

DFAT-ACIAR

PNG Economic Development Program
and Bougainville Agriculture Program



TADEP+

TRANSFORMATIVE AGRICULTURE *and* ENTERPRISE DEVELOPMENT PROGRAM *plus*

A multidisciplinary research program
that aims to improve the livelihoods of
rural men and women in Papua New Guinea

2019/20 ANNUAL REPORT



Australian Government
Australian Centre for
International Agricultural Research

**Australian
Aid** 

Table of contents

Table of contents.....	2
Executive summary	3
Key outcomes.....	4
Key challenges and issues	4
Lesson learnt	5
Background	6
Why a program?.....	7
Program principles	10
Gender equity and women’s economic empowerment	10
Private sector-led development.....	12
Program elements.....	15
Communication	15
Collaboration.....	16
Capacity building.....	18
Project updates	20
HORT/2014/094 Bougainville Cocoa	20
HORT/2014/096 PNG Cocoa	23
HORT/2014/097 Sweetpotato.....	26
ASEM/2014/095 Family Farm Teams – concluded in March 2019	28
FST/2014/099 Galip Nut – concluded in December 2019	28
Program Performance Framework.....	29
Purpose of the Program Performance Framework	29
Development of the Program Performance Framework	31
The Program Performance framework – contributions from each project	32
Glossary.....	47

Executive summary

The Transformative Agriculture and Enterprise Development Program (TADEP) is a multidisciplinary research program that aims to improve the livelihoods of rural men and women in Papua New Guinea through five component research projects. TADEP is co-funded by the Department of Foreign Affairs and Trade (DFAT) and the Australian Centre for International Agricultural Research (ACIAR). This Annual Report summarises activities and progress in the period from 1 July 2019 to 30 June 2020. Since inception of the program, the following five projects have commenced and are at varying stages of implementation:

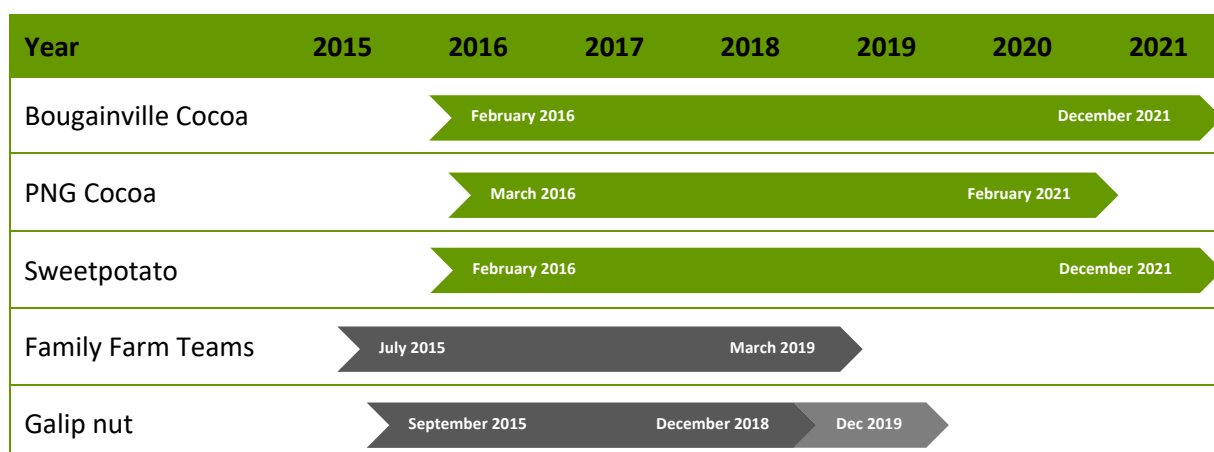


Figure 1: Timeline of TADEP projects as components of the program.

Due to the staggered commencement dates of the projects and varying project lengths, two of the five projects have concluded in this reporting period with the remaining three to conclude in 2021. Whilst the Family Farm Teams and Galip Nut projects have concluded as formal component projects of the program, both project teams have agreed to continue to contribute to the program in the next phases of their research. To reflect this evolution, the program has been informally rebranded as TADEP+.

Whilst the timelines of the individual component projects vary, the design of the multidisciplinary research for development program, or its program logic, articulates what the program can expect to achieve along its six-year timeframe. As TADEP+ is over halfway through its program design, research outcomes and early evidence of research impacts have emerged, as reported in the program Performance Framework (refer to page 32).

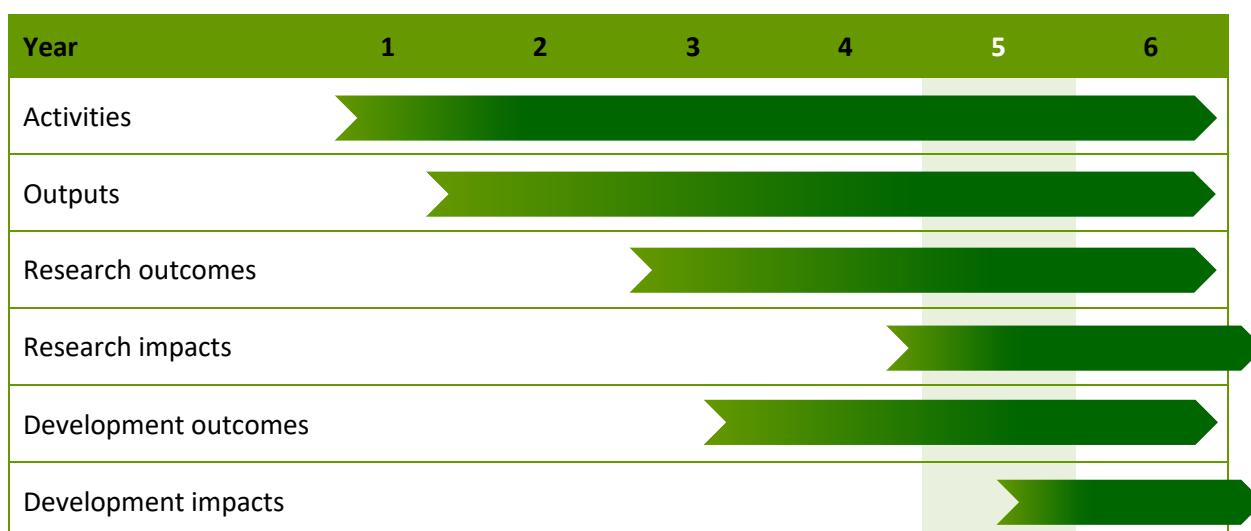


Figure 2: An example of anticipated timing for a research for development (R4D) project or program.

The monitoring and evaluation (M&E) framework articulates how each of the projects are responding to the higher-level goals of the program. Other key roles of TADEP+ are to facilitate opportunities for cross-program *collaboration* and *capacity building*, deliver a coherent and coordinated *communications* strategy, and ensure that the guiding principles of *gender equity and women's economic empowerment* and *private-sector led development* are embedded across all program-level activities. This annual report distils the significant progress of the program against the guiding principles (refer to page 10) and towards each of the program elements (refer to page 15).

Key outcomes

The program elements describe the extent to which TADEP+ delivers value beyond the sum of the component projects, and are summarised as follows:

- Communications
 - Six bimonthly comprehensive TADEP+ Updates sent to 174 recipients detailing progress of the component projects and more broadly of the program
 - Multiple face-to-face and virtual Steering Committee meetings
 - Numerous stakeholder meetings held in Canberra and various locations across PNG with donor agencies, project teams, partner organisations
 - Project teams meeting with DFAT representatives and other key stakeholders during transit through Port Moresby and other major centres
 - Stories communicating the impact of the projects featured in print media, online blogs and articles, social media
 - Updates to the program website: www.tadep-png.com
- Collaboration
 - Ongoing, proactive relationship management with donor agencies, the projects and partner organisations
 - Identification and facilitation of synergies between projects and other relevant programs in PNG
 - Concluded three Collaborative Research Grants, with one remaining project to conclude in December 2020
 - Planning for TADEP+ Showcase in 2021
- Capacity building
 - Exposure of project teams to other diverse and experienced researchers
 - Opportunities for project team members to learn from research and approaches from other disciplines
 - Formal training as part of project activities or Collaborative Research Grant activities

TADEP is progressing well against each of the program objectives and is delivering value as a multidisciplinary research for development program. The program will continue to evolve as it matures and ideas for greater or improved cross-program collaboration are identified.

