



partners

IN RESEARCH FOR DEVELOPMENT

Communities
improve fisheries
management

— PAGE 7

Greenhouse-
grown crops

— PAGE 10

Composting
for improved
nutrition

— PAGE 25



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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IN THIS ISSUE

- 1 From the CEO
 - 2 Events
 - 3 Food security: challenge is changing human habits
 - 7 Compost recipe gives Pacific island countries a nutrient boost
 - 10 Greenhouse-grown crops open doors to high-value markets
 - 14 Accessible weather forecasts, advisories key to PNG farm resilience
 - 18 Genetically superior whitewood a useful tree for Vanuatu
 - 21 Communities help themselves to improve fisheries management
 - 24 Rich learning makes research graduates world-ready
 - 26 Strengthening institutions and individuals
 - 28 Regional Roundup
-

Front cover: Leah Apon cooks fish in Vanuatu (see page 21).
Photo: Dirk Steenberg, University of Wollongong.

Back cover: Tomatoes on sale in a market in Nadi, Fiji.

FROM THE CEO

Professor Andrew Campbell



In this issue of *Partners* we focus on the Pacific in celebration of the upcoming Pacific Week of Agriculture in Samoa. We cover topics as diverse as composting to improve atoll soils, to better weather forecasts and advisories to help farmers plan for climate variability.

Our commitment to the Pacific reflects our role in the Australian Government's effort to step-up its engagement in the region that Australia's Prime Minister Scott Morrison spoke of at the recent Pacific Island Forum in Tuvalu in August.

In his statement about the forum, Prime Minister Morrison acknowledged the threat climate change posed to the Pacific and Australia's commitment to help. 'The Pacific is our home, which we share as a family of nations. We're here to work with our Pacific partners to confront the potential challenges they face in the years ahead,' he said.

We have a long history of research in the region spanning agriculture, forestry and fisheries projects, all focused on securing a better future for Pacific Islanders. I'm looking forward to seeing some new initiatives start on climate change mitigation and adaptation. A couple of examples include research to improve plant biosecurity and the genetic diversity of coconuts to ensure their long term resilience as temperatures rise.

ACIAR also supports capacity building and, in July, launched a new program to develop the capacity of research organisations in the Pacific, through furthering professional development and strengthening institutional linkages to Australia.

The first Institutional John Dillon Fellowship (iJDF) involves 15 fellows from organisations across Papua New Guinea, including the National Fisheries Authority, National Agricultural Research Institute (NARI), University of Technology, Science and Technology Secretariat and the Autonomous Bougainville Government's Department of Primary Industries, as well as regional partner the Pacific Community (SPC).

This new 'institutional' version of the John Dillon Fellowship will help interconnected organisations develop innovative solutions to contemporary challenges in the agricultural research sector. It combines a range of capacity building approaches, including in-country mentoring and professional development workshops with industry visits and networking opportunities.

ACIAR again supported the annual Crawford Fund Parliamentary Conference on food security held in Canberra in mid-August, with the theme this year being 'weathering the perfect storm: addressing the agriculture, energy, water, climate change nexus'. It was my pleasure to moderate the lively question and answer session which followed an authoritative keynote address by the eloquent Professor Sir Charles Godfray, Director of Oxford University's Martin School. Key themes across the conference program challenged delegates to continue increasing food production while improving environmental sustainability and mitigating climate change.

It was a pleasure to host our country and regional office managers and staff for a week of capacity building, workshops and networking in Canberra at the end of August. Despite the contrast of Canberra's winter with the warmer climes most attendees had left, everyone enjoyed an extremely productive and successful week together. 🌱

EVENTS

30 SEPTEMBER–4 OCTOBER

2ND PACIFIC WEEK OF AGRICULTURE

Apia, Samoa

This event will be held in partnership with the Pacific Community (SPC) and the United Nations Food and Agriculture Organisation (FAO). It will comprise an intensive week of meetings, workshops and displays under the theme 'Enhanced partnerships for sustainable agriculture and forestry systems in the Pacific'. It will also include a special session of the Heads of Agriculture and Forestry Services (HOAFS) and the regional meeting of the Ministers of Agriculture and Forestry (MOAF).
pwasamoa2019.ws

8–11 OCTOBER

5TH GLOBAL SCIENCE CONFERENCE ON CLIMATE SMART AGRICULTURE

Bali, Indonesia

Hosted by CCAFS—the CGIAR Research Program on Climate Change, Agriculture and Food Security—together with ACIAR and the Indonesian Government the conference is the key global forum for scientific exchange to underpin climate smart agriculture implementation. This year's theme is 'transforming food systems under a changing climate' and is being held in Asia for the first time this year.

globalcsaconference.org

11–13 NOVEMBER

TROPAG 2019: INTERNATIONAL TROPICAL AGRICULTURE CONFERENCE

Brisbane, Australia

TropAg 2019 will focus on 'Shaping the science of tomorrow' and include five program themes across field crops, horticulture, livestock, nutritious food and an AgFutures stream focused on technology and investment. The conference attracts researchers, growers, investors, industry, policy makers and agribusiness.

tropagconference.org

13–14 NOVEMBER

9TH CGIAR SYSTEM COUNCIL MEETING

Chengdu, China

The CGIAR System Council is the strategic decision-making body of the CGIAR System that keeps under review the strategy, mission, impact and continued relevancy of the System as a whole. This meeting will be hosted by the Chinese Academy of Agricultural Sciences (CAAS).

cgiar.org




ACIAR is awarded the Vietnam Government's Friendship Order. (l-r) Outgoing Australian Ambassador to Vietnam Craig Chittick; ACIAR CEO Professor Andrew Campbell; Australian Government Minister for Foreign Affairs, the Hon Marise Payne; and Deputy Prime Minister and Foreign Minister of Vietnam H.E. Pham Binh Minh.

ACIAR AWARDED VIETNAM'S FRIENDSHIP ORDER

On 12 June 2019, the Vietnam Government awarded its Friendship Order to ACIAR—the country's most prestigious award for foreign organisations. The Order was nominated by the Vietnam Academy of Agricultural Sciences (VAAS) for ACIAR's significant contribution to Vietnam's agricultural sector.

The award, presented by Vice Minister of Agriculture and Rural Development, His Excellency Nguyen Hoang Hiep, recognises more than 25 years of collaboration and partnership between ACIAR and the Vietnamese Government, which has resulted in the significant development of Vietnam's agricultural sector and improved the lives and incomes of rural Vietnamese people.

Since 1993, ACIAR has invested A\$105 million in 175 projects across six key research areas: agribusiness, fisheries, forestry, livestock, soil and land management, and water and climate change. As well as contributing to the strong and sustainable development of agriculture in Vietnam, these projects have also greatly enhanced the country's research capacity. 



Sir Charles Godfray: Calling for a green revolution on the demand side, Professor Sir Charles Godfray suggested that if we care about reducing the effects of agriculture on greenhouse gas emissions, we also need to think about diet change. Photo: Patrick Cape, ACIAR.

