate: ACIAR Filipino Alumni Stories’ and associated video interviews. They showcase Filipino scientists and researchers who have completed either the John Allwright Fellowship or the John Dillon Fellowship. The fellowships provide learning opportunities in Australia for both aspiring Filipino scientists and Filipino agricultural professionals. During the 35 years of partnership with the Philippine Government, 67 Filipinos have completed a fellowship with ACIAR.



The launch of the storybook and video showcasing Filipinos who have completed fellowships with ACIAR.

### PAPUA NEW GUINEA AND THE PACIFIC REGION

Pacific Week of Agriculture 2019, held in Samoa, was a key focus for ACIAR and its partners in the region—more information about the event is reported on page 8 of this issue.

In October ACIAR attended the Unitech Post Graduate Student Research seminar in Lae, Morobe Province, Papua New Guinea (PNG). The event attracted heads of key PNG institutions and the private sector and provided an opportunity to showcase student research. ACIAR facilitated a technical session on community and development studies.

ACIAR also attended the 58th Annual Morobe Show in Lae with a theme of ‘be productive, grow something’. It drew together agricultural stakeholders, allowing ACIAR to meet and engage with the key agricultural institutions, the private sector and the public to showcase ACIAR’s work in Morobe Province.

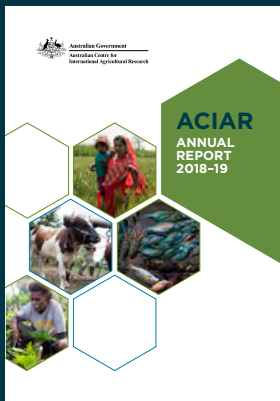
The inaugural Institutional John Dillion Fellowship (IJDF) cohort of fellows completed a three-day workshop in Kavieng, New Ireland Province, PNG—the last workshop of the group’s three-month program. Fourteen Papua New Guineans and two Samoans from the Pacific Community (SPC) attended and received their completion certificates. The IJDF targets emerging leaders in research organisations that work in partnership with ACIAR to strengthen their capacity in agricultural research. 🌱



ACIAR PNG Country Manager Doreen Iga (left) talks about the work of ACIAR’s research partnership in PNG at this year’s annual Morobe Show with Benson Birau (centre) Darusila Virginia (right).



# Get to know ACIAR better



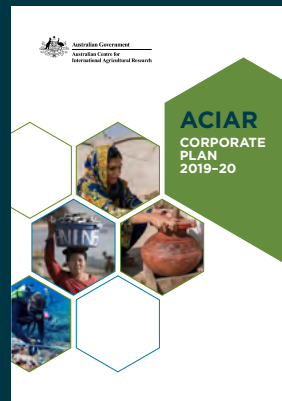
## ACIAR ANNUAL REPORT 2018-19

The ACIAR Annual Report 2018-19 summaries ACIAR's achievements, activities and investments from July 2018 to June 2019. It shares case studies of ACIAR-brokered research and evaluates progress towards ACIAR's strategic outcomes.



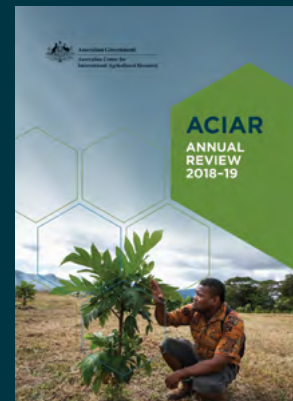
## ANNUAL OPERATIONAL PLAN 2019-20

The Annual Operational Plan describes our intended work program throughout the Indo-Pacific region during 2019-20 year. It explains the context and priorities of our program areas, and describes our partnerships and projects.



## ACIAR CORPORATE PLAN 2019-20

The ACIAR Corporate Plan 2019-20 outlines ACIAR's aspirations and direction for the next four years. Through partnerships, it aims to continue to grow the knowledge base for agricultural research-for-development, and in turn, improve livelihoods of smallholder farmers and fishers in the organisation's partner countries.



## ACIAR ANNUAL REVIEW

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



**ACIAR**

**Australian  
Aid** 

The Australian Centre for International Agricultural Research (ACIAR) is part of Australia's international development cooperation program. Its mission is to achieve more productive and sustainable agricultural systems for the benefit of developing countries and Australia. ACIAR commissions collaborative research between Australian and developing-country researchers in areas where Australia has special research competence. ACIAR also administers Australia's contribution to the international agricultural research centres.