Key challenges and issues

Whilst the program has achieved some significant progress and outcomes, there are still areas for improvement;

- COVID-19 has disrupted many of the TADEP project and program activities. Face-to-face interaction has been the modus operandi for ACIAR project implementation and new ways for working, many relying on internet connectivity, have needed to be developed. This lack of face-to-face interaction has impacted much of planned and informal cross-program communication, collaboration and capacity building that TADEP facilitates.

- Another key challenge has been distilling the key outcomes and impacts from the projects and program in a form that is conducive to broad and busy audiences. Project Leaders and project team spend significant time and energy to write informative reports that can sometimes be too time consuming for the TADEP audience to read thoroughly.
- Similarly, extracting and disseminating engaging media content and human interest stories has continued to be a challenge. ACIAR has appointed a Communications Officer in the PNG Country Office and has been working closely with TADEP to develop a proactive and easily implemented communications plan for the remainder of the program.
- As has been since the inception of the program, often projects are justifiably focused on project activities, with secondary focus on the program. Whilst each project aligns with and reports against the over-arching program objectives and contributes significantly to agreed upon cross-program activities, having projects allocate time and resources as part of project design would enable greater ability to contribute and collaborate.

Lesson learnt

Coming towards the end of the program, much has been achieved within and learnt about how a program of agricultural research for development projects, as distinct from standalone projects, can add value to be more than the sum of its parts. Some of the lessons learnt to date have been;

- Regular and proactive communications are critical. The TADEP+ Update continues to be a useful tool for information dissemination and to catalyse discussions and opportunities. Since the onset of the COVID-19 pandemic, more succinct and varied methods of communication have proven to be valuable, such as Webex or Zoom meetings, brief email updates, phone calls and more interaction via social media. This has enabled all involved to be responsive and adaptive in our planning for the remainder of the program.
- Whilst the face-to-face interactions such as the Annual Meeting have previously been the key opportunity to bring together the five component projects and key program stakeholders, COVID-19 has forced more virtual communications. Steering Committee meetings have been happening more regularly and more topic specific, which has saved significant travel costs to the program.
- Relationships between and across projects and the program are integral to its success. The momentum for the program has grown significantly since year one and the interest of projects to work together has increased. A key lesson for the program is that, whilst the intention is to have projects work together collaboratively from day one, it takes time to develop relationships, identify areas where projects can work together and find ways the program can support this.

Report author:

Elizabeth Brennan

TADEP Program Coordinator

+61 403 292 158 | +675 7113 9777

tadep.png@gmail.com

Background

Despite the robust economic growth Papua New Guinea has experienced in the past decade, the nation's social indicators remain among the most challenging in the Asia Pacific region. High international prices for PNG's mining and agricultural exports boosted economic growth and increased government spending and expenditures. However, as public debt has increased and international commodity prices have declined, this inflated prosperity has failed to translate into equitable development for Papua New Guineans.

Poverty is a significant issue for all Papua New Guinea's provinces, including the Autonomous Region of Bougainville, with over 80% of the nation's population being rural-based subsistence smallholder farmers. About half of the labour force work in agriculture, which generates 15% of gross domestic product (GDP). While an estimated 30% of the land is suitable for agriculture, only 2.2% is used for commercial agriculture. Enhancing the livelihoods of rural men and women in PNG will enable the nation to reduce poverty and promote sustainable economic development. Increasing agricultural productivity and supply-chain efficiency for both domestic and export commodities is essential to promote economic growth in the rural sector. Long-term commitment and holistic approaches are needed to address these complex challenges and generate sustainable solutions.

Enhancing the lives of rural people and promoting stability in PNG are central to Australia's interests. In response, there is a strong focus in Australia's development cooperation programs on economic development as a pathway out of poverty and on empowering women and girls. These objectives are reflected in the PNG development priorities articulated by both the PNG and Australian governments.

In 2018, the PNG Government released its Medium-Term Development Plan III (MTDP III) 2018–2022, which describes the objectives, strategies and financing plan towards achieving its aspirational, long-term Vision 2050. The PNG National Agriculture Development Plan also aligns with Vision 2050 and the MTDP III, and aims to enhance agricultural productivity, scale of production, market access and income generation through smart partnerships and innovative, sustainable and entrepreneurial farming systems and agro-industry. Australian assistance aims to complement, not substitute for, PNG's own investment in priority areas.

Why a program?

Recognising the valuable role and outcomes that the Australian Centre for International Agricultural Research (ACIAR) has in brokering research for development (R4D) projects in Papua New Guinea, a new multi-disciplinary programmatic approach was developed to address priority areas of development in PNG. The Australian Department of Foreign Affairs and Trade (DFAT) partnered with ACIAR to co-fund the Transformative Agriculture and Enterprise Development Program (TADEP) which focuses on opportunities to scale up and scale out successful innovations from previous ACIAR projects in PNG. The program constitutes of two separate records of understanding (ROU), relating to areas of focus for both the PNG and Australian governments:

- PNG Economic Development Program (ROU 14376, Sch 53)
- Bougainville Agriculture Program (ROU 14376, Sch 54)

Commencing in April 2015, the multidisciplinary research program aims “to improve livelihoods of rural men and women in Papua New Guinea”. TADEP has a series of correlating objectives that help realise this fundamental aim and identify key areas of change that the program seeks to catalyse:

- To stimulate and strengthen inclusive private sector-led development in agriculture
- To sustainably increase agricultural productivity, quality and value
- To improve access to markets and strengthen value chains
- To promote gender equity and women’s empowerment in rural communities
- To build individual and institutional capacity

The multidisciplinary and adaptive approach of TADEP intends to dispel the sometimes-siloed approach to research, policy and development practice, recognising the value of a systems-thinking methodology to address intrinsically interconnected and complex challenges. Whilst the PNG context is the commonality between the five impact-focused research for development (R4D) projects within TADEP, the projects are otherwise diverse in research subject and goal.

The five projects are:

- HORT/2014/094 Developing the cocoa value chain in Bougainville (Bougainville Cocoa)
- HORT/2014/096 Enterprise-driven transformation of family cocoa production in East Sepik, Madang, New Ireland and Chimbu Provinces of Papua New Guinea (PNG Cocoa)
- HORT/2014/097 Supporting commercial sweetpotato production and marketing in the Papua New Guinea highlands (Sweetpotato)
- *ASEM/2014/095 Improving opportunities for economic development for women smallholders in rural Papua New Guinea (Family Farm Teams)
- *FST/2014/099 Enhancing private sector-led development of the canarium industry in Papua New Guinea (Galip Nut)

*As mentioned in the Executive Summary, both the Family Farm Teams and Galip Nut projects have formally concluded as part of TADEP but have agreed to continue to contribute to the program as both see value in a multidisciplinary and collaborative approaches. This evolution is reflected in the informal rebrand of the program as TADEP+.

In partnership with multiple institutes in PNG, each of the projects has a legacy of research which TADEP+ seeks to build upon, or *transform* – as per the implicit transformative nature of the program. A critical element of this transformative agricultural research is also how it enables economic development opportunities, ultimately *transforming* the lives of rural men and women in PNG.

TADEP+ derives its name from, for example, the ability of women's groups to *transform* themselves and their businesses from subsistence to small enterprise; that sweetpotato can be *transformed* from a subsistence crop to a cash-crop for urban markets and also as a raw material for new products, that cocoa can be *transformed* from an opportunistic forest crop to an intensive and profitable garden crop; and that standing plantations of galip nut can be *transformed* into the basis of a new industry. *Transformation* and *enterprise development*, especially through women's groups and the private sector, are the essence of the program

The impetus for scaling up and scaling out of the project's successful innovations is enabled by private sector involvement at various points along the value chain, from increasing productive capacity to market development and access. This has and will continue to achieve economic benefits, especially increased employment and incomes in rural areas, and enhanced rural–urban supply chains. It works in the sectors of greatest benefit to rural communities and has a particular focus on the empowerment of women, and commodities that can be brought to market.