Food security: challenge is changing human habits

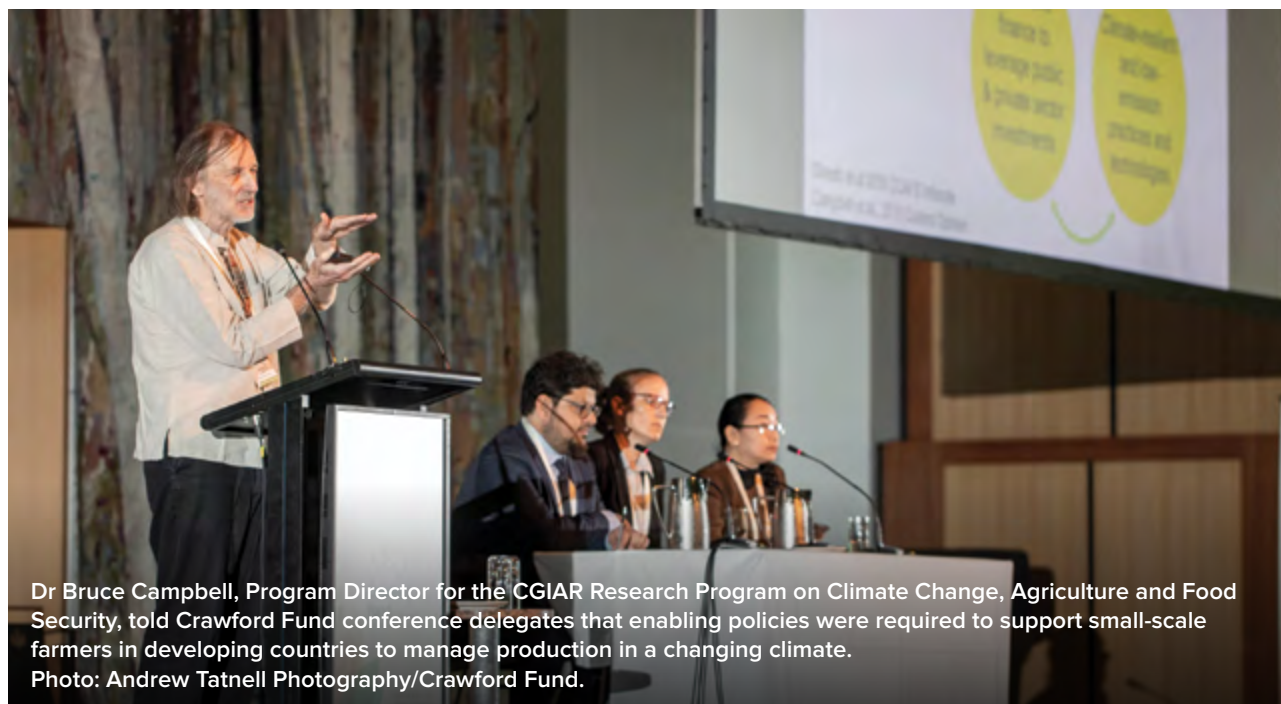
The challenge was posed as researchers addressed the agriculture, energy, water and climate change nexus at The Crawford Fund's 2019 conference, 'Weathering the perfect storm', in Canberra, Australia, in August.

The conference heard that the projected 70% increase in demand for food globally by 2050 would be accompanied by a 28% increase in demand for water and a 38% increase in demand for energy. Current agricultural practices produce 14% of total greenhouse gas emissions globally.

A week earlier, the *Special Report on Climate Change and Land* (SRCCL) from the Intergovernmental Panel on Climate Change (IPCC) concluded that keeping global warming to well below 2°C could be achieved only by reducing greenhouse gas emissions from all sectors, including land and food.

However, the modest uptake of technology, science and practices for growing food under a changing climate indicated the food production system is not yet ready to meet the 'massive' challenge.

'Current agricultural technologies can only achieve 20–40% of what is needed by 2030,' said Dr Bruce Campbell, Program Director for the CGIAR Research Program on Climate Change, Agriculture and Food Security, who cited research showing that 11–21% of small-scale farmers across Africa, Asia and Latin America were 'stepping up' to the challenge of changing their practices.



Dr Bruce Campbell, Program Director for the CGIAR Research Program on Climate Change, Agriculture and Food Security, told Crawford Fund conference delegates that enabling policies were required to support small-scale farmers in developing countries to manage production in a changing climate. Photo: Andrew Tatnell Photography/Crawford Fund.

‘None of the changes required in agricultural production to make a positive impact on food production and the environment will happen without the right policies and institutions,’ Dr Campbell told the conference.

So, what will it take to transform the food production system to manage climate change?

According to Dr Campbell, there is a five-step pathway to such a transformation:

1. establishing climate-resilient and low-emission practices and technologies
2. using innovative finance to leverage public and private investments
3. reshaping supply chains, food retail, marketing and procurement
4. empowering farmer and consumer organisations, women and youth
5. delivering and facilitating the use of digitally enabled, climate-informed services.

At the centre of this ‘change strategy’, as Dr Campbell called it in his keynote presentation, ‘Weathering and halting the perfect storm’, were the policies and institutions that would enable this transformation.

‘Farming as we know it will not be feasible in many places by 2090. This is a massive adaptation and mitigation challenge. It’s why I’m

calling for a transformation to our food systems,’ said Dr Campbell.

‘Success under a changing climate must go way beyond business as usual. Tens of millions of [small-scale] farmers [in developing countries] need help and incentives to manage the changing climate.’

However, scientists and policymakers needed to get together before policy incentives for farmers could be built, said Dr Jim Woodhill, Food Systems Adviser for the Sustainable Development Investment Portfolio with the Australian Department of Foreign Affairs and Trade.

‘The framework between science and policy to build the incentives required to reduce the environmental impact and emissions created by agricultural production is not in place,’ said Dr Woodhill.

He said incentives and policies must be tailored for specific sub-groups of farmers, especially small-scale farmers. Farmers should not be treated as a homogenous group, he said.

‘There are different scales, different sizes, men, women, and different geographic locations, so we have to disaggregate who we are talking about when we use the term “small-scale farmers” to understand what sort of incentives

are going to drive changes to practices,' Dr Woodhill said.

'The next decade is going to need a fundamental transformation of small-scale agriculture in order to meet some of the environmental and social issues we need to address.'

These small-scale farmers, however, should not be the sole focus of the international agricultural research and development community, according to Dr Lini Wollenberg of the University of Maine, USA.

Speaking at ACIAR a day earlier, Dr Wollenberg said efforts by small-scale farmers to mitigate climate change 'won't cut emissions much'.

'Working with smaller, vulnerable landowners [in developing countries] is not necessarily the answer, but working with bigger farmers and cooperatives in the big-emitting countries is,' said Dr Wollenberg.

'Four countries—Brazil, China, India and the USA—plus the European Union produce 50% of agriculture's emissions. In scaling up low-emissions development in agriculture, the countries targeted matter.'

Regardless of which type of farmer the research-for-development community is working with—and in which country—farmers need commercial incentives to use new technologies to grow food.

'What we need are the right business models and the right kinds of loans that banks can provide. It's not a matter of subsidies; it's a matter of re-orienting financial flows into this sector,' Dr Ajay Mathur, Director-General of The Energy and Resources Institute, told the Crawford Fund conference.

Using solar energy to pump water was raised by both Dr Mathur and Dr Campbell as an example of a practice small-scale farmers in India and Africa (where 5% of cropland is irrigated, compared to the global average of 20%) could use to mitigate the risk of climate change. When a farmer chose to sell excess energy back into a local grid for other farmers to use, solar-powered irrigation became a 'remunerative crop,' said Dr Campbell. But a business model still needed to be developed to make solar power and

renewable energy the more viable solution for farmers on a bigger scale, Dr Mathur said.

Implementing interventions—be they policy, social or commercial—does not appear to be a barrier to scaling up science-based climate adaptation and mitigation practices, with researchers showing confidence in well-established participatory processes with farmers in developing countries.

'Participatory approaches in research help build trust among diverse stakeholders—it's been the key to the implementation of interventions in building Climate Smart Villages in South-East Asia,' said Professor Alice Joan Ferrer, University of Philippines Visayas, Philippines, who gave examples of how climate-smart agriculture was being integrated into existing farming systems to transform smallholder farming food systems in Laos, Vietnam and the Philippines.

So, while a lack of political will is one risk inhibiting the contribution of agricultural research and development to building food security under a changing climate, another major issue is consumerism.

In his keynote address to the conference, 'Can we feed the world without wrecking the environment?', Professor Sir Charles Godfray,

KEY POINTS

- 1 Current agricultural technologies alone will not be enough to meet future global food requirements.
- 2 Incentives and policies are required to help small-scale farmers adapt to climate change.
- 3 ACIAR's new climate change research program will continue to build agriculture's capacity in developing countries.

