Australian Government

Australian Centre for International Agricultural Research

ACIAR

IN THE PACIFIC 2022–23

This report should be attributed as the ACIAR in the Pacific 2022–23

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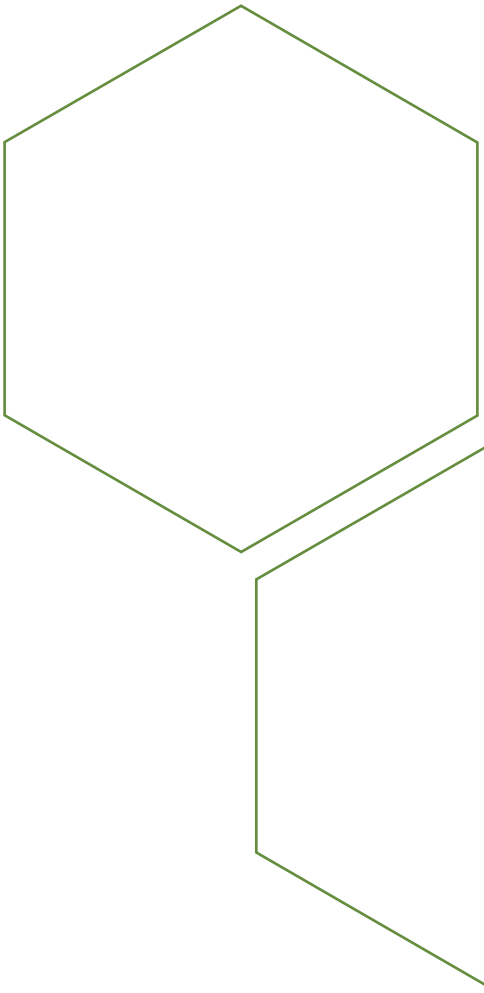
ACIAR

IN THE PACIFIC 2022–23



ACIAR

About ACIAR

Research that works for developing countries and Australia

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

Mission

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

Enabling legislation

ACIAR is established by the *Australian Centre for International Agricultural Research Act 1982*, as amended.

Also established under the Act are the Commission for International Agricultural Research and the Policy Advisory Council.

Vision

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

Responsible minister

ACIAR is part of the Australian Government Foreign Affairs and Trade portfolio, and is accountable to the Minister for Foreign Affairs, Senator the Hon Penny Wong.

Governance

ACIAR has an executive management governance structure headed by the Chief Executive Officer, who reports directly to the Minister for Foreign Affairs.

Photo: Adi Rahmatullah

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Welcome

The Australian Centre for International Agricultural Research (ACIAR) is celebrating the achievements and impacts of 40 years of agricultural research-for-development, throughout 2022. Tackling shared challenges with partner countries in the Indo-Pacific region through agricultural research collaboration remains a compelling element of Australian soft power in our region. Australia is well equipped to play a leading role within our region and globally – disproportionate to the size of our population and economy.

At the outset of 2022, ACIAR released a 2-part impact assessment of 40 years of research. The quantitative assessment calculated a total benefit of at least $64 billion dollars, with a $3.7 billion benefit to Australia. This is a conservative result, as the study focused on just 10% of investment since 1982, and is based on parameters that are readily quantifiable. The qualitative assessment identified the key design, management and practice principles that support effective translation of research knowledge into development outcomes.

The study gives us confidence that our well-established but continually evolving research partnership model is delivering against our vision and mission. The work of ACIAR and its partners supports regional stability, health security and economic recovery, and builds scientific and policy capability for more productive and sustainable agriculture, fisheries and forestry.

A time to review and refresh

ACIAR has conducted systemic ex-post economic impact assessment on research investments since the late 1980s. Our work is monitored at the project and portfolio level, to understand the impact of our achievements and to guide future investment. The culture of a learning organisation is central to the ACIAR 10-Year Strategy 2018–2027.

As well as a time for celebrating, the milestone of 40 years of operation is a good time for reflection and coincides with a mid-term review of the 10-year strategy. The Commission for International Agricultural Research appointed a highly qualified panel, chaired by Dr Wendy Craik AM, to review progress against the objectives of the strategy and to assess if the strategy remains fit for purpose, especially given the significant change to the ACIAR operating environment due to the COVID-19 pandemic.

During 2022–23, and the second half of the 10-year strategy, ACIAR will consider and implement the recommendations of the review, with an immediate focus on transferring a proportion of research investment from single issue or single discipline projects, to transdisciplinary and cross-program initiatives. We will also look to maximise synergies between our multilateral and bilateral investments, by developing innovative partnerships with multilateral agricultural research-for-development institutions, including CGIAR. We will also release a refreshed version of the ACIAR 10-Year Strategy 2018–2027.

Equitable, inclusive and empowering

This year we look forward to working with some 370 organisations on approximately 170 projects, to address many challenges and opportunities.

Recognising the centrality of gender equity and of inclusive approaches to diversity across all stages of the research cycle, we look forward to releasing the ACIAR Gender Equity and Social Inclusion Strategy and Action Plan 2022–2027. The plan will provide a road map to scale up and integrate gender equity and social inclusion into ACIAR research, capacity building and outreach programs.

This year we will also work towards a stronger integration of investments by the ACIAR Capacity Building and Research programs by embedding strategic capacity building initiatives at the planning stage of selected research projects. ACIAR projects that share expertise in genuine partnerships, build scientific and policy capability in partner countries and deliver benefits back to Australia.

Recognised global science partner

Australia's reputation as a valued international partner in agricultural research-for-development was in the spotlight in November 2022, as ACIAR hosted the CGIAR System Council for the first time.

The CGIAR is the world's largest agricultural innovation network dedicated to reducing rural poverty, increasing food and nutrition security for human health and improving natural resource systems and ecosystem services. Australia contributes approximately $20 million to CGIAR each year (see more about CGIAR in Chapter 2). ACIAR represents and manages Australia's investment in CGIAR, and as one of the top 15 funders, Australia has a seat on the CGIAR governing body, the System Council. Dr Jurgen Voegele, System Council Chair and World Bank Vice President for Sustainable Development, invited Australia to host the 17th CGIAR System Council meeting.

ACIAR timed the System Council meeting to coincide with the TropAg International Agriculture Conference, also in Brisbane, a biennial conference attended by approximately 800 food and agricultural scientists. Hosted by the University of Queensland, a major ACIAR collaborator, the conference features scientists actively engaged in agrifood systems research for improved nutrition, sustainability and human health.

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

Minister for Foreign Affairs, Senator the Hon Penny Wong, visited ACIAR House, Canberra, in September 2022.

Australia's contribution to the region

In 2022–23, ACIAR will be consolidating the functions of its newest, and eleventh, country office – in Dili, Timor-Leste. ACIAR has been a development partner with Timor-Leste for more than 20 years. However, health and nutrition outcomes in the small nation are not satisfactory, and R&D capacity at the individual, organisational and institutional levels remains low. The opening of an ACIAR country office in Timor-Leste allows for a locally focused but regionally strategic approach to research and capacity building investment.

Science partnerships in areas of shared concern like food security, water security, health security and biosecurity – all amplified by climate change – are a distinctive element of how Australia projects itself across the Indo-Pacific region. This Annual Operational Plan provides a comprehensive outline of the investment by ACIAR of around 2.5% of the Australian Overseas Development Assistance (ODA).

The Australian Government is revising its development policy, that will necessarily inform the ODA budget and the delivery of aid programs. From initial discussions with the Foreign Minister, Senator the Hon Penny Wong, I am confident that ACIAR and the research investments we manage are well-positioned to inform development policy and its implementation. Minister Wong has a very clear understanding that Australia's strengths in agricultural, environmental and health sciences are a strategic national asset, highly relevant to the challenges faced by all countries across the Indo-Pacific region. Food security concerns, exacerbated by the 'three Cs' of climate change, COVID-19 and conflict, are central once again. The intersections between food security, biosecurity, water security, health security and national security have never been more obvious or cogent.

This Annual Operational Plan, my last as CEO of ACIAR, sets out where and how we plan to invest over the coming year. I have every confidence that our highly committed and skilled staff and partners in Australia and our partner countries will deliver this plan successfully, adding to the 40 years of durable impact already delivered through ACIAR. It has been an honour to be part of this endeavour since 2016.

Andrew Campbell
Chief Executive Officer

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Overview

Photo: Conor Ashleigh

Overview

The Australian Centre for International Agricultural Research (ACIAR) brokers and supports collaborative international research partnerships to improve livelihoods in the agriculture, fisheries and forestry sectors in the Indo-Pacific region, while emphasising individual and institutional capacity building and opportunities for development led by the private sector.

As an agency of the Australian Government, ACIAR works with regional partners to tackle the intersecting and complex challenges of growing more food, improving human nutrition and reducing poverty while using less land, water and energy. At the same time, while striving for more productive and sustainable agriculture, we must adapt to and mitigate the effects of climate change.

Our work reflects Australian Government policy imperatives articulated in the:

- Australian Government's development program
- Sustainable Development Goals of the United Nations (UN) 2030 Agenda for Sustainable Development
- Paris Agreement under the UN Framework Convention on Climate Change.

Diversity and flexibility are key to our work, but equally important is that all programs, projects and partners are working towards common objectives and goals.

The ACIAR 10-Year Strategy 2018–2027 sets out 6 high-level strategic objectives that guide our partnerships, programs and projects. These objectives are consistent with the purpose stated in our enabling legislation and reflect the policy imperatives of the Australian Government. Of these objectives, 3 build knowledge to underpin crucial development objectives and 3 ensure that our work is equitable, inclusive and empowering.

Reflecting our ethos of ongoing reflection and improvement, ACIAR will start addressing recommendations arising from a mid-term review of our 10-year strategy during 2022–23. While much of the strategy has been achieved, there is still room for improvement and progress. We have the challenge of developing longer-term transformational and transdisciplinary research programs, and greater synergies between our bilateral and multilateral research investments, to respond to major issues of concern in our region.

ACIAR 10-Year Strategy 2018–2027

ACIAR brokers and invests in research partnerships with developing countries in the Indo-Pacific region to build knowledge to support crucial development objectives

Strategic objectives 1, 2 & 3

1. **Food security and poverty reduction**
   Improving food security and reducing poverty among smallholder farmers and rural communities
2. **Natural resources and climate change**
   Managing natural resources and producing food more sustainably, adapting to climate variability and mitigating climate change
3. **Human health and nutrition**
   Enhancing human nutrition and reducing risks to human health

ACIAR works to ensure that its research-for-development programs are equitable, inclusive and empowering

Strategic objectives 4, 5 & 6

4. **Gender equity and women's empowerment**
   Improving gender equity and empowerment of women and girls
5. **Inclusive value chains**
   Fostering more inclusive agrifood and forestry value chains, engaging the private sector where possible
6. **Capacity building**
   Building scientific and policy capability within our partner countries

An enduring operational model

Establishment of ACIAR

Australian Centre for International Agricultural Research Act 1982 – an Act to encourage research for the purpose of identifying, or finding solutions, to, agricultural problems of developing countries

July 1981

The establishment of a small statutory body was approved by the Cabinet of the Australian Government. The agency would be charged with contracting research work to Australian institutions in the field of agriculture and related disciplines for the benefit of developing countries (Cabinet Minute – Decision No. 15987).

June 1982

The *Australian Centre for International Agricultural Research Act 1982* was passed, establishing ACIAR as a statutory authority in the Foreign Affairs portfolio. Responsibility for operations of the centre was assigned to a Board of Management.

A Policy Advisory Council was established to advise the Minister on the agricultural problems of developing countries and research programs and policies that may address understanding and solving of these problems.

June 2007

The ACIAR Act was amended. Principally, the Board of Management was replaced by an executive management structure with a Chief Executive Officer reporting directly to the Minister for Foreign Affairs. A 7-member Commission for International Agricultural Research was established to provide advice to the Minister on the functioning of the Act. The responsibilities of the Policy Advisory Council were unchanged.

March 2018

The ACIAR 10-Year Strategy 2018–2027 was launched, setting out the high-level direction and priorities of the agency, to achieve its mission of 'more productive and sustainable agricultural systems, for the benefit of developing countries and Australia, through international agricultural research partnerships'.

November 2022

The ACIAR 10-Year Strategy 2018–2027 was updated to incorporate recommendations from a mid-term review of the strategy.

On 3 June 2022, ACIAR marked the 40-year milestone of working with regional partners to reduce poverty and improve livelihoods. The ACIAR business model of brokering science partnerships in agriculture, fisheries and forestry between the Australian innovation system and our neighbours in the Indo-Pacific region remains as relevant today as it was when ACIAR was established in 1982.

Ensuring that the best of Australian science can be combined with local knowledge and implemented effectively in the field depends on the quality and durability of partnerships between farmers, researchers, industry and government. Our outstanding track record of building and sustaining deep, trusting partnerships over the last 40 years is now a great strategic asset.

As the capabilities and capacity of partner countries develop, through maturing economies and innovation systems, ACIAR actively seeks to devolve greater initiative, leadership and control to partners in project initiation, delivery and linking with Australian partners. ACIAR then takes on a more consultative role.

Within this evolving context, our operational model continues to deliver against our enabling legislation, Australia's development program and the UN Sustainable Development Goals, through 6 strategic objectives and 3 key areas of work:

1. **Global research collaborations**
   We develop and foster partnerships and relationships with other international research and development agencies, the most significant being CGIAR. We also develop and foster partnerships with development donors and the private sector to pursue shared goals and ensure that ACIAR-funded research results are implemented at scale.

2. **Bilateral and regional research projects**
   We generate knowledge from ACIAR-funded projects and programs to empower smallholder farmers, extension agents, scientists and policymakers to take on the intersecting challenges of growing more and healthier food and reducing poverty while using less land, water and energy.

3. **Scientific and policy capacity-building activities**
   We identify and establish opportunities for individuals and institutions in partner countries to boost technical, policy and management skills in agriculture, fisheries, forestry and management of land and water resources.

ACIAR partnership model

2022–23 operating environment

Our operating environment within the Indo-Pacific region is being reshaped by global-scale food, health and biosecurity crises, direct and indirect impacts of geopolitical tensions, and unprecedented weather events precipitated by a more variable climate.

While ACIAR has contributed to improved livelihoods in partner countries over 40 years, there is still much work to be done. The COVID-19 pandemic has reversed the 25-year trend of poverty reduction; and COVID-19 is just one of many zoonotic diseases that have the potential for endemic and pandemic impact. ACIAR will continue to build its participation and expertise in One Health and biosecurity – for the benefit of smallholder farmers, as well as the agriculture industry in Australia.

Food and energy shortages and rising inflation are having a global impact, including on the populations of our partner countries. These factors influence the opportunities we have to work with our neighbours to build the partnerships, knowledge and capacity required to achieve more productive and sustainable agricultural systems, while also enhancing food security, nutrition security and livelihoods.

In 2022–23 ACIAR will continue to develop long-term agreements for research collaboration with partner countries. Historically, these agreements defined a program of research collaboration, geographically and thematically tailored to the agricultural development needs of the partner country. Recently and into the future, many of these agreements have and will become partnering arrangements reflecting new opportunities for collaboration as the science capability of partner countries increases and their innovation systems mature.

We will continue to foster positive changes to our operating models that came about during the height of the COVID-19 pandemic, such as increased decision-making and leadership by in-country partners. However, we also plan to embrace the relationship and operational benefits that come from international travel by researchers between Australia and partner countries, and travel to Australia for training by scientists from partner countries.

The purpose of ACIAR to identify or find solutions to agricultural problems of developing countries has remained relevant over 40 years. The work of ACIAR and our partners with smallholder farmers in the Indo-Pacific region contributes to the knowledge, skills, technology and frameworks required to restore disrupted production systems and value chains across the agriculture, fisheries and forestry sectors.

Regional stability and economic security

Australian security and economic interests remain linked with the countries of our region. The Australian Government's investment in agricultural development, through ACIAR, supports regional processes for promoting peace and economic growth, ensuring Australia is a trusted science partner and leader in the agriculture and natural resources sectors.

In June 2022, then Vice Minister Le Quoc Doanh (left) from the Vietnamese Ministry of Agriculture and Rural Development presented a medal to ACIAR CEO Professor Andrew Campbell (right) in recognition of the work of ACIAR and its colleagues to advance agriculture and rural development in Vietnam over many years.

Improving food system security

Our first strategic objective of 'improving food security and reducing poverty among smallholder farmers and rural communities', is central to the purpose, vision and mission of ACIAR.

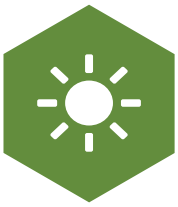
The COVID-19 pandemic exposed and exacerbated existing vulnerabilities in food systems around the Indo-Pacific region. Agriculture has played an important role as 'shock absorber' by sustaining food production and absorbing significant movements of people and providing useful work. While new variants of the coronavirus continue to emerge, countries in our region are opening their borders and rebuilding their economies. ACIAR is well placed to be an integral and constructive part of the response to the COVID-19 pandemic in our region, with our ability to harness the strengths of the Australian agricultural innovation system to provide scientific leadership.

The zoonotic origins of COVID-19 have shone a spotlight on biosecurity and One Health (the intersection of animal, human and environmental health) and during 2022–23 ACIAR will continue to support partnerships and programs that strive to develop far more effective integration across the human and animal health systems.

Our research portfolio will also support innovation in food systems through projects that produce livestock and grain with greater efficiency and targeting higher quality produce. This serves not only to provide more nutritious food for smallholder farmers and their families and communities, it also enables the production of marketable surplus to improve livelihoods.

ACIAR projects improving food systems in 2022–23 include:

- Food loss in the *Pangasius* catfish value chain of the Mekong River Basin (CS/2020/209)
- Sustainable intensification systems for climate-resilient development in Pacific island countries (CLIM/2020/186)
- Innovating fish-based livelihoods in the community economies of Timor-Leste and Solomon Islands (FIS/2019/124)
- Strengthening vegetable value chains in Pakistan for greater community livelihood benefits (HORT/2016/012)
- Increasing the productivity and profitability of smallholder beekeeping enterprises in Papua New Guinea and Fiji (LS/2014/042)
- Crop health and nutrient management of shallot-chilli-rice cropping systems in coastal Indonesia (SLAM/2018/145)
- Cropping system intensification in the salt-affected coastal zones of Bangladesh and West Bengal, India (LWR/2014/073)



Working in a changing climate

'Managing natural resources and producing food more sustainably, adapting to climate variability and mitigating climate change', our second research-based objective, is fundamental to the livelihoods of smallholder farmers, fishers and foresters throughout the Indo-Pacific region. Many countries are experiencing a degraded natural resource base, for example, poor soil health and water quality, and these issues are increasingly amplified by the growing impact of a changing climate.

Many projects across the ACIAR research portfolio address elements of this objective, and in particular the ACIAR Climate Change Program, which continues to consolidate its activities. The year ahead presents several opportunities to contribute and influence global discussions on food security and climate change, including the 27th session of the United Nations Conference of the Parties (COP27) for the Framework Convention on Climate Change. ACIAR plans to share tangible examples of game-changing Australian innovation and investment that, with the right partnerships in place, can be scaled for significant impact globally.

ACIAR will continue to represent Australia in collaborations with international partners through the Adaptation Research Alliance, which aims to increase investment and opportunities for action-orientated research to inform effective climate change adaptation, particularly for vulnerable countries and communities; and the Global Research Alliance for Agricultural Greenhouse Gases, an organisation finding ways to reduce the emissions intensity of agrifood systems.

ACIAR projects supporting climate change adaptation and mitigation in 2022–23 include:

- Transformation pathways for Pacific coastal food systems (CLIM/2020/178)
- Regional networks for large-scale coral and fish habitat restoration in the Philippines (FIS/2019/123)
- Enhancing livelihoods through improved forest management in Nepal (FST/2017/037)
- Responding to emerging pest and disease threats to horticulture in the Pacific islands (HORT/2016/185)
- Climate smart agriculture opportunities for enhanced food production in Papua New Guinea (ASEM/2017/026)
- Farmer options for crops under saline conditions in the Mekong River Delta, Vietnam (SLAM/2018/144)
- Trees for salinity Pakistan (WAC/2021/136)

Building healthier food systems

Better nutrition, food safety and food security are priority concerns in our partner countries, and therefore fundamental elements of the research and programs supported by ACIAR and its partners.