In line with the increased emphasis on gender and youth in both Australian and PNG government policies, and because of the experience in many commodity projects of male-dominated farmers' groups, new skills are needed to engage with men, women and youth in communities, to support and build their contribution to their families and their community. The Family Farm Teams methodology focuses specifically on empowering women and rural families to engage in a range of agriculture-based economic activities and acts as a source of ideas and approaches for the other projects, and has been widely adopted across the program.

The role of TADEP+ is to facilitate opportunities for cross-program collaboration and capacity building, deliver a coherent and coordinated communications strategy, develop and maintain a program-wide participatory monitoring and evaluation framework, and ensure that the guiding principles of gender equity and private-sector led development are embedded across all program-level activities. The success of TADEP+ as a program will be judged in part by:

- i. the extent to which it delivers value beyond the sum of the component projects, and
- ii. the extent to which the projects contribute to the overall TADEP performance indicators.

Ultimately, TADEP+ seeks to embody the agricultural research for development (R4D) methodology where emphasis is placed on the *impact* of the research, rather than just the *output*, which is afforded by the diversity, design, geographical spread and scalability of the five component projects.

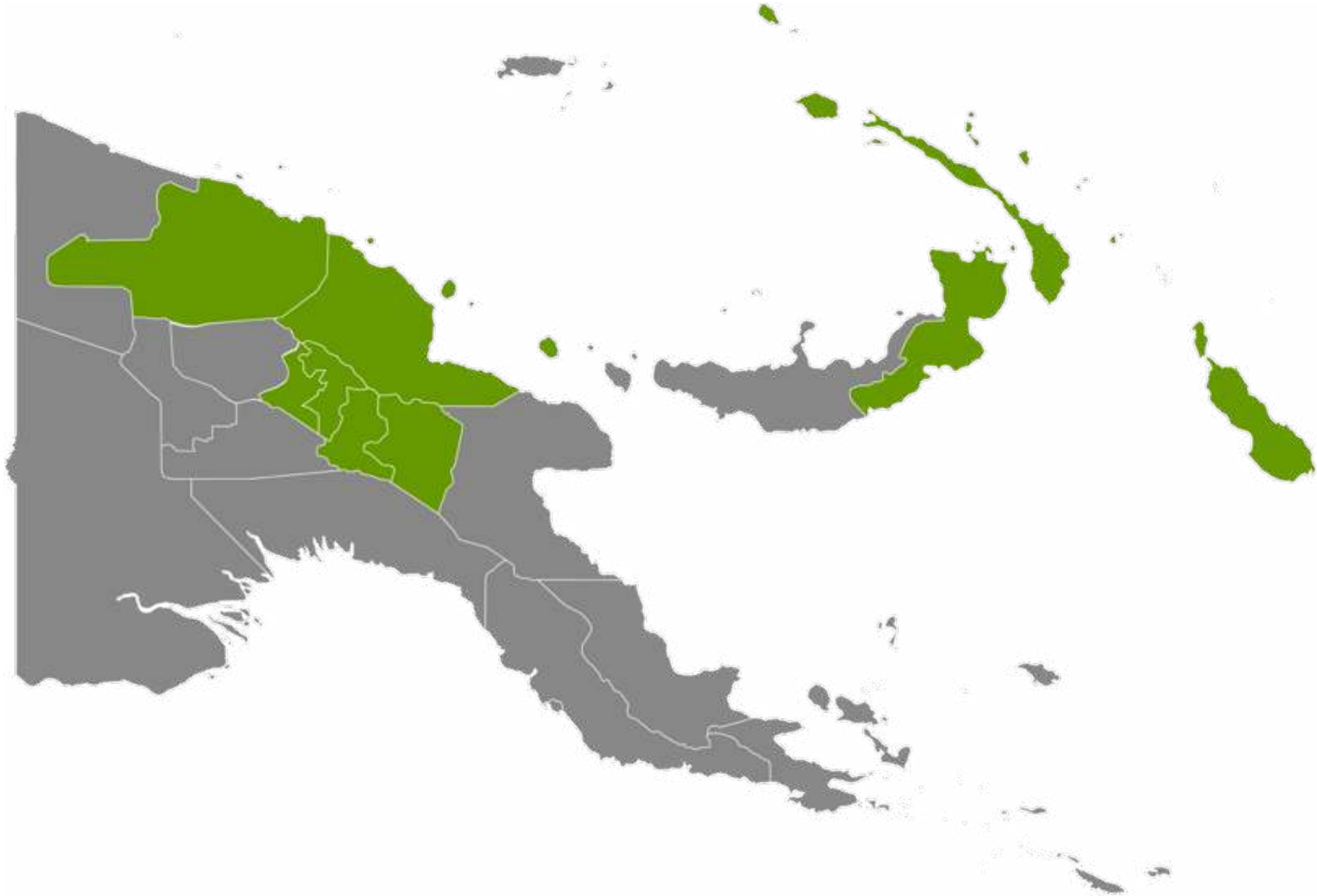


Figure 3: TADEP areas of focus in Papua New Guinea and the Autonomous Region of Bougainville. (Source: FreeVectorMaps.com)

Program principles

To support the projects in delivering against the TADEP+ goals, the program has focused on facilitating cross project learning relating to two core principles:

- i. Gender equity and women's economic empowerment, and
- ii. Private sector-led development.

Gender equity and women's economic empowerment

Context

Women farmers not only play a significant role in the agricultural industry in PNG but are also key to PNG family livelihoods. The role is often concentrated in early stages of production and they rarely participate in cash crop marketing and financial decision making. In addition, women often face significant constraints that further gender inequity such as low literacy, limited access to resources, limited access to finance, lack of understanding and access to markets, primary responsibility and burden for household labour, restrictions to mobility, and overall safety issues. Earlier research¹ has shown that to promote gender equity and increase women's economic empowerment an understanding of the different roles and input of women and men along the value chain and appropriate training needs to be embedded in the family and community.

Gender equality or equality between women and men refers to the equal enjoyment by men and women of all ages of rights, socially valued goods, opportunities, resources and rewards. Gender equity refers to fair treatment for women and men according to their respective needs.²

Progress

Whilst gender equity is a core focus of the PNG and Australian governments and an objective of TADEP+, the inclusion of the Family Farms Team project in the program has successfully translated this aspirational goal into practical approaches and considerations for ensuring that both men and women are actively and equally included and contributing in farming livelihoods. The Family Farm Teams project sought to scale out the family farm teams approach across a range of commodities and geographies. The premise of the approach is to engage women, men and the entire family to work in a more equitable and effective way to improve their livelihoods. By actively recognising the unique roles that each play within the family and integrating inclusive learning approaches into the training modules, the ability of women to access training and resources, with support and assistance from their husbands and families, has improved significantly. Whilst the Family Farm Teams (FFT) project has formerly concluded as a component project of TADEP, the project team has agreed to continue contributing to the program via ongoing FFT training within the PNG Cocoa and Bougainville Cocoa projects, and as part of the remaining Collaborative Research Grant (CRG) (refer to page 17). As part of the CRG, three of the nine identified villages have

¹ ASEM/2010/052: Examining women's business acumen in Papua New Guinea: Working with women smallholders in horticulture

² ACIAR Gender Equity Policy and Strategy 2017-2021

already received FFT training, with the remaining six to be completed in September 2020. Key to its project design, the PNG Cocoa project has facilitated a series of technical cocoa workshops across select provinces for the Cocoa Model Farmer Trainers (CMFTs) of which the FFT training has been incorporated into in East Sepik, Madang and Karimui. Initially, there was a bias toward male farmers in the selection of the CMFT farmers but with the introduction of the family farm teams approach, wives of the CMFTs have since attended all the training and about 30% of attendees at the farmer field days are women.

The Sweetpotato project has adopted a 'bottom up' training approach that empowers families (women and men) and communities to lead their own development. The National Standard for Community Development Workers (CDWs) has been developed by experienced CDWs in Papua New Guinea and has been endorsed by the National Apprenticeship and Trade Testing Board (NATTB), a PNG Government body. The impact of this approach is spreading with the training program currently being adopted by Government and NGO's in PNG.