Director of the Oxford Martin School, Oxford, UK, highlighted the impact increasing meat consumption would have on food systems and human health.

‘Eating a healthy diet as prescribed the World Health Organisation (WHO) will result in 5.1 million fewer deaths per year by 2050, with most of these lives being saved in the developed countries,’ Professor Godfray said.

‘We need a green revolution, again, and the revolution has to be not only on the supply side, as the industrial revolution and the green revolution were, but also on the consumption and demand side.

‘With “business as usual” we expect greenhouse gas emissions to increase by about 50% by mid-century. By just making a dietary shift [as recommended by WHO] the increase goes from 50% down to 7%.

‘If we care about reducing the effects of agriculture on greenhouse gas emissions, the single thing we really need to do is to think about diet change.’

However, reducing the impact of agriculture on the environment is not as simple as having more meat-free days. Greenhouse gas emissions from red meat production could be reduced through better land management, input-use efficiency and carbon sequestration, said Dr Di Mayberry, a Senior Research Scientist at the CSIRO. Also, livestock production was critical for livelihoods in low-income countries, said Dr Mayberry, and although epidemiological data indicated healthy diets contained more fruits and vegetables, growing these foods was water-intensive, Professor Godfray added.

According to Sarah Barker, Special Counsel for Climate Risk Governance at law firm Minter Ellison, who gave the closing keynote address of the conference, financial and legal risks were driving the business response to climate change. Policy makers and consumers needed to catch up.

Despite the community’s concern for environmental issues, led mainly by millennials,

the response of consumers to climate change was yet to be driven in the way business had been, she said.

Ms Barker said a raft of policy and regulatory shifts—including carbon taxes and national policies that set emissions, and renewable energy targets inspired by the Paris agreement on climate change—were forcing responses in the corporate world that were yet to be seen in the community.

‘Trying to convince the “global north” [consumers] that they need to reduce their share, with human nature being as such I don’t think it will ever happen unless it is forced,’ Ms Barker said.

ACIAR is doing its part by ensuring climate change is front and centre of its research projects. Articulated in its 10-year strategy is an objective focussed on ‘managing natural resources and producing food more sustainably, adapting to climate variability and mitigating climate change’.

This recommitment builds on ACIAR’s long history of research and work to help its country partners—including smallholder farmers—adapt to climate change. New research supported by ACIAR will add to this with projects now covering climate change mitigation as well.

This aligns well with the priorities of ACIAR’s partners—particularly in the Pacific. At the Pacific Island Forum held in August this year, leaders ‘reaffirmed climate change as the single greatest threat to the livelihoods, security and wellbeing of the peoples of the Pacific’.

Beyond the Pacific, ACIAR’s most important multi-lateral partner is CGIAR—including CCAFS. Adopting a pathway to transform food production and move to climate-smart agriculture—as proposed by CCAFS’s Dr Campbell—can only be achieved with many different partners, each doing their part, from helping smallerholder farmers, to changing government policies, to revolutionising businesses. And everyone has a role to play from farmer to consumer. 

Compost recipe gives Pacific island countries a nutrient boost

Researcher Geoff Dean's new recipe combines a sprinkling of ground-up rust, ash from coconut shells, a spread of seaweed and a select variety of green leaves. These ingredients would not be ideal for a dinner party but is great for composting in Pacific island countries, where they are easily found and provide a much-needed nutrient boost to sandy soils.

'We're feeding the soil, which feeds the plant, which feeds people,' says Mr Dean, a researcher at the University of Tasmania who leads a component of the ACIAR-funded project 'Improving soil health, agricultural productivity and food security on atolls'.

The project has been operating on the atolls of Kiribati and Tuvalu since 2016 with the long-

term goal of reducing skyrocketing rates of non-communicable diseases (NCDs). According to a major 2014 World Bank report, up to 75% of deaths in Pacific island countries are due to NCDs, such as heart attacks and diabetes. This is the result of reduced exercise coupled with a diet of imported low-nutrient food that is high in both sugar and starch.



On Nonouti island, Kiribati, having access to improved compost recipes could help communities produce more, and healthier, food in their home gardens. Photo: Geoff Dean, University of Tasmania.



Seaweed can be an excellent source of the macro-nutrient potassium (which is often lacking in atoll soils), making it a useful ingredient in a new compost recipe that can improve both soil health and the nutrient status of the foods it produces.
Photo: Geoff Dean, University of Tasmania.



Mr Kabuati Nakabuta, Senior Agriculture Officer, Kiribati Ministry of Environment, Lands and Agriculture Developments, sets up a trial using different compost formulations to develop guidelines for compost production with improved nutrient balance.
Photo: Geoff Dean, University of Tasmania.

Mr Dean and his colleagues from the Pacific Community (SPC), the University of Adelaide and local departments of agriculture are tackling the massive NCD problem from the ground up, starting with the soil to ensure people have access to more nutritious food.

Challenges abound. Atoll soils are formed almost entirely from coral so are low in most nutrients, particularly potassium, iron, manganese and copper. Because the soils are coarse-textured, water flows straight through them. The soil is also often salty and highly alkaline (having a high pH). Droughts

are common in the area. And, to top it all off, inorganic fertilisers are often prohibited on these atolls as they have the potential to pollute valuable underground fresh water.

To improve soil health, Mr Dean and his colleagues are promoting targeted composting, which he describes as ‘adding a little science to general composting’. Instead of just combining whatever’s available, the researchers first conduct tests to identify nutrient deficiencies in the soil. Then they look for local, readily available materials that contain those same nutrients to improve the make-up of the compost.

With nutrient deficiencies common in these soils, composting for taro production has a long history in Kiribati and Tuvalu. In addition to providing and holding necessary plant nutrients, compost can buffer against drought, salinity and high soil pH.

However, there's scope to improve local methods of composting. Ideally, animal manure would be included to add essential nutrients, but this is problematic as there are limited numbers of pigs and chickens on most atolls. And even when there are enough livestock they still need to be housed in a pen with a floor—a luxury in Pacific island countries, given that many human homes in the outer islands don't yet have concrete floors—to prevent the manure and urine being leached out through the soil. Mr Dean is now looking into using brown leaves as a base in pens to act as a sponge for nutrients, with these leaves to be used subsequently in compost-making.

The researchers have found that some trees and hedges produce leaves that are rich in the very nutrients the soil is lacking. For instance, chaya (*Cnidoscolus aconitifolius*) contains high levels of iron, yellow beach pea (*Vigna marina*) holds useful

amounts of manganese, and ash—especially from burning coconut shells and husk—provides enough potassium to balance out the most limiting macro-nutrient deficiency in atoll soils. Some species of seaweed are also high in potassium. At the same time, locally available materials such as rusty nails appear to be a source of iron. Fish waste from local processing factories and council green waste also have the potential to be used in upscaling compost production. And, in Tuvalu's capital, Funafuti, where more pigs are kept, there is scope to develop improved dietary rations which will in turn produce a better quality of manure for composting.

Mr Dean and his team have created targeted composting guidelines to share with local communities. In these, one key feature is balance. For instance, there are limits to the amount of ash that can be used as a source of potassium because ash brings with it high levels of chloride, sodium and magnesium.

Education is critically needed. 'Like many people, Pacific islanders commonly are not fully aware of the value of nutritionally rich leafy plants,' says Mr Dean. 'Many plants of high value are grown as ornamentals or animal feed but there is a lack of awareness of their benefit for better compost production and human health.'

Pacific island countries are open to change. Kabuati Nakabuta, a senior agriculture officer at the Kiribati Ministry of Environment, Lands and Agriculture Developments and the research counterpart on the project, says, 'Interest in producing healthy vegetables in Kiribati is medium-to-high.' He says the compost recipes coming out of the ACIAR project will help mobilise communities to act and 'make a huge difference in their home gardens'. 🌱

ACIAR PROJECT: Improving soil health, agricultural productivity and food security on atolls, SMCN/2014/089.