Throughout the Indo-Pacific region, there are countries, provinces and communities experiencing the triple burden of nutrition – acute hunger and malnutrition alongside increasing levels of obesity and diet-associated diseases, such as diabetes and heart disease. Higher incomes and urbanisation have led quickly to obesity and a rise in the incidence of non-communicable diseases. In many cases these are affecting previously under-nourished communities.

As we take steps to recover from the COVID-19 pandemic, the safety of food systems is under scrutiny. During 2022–23, ACIAR will implement a program of One Health projects in partnership with International Development Research Centre (Canada). Focused on the interface between human, animal and environmental health, the program aims to support the continued operationalisation of One Health.

Leaders in farming, business, science and government recognise that if the UN Sustainable Development Goals are to be achieved by 2030, there must be a global transformation in how food is produced, processed, distributed and consumed.

Many projects in our research portfolio are designed with an element of enhancing human nutrition and reducing risks to human health. During 2022–23, ACIAR will continue to develop partnerships and broker research relationships that address the many factors that influence the nutritional value of food harvested and the safety of the food production system.

ACIAR projects supporting healthier food systems in 2022–23 include:

- Agribusiness-led inclusive value chain development for smallholder farming systems in the Philippines (AGB/2018/196)
- Increasing productivity and profitability of pulse production in cereal based cropping systems in Pakistan (CIM/2015/041)
- Fruit trees for climate adaption and mitigation in East Africa (FST/2021/163)
- Timor-Leste bacteria enteropathy and nutrition study (LS/2021/126)
- Climate-smart coastal landscapes for sustaining fisheries-based livelihoods and food security in the Pacific (SSS/2021/120)
- Managing heavy metals and soil contaminants in vegetable production to ensure food safety and environmental health in the Philippines (SLAM/2020/117)

Improving equity and empowerment

Gender equity is crucial to alleviating poverty in rural communities and a key consideration in all contexts in which ACIAR operates. As more than half the world's farmers are women, ACIAR cannot credibly pursue its objectives around food security, human health and nutrition, climate change and reducing poverty unless we also promote gender equality and equity vigorously, both externally and internally.

ACIAR will update and build on its Gender Equity Policy and Strategy 2017–2022 with the ACIAR Gender Equity and Social Inclusion Strategy and Action Plan 2022–2027. The strategy provides a road map to scale up and integrate gender equity and social inclusion into all aspects of ACIAR research, capacity building and outreach programs. These efforts require improved analytical capacity to support research that addresses multiple and intersecting forms of discrimination and exclusion (such as socio-economic status, disability, ethnicity, age, gender and sexual identity, location and migration), while ensuring fair distribution of outcomes of research-for-development in agriculture, natural resources and food systems.

Consistent with the strategy and Australia's aid program targets, we aim for a minimum of 80% of ACIAR investments reflecting the principles of gender equity in project design and implementation. Currently, women make up less than 25% of project leaders in ACIAR-supported research, and the new strategy seeks to address barriers to project leadership for women scientists. The strategy also guides our internal planning and organisation. The proportion of senior positions occupied by women within ACIAR increased from 11% in 2016 to 58% by June 2022.

ACIAR projects improving equity and empowerment in 2022–23 include:

- Rapid breeding for reduced cooking time and enhanced nutritional quality in common bean (*Phaseolus vulgaris*) (CROP/2018/132)
- Towards more profitable and sustainable mabé pearl and shell-based livelihoods in the western Pacific (FIS/2019/122)
- Enhancing private sector-led development of the canarium industry in Papua New Guinea – Phase 2 (FST/2017/038)
- Improving smallholder wellbeing through participation in modern value chains: sustaining future growth in the Pakistan citrus industry (HORT/2020/129)
- Asian chicken genetic gains: a platform for exploring, testing, delivering, and improving chickens for enhanced livelihood outcomes in South-East Asia (LS/2019/142)
- Transforming smallholder food systems in the Eastern Gangetic Plain (WAC/2020/148)

Fostering inclusive value chains

Through the strategic objective of 'fostering more inclusive agrifood and forestry value chains and engaging the private sector where possible', ACIAR brokers projects that identify opportunities and improve business outcomes for people all the way along the value chain, from the input providers and smallholder farmers, to their households and communities.

Effective, efficient and inclusive value chains have the power to transform livelihoods of some of the poorest regions of the world. Unlocking the potential for people to participate equitably in markets and benefit from the opportunities provided by business is a proven way to create employment, improve business outcomes for smallholders and communities and increase economic security in developing countries.

The ACIAR Agribusiness Program focuses on research opportunities to develop new or better business systems and build partnerships to increase the efficiency, safety and inclusivity of supply chains. However, projects in other programs of the ACIAR research portfolio link best practices in agriculture, fisheries and forestry to opportunities to support innovation in production systems and value chains, and create new domestic market opportunities.

During 2022–23, ACIAR and IDRC will continue the Food Loss Research Program, which is a series of projects working with partners in developing countries to address food loss through innovative, locally driven solutions. Read more on page 23.

ACIAR projects fostering inclusive value chains in 2022–23 include:

- Inclusive agriculture value chain financing (AGB/2016/163)
- Preparing for mangrove-based climate and agribusiness transformation in the Mekong Delta (CLIM/2021/138)
- Innovating fish-based livelihoods in the community economies of Timor-Leste and Solomon Islands (FIS/2019/124)
- Coconut and other non-traditional forest resources for the manufacture of engineered wood products (FST/2019/128)
- Strengthening vegetable value chains in Pakistan for greater community livelihood benefits (HORT/2016/012)
- Improving small ruminant production and supply in Fiji and Samoa (LS/2017/033)
- Improving livelihoods of smallholder coffee communities in Papua New Guinea (ASEM/2016/100)

Building capability

Innovation in agriculture is a key pathway to poverty reduction, increased food security and economic growth. Building the capacity of agricultural researchers and policymakers, their networks and institutions contributes to innovation potential and supports partners to deploy relevant and effective agricultural practices and policies to reduce poverty.

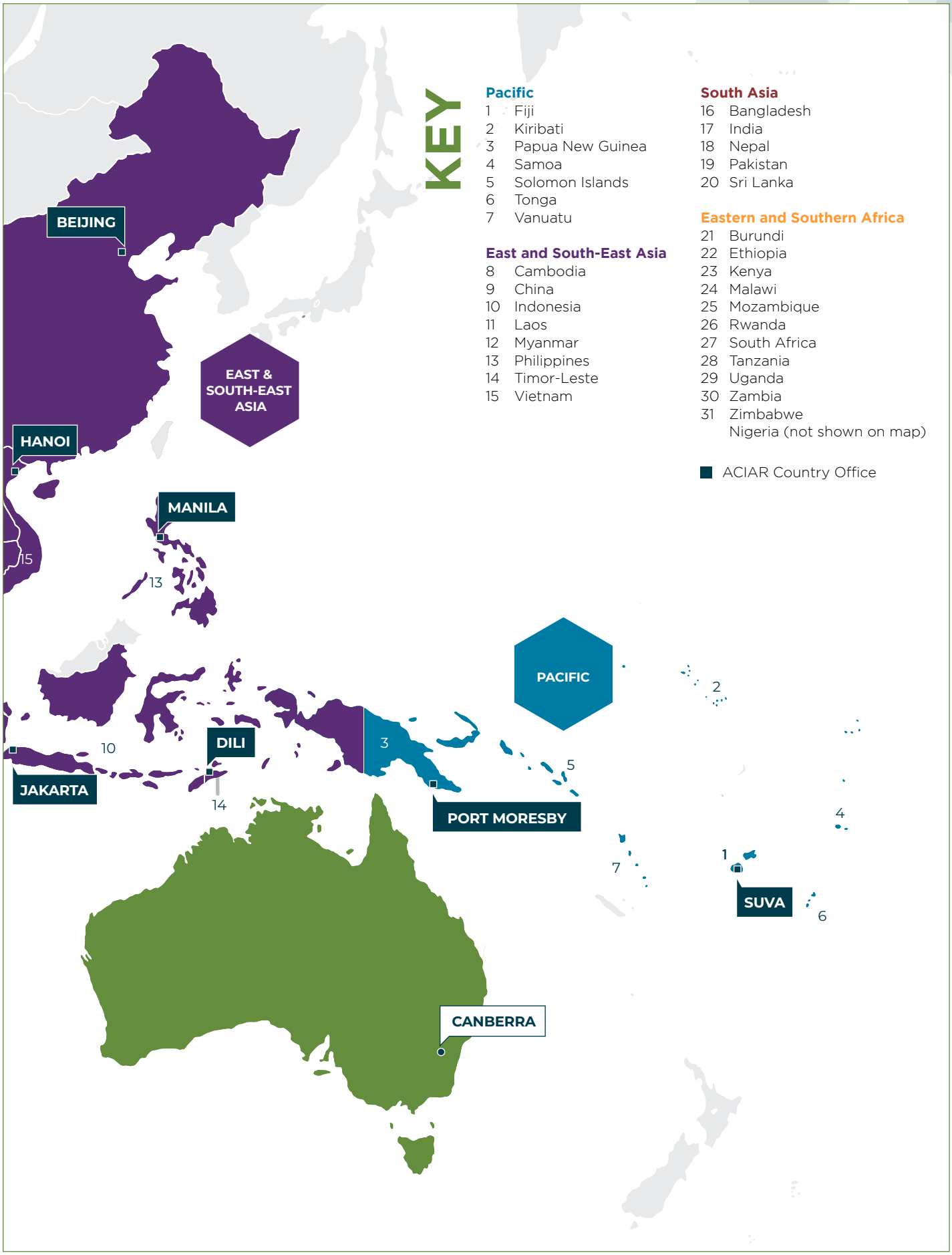
The ACIAR 10-Year Strategy 2018–2027 committed ACIAR to building its investment in postgraduate research training for individual scientists, as well as value-added training in management and leadership. Further, the strategy also identified the value in developing ongoing relationships with the network of ACIAR collaborators. During 2022–23, we will continue to deliver our core activities within the Capacity Building Program, being flexible and adaptive as COVID-19 continues to affect our region. Where possible, we will return to face-to-face learning opportunities and build on our lessons learned to strengthen our online platforms.

Capacity building is an intrinsic factor of many of the research projects we broker. This ensures that the people we work with have the skills, resources and knowledge to sustain new initiatives, systems and approaches, so our investment leads to lasting change. The collaborative international programs and partnerships underpinning ACIAR-supported research also serve to improve Australian scientific capabilities. We will also be reviewing our program to further integrate with the research function of ACIAR, a key recommendation from the mid-term review of the 10-year strategy.

ACIAR programs and projects building capability in 2022–23 include:

- Pacific Agribusiness Research in Development Initiative Phase 2 (PARDI 2) (AGB/2014/057)
- Locally led learning to turn polders into flexible assets for adaptation (CLIM/2021/137)
- Demand-led plant variety design for emerging markets in Africa (FSC/2013/019)
- Building effective forest health and biosecurity networks in South-East Asia (FST/2020/123)
- Development of area-wide management approaches for fruit flies in mango (HORT/2015/042)
- Intensification of beef cattle production in upland cropping systems in Northwest Vietnam (LPS/2015/037)
- Managing heavy metals and soil contaminants in vegetable production to ensure food safety and environmental health in the Philippines (SLAM/2020/117)
- Transforming smallholder irrigation into profitable and self-sustaining systems in southern Africa (TISA) (LWR/2016/137)

ACIAR regions and partner countries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SUVA
CANBERRA

Operating structure

ACIAR is established by the *Australian Centre for International Agricultural Research Act 1982* (ACIAR Act), as amended, and it is an agency of the Australian Government Foreign Affairs and Trade portfolio.

ACIAR is a non-corporate Commonwealth entity under the *Public Governance, Performance and Accountability Act 2013* and a statutory agency under the *Public Service Act 1999*.

ACIAR has an executive management governance structure headed by the CEO, who reports directly to the Minister for Foreign Affairs.

The CEO manages the administrative and financial affairs of ACIAR and its staff, subject to, and in accordance with, any directions given by the Minister. An executive team supports and advises the CEO on strategic priorities and corporate and operational policies.

The CEO is supported by an Audit Committee, which provides independent assurance to the CEO on financial and performance reporting responsibilities, risk oversight and management, and systems of internal auditing of ACIAR.

Also established under the ACIAR Act is the Commission for International Agricultural Research (the Commission), which provides collective decision-making and expert strategic advice to the Minister on the operations of ACIAR; and the Policy Advisory Council, which provides advice to the Minister on strategic aspects of national and regional development.

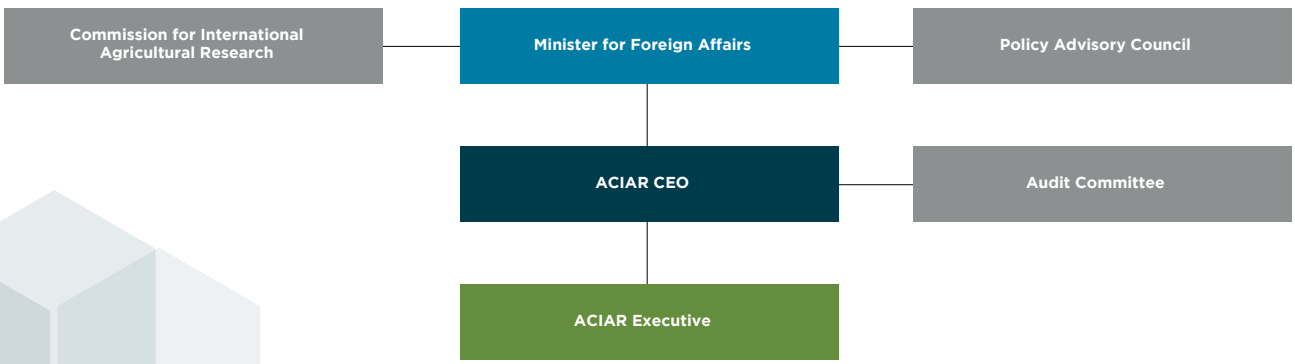
ACIAR CEO

Chief Executive Officer
Professor Andrew Campbell FTSE FAICD

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

Professor Andrew Campbell was appointed to the role of CEO on 31 July 2016, and reappointed to the role for another 2 years in June 2021. Andrew has played influential roles in sustainable agriculture and natural resource management in Australia for more than 30 years. He has a Diploma of Forestry from the Victorian School of Forestry, Creswick, a Bachelor of Forest Science (Honours) from the University of Melbourne and a Master of Science (Management of Agricultural Knowledge Systems) from Wageningen University in The Netherlands. Andrew is an elected Fellow of the Academy of Technology and Engineering, Fellow of the Australian Institute of Company Directors and an honorary Professorial Fellow at the Australian National University.

Governance structure of ACIAR



ACIAR Executive

Chief Finance Officer Ms Audrey Gormley

The Chief Finance Officer is responsible for providing strategic financial advice to the organisation, in addition to managing human resources, business services (information technology), procurement, legal, property and other corporate activity.

Ms Audrey Gormley joined ACIAR in July 2017 and has over 30 years experience in all facets of finance and accounting both at strategic and operational levels, working in investment banking and insurance sectors before joining the Australian Government. Prior to joining ACIAR, Audrey was Chief Finance Officer at Food Standards Australia New Zealand for over 10 years. She holds a Bachelor of Commerce from University College Dublin and is a Fellow of the Association of Chartered Certified Accountants.

Chief Scientist Dr Daniel Walker

The Chief Scientist oversees the strategic science focus of the ACIAR research portfolio and its impact assessment, monitoring and evaluation work. The Chief Scientist also provides leadership for research program managers across 10 research areas, and oversight of our relationship with the Australian innovation system.

Dr Daniel Walker joined ACIAR in November 2017 to take up the newly created role of Chief Scientist. Prior to ACIAR, Daniel spent 23 years at CSIRO, where he was Research Director for Agriculture and Global Change with CSIRO Agriculture and Food and previously, Chief of CSIRO Ecosystem Sciences. Daniel has a Bachelor of Science (Honours) in agriculture, forestry and rural economy from the University of Edinburgh and a PhD from the University of Wales.

Acting General Manager, Country Partnerships Prof Ann Fleming

The General Manager, Country Partnerships is responsible for leading and setting the partnership approach for ACIAR country (bilateral) programs, managing the ACIAR Country Network, and leading the engagement with key research partners and stakeholders overseas.

Professor Ann Fleming has stepped up to this acting role from ACIAR Research Program Manager, Fisheries. Ann came to ACIAR from Monash University, where she was a research development specialist for 2 years. Before that, Ann was Manager of Aquaculture in NT Fisheries for 5 years, and for the 10 years prior she was Assistant Leader and then Leader of the Abalone Aquaculture Program for the Fisheries Research and Development Corporation (FRDC). Ann has a PhD in Aquaculture from the University of Melbourne, a BSc (Hons) from Monash and a Graduate Certificate in Public Sector Management from Flinders University. She is currently undertaking a Master of International Development at RMIT.

General Manager, Outreach and Capacity Building Ms Eleanor Dean

The General Manager, Outreach and Capacity Building leads the development and implementation of the ACIAR outreach strategy, and leads and directs a team responsible for ACIAR communications, stakeholder engagement, capacity building and outreach activities.

Ms Eleanor Dean has worked in public affairs and communication for the Australian Government for more than 25 years on a diverse range of issues including natural resource management, biodiversity, education and training. Prior to joining ACIAR in 2017, Eleanor led the safety promotion and communication branch at the Civil Aviation Safety Authority. She has a Bachelor of Communication (Honours) from the University of Canberra.

Organisational structure 2022–23

ACIAR is a small government agency with 82 staff (full and part-time).

- 60 people are located at ACIAR House in Canberra, Australia
- 22 people are locally engaged staff at missions and embassies of the Australian Government, throughout the Indo-Pacific region.

Staff are organised into 4 lines of management:

- Country Partnerships
- Research Programs
- Outreach and Capacity Building
- Corporate Services.

The organisation of executive and management staff is shown in the diagram.

Commission for International Agricultural Research

The Commission for International Agricultural Research (the Commission) has a critical governance role under the ACIAR Act to provide strategic advice to the Minister. The Commission will continue to play an important role as a sounding board and source of strategic advice for ACIAR. In 2022–23, it will also focus on the implementation of recommendations of the mid-term review of the ACIAR 10-Year Strategy 2018–2027. The Commission will also undertake recruitment of a new CEO for ACIAR, with the term of Professor Campbell ending 31 July 2023.

Commissioner	
Mrs Fiona Simson GAICD BA (Chair)	Grazier, northern New South Wales President, National Farmers' Federation
Professor Andrew Campbell FTSE FAICD	Chief Executive Officer, ACIAR
Dr Sasha Courville	Chief Impact Officer, Bank Australia
Emeritus Professor Lindsay Falvey FTSE, FAIAS	University of Melbourne
Ms Su McCluskey	Cattle farmer, southern New South Wales Non-executive director and commissioner Australia's Special Agriculture Representative
Dr Beth Woods OAM FTSE	Independent consultant, agricultural management Chair of the Council of the Australian Institute of Marine Sciences
Mr Tony York	Farmer, central wheatbelt, Western Australia Director, National Farmers' Federation

Policy Advisory Council

The role of the Policy Advisory Council under the ACIAR Act is to advise the Minister and ACIAR on the agricultural problems of developing countries, providing rich contextual detail and insight that informs the design and implementation of ACIAR-funded research. The Council will continue its important role of facilitating partnerships and being pivotal in discussions for setting priorities and research focus when developing new ACIAR partner country strategies.