Whilst women are traditionally more involved in the food crop production, the more manageably-sized and integrated cocoa systems of the both Cocoa projects are providing more opportunities for them to be involved in cocoa production. When women are tending to the food crops, they are also checking the cocoa budwood gardens, which is helping the early identification of production issues and regular plot maintenance. The CRG in Bougainville has also focussed on family nutrition and marketing of surplus food crops, which is a major source of income for women, especially in light of COVID-19.

The klin kaukau ('clean' sweetpotato seed) scheme promoted in the Sweetpotato project has been found by project participants to look and taste better than conventional kaukau. One benefit of this improved quality is that buyers at roadside and town marketplaces prefer these sweetpotatoes over others, so the produce sells faster. As women are nearly always responsible for selling produce in the markets, faster sales mean that they need to spend less time at the markets. Facilities are often lacking at markets, and security can be an issue for women, so the opportunity to sell produce faster is a welcome benefit of the clean seed technology being delivered in the project.

Aligned with the adage of *that which is measured, improves* is impetus of recording gender specific data for activities such as training and workshops. Sex-disaggregated data is data that provides a breakdown of men's and women's activities and perspectives by collecting separate data on men and women. Data can also be disaggregated by age, location, ethnic group, education, income and other demographic variables to help understand the differences between groups and to effectively target interventions and solutions.³

To assist in measuring the impact of the program in the livelihoods of rural men and women, the over-arching monitoring and evaluation performance framework for the program (refer to page 29) stipulates that attendance records for project activities are to be delineated by gender. This simple data point has helped highlight lack of diversity in some project activities, which has resulted in more proactive strategies to engage a broader cross-section of the community, including women and youth. The inclusive and considered nature of the family farm teams approach has also resulted in training being centric around whole of family involvement and collective decision making.

³ ACIAR Gender Equity Policy and Strategy 2017-2021

As women are equipped with greater knowledge and skills, their ability to meaningfully contribute in decision making and leadership is significantly improved. In the Bougainville Cocoa team, there are more than 50 women directly involved in the project including interviewers trained to undertake the comprehensive household survey and hub coordinators. The Village Resource Centres across Bougainville are designed to include Village Extension Workers (VEWs), Village Health Volunteers (VHVs) and Family Farm Teams (FFT) trainees to encourage gender equitable enterprise development. Similarly, the Sweetpotato and Family Farm Teams projects have almost equal numbers of women and men involved in the research team. Three of the commercial farmers managing vine multiplication in screenhouses provided by the Sweetpotato project are women, and each have great stories of livelihood improvements for themselves and their families. They are role models and are promoting opportunities for other women in their communities. The Family Farm Teams project has also trained 183 female Village Community Educators (VCE) in the project's respective Highlands and Islands Hubs, along with 72 Islands women involved in leadership specific training in 2018.

The Galip Nut project has identified critical areas for improvement in small-scale processing, much of which is undertaken by women. From this, a mentoring program and multiple formal workshops were undertaken in East New Britain and Bougainville, which included tree maintenance, galip processing, food hygiene, income diversification, drying and value adding, depending on what is locally available. A Galip Club has also been formed in East New Britain and Port Moresby to support women to start and sustain micro-enterprises to add value and market galip products.

Many women are making small regular sales to the galip nut factory and this is improving their livelihoods. Female entrepreneurs and smallholders also have participated in a range of demonstration and training activities including multiple factory awareness and business encouragement tours at the NARI Kerevat Islands Research Centre. Galip industry awareness, technologies and value adding expos have been held around the region catering to over 280 registered participants. The expos have demonstrated innovative ways to incorporate galip products into their livelihoods, including the use of solar driers and packaging to extend shelf life, value adding to galip nuts and baking with galip products.

Private sector-led development

Context

Given that 90% of Papua New Guinea's poor are living in rural areas and over 80% of the poor are rural-based semi-subsistence smallholder farmers, programs to promote sustainable economic development are critical to poverty alleviation. Most farmers are participating in some form of informal or formal market. By strengthening the markets themselves, improving farmer's access to these markets, increasing productivity, reducing limiting regulations and policy, building entrepreneurial skills and new enterprises, farmers are able to generate income and enhance their livelihoods. These strategies are central to the concept of private sector development, which seeks to promote economic growth and reducing poverty in developing countries by building private enterprises.

Private sector-led development (PSD) can seem complex and is often foreign to traditional research projects that focus mainly on research *outputs*. The five research for development (R4D) projects of TADEP+ contribute to longer-term and aspirational research and development *impacts* by capitalising on private sector development at varying levels.

Progress

The nature and scope of each of the TADEP projects has resulted in a wide range of engagement and partnerships with the private sector, and along the value chain. Understanding the motivations of the private sector to invest in a project and involving them early on the project has helped manage expectations, create trust and foster positive

working relationships. An adaptive approach is also critical to success as markets shift and the supply and demand fluctuates.

The PNG Cocoa project has been training and working with approximately 25 cocoa model farmer-trainers (CMFTs) in each target province (East Sepik, Madang, New Ireland, Chimbu) to establish cocoa budwood gardens and correlating nurseries. Each of the CMFTs has a group of approximately 25 farmers each that they will sell the best performing cocoa clones to and train in improved production practices. The CMFT group at Yekimbole in East Sepik has established a very successful wet bean buying, fermenting and solar drying business and is selling dry beans to Globe Cocoa Exporter. CMFT groups at Saparu-Kausimbi in East Sepik and Panamecho in New Ireland have established successful nursery businesses, selling clones to Productive Partnerships in Agriculture Project (PPAP) and other farmers. Many CMFTs have been paid to deliver planting material to farmers in the New Ireland Provincial Government cocoa project. The restored nursery and budwood garden at Hawain has been a major supplier of clones to the PPAP program in East Sepik.

The Bougainville Cocoa project has also adopted a similar approach with Village Extension Workers (VEWs) and both cocoa projects have been leveraging partnerships with PPAP for seedling supply. Whilst the Bougainville Cocoa project is focused on improving productivity, the project has a stronger focus on market access and development, as evidenced by the Bougainville Chocolate Festival. The festival demonstrates best practice in production and processing of cocoa beans, but just as critically, invites potential private sector partners to attend and establish relationships directly with farmers. The 2019 Bougainville Chocolate festival held on the 7-8 August 2019 in Arawa. The festival provided the opportunity for organisations such as the Autonomous Bougainville Government (ABG) Department of Primary Industries and Marine Resources (DPIMR), PPAP and others key partners to display and provide information to farmers and SME groups on income and farm diversification with fresh produce, livestock and galip (as part of PPAP) and health initiatives, including nutrition and food safety. An assessment of bean quality, progression on cocoa quality improvement and capacity building across each of the Bougainville Chocolate Festivals has shown a steady improvement across the project lifespan.

Conversely, the Sweetpotato project is focussed on leveraging opportunities in the PNG domestic market. Since mapping the supply chain of sweetpotato to its major markets, significant improvements have been made in product quality and logistics, and commercial kaukau growers in Eastern Highlands and Western Highlands Provinces have established new supply chain links to supermarkets in Mountt Hagen and Port Moresby. Sales volumes are slowly growing and will develop into a significant new market for sweetpotato in PNG. The final product was graded and packed into boxes rather than large bags to retain quality during transport, significantly reducing product losses and improving quality.

As part of a strategy to create SMEs to propagate and disseminate the clean seed sweetpotato, 14 commercial kiln kaukau vine multiplications sites have been established in the PNG Highlands, each with a network of farmers that liaise with and purchase from these new commercial businesses. Supplying growers with clean vines is a new agricultural business opportunity and the growers are achieving proceeds of PGK500 to PGK1,000 per month from sales of clean vines. These 14 commercial farmers participated in a study tour to Australia, learning about production and marketing practices used by the Australian industry. Lessons learnt on the tour have been implemented in PNG to help drive an expansion in commercial production.

At the commencement of the project, the supply and demand of Galip Nut in the domestic market was largely unknown. The project undertook a series of product development research to better understand the product attributes and correlating market scope. The traditional markets still remain a strong feature in the value chain, with new retail markets in Kokopo and Port Moresby now being serviced. Both markets have distinct differences in size and product offering, with the traditional markets dominated by SMEs and the new retail opportunities calling for a uniformly packaged and branded product.