KEY POINTS

- 1 Soils in Kiribati and Tuvalu are low in many nutrients and consequently produce crops that grow poorly.
- 2 Through enhanced compost recipes using locally available ingredients a richer growing medium is improving local vegetable production.
- 3 With better access to fresh produce, the health and nutrition of local communities can also improve.



Greenhouse-grown crops open doors to high-value markets

A decade ago, Munsami Naicker didn't think he would ever own a tractor. Now the farmer in Tavua, Fiji, is building a new house and swimming pool, funded by his income from high-value greenhouse crops. 'The results speak for themselves,' says Mr Naicker.

Mr Naicker is one of more than 40 direct beneficiaries of the ACIAR-funded project 'Integrating protected cropping systems into high-value vegetable value chains in the Pacific and Australia', which has been operating in northern Australia, Fiji, Samoa and Tonga since 2017.

The three and a half year project has two key objectives. Firstly, it promotes the effective use of protective structures, such as greenhouses and walk-in tunnels, to enable farmers to grow high-value crops such as tomatoes, cucumbers and capsicums all year round. The second aim is to help farmers access the lucrative local

tourism industry in order to earn a healthy profit by selling their produce directly to hotels and supermarkets.

Currently, small- and medium-scale farmers produce the vast majority of high-value crops in Fiji, Samoa and Tonga. But, since the local growing season lasts for only a few months, farmers can't produce a steady and reliable enough supply to attract the vibrant tourism industry and end up selling their produce in local markets instead. Meanwhile, hotels and supermarkets import the shortfall, which in Fiji alone numbers several hundred tonnes per year.



Training for farmers—such as this on irrigation system construction—is key to ensuring growing crops under protected structures is successful. Photo: Phil Brown, Central Queensland University.



Munsami Naicker inspects a newly planted capsicum crop growing in the project demonstration greenhouse in Fiji.
Photo: Phil Brown, Central Queensland University.

KEY POINTS

- 1 Farmers in Fiji, Samoa and Tonga are growing crops under the protection of greenhouses to minimise damage caused by extreme weather.
- 2 Growing crops year-round means farmers can potentially access high-value markets such as tourist resorts that currently import fresh produce.

Greenhouses have the potential to close the gap between local supply and demand. Unlike the European version of greenhouses, which were created to keep conditions warm in cold environments, in Pacific island countries the ideal versions protect against the region's harsh wet and dry seasons. '[Greenhouses] function like an umbrella over the crop,' says Professor Phil Brown, an agriculture scientist at Central Queensland University and the project leader. 'Then you have to put in an irrigation system so crops can grow in the dry season as well.'

Traditionally, there has been limited use of greenhouses in Fiji and Samoa, but that situation has changed quickly in the past few years. That's due in part to a brief project on protective cropping under the 2009 ACIAR-funded Pacific Agribusiness Research for Development Initiative in which Mr Naicker was also involved, as well as additional investment programs. For instance, Chinese development aid funds have been used to build up to 60 greenhouses in Samoa over a roughly two-year period, says Professor Brown, while the Fijian Government provides farmers with funding for their structures.

The ACIAR project isn't giving farmers materials to actually build greenhouses. Instead, Professor Brown and his colleagues are conducting key

research into the type of protected cropping structures and approaches that work well in the local landscapes and then working with suppliers of inputs (such as fertilisers and irrigation systems) to ensure interested farmers have easy access to these materials.

Part of the project research is being conducted in northern Australia, where project partner Dr Elio Jovicich from the Queensland Department of Agriculture and Fisheries is looking into crop production practices in the Australian tropics, where climatic conditions are similar to those in Pacific island countries. While these places probably use higher-end technology, Dr Jovicich says the same issues and lessons are likely to apply. ‘By figuring out which crop varieties grow well through the research in Australia, that information can help growers in the Pacific,’ he says. Dr Jovicich offers the example of a variety of Lebanese cucumber that ‘grew really well’ in Australian greenhouses so was then introduced by the researchers to a Samoan farmer who in turn offered it in the local market, where it sold ‘like hotcakes’ despite the fact it hadn’t traditionally been marketed in Samoa.

The other component of the research is being conducted in Fiji, Samoa and Tonga. ‘One of the key things we’ve discovered about protected

cropping [in these countries] is that there’s probably an overemphasis on the structure itself,’ says Professor Brown. Farmers don’t think about other essential parts of protected cropping, such as which crop varieties are best suited to greenhouses and which pest management strategies work best. When crops don’t grow well because the farmers haven’t learned the necessary skills or because a hurricane flattens the greenhouses and their owners don’t have the necessary tools to repair them, the end result is the same: the structures are abandoned.

That’s why in promoting a holistic approach to protected cropping, Professor Brown and his colleagues have come up with an analogy that incorporates the kava bowl: a ceremonial instrument used in many Pacific island countries. In the analogy the bowl represents the potential return that can be gained from the protected cropping system, with larger bowls able to hold greater volumes. The four legs holding up the bowl represent the four essential elements of greenhouse farming: the physical infrastructure (the greenhouse design, materials and associated equipment used in production); the crop agronomy (management of the crop, including varietal selection, pruning, training, irrigation and fertiliser use); the management of



On the project demonstration site in Tavua, Fiji, a 360m² passively ventilated structure has been built. Photo: Phil Brown, Central Queensland University.



Polytunnels with no roof ventilation—such as this one in Samoa—work well for low-growing crops. Photo: Phil Brown, Central Queensland University.

pests and diseases; and the value chains that link production to market.

To prevent the bowl tipping over, all legs need to be present and proportional. As the size of the bowl increases so must the length of each leg, representing the resources, knowledge and skills needed in each area.

The analogy is informing the researchers' crop production trials, which continue to be conducted at demonstration sites in Fiji and Samoa established in a previous ACIAR-supported project. Planned sites in Tonga are still not operational due to cyclone damage but are expected to be constructed soon. The sturdiness of the greenhouses in Fiji and Samoa—despite moderate damage having been caused by cyclones—was 'valuable' in promoting the viability of protected cropping in these countries, says Professor Brown.

These facilities are not the small-scale low-cost structures that farmers are likely to build when they first try protective cropping. These high-spanned greenhouses are owned by commercial growers and contain key features, such as a roof vent to allow hot air to escape and a plastic covering that can easily be detached when strong winds are expected to prevent the structure's metal frame being damaged.

The decision to take farmers to view a commercial greenhouse was intentional. 'Farmers say, "Yeah that has to do with the Department of Agriculture; that's not farming",' explains Professor Brown. 'But if they go to another farmer's property to see a structure, and the farmer who owns it can explain to them what works, what doesn't and what they've done, that is a really fantastic resource for the rest of the community.'

In terms of the third leg—pest and disease—Professor Brown is working closely with another ACIAR project run by Mike Furlong from the University of Queensland. 'There's a network of plant health experts in the Pacific who are supported by that project who are now engaging with us,' says Professor Brown. He points to nematodes in the soil as one particularly

problematic pest found in greenhouses in Fiji, and broad mites pop up in capsicum crops.

But, Professor Brown says the hardest leg to work through is the fourth one: access to market. The skills needed to grow crops are very different from the ones necessary to effectively sell to high-value markets, and different value chains require different skills and approaches.

One model the study has evaluated is the Participatory Guarantee Scheme. A key hurdle that smallholder farmers face in accessing markets is being able to produce vegetables in large enough quantities to attract premium markets like resorts. Guided by project partner Sunshine Coast University, each Participatory Guarantee Scheme farmer group forms a government-registered company with sufficient capacity to fulfill its resorts' demands. 'That seems to have worked quite well,' says Professor Brown, who adds, however, that for the model to succeed one of the farmers or another community member needs to be able to work effectively with the tourism industry. 'It is a bit of a weakness,' he concedes. 'We're still doing more research to better understand which approach is best to help farmers shift from a production mindset to a commercial one.'