Council member	
Prof Wendy Umberger (President)	Executive Director, Centre for Global Food and Resources, and Professor of Agricultural and Food Economics and Food Policy, University of Adelaide, South Australia
Dr Audrey Aumua	Chief Executive Officer, Fred Hollows Foundation, New Zealand; Australian Pacific Women Advisory Board
Dr Nguyen Van Bo	Former President of the Vietnam Academy of Agricultural Sciences; Member, Vietnam Panel on Climate Change; Vice Chairman, Vietnam Rural Development Science Association; Board of Trustees member of Vietnam National University of Agriculture
Prof Ramesh Chand	Union Minister of State & Member of Fifteenth Finance Commission NITI Aayog, India. Member, Board of Trustees, CIMMYT (International Maize and Wheat Improvement Centre), Mexico
Dr Rachel Chikwamba	Member, Group Executive, Chemicals, Agriculture, Food and Health Division, South Africa Council for Scientific and Industrial Research (CSIR)
Dr Reynaldo Ebora	Executive Director of the Department of Science and Technology – Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST – PCAARRD)
Dr Segenet Kelemu	Director General and CEO of the International Centre of Insect Physiology and Ecology (icipe), Kenya; Member, United Nations University Council
Prof Teatulohi Matainaho	Vice Chancellor, Pacific Adventist University, Papua New Guinea
Dr Surmsuk Salakpetch	Former Director-General Thailand Department of Agriculture; Member, The Senate Sub-Committee on Factors of Production under The Senate Committee on Agriculture and Cooperatives, Thailand; Advisor of National Bureau of Agricultural Commodity and Food Standards, Thailand
Prof Achmad Suryana	Member, former Indonesian Agency for Agricultural Research and Development (IAARD) Experts Communication Forum; Professor, Indonesian Centre for Social, Economic and Policy Studies
Mr Sunny Verghese	Co-founder & Group CEO, Olam International Limited Singapore; Chairman of the World Business Council for Sustainable Development (WBCSD); Chairman of the Board of the Human Capital Leadership Institute (HCLI) Singapore; Chairman of JOil (S) Pte Ltd, and Member, Board of Trustees of Singapore Management University
Ex-officio member	Secretary of the Department of Foreign Affairs and Trade, or nominee of the Secretary

Funding and expenditure

Table 1.1 Overview of planned funding and expenditure, 2022–23

Budget estimate		
Funding		**A$ million**
Administered	Administered appropriation	92.92
	Special accounts	8.31
	Total administered funding	**101.23**
Departmental	Departmental appropriation	9.44
	s 74 Retained revenue receipts[a]	2.11
	Expenses not requiring appropriation[b]	1.27
	Total departmental funding	**12.83**
Total funding		**114.07**
Expenditure		
Administered	Bilateral and regional research projects[c]	71.06
	Global research collaborations[d]	18.79
	Scientific and policy capacity building activities[e]	9.35
	Outreach	2.03
	Total administered costs	**101.23**
Departmental	**Total departmental costs**[f]	**12.83**
Total expenditure		**114.07**

a) Revenue from external sources.
b) Depreciation, amortisation and audit fees.
c) Includes program support and impact evaluation.
d) Includes unrestricted funding to international centres.
e) Does not include training and communication activity within projects.
f) Includes salaries, executive, Commission, Policy Advisory Council and corporate support.

Table 1.2 Planned contribution to ACIAR activities by external funders or partners, 2022–23

Activity area	Partner funder	Expenditure
		A$ million
Regional and country projects	Department of Foreign Affairs and Trade	4.01
Postgraduate Scholarships	Department of Foreign Affairs and Trade	2.73
Food Futures Research Program	International Development Research Centre (Canada)	0.63
Total		**7.37**

Note There is no external funding expenditure on projects and programs in Africa by Department of Foreign Affairs and Trade.

Table 1.3 Australia's funding to international agricultural research centres, 2022–23

	Unrestricted	Restricted (project specific)	Total
	A$ million	A$ million	A$ million
CGIAR	17.30	2.21	19.51
Other centres	5.93	—	5.93
Total	**23.23**	**2.21**	**25.44**

Note 'Other centres' encompasses international partners that do not belong to the CGIAR network.

Table 1.4 **Planned project expenditure by country, 2022–23**

Region and country	Target appropriation budget allocations	ACIAR base appropriation	DFAT and other external funding	Total allocation
	%	A$ million	A$ million	A$ million
Pacific region	**31**	**16.35**	**2.29**	**18.64**
Fiji	—	3.69	0.20	3.89
Kiribati	—	0.50	0.36	0.86
Samoa	—	1.36	0.03	1.39
Solomon Islands	—	2.12	0.39	2.51
Tonga	—	1.10	0.03	1.13
Vanuatu	—	1.01	0.36	1.37
Pacific island countries - general	—	0.34	0.36	0.70
Papua New Guinea	—	6.23	0.56	6.79
East and South-East Asia	**44**	**23.41**	**1.83**	**25.24**
Cambodia	—	3.35	0.31	3.66
China	—	0.07	—	0.07
Indonesia	—	4.27	0.78	5.05
Laos	—	4.11	0.09	4.20
Myanmar	—	0.79	—	0.79
Philippines	—	3.92	0.55	4.47
Timor-Leste	—	1.98	—	1.98
Vietnam	—	4.92	0.10	5.02
South Asia	**14**	**7.50**	**0.25**	**7.75**
Bangladesh	—	2.06	0.05	2.11
India	—	0.67	—	0.67
Nepal	—	0.77	—	0.77
Pakistan	—	3.49	0.10	3.59
Sri Lanka	—	0.51	0.10	0.61
Eastern and Southern Africa	**10**	**5.52**	**2.68**	**8.20**
Burundi	—	0.06	—	0.06
Ethiopia	—	1.36	0.11	1.47
Kenya	—	1.89	0.80	2.69
Malawi	—	0.14	0.15	0.29
Mozambique	—	0.23	0.24	0.47
Nigeria		—	0.10	0.10
Rwanda	—	0.31	—	0.31
South Africa	—	0.09	0.28	0.37
Tanzania	—	0.43	0.15	0.58
Uganda	—	0.58	0.13	0.71
Zambia	—	0.13	0.07	0.20
Zimbabwe	—	0.30	0.65	0.95
Total project expenditure		**52.78**	**7.05**	**59.83**

Note: Due to rounding, subtotals may not always add up to the totals shown

2

Global collaborations

Photo: Lorima Vueti, The Pacific Way

Global collaborations

ACIAR works with international partners to foster and implement global research collaborations that support strategic development in agriculture, fisheries and forestry.

The ACIAR 10-Year Strategy 2018–2027 proposes that by leveraging strategic international partnerships we can continue to influence and promote more productive and sustainable agricultural systems for the benefit of low-income and lower-middle-income countries and Australia. ACIAR builds and maintains multilateral partnerships with a range of international organisations, institutes and associations that are engaged in agricultural research and the delivery of global public goods. Our goal is to be a valued, engaged donor and a strong, innovative partner in international agricultural research.

The funding and support of international agricultural research centres is one of the roles of ACIAR, mandated by the ACIAR Act. We foster and maintain active working relationships with international agricultural research centres by providing timely, reliable and consistent funding, as well as strategic advice on research and governance.

The largest component of support is provided to CGIAR, an international network of research centres dedicated to reducing rural poverty, increasing food and nutrition security for human health, and improving natural resource systems and ecosystem services.

In addition to CGIAR, we establish and foster partnerships with other international research centres and networks relevant to our mission.

We also develop and manage co-investment alliances and partnerships with like-minded organisations and donors. Co-investment partnerships demonstrate deep trust, enabling partners to leverage capacity and complement research strengths to build a critical mass of resources to invest in more ambitious research.

During 2022–23, we will seek to strengthen multilateral collaborations by serving the international research community as:

- an engaged investor
- a strategic research facilitator
- a broker of Australian science (by engaging relevant Australian research expertise).

Australia as a global contributor

Partnerships built by ACIAR Multilateral Collaborations contribute to Australia's global citizenship goals. Our deep engagement in collaborative international research maximises the influence of the Australian agricultural innovation system and the international standing of Australian agriculture.

Investing in global agricultural innovation

Australia has invested in CGIAR since it was established in 1971. CGIAR is the world's largest global agricultural innovation network, comprising 15 international agricultural research centres with more than 9,000 scientists who work mostly in low-income and lower-middle-income countries.

With 50 years of experience, a presence in 89 countries, and a deep knowledge of local customs, values and markets, CGIAR research centres work closely with more than 3,000 partner organisations. These include national and regional research institutes, civil society organisations, academia and the private sector. CGIAR research centres work towards a world free of poverty, hunger, malnutrition and environmental degradation. The centres conduct world-class, interdisciplinary research that combines biophysical and social sciences to deliver development impact at scale. CGIAR operates on an annual budget of about US$900 million. The location of these centres is shown in Figure 2.1.

CGIAR is better connected to the global development agenda than any other agrifood research entity. CGIAR research centres are responsible for hands-on research programs and operations guided by policies and research directions set by the CGIAR System Board with guidance from the CGIAR System Council. A strong research-based relationship between ACIAR and CGIAR was forged soon after the establishment of ACIAR in 1982. With an amendment to the ACIAR Act in 1992, ACIAR was then mandated as Australia's representative to CGIAR.

As a significant funder of CGIAR, Australia has high-level representation on CGIAR governance bodies. The CEO of ACIAR represents Australia on the System Council.

During 2022–23, CGIAR will finalise reforms to a more unified and integrated One CGIAR. This will better equip the network to swiftly respond to new challenges in international agricultural research while keeping up with emerging crises. In essence, the reform involves a move from the network of 15 independent international research centres, currently configured mostly around agricultural commodities, to a more cohesive structure under a common board. ACIAR has been deeply engaged in the reform process, which has involved profound change across CGIAR, its culture, values, people, policies and systems. We have actively contributed to the reform to ensure CGIAR is well-placed to deliver against both the UN Sustainable Development Goals and the Paris Agreement under the UN Framework Convention on Climate Change, as well as to attract new funder contributions.

Australia contributes to CGIAR alongside the World Bank, United States of America (USA), Bill & Melinda Gates Foundation, Germany, India, United Kingdom, European Commission and Mexico among many others. Further information on CGIAR governance and funding can be found on the CGIAR Governance and CGIAR Dashboards sites on the CGIAR website. In addition to the governance role, provided to CGIAR by ACIAR, many Australian scientists contribute at the highest levels of leadership within the CGIAR and research centres.

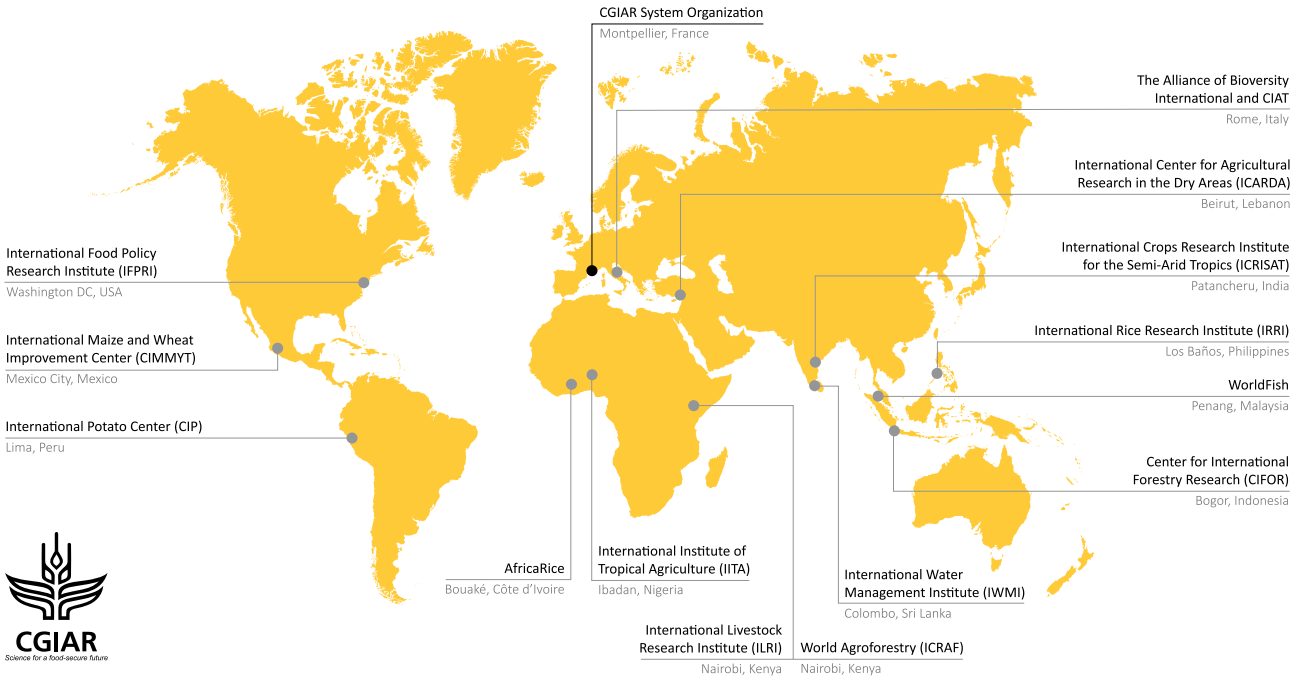


Figure 2.1 **Agricultural research centres of the CGIAR system. Source: CGIAR**

CGIAR investment 2022–23

ACIAR provides unrestricted core funds (designated and undesignated) and restricted project funds to CGIAR. More than half of the total funding is unrestricted, and this is reviewed annually. Restricted funding is delivered through specific research projects delivered by individual centres of the CGIAR network. Australian support of CGIAR in 2022–23, through ACIAR, is forecast to be approximately A$20 million (Table 1.3).

CGIAR implemented a new research portfolio, during 2021–22, that strives for global and regional impact by organising its work around 3 Action Areas:

- Systems Transformation
- Resilient Agrifood Systems
- Genetic Innovation.

These Action Areas fit the newly designed 2030 Research and Innovation Strategy, which aims to ensure that research provides real solutions for development. This is a substantial shift in the way CGIAR works, and will be achieved following 7 new implementation approaches:

1. embracing a systems transformation approach
2. leveraging ambitious partnerships for change
3. positioning regions, countries and landscapes as central dimensions of partnership, worldview and impact
4. generating scientific evidence on multiple transformation pathways
5. targeting risk-management and resilience as critical qualities for food, land and water systems
6. harnessing innovative finance to leverage and deliver research through new investment and funding models
7. making the digital revolution central to our way of working.

To ensure research excellence and value for investment in CGIAR for Australia, during 2022–23 ACIAR will:

- participate at the highest levels of governance of the CGIAR system, through membership and leadership on the CGIAR System Council, the Strategic Impact Monitoring and Evaluation Standing Committee and Investment Advisory Groups
- continue our collaboration with other donors to CGIAR through participation in multi-funder activities that align with ACIAR strategy and Australian interests
- coordinate Australian engagement with CGIAR, including consultation with Department of Foreign Affairs and Trade (DFAT) and other Australian organisations, primarily through the CGIAR Australian Leadership Group, established by ACIAR in 2015
- involve ACIAR Research Program Managers in the technical oversight of CGIAR Research Programs.

ACIAR hosts international ag research meeting

In November 2022, ACIAR, on behalf of Australia, hosted a meeting of the CGIAR System Council. The System Council is the vision, strategic direction and advocacy body of CGIAR and meets twice yearly, with approximately 70 delegates of high standing from across the globe.

The System Council Meeting was held in Brisbane, home of world-leading tropical and sub-tropical agricultural research. The meeting was timed to align with the TropAg International Agricultural Conference and a Food Diplomacy Dialogue hosted by the Commission for International Agricultural Research and the Policy Advisory Council.

Impressive return on investment

CGIAR delivers impressive economic, social and environmental returns on research investment. Over the past 5 decades, the benefits of CGIAR investment are tenfold for each dollar invested.

A 2020 study calculated a benefit-cost ratio of 10:1 for CGIAR investment since 1961, which is primarily due to enhancing the yields of staple food crops in developing countries. There are additional less-easily measured payoffs such as greater food abundance, cheaper food, reduced rates of hunger and poverty, and a smaller geographical footprint of agriculture.

CGIAR research outputs have helped keep Australian farmers competitive in world markets by increasing yields and reducing costs. CGIAR germplasm has been incorporated into, and has greatly improved, Australian plant and livestock breeding programs. For example, 98% of all wheat grown in Australia is derived from CGIAR wheat germplasm. CGIAR germplasm is also prominent in improved varieties of sorghum, maize and chickpea in Australia.

Source: The payoff to investing in CGIAR research (2020)

Partnering in global and regional programs

In addition to our partnership with CGIAR, ACIAR has formal multilateral partnership arrangements with a number of international agricultural research centres and networks.

During 2022–23, we will support global research collaborations with:

- The Pacific Community
- Asia–Pacific Association of Agricultural Research Institutions
- World Vegetable Center
- Centre for Agricultural Biosciences International.

The Pacific Community

The Pacific Community (SPC), previously known as the Secretariat of the Pacific Community, has been the principal scientific and technical organisation working to support development in the Pacific region since 1947. SPC is an international development organisation owned and governed by 26 country and territory participants.

SPC provides a regional specialist technical expertise to strengthen or, in some cases, supplement regional and national capacity. Of SPC's core functions, some are of particular interest to ACIAR:

- to strengthen sustainable management of natural resources (fisheries, forestry, land use, agriculture, minerals, water)
- to improve pathways to international markets
- to improve multi-sectoral responses to climate change and disasters
- to advance social development through the promotion of human rights, gender equality, cultural diversity and opportunities for young people
- to improve multi-sectoral responses to non-communicable diseases and food security.

Coastal fisheries is a very important sector in Fiji and other Pacific island countries as it contributes to food security, protein and micro-nutrient uptake, subsistence aquaculture and supports livelihoods and income generation. Photo: Lorima Vueti

SPC and ACIAR have worked in partnership for more than 30 years and SPC is a key partner of both ACIAR and DFAT. SPC helps deliver on Australia's strategies to support the production of strategic regional public goods with strong benefits for the region's agriculture, fisheries, forestry and biosecurity sectors.

ACIAR currently provides core and project funding to the Land Resources Division and the Fisheries Aquaculture and Marine Ecosystems Division. The current core strategic partnership agreement, associated with this funding, extends to December 2026.

The partnership between ACIAR and SPC supports the production and maintenance of scientific, technical and management capacities, and activities in agriculture and fisheries that provide shared benefits for agricultural development activities of Pacific island countries and territories. Our funding is also aimed at building stronger strategic relationships between our organisations, enhancing strategic management capacity in the Land Resources Division and strengthening capacity for coastal fisheries development in Fisheries Aquaculture and Marine Ecosystems Division.

SPC facilitates the participation and engagement of ACIAR in regional consultation processes such as Pacific Week of Agriculture and Forestry, Heads of Agriculture and Forestry Services, and Ministers of Agriculture and Forestry Services. During 2022–23, ACIAR and SPC will collaborate to progress strategic regional initiatives, particularly mitigating the impacts of current and future risks.

Asia-Pacific Association of Agricultural Research Institutions

The Asia-Pacific Association of Agricultural Research Institutions (APAARI) promotes and coordinates the national agricultural research institutes in the Asia-Pacific region, through inter-regional and inter-institutional cooperation. APAARI's Strategic Plan 2017–2022, Pathways to strengthened agrifood research and innovation systems in Asia and the Pacific, identifies strategic priorities that are used to inform our input into its wider regional consultation process.

ACIAR has a history of working with and supporting APAARI. We provide annual core funding for research communication, knowledge management, advocacy for agricultural biotechnology, support for capacity building, and participation in expert consultations with national agricultural research system leaders in the region.

World Vegetable Center

The World Vegetable Center (WorldVeg) is an international non-profit research and development institute committed to alleviating poverty and malnutrition in low-income and lower-middle-income countries through increased production and consumption of vegetables. It also manages the world's largest vegetable gene bank. WorldVeg undertakes research and development to realise the potential role of vegetables for healthier lives and more resilient livelihoods.

Through its extensive networks and research partnerships WorldVeg disseminates improved varieties of vegetable crops and promotes improved production methods to farmers. This results in higher vegetable harvests, higher incomes, more jobs and healthier, more nutritious diets.

Investment in WorldVeg is an investment in research into the nexus between agriculture, livelihoods, nutrition and health. ACIAR provides WorldVeg with both core funding and project-specific funding. ACIAR has a strategic partnership arrangement with WorldVeg, which supports breeding activities and capacity building in low-income and lower-middle-income countries in Asia and Sub-Saharan Africa. The partnership focuses on the development of improved vegetable varieties (49% funding allocation), introduction of agricultural practices (36%) and collaboration and capacity building of public and private seed sectors (15%).