An alternative market was also established for galip nut farmers, whereby they can deliver their product to the factory at NARI Kerevat for PGK1.50/kg or have it collected by cooperatives such as the East New Britain Women in Agriculture for PGK1.00/kg. Galip Clubs of SMEs in East New Britain and Port Moresby have been formed to provide additional processing and marketing training and mentorship, enabling the farmers and farming families to become more financial sustainable.

In the formal retail market, the Galip Nut project has created two public-private partnerships. The project team and NARI worked closely with Equanut, a NZ based investor, co-funded by MFAT in New Zealand. After the departure of this company due to COVID-19, another processor has since expressed an interest in sharing the factory on a similar arrangement, bringing the number of processors investing in galip nut processing to four; DMS, Bisi Trading, Niugini Organics and the new entity. These were sourcing and producing their own value-added product separately to the NARI factory. The emerging industry has an estimated farm gate value of PGK300,000 to PGK400,000 per annum, in addition to the demonstration factory. It has also created employment for approximately 40 people. CPL, a PNG based company has partnered with the project team to act as a distributor for the product for the market testing phase in Port Moresby.

The Bougainville Cocoa project has assisted DPMIR to develop a mini chocolate laboratory in Buka to assist in timely quality testing, which would otherwise need to be conducted offshore. Regular quality assessments of farmers' dry bean samples have continued with small chocolate samples being made for farmers to taste the end product, which enables them to understand the direct link between the raw cocoa quality and the quality of the chocolate end product. Further to this, DPIMR are currently working on designs for packaging for locally produced chocolate. With the Enactment of Commodity Regulation Act 2020 by the Bougainville House of Representatives, the establishment of Bougainville Agriculture Regulatory Authority (BACRA) has been permitted. One functional division of this new Authority will be research and development into local downstream processing and packaging of commodities to finished products. This will enable BACRA, as a subsidiary of DPIMR, to explore opportunities for processing cocoa produced in Bougainville into chocolates and other products. Technical advice and expertise from other organisations such as the Bougainville Partnership's Community Support Facility (CSF), ACIAR and chocolate makers in Australia.

Program elements

The role of the program is to facilitate opportunities for cross-program *collaboration* and *capacity building*, deliver a coherent and coordinated *communications* strategy, develop and maintain a program-wide participatory *monitoring and evaluation* framework, and ensure that the guiding principles of gender equity and private-sector led development are embedded across all program-level activities, as mentioned above. The success of TADEP+ as a program will be judged in part by the extent to which it delivers value beyond the sum of the component projects, and the extent to which the projects contribute to the overall TADEP+ performance indicators.

The following three sections articulate how TADEP+ is adding value to the otherwise distinct component projects as a coherent multidisciplinary program. The participatory monitoring and evaluation (M&E) program performance framework is explained and reported against later in the report (refer to page 29).

Communication

Communication across and beyond TADEP+ is critical to the success of the program. The program communications strategy targets internal (projects, partner agencies, funding bodies) and external (other ACIAR projects, other programs in PNG) stakeholders with a multiple tools, regularity and purposes. The cross-program communication assists with the identification and facilitation of coordinated and collaborative activities.

TADEP+ Updates

Updates were previously circulated on a monthly basis but after feedback from the program Mid-Term Review, the frequency was reduced to bimonthly. Progress reports are collated by the Program Coordinator and circulated to a database of 174 subscribers including TADEP+ project team members, relevant DFAT and ACIAR contacts, project and program stakeholders, inter-related ACIAR or other projects and other interested parties. Whilst these TADEP+ Updates provide a valuable snapshot into the progress of each of the TADEP+ projects, they also encourage the sharing of context-specific approaches, ideas or lessons learnt that exemplify the collaborative aims of the overall program.

The format of the TADEP+ Updates are designed to be less formal and structured which allows the projects to share relevant information beyond the scope of the project. Various resources and novel ideas have been adopted across projects resulting in positive unintended outcomes. Feedback from all stakeholders on the Monthly Updates is continually embedded into the process and production.

As of September 2017, the TADEP+ Updates were transferred into an online newsletter platform, MailChimp, which provides branded templates to customise content and improve readership. The format of the TADEP+ Updates altered slightly to feature a short summary of three or four dot points per project with links to the extended version with the full updates. MailChimp also provides useful data on open and click rates of featured hyperlinks. The open rate of the TADEP+ Updates has slightly decreased from 45.03% in the previous reporting period to 42.4% in the past 12 months, which is still significantly higher than compared to 26.52% for government and 23.12% for agriculture and food services.

The TADEP+ Updates can be likened to an innovation platform, which is a mechanism to foster interactions that facilitate information exchange and learning amongst projects, leading to idea generation and innovation. Most of the connections generated across the program are of a serendipitous nature, when projects are working geographically in the same area or when a key learning is discovered and applied to a different context.

All TADEP+ Updates are available online: www.tadep-png.com/communications/tadep-updates

Stakeholder meetings

In this reporting period, the TADEP Program Coordinator travelled twice to Papua New Guinea, once to Canberra and once to Melbourne to meet with various DFAT and ACIAR representatives along with key stakeholders to the program. Whilst each of the projects have unique project partners, there are a number of mutual key stakeholders such as National Agricultural Research Institute (NARI), Cocoa Coconut Institute Limited (CCI), Fresh Produce Development Agency (FPDA), University of Natural Resources and Environment (UNRE), Department of Primary Industries (DPI) in numerous provinces and regions, and many others. Maintaining proactive communication and positive relation management is critical to the success of the projects and overall program.

Media

There have been opportunistic features of various project and program outcomes online, in print media and on the radio. The *ACIAR Matters magazine* and ACIAR website has also published numerous blog entries relating to various project successes, linking to the multiple social media platforms in utilises including Facebook and Twitter.

Website

Content for the TADEP website was developed and collated in the second half of 2018 and officially launched in January 2019. The website provides context for the program, updates and reports from the component project and the program, communicates the impact of the program against the program goals and shares resources relating to multidisciplinary research programs.

The TADEP website address: www.tadep-png.com

Collaboration

Partnerships

The goal of TADEP+ is to improve the livelihoods of rural men and women in PNG. This lofty goal and many of the societal, environmental, business and humanitarian challenges faced by PNG are so complex and interconnected that they can only be tackled by different sectors working together. To stimulate innovation, ensure sustainability and create maximum value for all, project teams, partner organisations, funding agencies, all levels of government, the private sector, civil societies and NGOs all need to collectively unite resources and expertise.

Partnerships within and across the program are critical to the success of TADEP+. The program seeks to create common understanding of the role and aim of the program, foster strong relationships with funding agencies and key partner organisations, create a collaborative mindset and continually strive for collective action to realise the goal of improving livelihoods of rural men and women in PNG. With these elements in place, partnerships can achieve real impact.

Clear and regular communication and information to major stakeholders such as the TADEP+ Updates assists in sharing ideas and opportunities for partnerships to develop and collaborations to actuate. Many of the collaborative activities between the projects and program have been serendipitous, according to need and what skills the projects have to offer, but there have also been concerted efforts to create more structured and supported program initiatives to nurture deeper, more prevalent and effective partnerships and collaborations.

Steering committee meetings

A key recommendation from the TADEP+ Mid-Term Review was to improve planning processes and engage the key stakeholders in a more strategic capacity. As a result, biannual steering committee meetings were agreed to. The first was held in February 2019, the second after in conjunction with the 2019 TADEP+ Annual Meeting and another

in February 2020. Whilst each of these meetings have been face-to-face, we have also convened a number of virtual meetings via Webex and Zoom, especially since the COVID-19 pandemic.