When all is said and done, the researchers want to make sure the lessons learned extend well beyond the end of the project. That's why they have been developing a training program with the Ministries and Departments of Agriculture in Fiji, Samoa and Tonga centred on the kava bowl and its four legs. The researchers intend local government employees to use that information to develop and administer their own set of training for local farmers. 'We're trying to really build the local capacity, local knowledge and ownership of the training within the Ministries, the Departments of Agriculture and the commercial farmers of the demonstration sites so that when the project finishes they will still be there,' says Professor Brown. 'It will be the legacy of the project.' 🌱

ACIAR PROJECT: Integrating protected cropping systems into high value vegetable value chains in the Pacific and Australia, HORT/2014/080.



The Asaro Valley in the Eastern Highlands of Papua New Guinea is one of the case study regions in which accessing and using seasonal weather forecasts to help farmers adopt climate-smart agriculture will be piloted. Photo: Steven Crimp, Australian National University.

Accessible weather forecasts, advisories key to PNG farm resilience

In 2017 Dr Sergie Bang reached out to ACIAR for new insights.

In his approach the Director General of Papua New Guinea's National Agricultural Research Institute (NARI) detailed the many ways in which his country continued to reel from the effects of one of the worst El Niño-induced droughts in history, which had started two years earlier. In a country where 80% of the population depends on rain-fed farming and more than three-quarters of food consumed is locally grown, the drought had caused widespread hunger, malnutrition and in some cases even death due to starvation. Then when the dry period had seemed to be over and farmers in the Eastern Highlands had planted

sweet potato, these recovery crops had been crushed by unseasonal frosts.

'We want fewer Papua New Guinea [PNG] people dying from starvation caused by climate change,' says Dr Bang.

ACIAR quickly mobilised. The Social Sciences Research Program led by Dr Jayne Curnow set up a meeting between Dr Bang and 20 of Australia's leading scientists in the field of weather prediction and climate change. One of them was Dr Steven Crimp, a climate applications scientist at the Australian National University (ANU).

'I was initially surprised by the scale of the impact [in PNG]; he says, adding that Bang's stories and local media accounts and peer-reviewed literature detailing the dire situation in the country's highlands 'strengthened my resolve to help these communities establish improved preparedness to climate variability'.

SEASONAL WEATHER FORECASTING IN PNG

After the meeting, ACIAR commissioned Dr Crimp to begin a scoping study on seasonal weather forecasting in PNG. Two of the key publications that informed his work were a 2016 study conducted by ANU's Dr Mike Bourke which analysed the impact of the 2015–16 El Niño on rural food production and supply and a 2017 report produced by Bernard Broughton regarding local, national and international responses to the event. 'Those findings gave us a baseline,' says Dr Crimp.

For instance, Dr Crimp learned that any information communicated with farmers should consider not just which crops to grow but also how to prepare the land for different growing seasons. Offering recommendations on the ideal

KEY POINTS

- 1 El Niño can wreak havoc in the highlands of Papua New Guinea where it has previously caused droughts resulting in hunger and starvation.
- 2 Improved weather forecasts combined with better ways to manage affected crops can help highland farmers prepare for weather extremes.
- 3 Reducing the negative impact of weather on crop harvests means farmers can retain productivity and food availability.



Farmer engagement is key to the project. In this example, NARI field staff collect data during a sweet potato trial in Aiyura. Results from such field trials will be shared with farmers. Photo: Wilfred Wau, NARI.

proportion of crops to grow is important but so, too, is providing guidance on demand irrigation, given that rainfall in PNG, while abundant, can be unpredictable at times. Ensuring that water-sensitive crops are watered regularly can significantly boost production.

With Bourke and Broughton's research in mind, Dr Crimp's scoping study focused on how farming in PNG could change to improve food security outcomes, which forecasting systems could lead to the development of useful advice for farmers and what sort of information the communities were most comfortable accessing and circulating among themselves. 'The study was completed in December 2017 and what came out of that was a set of ideas that we developed in a full project proposal commissioned by ACIAR,' says Dr Crimp.

EXTENDING FORECASTS TO ENGAGING WITH FARMERS

Having started in May 2019, the full 4.5-year project led by Dr Crimp will operate in three case-study regions: the Eastern Highlands (Asaro Valley), Morobe (Markham Valley) and East New Britain (Kerevat).



Farmer interviews conducted by NARI and Anglo Pacific Research staff in the Asaro Valley aim to identify which information farmers want and which sources of information they trust and value. Photo: Steven Crimp, ANU.

The project will build an understanding of the ‘knowledge landscape’ of how communities access and process climate information. Then it will create engaging activities with farmers (including the promotion of climate-smart agriculture) and establish field trials in three locations to demonstrate the value of providing climate forecast information to farmers. Using what it learns, the team will then determine ways to scale out its work to help more people.

To map that knowledge landscape, Dr Crimp will build on earlier work which was supported by the Australian Government Department of Foreign Affairs and Trade (DFAT) to build on a household survey, an individual survey, and the purchase and deployment of weather stations.

The surveys will aim to answer where and what information on seasonal climate forecasts communities are able to access, how confident they are in that information and how it’s being used to manage food production. As part of this they will consider differences according to gender.

Across the three case study regions the household survey will be run in 30 households. The individual survey, which has already been

taken by 900 farmers—450 men and 450 women—in the Asaro and Markham valleys, will be extended to an additional 450 farmers in Kerevat.

GENDER PREFERENCES

Some of the data from the 900 surveys has already been analysed.

Researchers found that while the church played a key informal role in the exchange of climate information, that institution (along with community groups) was more valued by women. Women said they had ‘a significant amount of confidence’ in the information coming from these sources.

In contrast, men trusted community groups and their own observations of the weather, with results suggesting low confidence in the agriculture and government extension groups despite relying on these sources the most.

Some of the information that most interested women (such as drought and the likelihood of having sufficient rain when their crops needed it) also factored high on the list for men. However, when it came to information on climate extremes, men were more interested than women.

In terms of accessing information, Dr Crimp noted that only one female respondent read the newspaper for climate news and a 'much lower' representation of women received climate information via mobile phones compared to men.

Dr Crimp and his colleagues have already developed some seasonal climate forecast calendars based on the outcome of the surveys showing geographical differences between farmers in the Asaro and Markham valleys. For instance, farmers in the highland region felt a stronger sense of connectedness so were more likely to share climate information compared to those living in the Markham Valley. Dr Crimp attributes this difference to the stronger church and community group presence in the former.

Farmers saw seasonal climate forecasts as very important for the months of January, June, July and September, and less important in other months. 'Those were really important times the participants identified for land preparation,' says Dr Crimp. When gender was considered, female farmers had a much broader interest than men in accessing climate information throughout the year. January, March, June, August and September were the months when women were interested, whereas most men prioritised June and July.

'These findings are already starting to inform the design process for us,' says Dr Crimp. 'Initially we thought we would rely on radio, newspaper and mobile phones for the dissemination of information but we discovered that we need to also have someone from our extension group physically exchange the information for farmer advisory information with church and community groups to ensure it's getting the best penetration possible in the communities.'

TARGETING RESILIENT, CLIMATE-SMART AGRICULTURE

To engage with farmers on climate-smart agriculture, researchers at NARI and the PNG Government's Fresh Produce Development Agency will use ACIAR's participatory agricultural innovation platform approach.

'We will examine what has and has not worked in countries where climate-smart agriculture has been undertaken and determine what elements will be best applied in the PNG context,' says Dr Crimp.


The approach will elicit and extend information to rural communities, with those responses to be used later to inform the development of field trials. As part of the extension component of the approach, farmers will learn how to interpret the existing seasonal forecast, deal with probabilities and eventually receive the field trial results to enable them to determine the value of using the farm advisory.