ACIAR funding has enabled:

- better conservation of vegetable crop biodiversity and development of more resilient crops to address current and future biotic and abiotic constraints to vegetable production in the context of climate change
- development, evaluation and validation of good agricultural practices for vegetable production that are safe for consumers, profitable and sustainable for all value-chain stakeholders
- collaboration to strengthen the capacity of smallholder farmers and national partners from both the public and private sectors in vegetable production and commercialisation.

WorldVeg has brought significant benefits to Australian agriculture, particularly through its mungbean breeding program, which has provided the varieties grown across much of northern Australia for many years. WorldVeg also holds breeds of tomato with genetic resistance to tomato yellow leaf curl virus, which poses an ongoing threat to the Australian tomato industry.

WorldVeg has brought significant benefits to Australian agriculture as well as international partners through its mungbean breeding program.

Centre for Agricultural Biosciences International

The Centre for Agricultural Biosciences International (CABI) is an intergovernmental, not-for-profit organisation established by a UN treaty. Australia is a member country of CABI, along with 48 other member countries from Africa, Asia, the Americas and Europe.

CABI addresses issues of global concern through science, information and communication, with a focus on international development and research, publishing and microbial services. CABI works to improve global food security, combat threats to agriculture and the environment from pests and diseases, protect biodiversity from invasive species, and improve access to agricultural and environmental knowledge. CABI improves lives worldwide by providing information and applying scientific expertise to solve problems in agriculture and the environment.

Australia's funding and membership, through ACIAR, enables CABI to address key issues of importance to both organisations. The 4-year partnership (2019–23) between ACIAR and CABI supports PlantwisePlus, the CABI Development Fund and Australia's CABI membership (services relating to CABI's scientific expertise, products and resources). The CABI Development Fund invests in pilot projects to enable the development of strategies for climate-change adaptation and mitigation actions in smallholder agriculture. Australia's investment in CABI has contributed to improved agricultural outcomes for low-income and lower-middle-income countries and delivered benefits to Australian agriculture.

Plantwise Plus program

The Plantwise program launched by CABI in 2011 is based on a network of plant clinics run by trained plant doctors to provide practical advice to smallholder farmers about plant health. The network also organises plant health rallies, mass extension campaigns and farmer-to-farmer sharing of information, and has helped more than 44 million smallholder farmers in 30 countries, and reduced the likelihood of a household falling into poverty by 5%.

In 2021, CABI launched PlantwisePlus, building on Plantwise, to support countries predict, prepare for and prevent potential plant pest and disease threats. The new program will give farmers the knowledge and services needed to improve crop production; raise awareness of agricultural best practice and nutritional information; provide access to affordable, more sustainable plant protection products; and create effective pest monitoring systems, enabling quick and effective responses to pest threats.

Ms Roseanne Mwangi is an entrepreneur under the icipe-implemented project, Insects for Feed (INSFEED). In 2022-23 ACIAR will strengthen its relationship with icipe, committing to the organisation as a strategic long-term funder and partner, in addition to existing research collaborations. Photo: Emmie Wachira

International Centre of Insect Physiology and Ecology

The International Centre of Insect Physiology and Ecology (icipe) plays an important role in agricultural research for development, and in producing and maintaining global public goods in entomology.

ACIAR has engaged icipe as an implementing partner on research projects since 2015. In 2022, icipe is leading an initiative, in partnership with ACIAR and AgriFutures Australia, to accelerate insect farming as an emerging industry in Africa and Australia. The Emerging Insect Technology Hub (EIT-Hub) will centralise engagement and knowledge sharing around insects as food, animal feed and fertiliser, and bring together industry stakeholders, scientists and investors to discuss issues related to emerging insect technologies.

In 2022–23 ACIAR will strengthen its relationship with icipe, committing to the organisation as a strategic long-term (core) funder and partner. Formal partnership arrangement will be established to reflect the strength of the relationship between ACIAR and icipe, the alignment of organisational aims, and the important role of icipe in the global agricultural research landscape.

Building strength through collaboration

Co-investment programs enable ACIAR to harness the complementary skills of partners, leverage ACIAR funds, and engage in larger and more ambitious programs.

Co-investment programs take many forms, from shared design and implementation of a suite of research, to programs designed to support industry and build capacity.

International Development Research Centre

Our most significant partner in terms of co-investment is Canada's International Development Research Centre (IDRC). IDRC was a model for ACIAR when Sir John Crawford submitted his recommendation to Prime Minister Fraser in 1981 to establish a centre for international agricultural development in Australia. Of all our partners, IDRC is most like ACIAR in that it is a specialist statutory agency investing in research as a form of strategic official development assistance.

IDRC has an agreement with ACIAR to build collaborations on a range of research initiatives of mutual interest until 2027. Current co-investments are 50:50 partnerships and include:

- Cultivating Africa's Future Fund (CultiAF2), CA$20 million in total, described on page 148,
- Food Loss Research Program, CA$5 million in total, described on this page
- ACIAR–IDRC Research Program on One Health (AIRPOH), CA$4 million in total, described on page 24.

The Food Loss Research Program established by ACIAR and IDRC aims to gain a deeper understanding of the drivers of food loss, from the farm through to the consumer.

Food loss program

The Food Loss Research Program aims to gain a deeper understanding of the drivers of food loss, from the farm through to the consumer. The program marks an important evolution in looking at food from a systems perspective. In some countries where ACIAR operates, there is a lack of post-harvest infrastructure for reducing food loss. While technology solutions exist, they have not been adopted or implemented at scale.

The Food Loss Research Program addresses value chain inefficiencies, poor communication systems and overall structural inequalities. Through 4 projects the program seeks to:

- examine agricultural value chains within food systems at a provincial or local level in 2 or more countries in which ACIAR and/or IDRC work
- conduct foresight exercises until 2050, stipulating how value chains are likely to change given trends in labour, technology, mechanisation, climate change, urban and rural density, and nutritional requirements
- engage private agribusinesses along the value chain to document their experiences of food loss and explore models of innovation to mitigate food loss in the long term
- assess interventions that are currently being used at a local scale across the value chain
- assess factors that enable or prevent the transfer of intervention strategies from one location to another.

Food Loss Research Program projects

- Adopting a gender-inclusive participatory approach to reducing horticultural food loss in the Pacific (CS/2020/191) - page 59
- Developing food loss reduction pathways through smart business practices in mango and tomato value chains in Pakistan and Sri Lanka (CS/2020/193) - page 133
- Food loss in the catfish value chain of the Mekong River Basin (CS/2020/209) - page 80
- Managing food value chains for improved nutrition for urban vulnerable populations in Africa (Africitiesfood) (CS/2020/210) - page 144

One Health program

One Health is a framework that recognises that the health of people, animals and the environment is interconnected. It provides an approach for developing more effective integration across the human and animal health systems in regard to regulations, surveillance, diagnostics and responses to disease outbreaks.

Globally, approximately 75% of newly emerging infectious diseases are zoonoses (diseases that can transmit from animals to humans). These diseases arise as a result of one or several factors that may be anthropogenic, genetic, ecological, socioeconomic or climatic in origin. Across the Indo-Pacific region, animal production systems are changing rapidly; however, local and regional capacity to diagnose, treat and control disease is generally weak and under-resourced.

Jointly funded for A$4.3 million, the ACIAR–IDRC Research Program on One Health (AIRPOH), will form a portfolio of interconnected projects supporting research that will have a transformative impact on human, animal and environmental health. The program aims to promote new ideas and thinking on One Health.

Research Program on One Health projects

- Timor-Leste: Developing strategies to reduce brucellosis transmission in Timor-Leste based on One Health collaboration (LS/2022/161) – page 107.
- Policy support to the Philippines' national surveillance and control programs for African swine fever, avian influenza and antimicrobial resistance: A One Health systems approach to animal food security, public health resiliency and environment sustainability (LS/2022/162) – page 103.
- Livestock enhancement through EcoHealth/ One Health assessment in South-East Asia (LS/2022/163) – page 103.
- The role of agricultural and forest landscapes on human and environmental health in Cambodia (SSS/2022/164) - page 82.

Alliance for Agricultural Research and Development for Food Security

The Alliance for Agricultural Research and Development for Food Security (Alliance) is a joint initiative between ACIAR, the Syngenta Foundation for Sustainable Agriculture and the Crawford Fund.

Alliance partners undertake complementary activities and/or co-fund innovative approaches to research-for-development activities and delivery, using the unique and diverse strengths and expertise of the parties to better promote and achieve food security.

The Alliance recognised the potential for demand-led plant variety design to transform plant breeding for small-scale agriculture and food security. In 2014 it established the project 'Demand led plant variety design for emerging markets in Africa' (FSC/2013/019) (page 146), which engages with plant-breeding and university sectors in many countries in southern and eastern Africa.

A new project in Bangladesh has evolved from a shared interest between ACIAR and the Syngenta Foundation, of wanting to improve the translation of scientific information on soil health into practical and useable information to support farmers in their decision making. Ultimately, the project aims to improve the resilience, sustainability and productivity of smallholder farmers (page 124).

Dr Julianne Biddle is the Director, Multilateral Engagement at ACIAR. Julianne has over 20 years' experience in plant science, working in research, science communication, education, policy and management. She has a keen interest in conservation biology, plant–pathogen interactions, ecology and plant physiology. Before joining ACIAR, Julianne worked at the University of Queensland where she focused on demand-led plant breeding in Africa and coconut physiology. Julianne grew up on a cattle farm in central Queensland and has a Bachelor of Science with advanced studies in biochemistry, molecular biology, cell biology and biological sciences from Griffith University, Honours in biochemistry and molecular biology and a PhD in ecology, evolution and genetics from the Australian National University.

Engagement in multilateral climate forums

ACIAR drives innovative international agricultural research and development through our strong engagement in multilateral forums, demonstrating Australia's commitment to global action to achieve the Sustainable Development Goals.

Adaptation Research Alliance

ACIAR worked with more than 30 organisations around the world to scope and develop a new global research alliance, the Adaptation Research Alliance. Launched at COP26 (2021), the Adaptation Research Alliance is now a global alliance of over 120 organisations dedicated to results-oriented adaptation research, particularly research that is locally led, driven by local needs, to support action that benefits people on the ground.

The Alliance seeks to facilitate collective learning across its members to improve the ability of research to support faster and more ambitious climate response. As a founding member of the Alliance, ACIAR is supporting the Secretariat (ACIAR project CLIM/2022/108) to turn a literature review of the latest methods for large-scale collective learning (completed by the International Institute for Environment and Development) into a practical platform for Alliance members to learn and improve outcomes from research together.

COP27

ACIAR will engage in events connected to the UN Conference of the Parties on Climate Change (COP27) in November 2022. The conference and associated events and dialogues aim to build on previous successes to define pathways and processes to effectively tackle the global challenge of climate change.

The endeavours of COP27 and the groups it brings together align with the objective of ACIAR, through its Climate Change Program, to progress the science and practice of how to transform food systems and livelihoods in our partner countries, to adapt to climate impacts and reduce greenhouse gas emissions.

At COP27, ACIAR will convene and participate in several pavilion sessions. One of these includes a panel session entitled 'Insights on implementation of food systems change in development'. In this session, ACIAR will share insights from our work on how food systems change can be practically implemented on the ground and invite discussion on others' experiences of barriers and enablers to food systems change.

The Global Research Alliance on Agricultural Greenhouse Gases

The Global Research Alliance on Agricultural Greenhouse Gases (GRA) is an organisation bringing together 66 member countries and 24 partner organisations. ACIAR is Australia's representative on the GRA Council. The GRA aims to share knowledge and increase cooperation on addressing the significant challenge of meeting a dramatic increase in global food demand, while reducing the contribution of the agriculture sector to greenhouse gas emissions.

Members of the GRA work together to deepen and broaden mitigation research efforts across the agricultural sub-sectors of paddy rice, cropping and livestock, and to coordinate cross-cutting activities in these areas, including promoting synergies between adaptation and mitigation efforts.

ACIAR Research Program Manager, Climate Change, Dr Veronica Doerr, and ACIAR Pacific Region Manager, Mai Alagcan (centre), with members of the Samoa Farmers Association (including former John Allwright Fellow Philip Tuivavalagi who is also the Samoa Assistant FAO Representative – furthest on the right). The Samoa Farmers Association has been working with ACIAR on sustainable intensification of taro-based production systems in Samoa.

3

ACIAR Research Programs

Photo: Dave Lavaki

ACIAR in the Indo-Pacific

Through longstanding partnerships with many countries in the Indo-Pacific region, ACIAR supports collaborative research on productivity, resilience, sustainability and equity in agriculture, forestry and fisheries systems to reduce poverty and improve livelihoods.

This work is dominated by bilateral and regional research projects underpinned by longstanding country partnerships. During 2022–23, 171 projects will be active in our operational area. These projects are collaborations between Australian and international scientists with in-country partners, and brokered by ACIAR research program managers, across 10 areas of research.

The projects are varied in design, execution and outcomes. Very broadly, projects range from research or investigations conducted by a group of partners across a number of field sites over several years to develop new knowledge, technology or methodology, through to small research activities where an individual agency or specialist may conduct a desktop or scoping study over 12 months.

When establishing research projects, our research program managers work closely with the ACIAR Country Network to ensure that the research aligns with in-country priorities, and to build connections and relationships with in-country organisations and institutions.

This chapter describes our research collaborations with each region and country in 2022–23. Our work is organised in 4 regions of operation in the Indo-Pacific, with 32 partner countries and guided by locally engaged staff in 11 Country Offices throughout the regions.

Within each region, we facilitate a varied program of research, reflecting the challenges and opportunities of a region and individual countries. In addition to bilateral and regional projects, we also conduct global research collaborations (Chapter 2) and scientific and policy capacity building (Chapter 4).

Pacific

52
projects

East and South-East Asia

75
projects

South Asia

28
projects

Eastern and Southern Africa

26
projects

This data was compiled in August 2022 and may change during 2022–23. Some projects occur in more than one region, therefore the total of projects in each region will exceed the total number of individual projects as listed on page 34.

5.1

Pacific

Photo: Cooper Schouten

Pacific

The countries of the western Pacific region are set apart from the rest of the world. Many are small and geographically isolated, have limited land mass and arable land, fragile natural environments and few resources. Increasingly, they are more vulnerable to natural disasters and climate change than many other regions of the world.

Each country in this region faces specific development and agricultural challenges including small formal economies, long distances from major markets, high costs and rapidly growing populations that hamper economic growth. Governance and capacity constraints in some countries also limit their ability to deliver services. These challenges make it difficult to respond and recover from disasters and climate change effects, which are prominent in the region.

In 2021–22, the region was confronted with a string of civil and natural disasters that included civil unrest and demonstrations in Solomon Islands, volcanic eruption and tsunami in Tonga, and flooding and landslides due to cyclones across several countries.

Pacific island countries also face the consequences of a triple burden of malnutrition – a situation where undernutrition, micronutrient deficiencies and obesity coexist. Unhealthy diets, lifestyles and environment are key risk factors contributing to these non-communicable diseases.

For the last 2 years, the COVID-19 pandemic has had devastating effects globally. Cities have been locked down, borders have closed, limiting international travel, and supply chains have been disrupted, upending economies. The Pacific region has been equally affected.

With the threat of inadequate health care to cope with COVID-19, Pacific countries were quick to close borders, establish isolation strategies and roll out protocols of social distancing. Many Pacific island countries have intensified their vaccination programs, including boosters to help manage the spread of the virus. Australia has assisted the region by providing donations of vaccines and support to local health systems.

In 2020 ACIAR published a report[1] that examined food systems in the Pacific region and the vulnerabilities that were exposed or amplified by the COVID-19 shock. Income and production by farmers and fishers were impacted by the movement restrictions; service delivery was disrupted, especially on small and medium islands; local markets closed reducing the availability of fresh produce, which was felt most by urban areas; tourism declined significantly reducing farm incomes that were reliant on supplying tourism establishments; and migration to rural areas increased food demand and pressure on agriculture. Lockdowns and border closures also resulted in employment and income losses, remittances declined and general household and business spending declined. In response to this analysis, ACIAR commissioned an assessment of agrifood systems transformation through circular migration between Pacific island countries and Australia[2]. This assessment concluded that the combination of continued labour demands in Australian agriculture, COVID-19 socioeconomic impacts in the Pacific, and future food systems risks in Pacific island countries, create an opportunity for greater agriculture-oriented research and training within agriculture-related labour mobility.

1 Robins L, Crimp S, van Wensveen M, Alders RG, Bourke RM, Butler J, Cosijn M, Davila F, Lal A, McCarthy JF, McWilliam A, Palo ASM, Thomson N, Warr P & Webb M (2020) *COVID-19 and food systems in the Indo-Pacific: An assessment of vulnerabilities, impacts and opportunities for action*, ACIAR Technical Report No. 96, Australian Centre for International Agricultural Research, Canberra.

2 Davila F, Dun O, Farbotko C, Jacobs B, Klocker N, Vueti E, Kaumaitotoya L, Birch A, Kaoh P, Pitakia T, Tu'itahi S (2022) Agrifood systems transformation through circular migration between Pacific island countries and Australia, ACIAR Technical Report No. 100, Australian Centre for International Agricultural Research, Canberra.

The impact of the pandemic continues to hit the Pacific region hard. Agriculture and fresh produce emerged as the foundation of the economy for the region and ensured food security for the population when the manufacturing sector, trade and services stalled.

To reduce and mitigate ongoing impacts of COVID-19 on economies, Pacific region countries adopted a variety of measures, including economic stimulus packages, home gardening programs through seed distribution, farm support packages and backyard aquaculture farms. Cash transfers to most vulnerable households were also implemented to augment loss of income.

While many Pacific region countries are still contending with and responding to the onshore surge of the Omicron variant of COVID-19, the region and governments are preparing to restart their economies and open borders. The past 2 years have resulted in renewed interest in, and support for, agriculture, fisheries and forestry; enthusiasm for innovation in food systems and value chains; and the creation of new domestic market opportunities.

Partner countries in the ACIAR Pacific region

- Fiji
- Kiribati
- Samoa
- Solomon Islands
- Tonga
- Tuvalu
- Vanuatu
- Papua New Guinea

Drivers of regional collaboration

While acknowledging the individual needs and unique research and development priorities of each partner country in the Pacific region, the scattered nature of the Pacific region nations and their small populations mean that many countries cannot address all their challenges and opportunities in agriculture alone.

The ACIAR program with the Pacific region has a strong focus on enabling regional collaboration, especially through our close relationship with The Pacific Community (SPC), which plays a key role in communicating research outcomes of relevance across the region. Regional research programs and projects are implemented through agencies with regional capability (including SPC, the University of the South Pacific and CGIAR centres) and bilateral research and extension agencies.

Papua New Guinea is a significant partner within our Pacific region program, and we have a specific strategy that highlights enabling collaboration with the small island states of the region on issues of common interest.

ACIAR research projects are designed with consideration for sustainable and inclusive economic development, such as projects in the highlands of Papua New Guinea where crop production and crop protection research enables growers to supply more product to local markets. ACIAR Research Program Manager, Horticulture, Irene Kernot (centre), visited a market with research team members to learn more about project impacts.

ACIAR alumnus and Senior Research Officer, Fiji Ministry of Agriculture, Dr Rohit Lal, leads soils training in Taveuni, Fiji. The soils training aims to help farmers learn to recognise soil nutrient deficiencies and ways to improve soil health. Photo: Sunayna Nandini

ACIAR Pacific region program

The 2017 Pacific Step-up highlighted in the Australian Government's 2017 Foreign Policy White Paper elevated Australia's partnerships with the Pacific region to a new level and focused on strategically secure and economically stable support for the region. This strong focus was re-emphasised by Australia's new government in 2022.

In 2022–23, we will continue to build on our long engagement with the Pacific region, through our regional office in Fiji. We will develop new 10-year strategies with the Pacific island states and Papua New Guinea.

We are developing our medium-term priorities under both 10-year strategies through consultation with national government partners and regional research and development agencies as the region enters the new normal. We will focus our efforts on re-building the agriculture sector post-pandemic and re-engaging with partners, including face to face discussions where possible. We are also supporting Pacific Week of Agriculture and Forestry, which Fiji will host in March 2023.