Meeting topics have included;

- Opportunities for cross-program collaboration and capacity building such as the Collaborative Research Grants and Family Farm Teams Masterclass.
- Opportunities to share project endline data collection surveys and results (with ethics approval)
- Planning for the 2020 TADEP+ Meeting (subsequently cancelled due to COVID-19) and the proposed 2021 TADEP+ Showcase.
- Program budgetary review and endorsement
- End of program reporting and review/evaluation
- Process for and development of impact stories to feature on various ACIAR, DFAT and other media platforms
- Impacts of COVID-19 to the projects and program, and business continuity planning
- How to best engage with key program partners with limited (or no) face-to-face meetings

2020 TADEP+ Annual Meeting and 2021 TADEP+ Showcase

The 2020 TADEP+ Annual Meeting was scheduled to be held in either Wewak or Madang to enable optional field tours to nearby Cocoa Model Farmer Trainer (CMFT) sites that form part of the PNG Cocoa project. This event is usually the major face-to-face event of the program, bringing together each of the five TADEP+ component projects, key partner agencies in PNG, ACIAR and DFAT representatives, as well provincial government or other local stakeholders. The Annual Meeting facilitates formal and informal collaboration across the program and enables a broader discussion about how the program is performing and whether there are opportunities to leverage even greater value.

When COVID-19 first reached Australia, it was hoped that the Annual Meeting could be postponed to later in the year but unfortunately, this wasn't the case, with the event being cancelled indefinitely. The Steering Committee discussed options for convening an online event in its place, but as the focus of all major partner agencies and project teams in PNG and Australia shifted to how best to respond to COVID-19 and given that the ACIAR PNG Country Office was in close communication with in-country partner agencies, it was agreed to reassess once work programs 'returned to normal'.

With the ongoing impact of COVID-19, decisions about the end of program TADEP+ Showcase have been deferred to Q1 2021. If domestic and international travel restrictions have eased and necessary COVID-19 transmission prevention measures have been effectively introduced, it is proposed that the Showcase be held in Lae. The event will focus on key program successes, impacts and learnings and be targeted to a broader audience including but not limited to our usual Annual Meeting attendees as well as the private sector, provincial and national government political and bureaucratic representatives, local high school and university students, relevant academics and development practitioners, etc.

Collaborative research grants

Key recommendations from other DFAT-ACIAR partnerships have previously highlighted the importance of stronger program reporting and cross-project collaborations. Further discussions arose from discussions at the 2017 Annual Meeting, where the five component projects expressed interest in working together in a greater capacity. Therefore, a small competitive, merit-based fund for cross project collaboration has been developed. Opportunities include:

- Cross project collaboration
- Cross-project capacity building

- New activities that could directly address high-level targets of the Australian aid program, especially women's economic empowerment and private sector engagement
- Activities that promote collaboration between Papua New Guinean agencies

The goal of the grant is to enable newly-identified opportunities for cross project collaboration and in doing so, enhance the value of the program beyond the sum of its five component projects.

There have been four Collaborative Research Grants to date, with three concluding in this reporting period;

- Enhancing the roles of women and families in cocoa production
- Organic wastes or wasted opportunities?
- Sharing income generating ideas for women market sellers across provinces
- Examining ways to improve nutrition and food security in 'at risk' villages in Bougainville (ongoing)

Brief final reports for the completed Collaborative Research Grants can be found on the TADEP website:

www.tadep-png.com/collaboration/collaborative-research-grants

Cross-program and cross-ACIAR

In addition to the formalised program activities that seek to facilitate collaboration across the program, there have also more informally formed partnerships within and beyond the program. Both of the TADEP+ cocoa projects have been working with the SMCN/2014/048⁴ soils project to develop composting field trials and demonstration sites. Similarly, the Family Farm Teams methodology has also been embedded into technical cocoa training for both TADEP+ cocoa projects.

Capacity building

ACIAR views capacity as the ability of individuals, organisations and systems to perform agricultural research for development effectively, efficiently and sustainably. Capacity building for ACIAR is a process of strengthening the abilities of individuals, organisations, and systems to undertake agricultural research and to continue to advance development outcomes. Capacity building occurs across multiple levels — individual, organisational and institutional — and is much more than merely transferring skills and knowledge through training. It includes on-the-job training, leadership, mentoring, two-way-transfers of ideas and technologies, and empowerment to undertake research. ACIAR considers capacity building holistically throughout all of our research activities, including investments in projects, fellowships, and interactions with Australian and developing-country scientists and project staff.⁵

Informal capacity building

One of the key strengths of the program is what happens outside the formal program activities. It provides an organic space for meaningful connections, networking and communication between participants. Ensuring these

⁴ Optimising Soil Management and Health in PNG integrated Cocoa Farming Systems

⁵ ACIAR Capacity Building Policy

connections remain natural and don't become forced is important, particularly since the Family Farm Teams and Galip Nut projects have formally concluded.

The Project Leader to Project Leader mentoring and sharing has helped create more resilient and effective leaders and teams. It has also facilitated some instances of projects being able to work with the same communities, which allows a level of resource sharing and ultimately increases the benefits to those communities.

The program being across sectors, commodities and regions is particularly beneficial, as it enables teams to focus on fundamental commonalities and issues.

Individual capacity building

Each of the five TADEP+ projects have delivered formal training as part of their respective project activities, as shown in the Performance Framework (refer to page 29). This training is in the form of hands on workshops and presentations as well as less formal mentoring and knowledge sharing. The audiences for training vary from staff directly involved in the project activities through to farmers that are part of the broader research.

In the past year, the program has also been planning to facilitate a Family Farm Teams Masterclass which would be offered to each of the four other projects. It had initially been planned to be face-to-face and would intentionally have varied project team members from across the program to stimulate greater learning and collaboration. COVID-19 has meant that we have needed to reconsider whether and how we can facilitate the Masterclass under the current restrictive circumstances. It is hoped that a hybrid format with smaller, localised, project-based groups to convene in a central location to undertake small group work with intermittent video footage or video calls with lead trainers.

Institutional capacity building

The opportunity that the program offers to bring together leading multidisciplinary researchers from across PNG and Australia has catalysed greater cross-agency collaboration, information and idea sharing, and collectively built the capacity of many individuals and, therefore, institutions.

HORT/2014/094 Bougainville Cocoa

Background

This project aims to improve the profitability and vitality of smallholder cocoa farming families and communities in Papua New Guinea. Bougainville is an autonomous province in Papua New Guinea recovering from a decade-long crisis that significantly disrupted the society and economy. Before the crisis, cocoa was a major contributor to the economy; more than 80% of Bougainvilleans produced cocoa. The project will foster and strengthen public and private sector partnerships and develop enterprises that enhance productivity and access to premium markets, while promoting gender equity, community health and well-being.

Progress

The past year has seen a number of delays due to the Bougainville Referendum, heavy rainfall and flooding and the COVID-19 pandemic. During these delays, the opportunity was taken to plan the transfer of responsibility to our Bougainville partners in anticipation of the end of the project. During this time, three papers using data from the livelihoods survey were written and published in peer-reviewed journals with another two being drafted. A number of workshop and conferences were attended by project members to share findings from the project. Work has continued on the sanitation, nutrition and vegetable farming TADEP-funded Collaborative Research Grant (CRG). Baseline surveys, nutrition and vegetable cultivation information sessions, monitoring and Family Farm Teams training has been conducted. A focus of this year has been the appointment of Borgia Sinato to support the Village Extensions Workers (VEWs) to develop the Village Resource Centres (VRCs). The fourth annual Bougainville Chocolate Festival was held in Arawa in August 2019 and was a great success. A press release was prepared on locally made cocoa products, an economic evaluation analysis and a Development Pathways analysis.

Achievements against project objectives

Objective 1: To improve the productivity, profitability and sustainability of cocoa farming and related enterprises

Several training workshops have been provided to farmers throughout the year on compost making, demonstration plot setup, bud grafting, nursery setup, Family Farms Teams, rehabilitation training, clone seedling production, nutrition, water and sanitation and vegetable cultivation. Training programs are now run by the VEWs and supported by the District Education Officers (DEOs). VEWs are leading their farmers by example and have their blocks rehabilitated to see the trees come into bearing again, budwood gardens and nurseries are also commercialised, offering alternate income sources. Further training and information sessions have been conducted at the Chocolate Laboratory. The Department of Primary and Marine Industries (DPIMR) are currently working on designs for packaging for locally produced chocolate.