CLIMATE FORECAST INFORMED MANAGEMENT

Field trials will run at the three NARI headquarters located in the Eastern Highlands (Aiyura), Morobe province (Lae) and Kerevat (East New Britain). The trials will be set up using both current best practices and climate-forecast-informed management practices to allow farmers to see the differences the two practices have on harvest yields.

Finally, Dr Crimp and his colleagues will develop a specific set of methodologies to capture the impact of their research and calculate how to scale and operationalise their research within PNG.

'Pivotal to all of that is the climate change development authority in PNG,' says Dr Crimp. 'Because it already coordinates with a range of expert panels and other action groups, we've asked it to examine opportunities for the project outcomes to be highlighted to these groups so we can potentially examine ways to scale out the activities beyond the three case study regions.'

This will help to make sure more farmers have access to and use information that can help them manage their crops in a way that minimises the harm weather events can have on harvests and, therefore, people's access to food. 

ACIAR PROJECT: Climate Smart Agriculture opportunities for enhanced food production in Papua New Guinea, ASEM/2017/026.

Genetically superior whitewood a useful tree for Vanuatu

When thinking of islands in the Pacific, for the average person images of fine sandy beaches, clear blue waters and an amazing array of rich marine life come to mind.

But Vanuatu—a group of small islands just above the Tropic of Capricorn in the southern Pacific Ocean—has other resources, such as timber. In fact, growers are divided between those who say Vanuatu could become a major supplier of commercially grown whitewood and those who advocate growing other wood species to maximise returns.

Whitewood has many market-recognised values—something a current Australian-funded agricultural research project for development is trying to impress on local growers.

EXCELLENT CHOICE FOR PLANTATION

The whitewood species grown in Vanuatu, *Endospermum medullosum*, is highly prized for its timber, especially in Japan, where it is commonly used in furniture, shingles and mouldings. Locally it is being used in house construction—particularly in roof trusses and walling.

Whitewood timber is preferred ‘due to its strength, low weight, workability, clean feature, light colour and flexible staining capacity’, says Dr Tony Page, Senior Researcher at the University of the Sunshine Coast in Queensland, Australia.



The Vanuatu Department of Forests and ACIAR are addressing knowledge gaps across the supply chain including silvicultural management, processing, utilisation, marketing and distribution. Photo: Tony Page, University of the Sunshine Coast (USC).

'Its environmental adaptability, root rot resistance, cyclone tolerance and rapid growth make it a worthwhile tree to grow.'

Despite these advantages and the Vanuatu Government's encouragement of making whitewood a priority species for plantation development, there are current issues with the functionality of the whitewood supply chain.

Vanuatu is aiming to establish some 20,000 hectares of commercial plantations, a significant chunk of which will be planted with whitewood. Currently whitewood covers about 350 hectares. Natural forest supplies of the species have been exhausted by extensive logging, particularly in the 1990s.

The country is a net importer of timber but fast-growing whitewood has the potential to quickly fill this demand.

ISSUES WITH SUPPLY CHAIN

According to a study, one impediment is the low value attributed to native species like *Endosperm medullosum*, resulting in an abundance of low-

KEY POINTS

- 1** Vanuatu is a net importer of timber, but whitewood has the potential to be grown more widely for local use and to be exported.
- 2** Genetic improvement of whitewood that makes it easier to grow and manage will reduce production costs.
- 3** Cheaper production costs, combined with knowledge-sharing to show growers how to manage whitewood, is making the tree a more attractive option.



Whitewood has potential to be a valuable forestry species in Vanuatu. Its timber has attractive features including strength, low weight, workability, clean feature, light colour and flexible staining capacity. Photo: Tony Page, USC.



Whitewood can be milled and used locally, but higher volumes could attract the investment needed for more efficient processing. Photo: Tony Page, USC.

grade non-native radiata pine being imported from New Zealand to fill the demand.

There is also the issue of cost. With scattered small-scale production of whitewood in Vanuatu there is insufficient volume to support investment in the type of processing plant that could reduce its price. Moreover, farmers have limited farm management knowledge where whitewood plantations are concerned.

‘To encourage whitewood planting, a price that reflects the cost and risks associated with growing plantation trees needs to be established,’ the study emphasises.

It is for this reason that the Vanuatu Department of Forests (DOF) has sought the assistance of ACIAR since ‘the early 2000s to address knowledge gaps across the supply chain, including genetic improvement, silvicultural management, processing, utilisation, marketing and distribution’, says Dr Page.

One of the current ACIAR-funded projects is the ‘Enhancing returns from high-value agroforestry species in Vanuatu’, handled by USC.

The project seeks to address current challenges within the supply chain to facilitate the flow of planted whitewood to high-demand urban markets.

DOF is the lead national agency implementing the research and development activities contained within the ACIAR projects. The current Director, Rexon Viranamangga, has been trained under an ACIAR scholarship to undertake a research masters across the whitewood supply chain to help generate an understanding of how to develop the commercial prospects of the species in the social, geographic and economic context of Vanuatu.



Improving the genetics of planted whitewood for faster growth, tree form, branch shedding and higher wood density will help improve the species’ appeal to farmers. Photo: Tony Page, USC.

COLLABORATION ON RESEARCH

ACIAR has demonstrated its commitment to supporting forestry projects and activities, especially research and training. In particular, ACIAR-funded research focuses on genetically superior planting materials and applications of silvicultural practices.

One particularly important collaboration is focussing on the genetic improvement of planted whitewood (such as faster growth, tree form, branch shedding and higher wood density) to improve efficiency and viability of production, thus encouraging farmers to grow this plantation crop.

‘Growers are much more inclined to plant species that have simplified methods of production, respond well to management interventions, reduce overall inputs required and produce a high-quality product,’ says Dr Page.

He says whitewood is exceptionally resilient to storms and diseases. The tree ‘will typically shed [its] canopy during high winds’ to reduce exposure and to ensure its main stem remains intact. In cases in which the main stem is broken, ‘they often regrow a canopy, whereby timber can be used from above and below the point of damage,’ says Dr Page.

‘This resistance to, and recovery from, cyclones is very important in Vanuatu, which has a high incidence of high-intensity cyclones,’ he says.

Providing tools for the supply of graded timber as well as local timber products for constructing dwellings and other structures that are resilient to Vanuatu’s environmental conditions is also part of the project.

By exploring how to make the most of whitewood, address issues and take advantage of opportunities, the project could benefit everyone along the supply chain, including smallholder growers and consumers. 🌱

ACIAR PROJECT: Enhancing returns from high-value agroforestry species in Vanuatu, FST/2016/154.



SPC Community-based Resource Management Officer Pita Neihapi (right) joins community members for a community-based fisheries management workshop in Vanuatu to help in the development of a fisheries management plan. Photo: Ada Sokach.

Communities help themselves to improve fisheries management

Empowering communities in Pacific island countries to manage their own inshore fisheries is key to ensuring their food and job security.

Inshore fisheries—those closer to shore—are typically used by local communities as a source of income and food in Pacific island countries including Kiribati, Solomon Islands and Vanuatu. However, fast-growing populations and unsustainable fishing practices are reducing the availability of fish and putting pressure on these fisheries' long-term health and viability.

Moreover, many communities throughout these countries are far from national agencies and the help they would otherwise provide local communities to help manage these fisheries.

In an Australian Department of Foreign Affairs and Trade/ACIAR-funded project, Professor

Neil Andrew, University of Wollongong, leads a multi-partner team working across the three countries to facilitate a process that supports community-based fisheries management to tackle these challenges. So far more than 100 communities have engaged with the project with the long-term aim of setting their own fisheries management goals and working to rally resources to meet them.

COMMUNITY-BASED FISHERIES MANAGEMENT

'Community-based fisheries management is a form of collective action,' explains Professor

Andrew. ‘In essence it’s a group of people making rules to organise themselves, sticking to those rules and sanctioning rule-breakers.