We continue to support alumni of ACIAR capacity building programs and fellowships to work hand-in-hand with Australian researchers to provide insights into how the pandemic is affecting local food security and to ensure future food security of the Pacific region. We also support the scaling up of new opportunities in COVID-19 relevant research areas such as One Health (the interface between human, animal and environmental health), biosecurity and improving resilience in food supply chains, both within partner countries and between Australia and partner countries.

A key focus of our program within the Pacific region will be enabling regional collaboration in research and capacity building to address common issues and opportunities. This regional approach includes various projects addressing biosecurity, climate-resilient livelihoods and opportunities for stronger agribusiness development. Multi-country projects and linked programs include:

- fisheries (pathways to change in Pacific coastal fisheries)
- forestry (domestication and breeding of sandalwood, agroforestry and catchment rehabilitation)
- crops (sweetpotato, indigenous vegetables, commercial vegetables, tropical fruits and cocoa)
- soil information and soil health.

Pacific region program 2022–23

Partner country	No. projects
Pacific island countries	34
Fiji	20
Kiribati	4
Samoa	13
Solomon Islands	14
Tonga	11
Vanuatu	9
Papua New Guinea	22

Note that a project may be conducted in several countries, therefore the total number of projects in this table will be greater than the number of projects in the region.

52 projects

37 research projects

15 small research activities

This data was compiled in August 2022. Additional projects may be commissioned during 2022–23.

Research portfolio

3 Agribusiness projects

5 Climate Change projects

1 Crops project

9 Fisheries projects

6 Forestry projects

11 Horticulture projects

6 Livestock Systems projects

7 Social Systems projects

4 Soil and Land Management projects

0 Water projects

Table 5.1 Current and proposed projects in the Pacific region, 2022–23

Project title	Project code	Country
Agribusiness		
Pacific Agribusiness Research in Development Initiative Phase 2 (PARDI 2)	AGB/2014/057	Fiji, Tonga, Vanuatu
Defining priority commercialisation pathways and potential private commercialisation partners for viable long-term commercialisation of products emerging from FST/2019/128	AGB/2021/172	Fiji
Landscape and opportunity analysis in the Pacific tuna sector: Foundation analysis to identify innovation pathways to enhance participation by the Pacific community and value retention in the region	AGB/2021/173	South Pacific general
Climate Change		
Transformation pathways for Pacific coastal food systems	CLIM/2020/178	Kiribati, Solomon Islands
Sustainable intensification for climate-resilient development in Pacific island countries	CLIM/2020/186	Samoa, Tonga
Institutional barriers to climate finance through a gendered lens in Fiji, Samoa and Solomon Islands	CLIM/2021/110	Fiji, Samoa, Solomon Islands
Supporting greenhouse gas inventories and livestock data development in Fiji	CLIM/2021/160	Fiji
Supporting the tracking sharing learning platform of the Adaptation Research Alliance	CLIM/2022/108	Global
Crops		
Finding a genetic basis for oil palm responses to basal stem rot in a long-term infected block	CROP/2021/130	Papua New Guinea, Solomon Islands
Fisheries		
Half-pearl industry development in Tonga and Vietnam	FIS/2016/126	Tonga, Vietnam
Improving peri-urban and remote inland fish farming in Papua New Guinea to benefit both community-based and commercial operators	FIS/2018/154	Papua New Guinea
Agriculture and fisheries for improved nutrition: integrated agrifood system analyses for the Pacific region	FIS/2018/155	Kiribati, Solomon Islands, South Pacific general, Vanuatu
Towards more profitable and sustainable mabé pearl and shell-based livelihoods in the western Pacific	FIS/2019/122	Fiji, Papua New Guinea, Samoa, Tonga
Innovating fish-based livelihoods in the community economies of Timor-Leste and Solomon Islands	FIS/2019/124	Solomon Islands, Timor-Leste
Improving nutrition through women's and men's engagement across the seaweed food chain in Kiribati and Samoa	FIS/2019/125	Kiribati, Samoa
Spatially integrated approach to support a portfolio of livelihoods	FIS/2020/111	Solomon Islands, South Pacific general
Coalitions for change in sustainable national community-based fisheries management programs in the Pacific	FIS/2020/172	Kiribati, Solomon Islands, South Pacific general, Vanuatu
Strengthening agricultural resilience in Western Province: Developing methods for strengths-based livelihoods approach	FIS/2021/113	Papua New Guinea
Strengthening agricultural resilience in Western Province: Mapping place-based strengths and assets	FIS/2021/122	Papua New Guinea

Project title	Project code	Country
Forestry		
Enabling community forestry in Papua New Guinea	FST/2016/153	Papua New Guinea
Enhancing private sector-led development of the canarium industry in Papua New Guinea - Phase 2	FST/2017/038	Papua New Guinea
Promoting smallholder teak and sandalwood plantations in Papua New Guinea and Australia	FST/2018/178	Papua New Guinea
Coconut and other non-traditional forest resources for the manufacture of engineered wood products	FST/2019/128	Fiji
Livelihoods in forest ecosystem recovery	FST/2020/135	Solomon Islands
Kava land use changes	FST/2021/146	Fiji, Vanuatu
Horticulture		
Adopting a gender-inclusive participatory approach to reducing horticultural food loss in the Pacific	CS/2020/191	Fiji, Samoa, Solomon Islands, Tonga
Aligning genetic resources, production and post-harvest systems to market opportunities for Pacific island and Australian cocoa	HORT/2014/078	Fiji, Samoa, Solomon Islands, Vanuatu
Developing the cocoa value chain in Bougainville	HORT/2014/094	Papua New Guinea
Responding to emerging pest and disease threats to horticulture in the Pacific islands	HORT/2016/185	Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga
Safeguarding and deploying coconut diversity for improving livelihoods in the Pacific islands	HORT/2017/025	Fiji, Papua New Guinea, Samoa, Solomon Islands, Vanuatu
Protecting the coffee industry from coffee berry borer in Papua New Guinea and Australia	HORT/2018/194	Papua New Guinea
Improving root crop resilience and biosecurity in Pacific island countries and Australia	HORT/2018/195	Fiji, Samoa, Solomon Islands, Tonga
Enhanced fruit systems for Tonga and Samoa (Phase 2): Community based citrus production	HORT/2019/165	Samoa, Tonga
PICfood: Driving vegetable food environments to promote healthy diets in Pacific island countries	HORT/2021/141	Fiji, Samoa
Biosecurity planning	HORT/2021/151	Cambodia, Papua New Guinea
Understanding school food provision in the Pacific: Scoping the potential of local food systems to improve diets, nutrition and livelihoods	HORT/2021/159	Fiji
Livestock Systems		
Increasing the productivity and profitability of smallholder beekeeping enterprises in Papua New Guinea and Fiji	LS/2014/042	Fiji, Papua New Guinea
Improving small ruminant production and supply in Fiji and Samoa	LS/2017/033	Fiji, Samoa
A farm planning approach to increase productivity and profitability of smallholder cattle systems in Vanuatu	LS/2018/185	Vanuatu
Drug sensitive and resistant tuberculosis and zoonotic infections as causes of lymphadenitis in 3 provinces in Papua New Guinea	LS/2018/217	Papua New Guinea
Development of a third party verified voluntary sustainable certification program for beef and other key commodities in Vanuatu	LS/2020/155	Vanuatu
Strengthened surveillance for vector-borne zoonotic and livestock diseases in Papua New Guinea	LS/2021/158	Papua New Guinea

Project title	Project code	Country
Social Systems		
Improving livelihoods of smallholder coffee communities in Papua New Guinea	ASEM/2016/100	Papua New Guinea
Climate-smart landscapes for promoting sustainability of Pacific island agricultural systems	ASEM/2016/101	Fiji, Tonga
Climate-smart agriculture opportunities for enhanced food production in Papua New Guinea	ASEM/2017/026	Papua New Guinea
Improving agricultural development opportunities for female smallholders in rural Solomon Islands	SSS/2018/136	Solomon Islands
Gender equitable agricultural extension through institutions and youth engagement in Papua New Guinea	SSS/2018/137	Papua New Guinea
Landcare: An agricultural extension and community development model at district and national scale in Fiji	SSS/2019/140	Fiji
Climate-smart coastal landscapes for sustaining fisheries-based livelihoods and food security in the Pacific	SSS/2021/120	Fiji, Tonga
Soil and Land Management		
Better soil information for improving Papua New Guinea agricultural production and land use planning: Building on PNGRIS and linking to the Pacific Regional Soil Partnership	SLAM/2019/106	Papua New Guinea
Optimising soil management and health in Papua New Guinea integrated cocoa farming systems - Phase 2	SLAM/2019/109	Papua New Guinea
Soil management in Pacific island countries Phase 2: Investigating nutrient dynamics and the utility of soil information for better soil and crop management	SLAM/2020/139	Fiji, Samoa, Tonga, Vanuatu
Sustaining soil fertility in support of intensification of sweetpotato cropping systems	SMCN/2012/105	Papua New Guinea

Pacific island countries

A$11.85 million
Budgeted funding

26
Bilateral and regional research projects

9
Small projects and research activities

Agriculture, fisheries and forestry are vital sectors for the majority of Pacific island communities and countries, because of their contributions to rural livelihoods, gross domestic product (GDP) and food security, as well as increasing opportunities for local regional and international markets.

The Multi-Country Programming Framework for the Pacific Islands 2018–2022, developed in partnership with the Food and Agriculture Organization of the United Nations (FAO), identified the following common challenges across the Pacific island countries:

- limited land mass and dispersed population
- fragile natural environments and lack of arable land
- narrow resource bases and reliance on ocean resources
- high vulnerability to climate change, external economic shocks, and natural disasters
- exposure to increasingly frequent and more intense severe weather and climate events, including droughts, floods and tropical storms
- high dependence on food imports
- dependence on a limited number of economic sectors
- remoteness and distance from global markets
- high costs for energy, transportation and communication.

These constraints interact with one another and contribute to increased vulnerability to shocks – both economic shocks (such as abrupt changes in food and fuel prices) and natural disasters (such as cyclones, floods and droughts, earthquakes and tsunamis). These vulnerabilities have limited the development of commercially oriented agriculture, fisheries, and forestry sectors and left many Pacific island countries heavily dependent on imports of food and other commodities.

The vulnerability of Pacific island countries is increased by their narrow resource base, which implies the economic dependence of many islands on exports of a single commodity or limited range of commodities.

For much of the twentieth century, most Pacific island economies were heavily dependent on copra as their principal source of export income; however, with the falling value of coconut oil, this previous source of wealth has become a ‘poverty trap’ for many communities and countries that lack the resources to diversify into higher value products (which could support the rejuvenation of the industry) or into other crops and commodities.

Other countries are heavily dependent on marine resources, especially tuna, for their export earnings. In this case, significant vulnerability arises from the limited control that each country has over the management of this resource. An emerging threat is that rising sea temperatures, especially when accentuated by El Niño cycles, may affect the migration of some tuna species, potentially taking fish populations out of the waters of Pacific island countries that depend heavily on them economically.

Dependence on logging – and especially the export of round logs – is a challenge in western Melanesian countries (Papua New Guinea, Solomon Islands and, to a lesser extent, Vanuatu). The natural forest resource is declining rapidly, often accompanied by serious environmental degradation, and exploitation brings little lasting benefit to landowners or to the national economy. Partner countries wish to move towards more sustainable management of forest resources and local processing to add value to the timber but lack the economic resources and skills to make this transition.

This context is not static but evolves on a number of scales, in time and space. Changing demographics are one key factor, with populations increasing at more than 2% per annum in Solomon Islands and Vanuatu (as well as Papua New Guinea), leading to mounting concerns about local food security and increasing pressure on the natural resource base. Elsewhere in the Pacific region, populations are either stable (increasing at less than 1% per year) or falling (due to emigration), leading to labour shortages and making it harder to develop profitable enterprises. Additionally, there is a strong move towards urbanisation across the Pacific region, with more than one-third of the total population now living in cities. This has disrupted traditional food systems and diets and is leaving some rural areas and outlying islands with declining populations, hampering economic development and making it hard for governments to assure basic services.

Another widespread vulnerability of Pacific islands agriculture – though with different impacts in each country and island – is to invasive pests and diseases. Island environments have inherently limited natural resilience in the face of aggressive invasive species due to the limited local diversity of 'natural enemies'. Recent years have been marked with rapidly spreading outbreaks of, for instance, invasive ant species, the destructive 'Guam strain' of the familiar coconut rhinoceros beetle, and the giant African snail. Emerging diseases of livestock (and potentially fisheries) may be equally destructive, even if less visible to the general public.

Pacific region leaders have repeatedly identified 2 overriding threats to the economic development and wellbeing of people in the region:

1. **Climate change and its impact on food systems**

   Pacific island countries are disproportionately affected by climate change, while having little scope to influence the drivers of climate change. All countries in the Pacific region are concerned about the potential impacts of climate change on rising sea levels (given that much of the population and most of the productive agriculture in the Pacific islands is in coastal areas or coastal plains), food systems (including new threats from invasive pest species) and on their fragile marine resources.

2. **Rapid rise in non-communicable diseases, associated with declining diet quality**

   While under-nutrition remains a problem in some poorer, rural areas of Pacific island countries, changes in diets and lifestyles associated with increasing incomes and urbanisation have led to Pacific island countries having some of the highest levels of obesity in the world, along with record levels of Type II diabetes and heart disease. As well as taking a tragic toll in terms of human wellbeing, this rise in the incidence of non-communicable diseases imposes a huge burden on health services and the economy of Pacific region countries in general.

Fijian farmer, Mr Emosi Ravato, uses a high tunnel (a plastic covered structure) to increase production of certain crops, increase the length of the growing season and grow crops that otherwise could not be grown in his area. Photo: Central Queensland University

Given these challenges, Pacific leaders have strongly emphasised the need for greater resilience in Pacific region food and agriculture systems as a means to counteract vulnerabilities and to increase food and nutritional security. While investing in agriculture fisheries and forestry has been widely recognised as one of the most effective ways of stimulating broad-based economic growth, the effort to increase resilience, rather than focusing primarily on increasing productivity, has become a theme that underpins the entire agricultural development agenda in the Pacific region. Given the scale and complexity of the problems faced by Pacific island partner countries, it is fortunate that the Pacific region has a strong tradition of multilateral and bilateral institutions and partnerships that have supported many decades of collaboration and concerted action, to address a wide range of issues.

The Pacific Islands Forum provides the overall framework for policy development and action, while the technical agencies, especially the Pacific Community (SPC) and the Secretariat of the Pacific Regional Environment Programme (SPREP), provide support to member countries in taking action across a range of sectors and development issues, including health, education, the environment, biosecurity, trade, communications and infrastructure.

ACIAR has been a leading supporter of regional and bilateral research collaboration in the region with SPC, partner countries and other agencies, in agriculture, forestry and fisheries. These existing relationships provide a vital foundation for a portfolio of integrated and cross-sectoral research that will be needed to tackle the 2 high level challenges outlined above. ACIAR started working with partners in the Pacific region in 1983 and, for the next 2 decades, the majority of projects were sectorally and technically focused.

Country priorities

The ACIAR 10-Year Strategy 2018–2027 positions the agency's support to the Indo-Pacific region. Following the 2017 White Paper Pacific Step-up. Stepping up Australia's engagement with our Pacific family, ACIAR placed greater emphasis on supporting Australia's 'near neighbours' in the Pacific region. This was in response to the significant long-term challenges faced by our partners in the Pacific region, including: climate change and responding to natural disasters; sustaining economic growth and boosting education, developing skills and jobs for growing populations; pursuing gender equality and recognising the essential role of women in achieving better development outcomes; preventing major disease outbreak and tackling transnational crime.

Our regional partner SPC emphasises integrated approaches to increasing resilience, including:

- deploying a diversity of species and products in trees, crops, livestock and aquaculture to increase resilience in the face of uncertainty
- growing a greater number and diversity of trees in forestry, agroforestry and horticulture systems to contribute to more sustainable and resilient agricultural landscapes
- diversifying crops to contribute to greater food security, nutrition and health
- better managing coastal fisheries and aquaculture to underpin healthier nutrition and more resilient livelihoods
- strengthening market chains for greater equity and inclusion to contribute to improved and more resilient livelihoods.

Across the board, trans-disciplinary approaches are needed to reduce the vulnerability of the natural resource base and create climate-smart agricultural landscapes. Using national policy, land-use planning and community engagement to manage water, soils, livestock, crops, forests, natural vegetation and coastal marine resources, from 'ridge to reef', in an integrated manner can increase resilience and sustainably improve livelihoods. But achieving this will require numerous, well-coordinated technological innovations and ways of working.

ACIAR currently works with 7 Pacific island countries: Fiji, Kiribati, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

2022–23 research program

- **35 ACIAR-supported projects in Pacific island countries**
- **28 projects are specific to one or more of these countries**
- **7 projects are part of regional projects**

The research program addresses our high-level objectives, as outlined in the ACIAR 10-Year Strategy 2018–2027, as well as specific issues and opportunities identified by ACIAR and our partner organisations. The following sections briefly describe individual ACIAR-supported projects and anticipated outputs in Pacific island countries. The projects are grouped according to research program. Each project description is referenced in a list at the end of this section, which provides the project title and code.

Agribusiness

The viability of the coconut sector in the Pacific region is being challenged by the increasing proportion of coconut palms becoming senile. Many farmers are reluctant to renew palms due to the initial cost and reduced income until the newly planted palms yield fruit. A current ACIAR-supported forestry project is exploring the sale of senile stems by farmers to the timber industry, with revenue from sales expected to act as an incentive for farmers to remove the senile palms and offset the costs of replanting. A small research activity led by Mr Ian Buck of Buck Advisory will develop a framework for directly engaging private sector partners in the project to ensure new value chains for coconut veneer timber products are connected to viable markets via committed and capable processing and marketing entities. This framework will be applicable to other projects where understanding the business operating environment and engagement of suitably qualified private sector partners are essential to maximising the adoption and uptake of project lessons and outcomes.[1]

The Pacific Agribusiness Research and Development Initiative (PARDI) has been a significant program of work supported by ACIAR and DFAT. Starting in 2010, it promoted sustainable livelihood outcomes for Pacific islands households through research and innovation, with the regional goal of catalysing and informing a more vibrant, diverse and viable agribusiness sector. Phase 2 of PARDI, led by Professor Steven Underhill of the University of the Sunshine Coast, studied benefits to community livelihoods from successful agribusiness developments and ways to make economic benefits more inclusive and sustainable. Concluding in 2022, the project will finalise the delivery and evaluation of mentoring programs tailored to the honey, tilapia and agritourism sectors, provide technical and supervisory support to master students at partner universities, and develop and trial a profitability and accounting tool for smallholder beekeepers.[2]

Tuna is recognised as one of the greatest shared natural resources of Pacific island countries, providing jobs, government revenue and contributing to meeting the nutritional needs of the Pacific island communities. However, population growth, climate change and overfishing have placed increasing pressure on the sustainability of tuna resources. A small research activity led by Ms Deb Doan of Business for Development will identify innovation pathways and assess the commercial feasibility for improving returns (defined as sustainable resource management, maximum catch utilisation and increased retention of value) for Pacific island countries' tuna sectors and economies more broadly. Researchers will analyse previous projects to identify key barriers to success and critical success factors.[3]

Climate Change

Australia is a world leader in greenhouse gas mitigation research in agriculture. A new project in 2022–23 works with Fiji to strengthen its national greenhouse gas accounting systems for livestock towards the same high standard used by Australia and to use these systems to support the identification and implementation of on-farm management options that reduce emissions. The project supports the implementation of Fiji's Low Emission Development Strategy. Led by Dr Natalie Doran-Browne of Riverine Plains Inc, the project team will work with government institutions in Fiji and will help grow capability in the data management, analyses and reporting needed to support current and future emissions reduction commitments under the Paris Agreement. The project team will also collaborate within Fiji and across the region to support Pacific greenhouse gas inventory systems.[4]

Evidence suggests that responding to climate change requires collaboration, learning and community-based participatory processes – all 'softer' types of response that are rarely formally supported through institutional mechanisms. A small research activity, led by Dr Rowena Maguire of Queensland University of Technology, is exploring whether the relative lack of institutional support for 'softer' types of climate response, and the underrepresentation of women and particular cultures, are linked, acting as both causes and consequences of the insufficient action on climate change. The team will conclude the research with a multi-country workshop and the production of 3 country case studies. The research team will present their findings at COP27.[5]

The impacts of climate change and population growth are projected to lead to the collapse of coastal livelihoods dependent on coral reef-based fish and nearshore fish throughout Pacific island countries. Different food and livelihood options need to be progressed in ways that are owned and driven by local communities, facilitated by governments and civil society groups. Led by Dr James Butler of the Cawthron Institute, a new project will combine scientific analysis and local knowledge about pathways toward novel and transformative circular food production options, and develop the transformative capacity needed in local communities to identify leverage points and create transformative change.[6]

Smallholder farmers in Pacific island countries are vulnerable to reductions in the availability of fresh water under climate change and increasing demands from growing populations. Co-led by Professor Timothy Reeves and Dr Dorin Gupta of the University of Melbourne, the project will explore opportunities for sustainable intensification systems in smallholder farming systems in Samoa and Tonga. In other parts of the world, these systems which combine multiple interventions for benefits that may be 'more than a sum of the parts' have been successful in intensifying agricultural production while providing climate adaptation and mitigation benefits. This project will investigate whether such integrated management changes may help Pacific island countries in similar ways.[7]

Basal stem rot is a fungal disease that kills oil palm in plantations across South-East Asia and the Pacific region. An ACIAR-supported project is studying the eggectiveness of removing infected dead trees to reduce inoculum pressure (CROP/2021/130).