Objective 2: To understand and raise awareness of the opportunities for improved nutrition and health to contribute to agricultural productivity and livelihoods

Health and DPIMR staff upskilled in nutrition and vegetable garden cultivation as part of CRG. The interdisciplinary teams support the One Health approach and understanding that improving livelihoods requires addressing the multiple constraints farmers face. Information sessions on nutrition, water and sanitation and vegetable cultivation were conducted in the ten villages selected for the CRG pilot (one village is no longer part of the CRG for safety reasons). This was followed by monthly monitoring and support visits by staff from Health and DPIMR. Preliminary findings from monitoring visits have shown villages already making changes to improve their health and nutrition. Villages have reported placing lids on drinking water sources, adding gates onto kitchens to keep animals out and

eating a more varied diet. Family Farm Teams training has been conducted in three villages so far with the rest to be completed in September 2021. This training reinforces and expands on the previous nutrition and vegetable garden training sessions. When farmers are trained in planned farming and understand the nutritional values of their local foods, they can apply this knowledge to their everyday to help their family grow, using locally grown produce for improved health and incomes.

Objective 3: To foster innovation and enterprise development at community level

A visit was made to the VEWs in January and February to discuss how they are to work with their communities and Hub Coordinators to plan and support the VRCs. Not all VRCs have buildings but 3/11 in Central, 4/11 in the South and 4/11 in the North have community-built structures that function as broad community resource centres that include cocoa farmer training. Issues and factors hindering progress of VRC construction were discussed and recommendations put forward to address them accordingly. One of the main challenges raised was that the VRCs are not getting enough support from their community government and ward steering committees. The project will have regular meetings and monitoring visits with the VRCs to strengthen this working relationship.

A team from University of Natural Resources and Environment (UNRE) with a National Agriculture Quarantine and Inspection Authority (NAQIA) officer visited goat farmers in North and South Bougainville to monitor the goat health and general growth performance then administered the necessary treatment drugs. The utilisation of goat manure as compost or direct application to crops looks promising as shown by growth parameters such as leaf size (length x width, and weight) of Chinese cabbages in small trials in Kubu, North Bougainville. This is also a supplementary income source for the communities.

VEWs Benjamin Tatou, Martin Masen (with Malasang Women's Group) and Chris Poto (Chocolate Festival 'Best of Show' winner) in North Bougainville were assisted with funds for their Investment Promotion Authority (IPA) registration of their farm businesses; BENJAY Business Group and POTO INTER FARM Business Group, respectively. Enterprise activities will include cocoa nursery and seedling sales, cocoa wet bean buying, fermentation and drying, budwood garden development, poultry and vegetables. All the other VEWs will be encouraged and assisted to do the similarly when required depending on their progress.

Objective 4: To strengthen value chains for cocoa and associated horticultural products

The fourth annual Bougainville Chocolate Festival was held in Arawa in August 2019 and was a great success. The festival provided the opportunity for organizations such as DPIMR, Productive Partnerships in Agriculture Project (PPAP) and others to display and provide information to farmers and small-to-medium enterprise (SME) groups on income and farm diversification with vegetable/fresh produce, livestock and Galip (PPAP) and Health. An assessment of bean quality, progression on cocoa quality improvement and capacity building across each of the Bougainville Chocolate Festivals has shown a steady improvement across the project lifespan.

Students from the University of Natural Resources and Environment (UNRE) and from the Highlands Agricultural College (3 x Northern Hub and 3 x Southern Hub) participated in the industrial training program. Their training covered cocoa technologies including grafting, nursery practices and management, rehabilitation techniques, pollination, farmer trainings and vegetable production. Students were also involved in conducting small projects and data collection.

A trial school cocoa curriculum will be piloted in selected schools later in 2020. The plan is to select three secondary schools, three vocation schools, three primary schools and three lower secondary schools which have agriculture classes taught as a selective subject.

Upcoming

The 2020 Bougainville Chocolate Festival has been cancelled due to COVID-19 and instead a series of regional field days, coordinated by DPIMR, will be held later in 2020 instead. The 2021 Festival will go ahead as a DPIMR event.

In February 2021 the project plans to conduct training of interviewers who will administer a shorter endline farmer survey. This survey comprising the same set of questions as the baseline survey plus additional questions about training and wet beans will involve random sub-sample of the VA's (n=150). A survey will also be administered to the VEW's.

VEW training is also proposed for February 2021, with one to two days training in each region. Training will include information on water and sanitation, nutrition and vegetables gardens. The training will be delivered providing the underpinning knowledge and theory as well as demonstrating how to provide the information to farming households and villages. The University of Sydney has provided ethics approval for the additional surveys. Ethics approval will also be obtained from the DPIMR.

HORT/2014/096 PNG Cocoa

Background

Cocoa production in East Sepik, Madang and New Ireland provinces, along with other provinces, was greatly reduced by the incursion of cocoa pod borer (CPB) from Indonesia in 2006, accelerating malaise in cocoa production in PNG linked to poor performance of hybrid seedlings and production lost by Phytophthora Pod Rot (Black Pod). Cocoa is grown in PNG overwhelmingly by smallholders, and the incursion of caused them to lose interest in the crop. Research and development work at the PNG Cocoa and Coconut Institute (CCI), Tavilo, East New Britain Province over the last two decades, partly sponsored by ACIAR, have produced a set of 18 new 'hybrid clones', selected from the best of the hybrid seedlings, and methods of integrated pest and disease management (IPDM) that were shown to be effective in greatly reducing damage by CPB and Black Pod. Using these new clones and the new management methods it was shown that production could be increased from the current average of about 200 to over 2,000kg/ha/yr. The aim of this project is to spread the application on farms of these transformative clones and methods. This was to be achieved by recruiting an enthusiastic, entrepreneurial farmer from a village, giving them a short, intensive training in the new methods and supporting them to return to their village as a Cocoa Model Farmer-Trainer (CMFT), to establish a budwood garden of the 18 new clones, a nursery to propagate the clones by budding seedlings, and to train their fellow farmers. The aim was to recruit an equal number of men and women, but in the event, in nearly all cases spouses attended the training with their partners and so CMFTs are nearly always husband/wife teams.

In addition, the Cocoa Board (now main project partner since CCI has dissolved) had success in testing the production of cocoa in a trial block at an altitude of 1,200m above sea level in the Karamui Valley in Chimbu Provinces, double the altitude considered suitable for cocoa. This opened up the possibility of expanding cocoa production in the highlands of PNG and so Chimbu Province was included in the project to further select clones suitable for higher altitudes and promote the new methods of growing cocoa through CMFTs.

Progress

The Cocoa Board (CB) extension staff in the provinces continued their strong leadership of the project, which provides all their operating funds. They maintained all activities during the COVID-19 lockdown from April. The project manager based in East New Britain (ENB), Trevor Clarke, maintained personal contact with the provinces and the staff at Tavilo headquarters in ENB, who accompanied him on field visits to oversee activities and develop research on cheaper solar dryers, re-assessment of cocoa clones and cheaper direct field planting methods. Collaboration between Cocoa Board and provincial Department of Agriculture and Livestock (DAL) staff, and close links to the World Bank cocoa project, cocoa exporting and farm supply companies, and the Kairak Training Centre (UNRE) were maintained.

Achievements against project objectives

Objective 1: To foster the development of self-supporting, village-based cocoa extension and other services as micro-enterprises supported by financial institutions, commercial cocoa buying and supply companies, and existing extension services

Field days at mature Cocoa Model Farmer-Trainer (CMFT) sites have become an important training activity. A feature this year has been farmer-funded establishment of many new satellite groups linked to original CMFTs. Of the 27 CMFTs in Madang, five are supporting satellite groups. Two groups were started on KarKar Island by project support staff. Of the 26 CMFTs in East Sepik, four are supporting new groups. Poro in West Sepik has twelve groups with about 600 farmers. The 21 CMFTs in New Ireland and project team members are assisting DAL and the 110 Village Extension Worker (VEW) sites of the provincial government cocoa project and the establishment of a cocoa project

by Business for Development on Simberi Island. The FAO/EU STREIT project in the Sepik is proposing to continue the ACIAR/CB strategy and extend it to 120 sites.