‘The role an external agent like us can play is to help a community work through that process of agreeing that there is a problem, agreeing what they can do about it, and then helping them learn about the rules that they might want to put in place to manage the resource.’

Without this support, a fisheries management approach that coordinates people and resources might never exist and fish resources could continue to decline. This could have devastating consequences on communities that rely on these fish for food and income.

The community-based fisheries management work is done under the banner of ‘A new song for coastal fisheries—pathways to change: The Noumea strategy’—or the New Song strategy. This strategy was developed by a group of far-sighted leaders in fisheries and environmental management back in 2015 at an ACIAR-supported workshop. The New Song strategy shifted political and national attention to inshore coastal fisheries to better support the local communities that were dependent on them.

Traditionally, the economically important large-scale commercial offshore tuna fisheries have dominated the attention of national agencies. The New Song strategy is seeing more support go into empowering Pacific island communities to manage their national fisheries, which are in various states of health but are critical to the local people’s wellbeing.

Through this project and others implemented in the region, the seeds of change are beginning to sprout. ‘We see changes in communities in terms of their perception of fisheries and we see changes in national capacity to support communities in terms of policies, regulations and even laws,’ says Professor Andrew. ‘Longer-term changes in fisheries resources and the wellbeing of communities are beginning to be seen but it is important to bear in mind that community-based approaches are not a panacea and are not appropriate for many places in the region.’

For Professor Andrew, it’s been the performance and growth of the national staff who are doing the on-ground work with communities that has impressed him the most. ‘They have so many skills and such a passion for the contributions they make to their countries.’

These benefits are reflected in the all-round progress of the project, with plans moving towards a national program in Solomon Islands and communities tracking positive progress in Vanuatu and Kiribati.

HEADING TOWARDS A NATIONAL PLAN

On the back of the project’s progress, Solomon Islands is working on a national strategy to spread community-based fisheries management. The aim is to increase both the number of communities reached and the quality of the service provided to them.

Delvene Boso, Country Director, Solomon Islands, for WorldFish, says they want to make sure the national scaling strategy makes community-based fisheries management even more inclusive to encourage more women and more provincial partners.

‘The national scaling strategy is the culmination of years of work with practitioners, government, non-government organisations and communities,’ says Ms Boso.

Previously, WorldFish’s work involved intensive engagements testing the models for community-based resource management to see what would work and how to best facilitate the process. But with 4,000-plus communities in the country, the new focus is on a ‘light touch’ model of engagement.

‘What we’ve done in the past year is go with a lighter engagement,’ says Ms Boso. ‘This focuses on one community, building its capacity, and in turn it then spreads the message along the region through its own community networks.’

The path toward community-based fisheries management is driven by the communities themselves. Firstly, they express their interest, which is followed by a supported process that sees them set goals and participate in education activities to increase their collective



and individual awareness and understanding of the issues. The result is the development of a community-owned management plan and improved capacity to collectively manage their inshore fisheries to ensure sustainable fish resources into the future.

ISLAND COMMUNITY SEES RESULTS

In Vanuatu, Pita Neihapi, Community-based Resource Management Officer for the Pacific Community (SPC), is supporting 31 communities in community-based fisheries management.

In the Maskelyne Islands, three communities wanted to have a management plan. One of these previously managed a large outer reef, but not the inshore area.

‘[This community] wanted to have a management plan because an agreed management plan would help them to better manage the resources,’ says Mr Neihapi. ‘They said it would be something that was not from the chief but was a community initiative with community input.’

In its management plan, the community also identified taboo areas where fishing was not allowed, unless to satisfy an urgent community need—and then only with approval.



Leah Apon cooks fish in Vanuatu. Inshore fisheries supply coastal people in local communities in Vanuatu with both nutrient-rich food and jobs, making fisheries a vital resource for the health and well-being of the human population.
Photo: Dirk Steenbergen, University of Wollongong.

KEY POINTS

- 1 Community-based fisheries management is empowering communities to improve the sustainability of their inshore fisheries.
- 2 Results are promising with reports of increasing fish diversity and quantity from some communities.

‘In accessing those taboo areas, they use the management plans. Their fishers are not allowed to use certain nets. They have to use what was in the management plan,’ says Mr Neihapi.

Mr Neihapi says since the community implemented the management plan, it has reported seeing a greater variety of fish species and more fish overall in the reef inshore area. He says people are very happy with both the plan and the increased number of fish they have observed as a direct result. 🌿

ACIAR PROJECT: Strengthening and scaling community-based approaches to Pacific coastal fisheries management in support of the New Song, FIS/2016/300.

Rich learning makes research graduates world-ready

The unique graduate development program run by ACIAR has been recognised on its 10th anniversary as one of the best in Australia.

ACIAR's graduate program, which engages young Australian agricultural scientists in a two-year experiential-learning program, has been named as a finalist in the 2019 Australian HR Awards.

The awards recognise outstanding achievements at the forefront of the human resource industry in Australia, with the winners announced at an awards night in September 2019.

'Our program is unique and innovative for Australian university graduates who are interested in international agricultural research and development,' says ACIAR's Human Resources Manager, Sharyn Turner.

'We support and mentor graduates to aim higher. They are not passed from one section of ACIAR to another to tag along but are supported in the first three months to identify a significant piece of work that they will own, lead and manage to completion. As an example, one graduate created an app to help researchers collect and analyse data from projects in developing countries that we oversee.

'By undertaking real projects, the graduates learn experientially and gain a complex range of skills: program design and evaluation, leadership, critical thinking, problem solving and team management.

'Rising to the opportunity of a real-world project with professionals and researchers means each graduate is an integral part of our team and realises the difference they can make.'

ACIAR CEO Professor Andrew Campbell says the program accelerates young researchers' careers. 'We treat them as young, emerging scientists. They get integrated into everything we're doing. They participate in mid-term and end-term project reviews. They get to travel

overseas and see amazing projects and they get close supervision from senior scientists,' says Professor Campbell.

Graduates are mentored for the duration of the program by an ACIAR research program manager (senior scientist) from one of 10 ACIAR research disciplines. Through their tailored program of mentored learning, the graduates help research program managers to develop and manage a research project commissioned by ACIAR. The graduates are developed ready for diverse roles within research institutions around the world.

ACIAR offers this opportunity to two graduates annually with 20 graduates participating since 2009. Of these, 17 continue to work in research for development, including one PhD working as a research fellow at the International Maize and Wheat Research Improvement Centre in Nepal.

'We are confident of more graduates rising into prominent positions internationally and we will seek to involve these researchers and their institutions in future ACIAR projects,' says Ms Turner.

KEY POINTS

- 1 Over the past 10 years, 20 people have participated in ACIAR's graduate program.
- 2 The program provides Australian university graduates with valuable experience in managing research for development projects.

IN THEIR OWN WORDS

Seven past and current participants explain how they benefited from the unique experiential learning program run by ACIAR for agricultural science graduates over the past decade.



**Dr Brendan Brown,
CIMMYT**

‘I have recently been made project leader of two ACIAR projects and ‘Roadmaps’. I should put on the record that I am forever thankful for the opportunities that the ACIAR graduate program has provided. I have no doubt that it has provided me a fast-tracked pathway that led me to work with the FAO in West Africa for a year, complete my PhD on the ACIAR funded SIMLESA program in Eastern and Southern Africa and now to be leading two ACIAR projects in South Asia by 30 years of age. Thanks, must go to all in ACIAR who have supported this program and from what I hear, it continues to go from strength to strength.’



**Jack Hetherington,
University of Adelaide**

‘Being in the room when decisions about proposals and funding are made by a project management team has taught me how to write strong proposals and requests for funding.’



**Rebecca McBride,
Australian Government
Department of
Agriculture and Water
Resources**

‘It was a unique opportunity to work in research with different perspectives, from the management side, from government and, mostly the really passionate people at ACIAR and all their research partners.’