Crops

Basal stem rot is a fungal disease that kills oil palm in plantations across South-East Asia and the Pacific region. Growers have limited options to manage the disease. New trees are planted after the death of the infected trees but experience suggests that the incidence of the fungus seems to increase with each successive planting. Removing infected dead trees may reduce inoculum pressure but is costly and the benefit has not yet been demonstrated. A new research activity in 2022, led by Dr Agnieszka Mudge of the University of Queensland will continue monthly monitoring of an experimental plot established 11 years ago. Data will be analysed to determine if infection dynamics and impact differ between genetically characterised families of trees and if there is a difference between lots where infected stem bases and roots of dead trees are removed compared with plot where they are left in place.[8]

Fisheries

Unique among Pacific island countries is the production of half-pearls, or mabé, in Tonga from the winged pearl oyster. Although half-pearls are generally less valuable than round pearls, an individual oyster can produce multiple half-pearls (unlike round pearls). With appropriate training, pearl production can be accomplished by community members over a 10-month culture period, compared to approximately 2 years for round pearls. Professor Paul Southgate of the University of the Sunshine Coast completes a project in 2023 that is supporting further expansion of community-based pearl farming and handicraft production in Tonga and demonstrating the feasibility of similar development in Vietnam.[9]

Mabé (half-pearl) jewellery and shell handicraft industries provide income opportunities for coastal communities and women's social enterprises in the western Pacific. Previous projects have increased the technical skills of communities in producing juvenile oysters, farming mabé shell in Fiji and Tonga, and producing shell-based jewellery in Papua New Guinea. The development of greater technical capacity and a better understanding of gendered preferences and aspirations sets the basis for a new project in Fiji, Tonga, Papua New Guinea and Samoa, led by Professor Paul Southgate of the University of the Sunshine Coast. Country-specific interventions are required to ensure uniform mabé pearl jewellery/shellcraft production protocols and standards, improve capacity for sector governance within partner institutions and stakeholders, develop marketing strategies and ensure optimal benefits flow to both women and men across the value chains.[10]

In the Pacific region, there is an opportunity to transform seaweed fisheries into nutritionally sensitive food systems comprised of short supply chains, village-based processing, sustainable use of natural resources and marketing for families. Nutrition-sensitive agriculture ensures the sustainable production of nutritious, affordable and safe foods to meet the dietary requirements of local communities. Dr Libby Swanepoel of the University of the Sunshine Coast will complete a small research activity in 2022 that is designing a framework for equitable empowerment of women and men within seaweed harvester families. This will be achieved by developing and evaluating gender-inclusive activities in Kiribati and Samoa that broaden the focus of seaweed production from an export commodity to one that provides direct benefits to the health and wellbeing of communities.[11]

In Pacific island countries, the paradox of apparently abundant fish, vegetables and root crops but poor public health outcomes presents a significant challenge for policymakers. Professor Neil Andrew of the University of Wollongong leads a project that has analysed regional agrifood systems using newly integrated data sources that allow mapping and analysis of what food is being produced, distributed, traded and sold. During 2022–23, the analysis results will continue to inform regional and national policy. Diagnostic tools developed by the project will be linked to methods that pertain to different nodes of the agrifood system to form an overarching 'agrifood system diagnostic' that can highlight the key challenges and opportunities in the Pacific agrifood system.[12]

Securing the sustainable supply of coastal fish is a development priority for Pacific countries and regional organisations, as coastal fisheries are important for food and nutrition security and economic development. A project led by Dr Dirk Steenbergen of the University of Wollongong aims to scale up the proven approach of community-based fisheries management in Kiribati, Solomon Islands and Vanuatu to self-sustaining national programs that support resilient coastal communities. The project also aims to drive the spread of community-based fisheries management throughout the Pacific region. In 2022–23 the project team will implement an awareness raising strategy, assess food and nutrition security in the scaling of community-based fisheries management and develop a centralised information management system to monitor the impact of information dissemination activities.[13]

Livelihood improvement projects for small-scale fishing communities are increasingly promoted in the Pacific region to build resilience to global change and dwindling fisheries resources. Often these projects focus on a single sector and individual communities and households, failing to acknowledge the complexity of people's livelihoods. Such projects also risk obscuring broader-scale economic development trends, such as the establishment of extractive industries or technological innovations. Dr Amy Diedrich of James Cook University leads a small research activity to establish an integrated livelihoods approach to guide scientists, practitioners and decision-makers engaged in livelihood improvement project planning and assessment. The improved approach aims to achieve 3 desired outcomes in Pacific coastal communities: a fair and just society, sustainable natural resource use and resilient livelihoods.[14]

Fish-based livelihoods play a critical role in the economies of coastal communities in Solomon Islands and Timor-Leste, and participation in catching, processing or trading of fish is an important pathway to poverty reduction. A project led by Dr Hampus Eriksson of the University of Wollongong will identify and support community-identified opportunities for innovation within the coastal fisheries post-harvest sector, focusing on income benefits. This new approach addresses the historic lack of success at the community level of large state-led investments in fisheries sector infrastructure and advanced technologies. It seeks to influence policy on how fisheries institutions can support remote communities through appropriate community-led infrastructure and skill development investments. In 2022–23 activities will include monitoring fish distribution and marketing, documenting livelihood experiences and building the capacity of women in safe aquatic food handling practices.[15]

Coastal fisheries are critical for providing food security and local employment across the Pacific region. Increasingly ACIAR-supported projects are focused on building resilience to global change and dwindling fisheries resources. Photo: Conor Ashleigh

Forestry

Renewal of the coconut estate is a priority for governments, development agencies and researchers throughout the Pacific region. In Fiji, a project led by Dr Rob McGavin of the Queensland Department of Agriculture and Fisheries strives to create market pull for senile coconut stems by converting them to high-value engineered wood products. A market for old palms will encourage coconut growers to remove them, reducing phytosanitary risk and incentivising new, more productive planting. The project will deliver and validate wood-processing technologies to transform coconut and other low-value forest resources into high-value products suitable for local and international markets. In 2022–23, the project team will focus on mapping senile coconut stands and identifying opportunities to promote gender equity within the value chain.[16]

Kava is a major cash crop in the Pacific region and a revered, traditional crop, grown for at least 3,000 years. Using time series geospatial data and ground truthing, this project will examine changes in the area and methods of kava cultivation in leading Pacific region producer countries, Vanuatu and Fiji. Kava is becoming big business, with the number of producers, production, sales, revenue and exports climbing. Governments and aid agencies are promoting the kava industry, but kava cultivation has resulted in deforestation. Researchers aim to assess land cover change from kava cultivation and to consider whether environmental harm is resulting and can be mitigated.[17]

Although primary forest reduction is significant, Solomon Islands economy and livelihoods remain dependent on forests. Logging royalties account for 60% of government revenue and 92% of the population are subsistence cultivators who supplement their material economy with forest-derived building materials, food, fuel, medicines, tools and household items. Professor Helen Wallace of Griffith University leads a new project with the central aim of learning how to efficiently restore forests to meet critical needs of rural Solomon Islanders, accelerating and channelling forest development to support livelihoods. The project also strives to support positive leadership in forest governance to secure remaining forests and those restored. Starting in 2022 are activities to foster community ownership and enhance women's participation, as well as a review of restoration methods for logged forests and establishment of field sites to measure the impact of interventions.[18]

Horticulture

School meals programs based on home-grown models can serve as platforms for transforming food systems while improving education quality. A small research activity led by Dr Sarah Burkhart of the University of the Sunshine Coast aims to understand the current extent and status of school food provision and environments in Pacific island countries. The research will identify and enhance nutrition-sensitive institutional food procurement opportunities, including school feeding programs, to provide reliable markets for small-scale producers in Fiji. It will also investigate the potential to scale-up school feeding initiatives in the Pacific region.[19]

Developing safe, high-value fruit and vegetable industries is a priority for many Pacific island countries. Dr Michael Furlong of the University of Queensland leads a project to develop integrated pest and disease management strategies for the sustainable intensification of fruit and vegetable crop production, addressing the threats posed by the inappropriate use of pesticides, emerging pests and diseases and climate change. During 2022–23, the project will focus on providing technical training for extension staff and conducting in-country plant health clinics and pesticide awareness workshops. The project will continue to build surveillance and diagnostic capacity for managing emerging pests and diseases, including fall armyworm. The project will generate new knowledge, resources and opportunities to encourage the adoption of integrated management strategies.[20]

Coconuts contribute, directly and indirectly, to the livelihoods of coastal communities throughout the Pacific region. Much of the coconut resource in the Pacific region is ageing or already senile and unproductive. A project led by Dr Carmel Pilotti of SPC aims to support the first step in rejuvenating coconut-based livelihoods in the Pacific islands by strengthening the conservation and use of genetic diversity in coconuts, addressing threats posed by the rhinoceros beetle and Bogia coconut syndrome, and establishing and sustaining a platform for coordinating coconut research-for-development initiatives. In 2022–23 researchers will focus on training staff in field transfer of plantlets derived from embryo culture and identifying key varieties for preservation in the new cryopreservation facility that will be built and commissioned.[21]

Increasing vegetable consumption is a key food system change required in the Pacific region to address malnourishment. Mrs Aradhana Deesh (right) is pictured with vegetable seedlings, she has grown as part of an ACIAR-funded research project for ACIAR alumni. Photo: Sunayna Nandini

In the Pacific region, vulnerability of horticultural produce to post-harvest losses is often more dependent on where and how a product is grown, transported and sold, rather than on the commodity-type. A new project in Samoa, Fiji, Solomon Islands, Tonga and Vanuatu aims to reduce food losses through a market-based and gender-inclusive approach to identify where food loss is greatest. Dr Seeseei Molimau-Samasoni of the Scientific Research Organisation of Samoa will lead a project team to identify value chains of fruits, vegetables and root crops that are most critical to improving nutrition and livelihoods of farmers and vendors. The team will then engage with farmers and vendors to trial interventions to address these drivers of food loss, with the ultimate goal of reducing food losses. This project is part of the ACIAR–IDRC Food Loss Research Program (page 23).[22]

Sweetpotato is a necessary component of food, nutritional security and disaster reduction strategies in Pacific island countries. Rapid production of planting material, ease of planting, quick maturation and high nutrition makes sweetpotato an ideal option in disaster recovery. However, yields of sweetpotato are low in the Pacific region compared with developed countries, as farmers do not have access to pathogen-free planting material. In times of high demand, under government assistance schemes following natural disasters, quality cuttings are not available, and those distributed are invariably infested with pests and diseases. Dr Julie O'Halloran of the Queensland Department of Agriculture and Fisheries leads a new project that has the overall aim of building capacity in the provision of high-quality, pathogen-tested sweetpotato planting material to support a larger program for resilient root cropping systems that are responsive to the challenges of pests and diseases and climate change.[23]

Cocoa is an important agricultural export for more than 50,000 households in Papua New Guinea, Solomon Islands and Vanuatu. Significant domestic and potentially useful export opportunities also exist in Samoa and Fiji. A project led by Mr Yan Diczbalis of the Queensland Department of Agriculture and Fisheries is strengthening cocoa value chains in Pacific island countries, as well as in Australia. In 2022–23, the project will complete activities that deliver market-oriented strategies for the exchange and dissemination of superior cocoa genetic resources, methods for intensifying production systems to meet market opportunities and systems for improved post-harvest handling.[24]

Pacific island countries are some of the most malnourished in the world, with among the lowest vegetable availability and consumption globally. Increasing vegetable consumption is a key food system change, but the barriers and opportunities to vegetable consumption are not currently well understood. The PICfood project aims to assess food environments in Fiji and Samoa, strengthen links between agriculture and health and identify the most important entry points for food system change towards increasing the diversity of vegetables consumed. Research findings and citizen food forums will inform agriculture, food and nutrition policy and practice for healthy diets in the Pacific.[25]

Fruit industry development in the Pacific region enhances food security, rural economies and healthy eating initiatives. A previous project in Fiji, Samoa and Tonga worked towards these benefits by supporting the development of resilient value chains for 5 regionally significant fruit crops: papaya, pineapple, mango, breadfruit and citrus. A new project led by Professor Steven Underhill of the University of the Sunshine Coast will build on the community and school-based citrus orchards established in the first project using introduced improved planting stock. The project will develop viable and sustainable fruit value chains, enhance the local capacity to support these chains, and gain wider human health impacts by piloting school and community healthy eating gardens.[26]

Livestock Systems

Strong domestic demand for honey and the potential to export honey and its by-products offers an opportunity to smallholder farmers in Fiji and Papua New Guinea. A project, led by Dr Cooper Schouten of Southern Cross University, aims to increase the productivity and profitability of beekeeping enterprises to complement smallholder incomes and promote an income-earning activity for women. During 2022–23, the project will continue to develop best-practice pest and disease management programs, particularly in readiness for incursions of varroa and tropilaelaps mites. Development of post-harvest quality management programs for producers and packers will continue, for standards, certification and testing processes for export grade honey. The project will also provide capacity building opportunities for beekeeping associations to support smallholder industry development.[27]

The productivity and profitability of sheep and goat production in Pacific island countries could be improved if domestic production was better aligned with national market requirements and smallholder farmers could more easily participate in value chains. Dr Frances Cowley of the University of New England leads a project addressing the constraints to production efficiency for smallholder and semi-commercial sheep and goat production systems in Fiji and Samoa. During 2022–23, the project will continue the on-farm monitoring program to understand the use and costs of feed resources on farms and reproductive productivity and stock losses, across the course of a year. Innovative feed systems, such as fodder banks and creep feeding, will be demonstrated and trialled.[28]

Increasing smallholder cattle productivity and income from cattle sales is a priority of the Vanuatu Government. A project led by Dr Simon Quigley of the Central Queensland University aims to integrate recommendations from previous and new research on cattle production and marketing. A set of best-bet production options will be formulated, from which smallholder farmers can develop their own cattle farming business plan using the Cattle Farm Planning Tool (a decision-tree framework). Local support agency staff will be trained to mentor farmers in the implementation of cattle farming plans. The project will also start studies to determine low-input interventions, such as improved grazing management, introduction of legumes and improved animal management, to increase productivity and farm-gate prices for smallholder cattle.[29]

In Vanuatu, meat exports are processed through 3 vertically integrated abattoirs. Smallholder beef producers in Vanuatu are largely excluded from these high-value export markets because of poor quality, insufficient quantity, poor organisation and high transport costs. Dr Cherise Addinsall of Southern Cross University will undertake a feasibility analysis to determine if greater equity and inclusivity between smallholders and large cattle producers could occur through an agritourism approach, linking a high-value, sustainable beef brand to Vanuatu's tourism industry. The project concludes in 2022, with the development of a proposed design, recognised standards and governance structure of a third party verified voluntary sustainable certification program for key commodities (beef, cocoa, coffee and agritourism).[30]

ACIAR-supported projects have enabled cattle farmers in Vanuatu to increase on-farm productivity and cattle sales through accredited abattoirs, which is a critical step to increase national beef production and meet expanding market opportunities. Photo: Jean Pierre Niptik

Social Systems

The Livelihood Improvement through Facilitated Extension (LIFE) model of improved extension, based on a Landcare approach, was developed through research in the Philippines. It rapidly enhanced agricultural livelihoods by improving farmer-based learning networks and community social capital. Dr Mary Johnson of RMIT University, in partnership with Filipino collaborators, will contribute to understanding the adaptability and adoptability of the Landcare–LIFE combination by trialling the LIFE model for livelihood improvement within a Fijian smallholder farmer context. The project will broker an escalation of the Landcare approach to deliver sustainable land management outcomes with government and civic partners. In 2022–23, the project team will visit Fiji to conduct a review and implement capacity building activities with community-based research staff. The project will also focus on developing the research partnership between the Philippines, Fiji and Australia.[31]

The agriculture sector has been identified as a sector for growth to support economic development and poverty alleviation in Fiji and Tonga. Livelihoods and landscapes in these countries are highly interconnected, so the populations are acutely vulnerable to the impacts of climate change and variability as well as the impacts of policy-driven intervention. With a vision of climate-smart landscapes, Dr Eleanor Bruce of the University of Sydney and Dr Bryan Boruff of the University of Western Australia lead a team to develop a collaborative geospatial platform that will identify responses to climate-smart landscape adaptation. In the project's final year, researchers will evaluate the effectiveness of the platform for promoting community and multi-stakeholder exchange and engagement with landscape knowledge. The project will also identify adaptation objectives for communities within the landscape to foster climate resilience and enhance environmental livelihood security.[32]

Integrated 'Reef to Ridge' management means protecting and sustainably utilising connected environments to promote co-benefits of biodiversity and natural and cultural resources. Dr Cherise Addinsall of Southern Cross University will lead a new project, working with Vanuatuan communities in developing 'Community Conservation Area' agreements between communities and the government to establish sustainable agricultural livelihoods alongside existing formalised land tenure and conservation goals. The project also aims to investigate models of inclusive and evidence-informed decision-making processes under climate change. In 2022–23 the project will be engaged in partnership building with local communities, government bodies and potential scaling institutions.[33]

Family Farm Teams is a peer education model of agricultural extension that has benefited the economic development of women smallholders in 9 areas of Papua New Guinea. Dr Deborah Hill of the University of Canberra leads a project to improve agricultural development opportunities for women smallholders in rural Solomon Islands. The project will investigate the adaptability of the Family Farm Teams approach in Solomon Islands, and provide comparative learning to apply it to other Pacific island countries to help communities move from semi-subsistence to planned farming in a gender-equitable way. In 2022–23, researchers will continue adapting the Family Farm Teams manual and identify individuals to undertake Family Farm Teams training and other capacity building activities. These peer educators will deliver training modules for participating smallholder men and women.[34]

Soil and Land Management

Agriculture in the Pacific region is generally confined to smallholder farms and household gardens. Its sustainability is threatened by nutrient imbalances, erosion, declining soil fertility and soil carbon loss, and climate change. A new project in 2023 expands on previous research to build farming systems resilience in Fiji, Samoa, Tonga and Vanuatu. Led by Dr Ben Macdonald of CSIRO, the project will address knowledge gaps in understanding soil organic carbon and crop nutrition management and develop the next generation of agronomic advisors and appropriate networks for collaboration. The project will continue the development and extend the reach of the Pacific Soils Portal. Researchers will introduce cost-effective technologies for rapid soil and plant analysis and real-time data capture to agricultural extension services. The project seeks to improve linkages along the export value chain by developing information pathways between the grower, extension agent and exporter, focusing on soil nutrient and carbon management.[35]

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See page 186 for contact details.