**Harry Campbell-Ross,
Livestock Program,
ACIAR**

‘My six months at ACIAR so far has given me two main things: it has improved my critical thinking skills and it’s given me a really great insight into the funding side of a partnership in agriculture development.’



**Jenny Hanks,
University of
Melbourne**

‘The program helped me understand research management and gave me an opportunity to lead aspects of research management with the support of the broader ACIAR team. It was amazing.’



**Rebecca Cotton,
Research Officer,
ACIAR**

‘The program gave me, as Andrew Campbell [ACIAR CEO] would say, a toolbox full of tools and I’m able to pull out whatever I need in different situations. It’s given me tools to apply as needed.’



**Candice Skelton,
University of Sydney**

‘The key thing I learned and value is understanding the importance of government relationships and strategic partnerships, and the role these play as an enabler for development change.’



Strengthening institutions and individuals

What would the Pacific look like in 20 years... if it was a food-secure and healthy region?... if research was better managed and coordinated towards sustainable impact on farmers' livelihoods?

The answers to these questions are the dreams of emerging leaders at ACIAR's partner organisations in Papua New Guinea (PNG) and the Pacific who are participating in a new program to strengthen the capacity of their institutions.

The first institutional John Dillon Fellowship (iJDF) is a six-month professional development program that provides a blended learning experience combining leadership training with industry visits and networking opportunities. It aims to arm fellows with skills, knowledge and connections to advance their institutions and enhance agricultural research and policies in the region.

'There are numerous challenges facing the Pacific's agriculture and food systems,' says Joy Hardman, who is coordinating the program on behalf of ACIAR.

'We hope the fellowship will ultimately strengthen the region's capacity to tackle these challenges.'

The iJDF program involves 16 fellows from institutions across PNG, including the National Fisheries Authority, the National Agricultural Research Institute, the University of Technology, the Science and Technology Secretariat and the Autonomous Bougainville Government's Department of Primary Industries, along with regional partner the Pacific Community (SPC). These organisations are a mix of policy, research and implementing agencies which underpin agriculture sector development.

Following an introductory module delivered in PNG in May, the fellows completed a two-week intensive module in Australia in July and

August. The core program is being delivered by the University of the Sunshine Coast (USC), supported by the Australian National University and Southern Queensland University. It will conclude in October.

Training covers project management and developing research proposals, as well as themes of ethics, gender equity, policy and governance. People skills are a critical aspect of the program, including brokering relationships, influencing and working with stakeholders.

Robert Kei is an entomologist at the National Agricultural Research Institute (NARI) in PNG, participating in the program along with two colleagues. He says he valued the training in planning and managing scientific projects.

'The training covered how to tailor a project for its context taking into account political,

KEY POINTS

- 1 The institutional John Dillon Fellowship (iJDF) focuses on developing institutional capacity and expertise within ACIAR country partners.
- 2 2019 marks the first year of the iJDF and is being run with PNG, the Autonomous Region of Bougainville, and regional partners SPC.

environmental and social factors—it's not “one size fits all”,” says Mr Kei.

With an academic background, Mr Kei is in a strong position to mentor young researchers at NARI, both male and female. Developing leadership skills to effectively support them is his primary motivation for participating in the fellowship.

Through the program, Mr Kei has also had the opportunity to build relationships with the two other NARI fellows, who are located at different research stations in PNG.

‘The program aims to strengthen networks within, as well as between, ACIAR partner institutions,’ says Ms Hardman.

‘Having multiple people from the one institution creates critical mass within that institution and enables change. Strong relationships are built around the shared learning curve.’

The program has been developed in consultation with the fellows’ institutions to address organisational needs. Each agency group has a specific management project to deliver as part of the program that provides an agency-agreed context in which the fellows can apply their learning. This approach aims to ensure the benefits of the training are felt by the institution more broadly. Fellows are also supported by senior leaders acting as mentor-coaches for the duration of the program.

‘The iJDF is very well supported by the participating agencies, with outcomes embedded into the fellows’ personal development plans,’ says Ms Hardman.

‘It is a wonderful opportunity to learn about leadership,’ adds Azaria Lesa-Ah Kau, who works in the Land Resources Division of SPC in Fiji.

Originally from Samoa, Ms Lesa-Ah Kau does work that spans many countries and teams and says she particularly appreciates the program’s focus on how to influence decisions.

‘Understanding who you need to influence and how, and taking into account cultural differences, is very useful, particularly in a male-dominated sector,’ says Ms Lesa-Ah Kau.



Participants in the institutional John Dillon Fellowship meet with ACIAR staff on a visit to ACIAR's office in Canberra, Australia. Photo: Geoffrey O'Keefe, ACIAR.

‘You need to influence sideways as well as up and down.’


For Ms Lesa-Ah Kau, the most valuable aspect of the program to date has been her exposure through it to the diverse backgrounds and experience of the other participants and to new ways of thinking and acknowledging the cultural differences in the region.

‘I have learned so much from my PNG colleagues. With their experience in managing whole project cycles, they have shared many new things which I can apply—practical tips as well as philosophies,’ she says.

The program is an expansion of the original John Dillon Fellowship which has been running since 2002 to further the professional development of outstanding mid-career agricultural scientists, economists and researchers.

‘Without transformative leadership, nothing will change,’ says project leader Tami Harriot, Manager of USC’s Centre for International Development, Social Entrepreneurship and Leadership.

‘We are arming the fellows with tools and technical knowledge, as well as capability and confidence, to support change.

‘There have been real lightbulb moments when participants have realised what they can actually do: effect change, have an impact and bring others on the journey. They believe they can make a difference and are taking accountability for what happens next.’ 

REGIONAL ROUNDUP

CENTRAL HIGHLANDS FOCUS, VIETNAM

The Central Highlands of Vietnam produces Robusta coffee and pepper, yet farmers there are challenged with soil, groundwater, quality, post-harvest and market chain issues. ACIAR has started two small research projects to assist. ACIAR CEO Andrew Campbell visited the region in July 2019 and met with research partners and farmers.

INDONESIAN NEWS

In July 2019, ACIAR and the Indonesian Forestry and Environment Research Development and Innovation Agency signed a new Memorandum of Understanding (MoU) to enable further collaboration. Eight Indonesian researchers, farmers and Government officials will visit Australia in September 2019 for a study tour to learn about community and farm-based forestry.

In October, the Climate Smart Agriculture Conference, kicks off in Bali, with Mr Allaster Cox, Deputy Head of Mission of the Australian Embassy, delivering a keynote speech.

CANBERRA VISIT

In August 2019 all 27 ACIAR country network personnel from 10 offices around the world visited ACIAR headquarters in Canberra for their

annual meeting. Their program was packed with activities that provided many learning opportunities including Security in Vulnerable Environments training, and instruction on ACIAR's new business systems and associated processes, and general policies and procedures—in particular in relation to finance management and accountability.

A major focus of the week was the interaction between all of the country network members and ACIAR's Research Programs. Research Program Managers provided detailed overviews of their priorities and country plans and country office teams presented and discussed priorities and country strategies. These sessions provided a solid platform for future planning.

The ACIAR country network has grown over the past five years from being providers of predominantly in-country administrative functions to a strong, strategic network through an on-going program of capacity building in communications, partnership brokering and planning. ACIAR country office personnel are now responsible for building and maintaining relationships with stakeholders and partners in country and providing advice to ACIAR programs and project teams on strategic and operational matters. 🌱



ACIAR's country network personnel on a visit to ACIAR House in Canberra.

Meet ACIAR researchers, partners and leaders at

Pacific Week of Agriculture

30 September – 4 October 2019

Apia, Samoa

ACIAR is part of the Pacific community. Together we can enhance partnerships for sustainable agriculture and forestry systems.

- Building partnerships
- Improving livelihoods
- Establishing new income streams
- Advancing food security
- Supporting future generations
- Empowering women
- Facing challenges
- Mitigating climate change
- Improving health
- Protecting resources

Together, our research can help ensure a better future for everyone.



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