Current and proposed projects

1. Defining priority commercialisation pathways and potential private commercialisation partners for viable long-term commercialisation of products emerging from FST/2019/128 [Fiji] (AGB/2021/172)
2. Pacific Agribusiness Research in Development Initiative Phase 2 (PARDI 2) [Fiji, Tonga, Vanuatu] (AGB/2014/057)
3. Landscape and opportunity analysis in the Pacific tuna sector: Foundation analysis to identify innovation pathways to enhance participation by the Pacific community and value retention in the region [South Pacific general] (AGB/2021/173)
4. Supporting greenhouse gas inventories and livestock data development in Fiji (CLIM/2021/160)
5. Institutional barriers to climate finance through a gendered lens in Fiji, Samoa and Solomon Islands (CLIM/2021/110)
6. Transformation pathways for Pacific coastal food systems [Kiribati, Solomon Islands] (CLIM/2020/178)
7. Sustainable intensification for climate-resilient development in Pacific island countries [Samoa, Tonga] (CLIM/2020/186)
8. Finding a genetic basis for oil palm responses to basal stem rot in a long-term infected block [Papua New Guinea, Solomon Islands] (CROP/2021/130)
9. Half-pearl industry development in Tonga and Vietnam (FIS/2016/126)
10. Towards more profitable and sustainable mabé pearl and shell-based livelihoods in the western Pacific [Fiji, Papua New Guinea, Samoa, Tonga] (FIS/2019/122)
11. Improving nutrition through women's and men's engagement across the seaweed food chain in Kiribati and Samoa (FIS/2019/125)
12. Agriculture and fisheries for improved nutrition: integrated agri-food system analyses for the Pacific region [Kiribati, Solomon Islands, South Pacific general, Vanuatu] (FIS/2018/155)
13. Coalitions for change in sustainable national community-based fisheries management programs in the Pacific [Kiribati, Solomon Islands, South Pacific general, Vanuatu] (FIS/2020/172)
14. Spatially integrated approach to support a portfolio of livelihoods [Solomon Islands, South Pacific general] (FIS/2020/111)
15. Innovating fish-based livelihoods in the community economies of Timor-Leste and Solomon Islands (FIS/2019/124)
16. Coconut and other non-traditional forest resources for the manufacture of engineered wood products [Fiji] (FST/2019/128)
17. Kava land use changes [Fiji, Vanuatu] (FST/2021/146)
18. Livelihoods in forest ecosystem recovery [Solomon Islands] (FST/2020/135)
19. Understanding school food provision in the Pacific: Scoping the potential of local food systems to improve diets, nutrition and livelihoods [Fiji] (HORT/2021/159)
20. Responding to emerging pest and disease threats to horticulture in the Pacific Islands [Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga] (HORT/2016/185)
21. Safeguarding and deploying coconut diversity for improving livelihoods in the Pacific islands [Fiji, Papua New Guinea, Samoa, Solomon Islands, Vanuatu] (HORT/2017/025)
22. Adopting a gender-inclusive participatory approach to reducing horticultural food loss in the Pacific [Fiji, Samoa, Solomon Islands, Tonga] (CS/2020/191)
23. Improving root crop resilience and biosecurity in Pacific island countries and Australia [Fiji, Samoa, Solomon Islands, Tonga] (HORT/2018/195)
24. Aligning genetic resources, production and post-harvest systems to market opportunities for Pacific island and Australian cocoa [Fiji, Samoa, Solomon Islands, Vanuatu] (HORT/2014/078)
25. PICfood: Driving vegetable food environments to promote healthy diets in Pacific island countries [Fiji, Samoa] (HORT/2021/141)
26. Enhanced fruit systems for Tonga and Samoa (Phase 2): Community based citrus production (HORT/2019/165)
27. Increasing the productivity and profitability of smallholder beekeeping enterprises in Papua New Guinea and Fiji (LS/2014/042)
28. Improving small ruminant production and supply in Fiji and Samoa (LS/2017/033)
29. A farm planning approach to increase productivity and profitability of smallholder cattle systems in Vanuatu (LS/2018/185)
30. Development of a third party verified voluntary sustainable certification program for beef and other key commodities in Vanuatu (LS/2020/155)
31. Climate-smart landscapes for promoting sustainability of Pacific Island agricultural systems (ASEM/2016/101)
32. Landcare - an agricultural extension and community development model at district and national scale in Fiji (SSS/2019/140)
33. Climate-smart coastal landscapes for sustaining fisheries-based livelihoods and food security in the Pacific [Fiji, Tonga] (SSS/2021/120)
34. Improving agricultural development opportunities for female smallholders in rural Solomon Islands (SSS/2018/136)
35. Soil management in Pacific island countries Phase 2: Investigating nutrient dynamics and the utility of soil information for better soil and crop management [Fiji, Samoa, Tonga, Vanuatu] (SLAM/2020/139)

Papua New Guinea

A$6.79 million
Budgeted funding

16
Bilateral and regional research projects

6
Small projects and research activities

Papua New Guinea's economy is made up of 2 main industries: the labour-intensive agriculture, fisheries and forestry sectors, and the mineral and energy extraction sector, which accounts for most of the country's export earnings.

The agriculture, fisheries and forestry sectors are incredibly diverse, from remote subsistence crop production in the highlands to emerging freshwater aquaculture systems to commercially oriented export crops such as cocoa and coffee. These mixed subsistence and market systems support the livelihoods of more than 6.8 million people (85% of the population of Papua New Guinea). This immense diversity of livelihood systems brings significant challenges for Papua New Guinea policymakers, including limited infrastructure for delivering inputs and products to markets, high rates of inadequate nutrition, vulnerability to weather variability and climate change, and widespread lack of off-farm employment for youth. On-farm productivity is consequently and typically low. Improving returns from agriculture, fisheries and forestry and strengthening food nutritional security remain critical to improving the livelihoods of the majority of households in Papua New Guinea.

Direction for development for the country is currently provided by the Papua New Guinea Vision 2050, Papua New Guinea Development Strategic Plan 2010–2030 and 4 Medium Term Development Plans. The government emphasises that by 2050, renewable sectors including agriculture, fisheries and forestry, must account for 70% of GDP compared with the current 26%. Complementing these plans, the Papua New Guinea National Food Security Policy 2018–2027 guides resources to build sustainable food security for all Papua New Guineans. A primary aim of the policy is to foster strong public–private partnerships and leverage agriculture's potential to promote enhanced nutrition and health by bringing together profitable smallholder farming, efficient food value chains, women's income and child nutrition. Of particular interest to ACIAR is the PNG Agriculture Medium Term Development Plan, which lapses this year. This plan defines the specific areas for investment in agriculture.

Over the past 40 years, ACIAR has supported projects throughout Papua New Guinea across its diversity of the rural livelihoods systems. While we continue to work across the country, areas of particular focus are the the Autonomous Region of Bougainville and the Western Province. Through the South Fly Resilience Plan, Australia is looking to assist communities in the South Fly District to transition out of food insecurity and develop resilient, sustainable livelihoods and inclusive governance.

Country priorities

ACIAR research partnerships with Papua New Guinea will continue to focus on horticulture, livestock, fisheries, forestry and socioeconomics. Ultimately, the research is working to secure improvements in food supply, food access and rural incomes for smallholders through increased productivity and enhanced access to markets and services.

Research partnerships aim to:

- overcome social, cultural and policy obstacles to benefits from agricultural technologies, particularly with respect to gender equity and women
- improve smallholder vegetables and starchy staple systems
- analyse commodity and market chains to guide policy and improve production and marketing for cocoa, coffee, coconut and oil palm crops
- enhance germplasm quality for high-value tree species to improve community forestry and agroforestry systems
- work with private sector partners and farmers to adopt promising agricultural technologies
- monitor and identify options for managing biosecurity threats
- enhance livelihoods from smallholder fisheries, and inland and marine aquaculture
- increase household income through diversifying enterprises.

In 2022–23, ACIAR will refresh its partnership with Papua New Guinea establishing a long-term intent to underpin both research and capacity building collaboration. ACIAR will continue to support partner institutions to build the capacity of research personnel through long-term and short-term courses, informal networking events and hands-on experience at the project level. Through this process, we play a very significant role in contributing to the human capital of Papua New Guinea to develop skills and knowledge in sustainable agriculture, fisheries and forestry.

As women make up more than 50% of the labour force engaged in agriculture and 35% of women are actively involved in economic agriculture, gender equity will remain integral to all our projects in Papua New Guinea. Women in rural communities play a significant role in subsistence food production, household food nutritional security and agricultural value chains.

2022–23 research program

- **22 ACIAR-supported projects in Papua New Guinea**
- **16 projects are specific to this country**
- **6 projects are part of regional projects**

The research program addresses our high-level objectives, as outlined in the ACIAR 10-Year Strategy 2018–2027, as well as specific issues and opportunities identified by ACIAR and our partner organisations. The following sections briefly describe individual ACIAR-supported projects and anticipated outputs in Papua New Guinea. The projects are grouped according to research program. Each project description is referenced in a list at the end of this section, which provides the project title and code.

Crops

Basal stem rot is a fungal disease that kills oil palm in plantations across South-East Asia and the Pacific region. Growers have limited options to manage the disease. New trees are planted after the death of the infected trees but experience suggests that the incidence of the fungus seems to increase with each successive planting. Removing infected dead trees may reduce inoculum pressure but is costly and the benefit has not been demonstrated. A new research activity in 2022, led by Dr Agnieszka Mudge of the University of Queensland, will continue monthly monitoring of an experimental plot established 11 years ago. Data will be analysed to determine if infection dynamics and impact differ between genetically characterised families of trees and if there is a difference between lots where infected stem bases and roots of dead trees are removed compared with plot where they are left in place.[1]

Fisheries

Mabé (half-pearl) jewellery and shell handicraft industries provide income opportunities for coastal communities and women's social enterprises in the western Pacific. Previous projects have increased communities' technical skills of communities in producing juvenile oysters, farming mabé shell in Fiji and Tonga, and producing shell-based jewellery in Papua New Guinea. The development of greater technical capacity and a better understanding of gendered preferences and aspirations sets the basis for a new project in Fiji, Tonga, Papua New Guinea and Samoa, led by Professor Paul Southgate of the University of the Sunshine Coast. Country-specific interventions are required to ensure uniform mabé pearl jewellery/ shellcraft production protocols and standards, improve capacity for sector governance within partner institutions and stakeholders, develop marketing strategies and ensure optimal benefits flow to both women and men across the value chains.[2]

For 10 years, ACIAR and the National Fisheries Authority of Papua New Guinea have co-invested in R&D for inland fish aquaculture. Research has focused on increasing the production efficiency of small-scale fish ponds (for tilapia) integrated into household gardens and helping the National Fisheries Authority improve the production capacity of fingerlings at its central hatchery. To aid dissemination and adoption of best-practice techniques and technologies, Associate Professor Jesmond Sammut of the University of New South Wales leads a new 5-year project. The project will support the National Fisheries Authority to develop commercial tilapia businesses in peri-urban areas and reservoirs, and support villages in remote regions to gain access to reliable and affordable farming inputs and culturally appropriate training services.[3]

The Western province is the largest province in Papua New Guinea. It encompasses great regional diversity in place-based economies, cultures and ecologies. After decades of development support, the Western province remains one of the poorest regions in the world. Development interventions to date have been based largely on a deficit approach that identifies the needs and problems to be addressed and offers solutions. A small research activity led by Associate Professor Katharine McKinnon of the University of Canberra offers an alternative, strengths-based approach, building on the strengths and assets of individuals, communities and places as a starting point for thinking collectively about solutions. The study funded by DFAT aims to identify locally appropriate, strength-based livelihood development practices for the agricultural development sector working across the diverse regions of Western province. It will foster a community of practice among development practitioners working in the region to support new approaches.[4]

A small research activity funded by DFAT is led by Professor Katherine Gibson of Western Sydney University. It seeks to draw on the lessons learned from the decades of development work in the Western province. It will take a strengths-based approach by building a deeper understanding of local people's current economic (largely artisanal) activities and their diverse livelihood assets across broad geographic and cultural contexts. This new knowledge will allow development practitioners and donors to identify the foundational building blocks (strengths and assets) underpinning people's current artisanal activities that future investments can build upon. The primary objective is to map (conceptually and geographically) the place-based strengths and assets of Western Province, thus producing a knowledge base to inform agricultural resilience-building strategies.[5]

Women from Kaviananga village, along the Fly River in Western Province, sell fish at a local market. Market access is a major challenge for communities living along the Fly River. Photo: Aaron English

Forestry

In East New Britain Province, Papua New Guinea, an earlier project focused on value-added processing and developing markets for galip nuts produced by the *Canarium* or galip tree. The project, led by Professor Helen Wallace of Griffith University, provided market research, technical advice, capacity building, business mentoring and access to infrastructure for private and public sector stakeholders. Phase 2 of the project will foster private sector-led development of the galip nut industry, increase value-chain efficiency and establish commercially viable business prospects for private sector investment. In 2022–23 the project will deliver training for 300 women in key processes of the galip value chain and pilot decentralised systems for galip nut initial processing, purchasing, consolidation and collection.[6]

Improved germplasm and smallholder-friendly silvicultural systems for teak (Papua New Guinea) and sandalwood (Papua New Guinea and Cape York Peninsula) were successfully developed in an earlier project led by Dr Tony Page of the University of the Sunshine Coast. However, the complexity of cultural, social and land tenure systems in Indigenous communities can be a significant obstacle for investment in the planted forestry sector. A follow-on project starts in 2022 and aims to scale out the smallholder forest estate to the point where supporting services like nurseries and contract harvesting can be sustained, leading to an increase in planted area, wood supply and smallholder incomes. Key research questions address social and legal structures to facilitate planting on customary land to allow larger, more commercial woodlots.[7]

A project in the Eastern Highlands province, the Ramu and Markham valleys and the Lae region of Papua New Guinea aims to improve rural livelihoods through family-focused community reforestation and ecoforestry in community-owned natural forests. Led by Associate Professor Grahame Applegate of the University of the Sunshine Coast, the project has implemented family-focused community reforestation activities, identified methods for scaling out community-based reforestation and reviewed institutional arrangements and policies that improve access to formal timber markets. The project concludes in 2022 with the delivery of a proposed improved ecoforestry management system for inclusion in national policy and alternative marketing and financial models to evaluate harvesting and marketing operations of small-scale, clan-based operators.[8]

Horticulture

High-value vegetable crops are essential to improving livelihoods in the Pacific region and Cambodia. Extension services are not well equipped to assist farmers in dealing with pests and diseases, with insufficient staff training resulting in crop losses of up to 30–40%, primarily due to pests and diseases. Plant health clinics offer a solution to this problem. A new project led by Dr Michael Furlong of the University of Queensland will establish an effective information system supported by research on key emerging pests in these regions to better prepare farmers to detect, respond to and continue to manage their farming businesses, all the while contributing to regional biosecurity preparedness.[9]

Improved germplasm and silvicultural systems for teak production, developed in an earlier ACIAR project, will underpin a new project aiming to scale out the smallholder forest estate.

Developing safe, high-value fruit and vegetable industries is a priority for many Pacific island countries. Dr Michael Furlong of the University of Queensland leads a project to develop integrated pest and disease management strategies for the sustainable intensification of fruit and vegetable crop production, addressing the threats posed by the inappropriate use of pesticides, emerging pests and diseases and climate change. During 2022–23, the project will focus on providing technical training for extension staff and conducting in-country plant health clinics and pesticide awareness workshops. The project will continue to build surveillance and diagnostic capacity for managing emerging pests and diseases, including fall armyworm. The project will generate new knowledge, resources and opportunities to encourage the adoption of integrated management strategies.[10]

Coconuts contribute, directly and indirectly, to the livelihoods of coastal communities throughout the Pacific region. Much of the coconut resource in the Pacific region is ageing or already senile and unproductive. A project led by Dr Carmel Pilotti of SPC aims to support the first step in rejuvenating coconut-based livelihoods in the Pacific islands by strengthening the conservation and use of genetic diversity in coconuts, addressing threats posed by the rhinoceros beetle and Bogia coconut syndrome, and establishing and sustaining a platform for coordinating coconut research-for-development initiatives. In 2022–23 researchers will focus on training staff in field transfer of plantlets derived from embryo culture and identifying key varieties for preservation in the new cryopreservation facility that will be built and commissioned.[11]

Cocoa production directly supports about two-thirds of the population of the Autonomous Region of Bougainville. Many cocoa farmers have formed cohesive communities with clear goals and objectives, which include assistance to improve crop profitability. Professor David Guest of the University of Sydney leads a project to improve the productivity, profitability and vitality of smallholder cocoa farming families and communities. During the project's final year, researchers will focus on completing village gardens and nurseries, evaluating soil quality, and finalising the establishment of support networks, research hubs and farmer training for cocoa production and other potential enterprises.[12]

Coffee production in Papua New Guinea provides employment for more than 2.5 million people and is a major source of income for approximately 400,000 smallholder farmers. The most serious pest of coffee globally, the coffee berry borer, is a recent incursion to highland coffee production areas. The pest is a major threat to the livelihoods of rural families and their communities and a significant threat to biosecurity in Australia. Dr Ian Newton of the Queensland Department of Agriculture and Fisheries leads a project to limit damage and introduce world-best crop protection practices. During 2022–23, activities will include evaluation and updating of a best-practice integrated pest management (IPM) package and testing of biological and chemical control solutions.[13]

Livestock Systems

Strong domestic demand for honey and the potential to export honey and its by-products offers an opportunity to smallholder farmers in Fiji and Papua New Guinea. A project, led by Dr Cooper Schouten of Southern Cross University, aims to increase the productivity and profitability of beekeeping enterprises to complement smallholder incomes and promote an income-earning activity for women. During 2022–23, the project will continue to develop best-practice pest and disease management programs, particularly in readiness for incursions of varroa and tropilaelaps mites. Development of post-harvest quality management programs for producers and packers will continue, for standards, certification and testing processes for export grade honey. The project will also provide capacity building opportunities for beekeeping associations to support smallholder industry development.[14]

Tuberculosis is a leading cause of death in Papua New Guinea, and a leading cause of death from infectious diseases worldwide. In addition to pulmonary tuberculosis, there is a high burden of suspected extrapulmonary tuberculosis in the Pacific region, which requires different approaches to management and prevention. Dr Philipp Du Cross of the Burnet Institute is conducting a small research activity to determine the types of bacteria causing tuberculous lymphadenitis, with a focus on risk factors associated with exposure to animals. The study aims to define the proportion of clinically diagnosed tuberculosis lymphadenitis that is attributable to drug-sensitive and drug-resistant *Mycobacterium* spp. The results will be important for the development of clinical and program management of tuberculosis.[15]

Dr Julianne Biddle (ACIAR) and Quang Nguyen (PhD candidate, University of Queensland) inspect coconut varieties grown through somatic embryogenesis in the microbiological and plant containment facility at Gatton Campus (HORT/2017/025) Photo: Andrew Sillis

Japanese encephalitis is one of the most important causes of viral encephalitis in humans in South-East Asia. In Papua New Guinea, the disease primarily affects rural communities, with the highest rates of disease occurring in children. Although an effective vaccine is available, more than 100,000 cases occur annually, and Japanese encephalitis remains a potentially important zoonotic risk for the PNG population. A small research activity, led by Dr David Williams of CSIRO, brings together partners with a strong track record in human, animal and vector surveillance and aims to consolidate and build on the previous research activity to expand a One Health surveillance approach for Japanese encephalitis and other arthropod-borne viruses in Papua New Guinea.[16]

Social Systems

Coffee is economically important for rural livelihoods in Papua New Guinea. Despite a rapidly growing population in the highland coffee-growing areas, national production is declining. A project led by Professor George Curry of Curtin University aims to increase returns for labour from the crop, particularly for women, through the adoption of culturally acceptable and nutrient-efficient coffee–vegetable intercropping systems. In the project's final year, researchers will hold meetings in participating villages outlining the results of the trials and the potential benefits for farmer families and industry.[17]

Communities reliant on agriculture-based livelihood systems in Papua New Guinea are particularly at risk from climate variability and change. Dr Steven Crimp of the Australian National University leads a project examining ways in which seasonal climate information, with a 3 to 6-month lead time, can be communicated and integrated with existing farm practices. The aim is to increase the adaptive capacity of farmers, to help them reduce risk and secure adaptive opportunities for food production. During 2022–23, activities focused on field sites will continue to demonstrate the potential value of integrating scientific and Indigenous knowledge. Results from the first-round field trials will be analysed and used to inform the design of second-round trials.[18]

The successful Family Farm Teams approach will be adapted and applied to develop the capacity of religious institutions in Papua New Guinea to work in a gender-inclusive way when engaging rural agricultural communities in smallholder farm development. The project led by Dr Josephine Caffery of the University of Canberra will also provide pathways for increasing youth involvement in family farm teams and sustainable farming futures. In 2022–23 the project team will deliver activities to build the capacity of youth change agents while developing Family Farm Teams resources specifically for young people.[19]

Soil and Land Management

In Papua New Guinea, sweetpotato is being grown with a shorter fallow period, more rotations with alternative crops and shorter cropping periods to cope with increasing population pressure. Sustainable intensification of production is needed. A project led by Professor Neal Menzies of the University of Queensland focuses on addressing soil fertility decline with smallholder farmers with the aim of improving yields and increasing household income through sweetpotato production. Concluding in 2023, the project will determine the optimum rates of mineral fertilisers and opportunities to use organic nutrient sources to avoid soil fertility decline, increase production, and improve the benefit:cost ratio of inputs.[20]

Papua New Guinea's Vision 2050 requires the contribution of renewable sectors, including agriculture, fisheries and forestry, to GDP to increase from 26% to 70%. A new project, led by Mr Peter Wilson and Dr Mark Thomas of CSIRO, will provide useful and targeted information about the natural resource base in support of agriculture, forestry and infrastructure planning, development and management. The project will modernise the Papua New Guinea Resources Information Systems that was developed in the 1980s and 1990s. It will deliver a technologically advanced, well-managed soil information system that adheres to FAIR (findable, accessible, interoperable, reusable) data principles and provides valuable information to key decision-makers and a range of stakeholders in the agriculture and forestry sectors.[21]

The successful Family Farm Training model has been adpated to empower youth, especially females, to ensure they become an integral part of the family farming team. Pictured are youths in East New Britain, learning how to budget their funds. Photo: Aaron English

The first stage of a cocoa farming systems project in Papua New Guinea demonstrated that yields can be increased with improved soil management and better soil fertility, lifting incomes and improving the livelihoods of smallholder cocoa farming households. A project led by Professor Damien Field of the University of Sydney will build on the outputs and outcomes of the first phase of research. The project will evaluate opportunities to develop site-specific solutions to improve cocoa farming systems using locally available resources to address soil constraints and improve the soil health and productivity of cocoa plantations. In 2022–23, activities include training a cohort of local staff as mentors for smallholder farmers, assessing a family farm teams approach to learning about soil management and studying the influence of composts and crop diversification on soil and plant health and the quality of cocoa.[22]

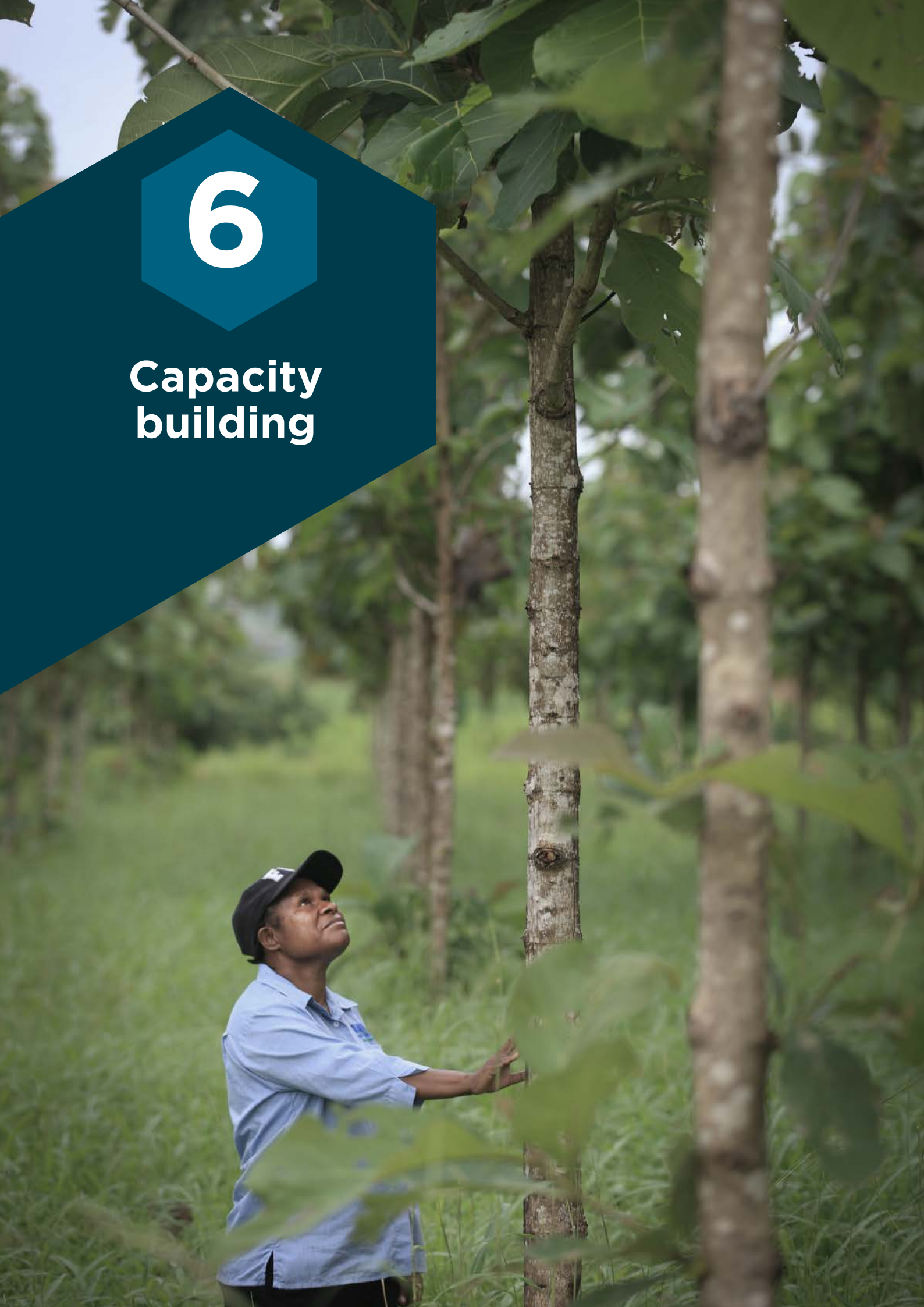
Country Manager
Dr Norah Omot

Research Program Managers
Crops: Dr Eric Huttner
Fisheries: Prof Ann Fleming
Forestry: Dr Nora Devoe
Horticulture: Ms Irene Kernot
Livestock Systems: Dr Anna Okello
Social Systems: Dr Clemens Grünbühel
Soil and Land Management: Dr James Quilty

See page 186 for contact details.

Current and proposed projects

1. Finding a genetic basis for oil palm responses to basal stem rot in a long-term infected block [Papua New Guinea, Solomon Islands] (CROP/2021/130)
2. Towards more profitable and sustainable mabé pearl and shell-based livelihoods in the western Pacific [Fiji, Papua New Guinea, Samoa, Tonga] (FIS/2019/122)
3. Improving peri-urban and remote inland fish farming in Papua New Guinea to benefit both community-based and commercial operators (FIS/2018/154)
4. Strengthening agricultural resilience in Western Province: Developing methods for strengths-based livelihoods approach [Papua New Guinea] (FIS/2021/113)
5. Strengthening agricultural resilience in Western Province: Mapping place-based strengths and assets [Papua New Guinea] (FIS/2021/122)
6. Enhancing private sector-led development of the canarium industry in Papua New Guinea - phase 2 (FST/2017/038)
7. Promoting smallholder teak and sandalwood plantations in Papua New Guinea and Australia (FST/2018/178)
8. Enabling community forestry in Papua New Guinea (FST/2016/153)
9. Biosecurity planning [Cambodia, Papua New Guinea] (HORT/2021/151)
10. Responding to emerging pest and disease threats to horticulture in the Pacific Islands [Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga] (HORT/2016/185)
11. Safeguarding and deploying coconut diversity for improving livelihoods in the Pacific islands [Fiji, Papua New Guinea, Samoa, Solomon Islands, Vanuatu] (HORT/2017/025)
12. Developing the cocoa value chain in Bougainville [Papua New Guinea] (HORT/2014/094)
13. Protecting the coffee industry from coffee berry borer in Papua New Guinea and Australia (HORT/2018/194)
14. Increasing the productivity and profitability of smallholder beekeeping enterprises in Papua New Guinea and Fiji (LS/2014/042)
15. Drug sensitive and resistant tuberculosis and zoonotic infections as causes of lymphadenitis in 3 provinces in Papua New Guinea (LS/2018/217)
16. Strengthened surveillance for vector-borne zoonotic and livestock diseases in Papua New Guinea (LS/2021/158)
17. Improving livelihoods of smallholder coffee communities in Papua New Guinea (ASEM/2016/100)
18. Climate-smart agriculture opportunities for enhanced food production in Papua New Guinea (ASEM/2017/026)
19. Gender equitable agricultural extension through institutions and youth engagement in Papua New Guinea (SSS/2018/137)
20. Sustaining soil fertility in support of intensification of sweetpotato cropping systems [Papua New Guinea] (SMCN/2012/105)
21. Better soil information for improving PNG's agricultural production and land use planning: Building on PNGRIS and linking to the Pacific Regional Soil Partnership [Papua New Guinea] (SLAM/2019/106)
22. Optimising soil management and health in Papua New Guinea integrated cocoa farming systems - Phase 2 (SLAM/2019/109)



6

Capacity building

Capacity building

Science and innovation are critical to advancing agriculture and livelihoods in the Indo-Pacific region. However, of equal importance to our partner countries is the development of individual and organisational science and policy capability to implement research outcomes.

Developing capability in partner countries is a key priority for ACIAR to maximise the adoption of new knowledge and technologies to contribute to our strategic objectives. The ACIAR Capacity Building Program identifies and establishes opportunities for individuals and organisations in partner countries to boost technical, policy and management skills in agricultural research-for-development. To achieve this, we facilitate programs in scientific research, leadership, management, policy and governance with our partners in the Indo-Pacific region.

In 2022–23 the program will return to face-to-face learning, after several years of remote delivery because of the COVID-19 pandemic. While face-to-face is the preferred mode of delivery, we will draw on the experience of remote delivery and apply some of the benefits discovered during this period. At the same time, we will continue to develop ACIAR Learn, a bespoke online learning portal, to offer flexibility and greater access to learning opportunities in our program.

This year we will also work towards a stronger integration of our Capacity Building Program with the Research Program. We will work to embed more strategic capacity building initiatives at the planning stage of selected research projects and facilitate connections between the extensive alumni network and current research projects and opportunities.

John Dillon Fellowship

We have been delivering the John Dillon Fellowship for 20 years. The program develops the leadership and management skills of mid-career professionals, particularly scientists, researchers and economists working in agriculture research-for-development in ACIAR partner countries. To date, there are more than 180 alumni of the program across our partner countries.

In 2022–23, we will be completing the program for cohorts in the Philippines and Vietnam and beginning new cohorts in Bangladesh and the Pacific Region in partnership with our provider, the University of New England. In 2022–23, ACIAR is continuing to deliver the program in individual country cohorts of up to 18 participants with a strong focus on cross-organisational collaboration and strengthening ties with Australian partners. This approach further bolsters Australia's approach to science diplomacy.

Meryl Williams Fellowship

ACIAR launched the Meryl Williams Fellowship Program in 2019. This initiative works with women agricultural researchers, providing them with the skills and knowledge to take on greater leadership positions in their employing institutions. The fellowship contributes to more secure food systems and our strategic objective of gender equality and women's empowerment by providing women in agricultural science with greater access to leadership resources, building collaborative networks, supporting career advancement and driving institutional progress towards gender equity. The fellowship is delivered by the University of New England. In 2022–23 the first cohort of fellows will conclude the program with face-to-face workshops in Australia in November.

The second cohort of the Meryl Williams Fellowship will meet in Australia for the first time in August to formally start the program. The cohort has been engaging in mentoring activities online for the last 12 months and will use their time in Australia to consolidate their learning and develop career development plans to implement until their final workshop in late 2023.

John Allwright Fellowship

In 2022–23 John Allwright Fellows who were previously impacted by travel restrictions are starting or restarting their studies in Australia. There are currently 37 fellows in the program. Applications for study in 2023 will be assessed and offers to new fellows made.

During the year the selection criteria for the John Allwright Fellowship will be revised for the 2024 round to ensure it better reflects the strategic priorities of the countries in which we work and current ACIAR research projects. This follows changes to the criteria for the 2023 round that identified priority countries for applications.

In 2022–23, the John Allwright Support Facility will provide support, advice and direction to John Allwright Fellowship scholars and ACIAR. The facility includes regular check-ins with fellows during their higher degree research program. This includes both academic and welfare support, noting the significant challenges associated with research during a global pandemic. The facility will primarily act as a second layer of support to provide advice and hands-on assistance to help the fellows achieve their qualifications and advise ACIAR on how we can improve management of the Fellowship.

The John Allwright Fellowship Executive Leadership program continues to be a key mechanism to enhance leadership skills development for fellows in Australia. The program equips the fellows with leadership and management skills designed to support their return to the workplace and will be revised for ongoing implementation this financial year.

Pacific scholarships

Our longstanding agricultural research scholarship program with the University of South Pacific was redesigned, expanded and renamed PASS-CR (Pacific Agricultural Scholarship Support and Climate Resilience program). 2021 saw the inclusion of scholarships at Fiji National University, and a return to offering PhD scholarships. Currently, there are 29 Pacific scholars studying under this program at either university, with this number set to expand as we finalise the 2023 intake. Scholars are aligned to an ACIAR research project in agriculture, forestry and fisheries and have an Australian co-supervisor. Through PASS-CR, ACIAR aims to support new generations of Pacific agricultural researchers who are equipped to tackle and address the challenges facing Pacific agriculture now, and into the future.

The redesigned PASS-CR academic support program is being delivered primarily through the University of Sunshine Coast's Australian Centre for Pacific Island Research, in conjunction with Southern Queensland University, Central Queensland University and Science Research Organisation of Samoa. Through PASS-CR, Pacific students and staff will have access to the extensive Pacific Agriculture Information System, which houses more than 1000 Pacific agricultural records. This will address the difficulty researchers have in locating information about their own countries.

The PASS-CR academic support program extends beyond awarding scholarships and engages both with the Schools of Agriculture and Offices of Research at University of South Pacific and Fiji National University, providing workshops, research training and networking to scholars and their supervisors.

Activities in 2022–23 include support to locate strategic research priorities, monthly Pacific seminars (which are jointly presented to Pacific and Australian students) and higher degree research supervision workshops for students and academics.

PASS masters scholarship recipient, Ms Nirma Nadan conducts her research on the on *Actinobacteria* as a bio-control approach for managing bacterial wilt in tomatoes. Photo: Nirma Nadan

Alumni program

In response to the COVID-19 pandemic, the Alumni Research Support Facility was opened for applications. This targeted activity provides up to $20,000 for small research activities that build resilience and respond to the emerging challenges that COVID-19 has placed on agricultural systems in our partner countries. The program will conclude in August 2023. Across the 3 phases of the program, the facility is supporting 103 small research projects led by ACIAR alumni across the Indo-Pacific. In 2022–23 the final research projects will be completed for participants from the first 2 rounds of the program, some 65 small research activities. We will be working closely with this cohort of researchers to support them to undertake outreach activities to ensure this research has maximum impact.

During 2022–23, we will be continuing to deliver our new Global Alumni Strategy, with an increased focus on supporting alumni through the post-COVID operating environment. The aim of this strategy is to engage with ACIAR alumni to develop the skills, knowledge and networks of agricultural researchers and scientists to contribute to positive development outcomes in the agricultural research-for-development sector.

Under the Global Strategy, ACIAR Country and Regional Offices will continue to implement their 3-year alumni engagement plans. These plans have identified the priorities and interests of each country's alumni. From these, annual plans identify a program of activities to be implemented at the country and regional level, including training workshops (both online and in-person), networking events and new opportunities for alumni.

In 2022–23, we will continue to build on our virtual alumni network, ACIAR Alumni 360, developing pathways for further engagement with ACIAR work. The platform is designed to be the central mechanism for alumni to interact with ACIAR and the greater alumni network. Country Office staff facilitate country chapter pages with links to information about events, research collaborations and discussion forums. ACIAR Alumni 360 also includes information on the Capacity Building Program, including calls for applications to our fellowships, funding opportunities, publications and other resources. There are currently around 600 active members on the platform, and we expect this will continue to grow in 2022–23.

ACIAR Learn (online learning)

ACIAR in partnership with University of Queensland and Catalpa International piloted a new mobile-learning platform, ACIAR Learn, in response to the COVID-19 pandemic. The platform is a bespoke online learning for agricultural researchers demonstrating best practice of Australian agricultural science knowledge. In 2022–23, we will continue to strengthen the platform, incorporating lessons learned from the pilot courses and working with the research program and Alumni to develop relevant and engaging content for users continued professional development.

The first cohort of the Meryl Williams Fellowship graduated in November 2022, in Brisbane. The fellows are pictured with ACIAR General Manager, Outreach and Capacity Building, Eleanor Dean (centre back, in pink), and fellowship facilitators from the University of New England, Dr Rebecca Spence and Dr Philip Harrell. Photo: Patrick Cape.

Organisational capacity building

ACIAR has long-term relationships with overseas agricultural research organisations. The ongoing nature of our research partnerships makes it important to understand the enablers, constraints and impacts that capacity building has on strengthening institutions. Under our organisational capacity-building research, we are identifying approaches that have been successful in enhancing our research partners' organisational effectiveness for improved agricultural research. This body of work is informing new approaches to enhance institutional awareness in research projects for more effective and sustainable research outcomes. In 2022–23 we will continue to work with a select number of partner organisations and develop shared pathways and approaches to supporting increased organisational effectiveness.

Other training activities

ACIAR supports training activities delivered by the Crawford Fund. This includes the Master Class and Training Program, a new program of e-mentoring linking agricultural researchers from developing countries with mentors in Australia, and the Next-Gen suite of activities designed to build interest in careers in international agricultural research.

Director, Capacity Building
Ms Kate Turner-Mann

See page 185 for contact details.

Table 4.1 Participation in ACIAR capacity-building programs

Programs	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23 (est)
John Allwright Fellowship						
No. active in year	97	85	75	70	37	37
No. awarded in year	7	12	10	10	No round	12
John Dillon Fellowship						
No. active in year	10	28	28	20	15	36
Meryl Williams Fellowship						
No. active in year	–	–	20	40	40	23
Pacific Scholarships						
No. active in year	13	10	10	23	23	29
No. awarded in year	6	6	3	14	11	To be awarded
Alumni engagement						
No. participants	–	75	90	140	180	120
Launch fund						
No. events supported	–	11	15	11	8	4

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Ms Mai Alagcan is based in Suva, Fiji. Before joining the Pacific Region Office in 2021, Mai was Country Manager for ACIAR in the Philippines for 5 years. Prior to joining ACIAR, she was a Senior Program Officer on the Climate Change, Disaster Risk Reduction and Humanitarian Program for DFAT at the Australian Embassy in Manila. Mai also has worked in the Philippine public sector and has extensive professional and management experience on program development, policy analysis and monitoring and evaluation in the agriculture and fisheries sector. Mai has a Bachelor of Science in agricultural economics from the University of the Philippines and a postgraduate certificate in regional development planning from the School of Urban and Regional Planning, University of the Philippines and Technical University of Dortmund in Germany.

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Dr Norah Omot is based in Port Moresby and joined ACIAR in 2022. She has worked with the Asia-Pacific Association of Agricultural Research Institutions (APAARI) in various roles since 2017, including as a coordinator of the ACIAR ASTI (Agricultural Science Technology Indicators) project, coordinating projects across Papua New Guinea, Fiji and 8 South-East Asia countries. Before working with APAARI, Norah worked with the Papua New Guinea National Agricultural Research Institute (NARI) in varying roles, from Senior Scientist to Program Director. Norah holds a bachelor degree in Agricultural Science (Papua New Guinea University of Technology), a Master of Agriculture, Agricultural Economics (University of Sydney) and a Doctor of Philosophy, Economics (University of Canberra). Norah was awarded a John Dillon Fellowship in 2004.

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