All 2,000 copies of the CCI extension handbook 'Buk Bilong Kakao Fama' have been distributed. Numbers of the Buk Bilong Kakao Fama were limited by cost and so a much larger number (10,000) of the cheaper 'Pacific Islands Cocoa Book', developed by Trevor Clarke, have been produced. Both books are filling an urgent need for farming information and are proving popular with farmers. Sustainable Livelihoods Training conducted by Kairak Training Centre at the University of Natural Resources and Environment (UNRE) for all CMFTs included financial literacy.

Objective 2: To introduce and evaluate on farms, with farmer participation led by village extension workers (now called Cocoa Model Farmer-Trainers), transformative new cocoa cultivars and cocoa selection, propagation, production and postharvest methods

Trevor took hybrid seed to several new groups in the Open Bay area of West New Britain formed by refugees from the eruption of Uluwun volcano. The Sepik project coordinator, Timothy Sam, led two days of training for the Tenkile Conservation Alliance cocoa project at Lumi in West Sepik. All training for farmer groups included establishment of budwood gardens and nurseries for clones and seedlings, budding methods, block rehabilitation and planting of food crops, vanilla and galip nut with cocoa. Goats have been introduced at four locations as an adjunct to cocoa farming.

All seven CMFTs in Karimui, Chimbu Province have budwood gardens of the CCI clones, are selecting and propagating the best adapted seedling trees derived from the original SG2 test-planting, and are producing cocoa commercially with cheap solar dryers. John Konam, project coordinator in Chimbu, and Peter Bapiwai, Cocoa Board agronomist from Tavilo, continued to assess local selections and expand cocoa development to other highland provinces. Open-pollinated seed from the best trees in Karimui was planted for testing and further selection of adapted types at other highland sites. John and colleagues continue to develop a proposal for World Bank support to expand cocoa development along with coffee, vanilla and vegetables in the highlands.

About fifteen budwood gardens have been established in each province and have become important sources of budwood with the loss of facilities at Murnas, Kopkop and Tavilo following the demise of CCI. These gardens will enable further assessment of the performance of the CCI clones. Some farmers are concerned about the susceptibility to stem canker of some clones.

Cocoa beans produced by the Charis Cluster Group led by Grace Klembasa and Wilson Miroi in West Sepik were selected among the 50 finalists (worldwide) at the Salon du Chocolat, Paris. Samples produced by CMFTs from Madang were placed second and eighth at the Cocoa Board Cocoa Show held in Lae.

While the project has concentrated on the supply of CCI clones, farmers have expressed unease about the performance of some clones and indicated that planting of seedlings, which they find easier to manage, remains important. SG2 seedlings as well as clones were supplied to farmers by CMFTs but the supply of hybrid seed has been restricted since the demise of CCI, and planting seed gardens in the provinces, and collecting and exploiting the original Trinitario cocoa types more suited to smallholders, have become priorities.

Objective 3: To introduce and evaluate on farms, with farmer participation led by village extension workers, options for development of new cocoa farming systems integrating food crops, livestock and high-value shade and other trees

Initially, the emphasis was on establishing budwood gardens and nurseries to disperse the latest released CCI clones. Farmers have since planted food crops among cocoa and Gliricidia during the development of budwood gardens. Farmers are continuing to be encouraged to concentrate on intensive management of a smaller block of cocoa, leaving land for food crops. Work with a food crop consultant (Mike Bourke) was not pursued in order to save money for a second vehicle desperately needed in Madang. Following the observation that farmers emphasise food

crop production alongside cocoa production, detailed studies of more formal ways of combining cocoa and food crops have not been pursued. Trials were not developed to compare intercropping systems.

At the beginning of the project, there was a strong interest in goat husbandry in many places but attempts to establish trials as part of an integrated cocoa farming system were not successful, probably mainly due to neglect and lack of husbandry knowledge. The colony at Niumindogum was transferred to Paliama in East Sepik and has been more successful. There has been great interest in the goats but much more education on goat husbandry is needed.

Project leaders and coordinators had several meetings with leaders of the FAO/EU project 'Support to Rural Entrepreneurship Investment and Trade' in the Sepik, which includes cocoa and vanilla development. FAO staff visited the CMFT site at Paliama and intend to support these sites after the conclusion of the ACIAR project and expand the project strategy to 20 villages per district in 6 districts. Three CB officers who have worked on the ACIAR project are now involved as leader-trainers in the FAO project.

In collaboration with the ASEM/2014/095 Family Farm Teams project three Family Farm Team training sessions for CMFTs were conducted by Josie Saul-Maora and Robert Taula in Madang, East Sepik and Karimui. Following the training in Madang, attendees from Amele Village initiated a CMFT group and repeated the training.

Studies at Wingei and Yekimbole, East Sepik in collaboration with the soils project SMCN/2014/048 and work by the Suaru CMFT group, Bogia District, Madang have shown that cocoa can be established on kunai grassland if tree cover is established first. Gliricidia shade is growing well following deep ploughing to aerate the heavy grassland soil in East Sepik.

CMFTs are being surveyed, to be followed with focus groups, to identify reasons for success of groups and improved ways to establish village farming associations led by extension workers.

Upcoming

Activities over the last 18 months of the project (July 2019 to Dec 2020) will be directed mainly at facilitating the handover of project leadership to REDS and Provincial Government DAL officers. A handbook will be written on the development and maintenance of an extension network involving Cocoa Model Farmer Trainers linked to REDS, Provincial Government DAL and cocoa businesses.

Increased support will be given to Provincial Government DALs in the highland provinces to test cocoa planting following the Karimui model. The provinces are prepared to use their own funds to support this work.

While project activities have been able to continue in PNG, with only one month restricted by a lockdown, COVID-19 has prevented travel to PNG by the project leader from March 2020. It is likely that a project extension will be needed to complete a visit by a soils consultant to the kunai field trial and a review of the project scheduled for November/December.

HORT/2014/097 Sweetpotato

Background

The economy of the PNG Highlands, especially in those areas with relatively good transport infrastructure, is evolving rapidly, with smallholders continuing to turn from subsistence farming to market-oriented production. Sweetpotato (kaukau) plays a key role in this evolution, becoming a cash crop in its own right and assuring food security in more diverse systems with coffee, vegetables and small livestock providing a cash income. This project is supporting smallholders to turn from subsistence farming towards market-oriented sweetpotato production, producing specifically for the market and managing production to meet market and customer requirements.

This project is supporting an expansion in market-oriented sweetpotato value chains by strengthening supply chains to selected high value markets and promoting enterprise development along supply chains, and by improving crop production capacity by introducing a scheme to supply clean, high performing planting material. An increase in market-oriented production will create income generating opportunities for growers as well as enable other groups to enter into sweetpotato fresh product and sweetpotato-based food product supply chains.

Progress

Growers in the Highlands provinces have reported that crops grown from clean seed supplied through the project not only produce higher yields but that the quality of the harvested roots is higher. This has enabled the growers to increase sales, including entry to new markets such as the supermarket sector in Port Moresby. Skills and confidence have been enhanced through a structured training program.

- Commercial scale clean planting material nurseries are operating at fourteen locations across Eastern Highlands Province (EHP), Western Highlands Province (WHP) and Jiwaka.
- Two additional commercial varieties of sweetpotato, Korowest and Rachel, were released to growers through the clean seed scheme in 2019.
- Commercial farmers have benefitted through access to new markets, development of new sweetpotato-based products and diversification through use of klin kaukau ('clean' sweetpotato) as fodder for pigs and cattle.
- Training materials for grower communities have been developed, and agreement reached for the training to be accredited under the PNG National Standard for Community Development Workers (CDW).
- A new technical training package covering business development skills was produced in 2019/20. This training has been adopted by National Development Bank (NDB) as a requirement for farmers intending to apply for loans through the PNG Government agriculture assistance program.
- Fourteen farmer communities have engaged in Community Development Worker training, identifying community goals and aspirations as well as training needs that the project can support.
- A series of twelve fact sheets have been developed for klin kaukau farmers in PNG. The fact sheets cover a range of topics outlining best practise handling and maintenance of klin kaukau planting material.
- A Clean Seed Scheme Laboratory Manual for managing processes at the NARI Aiyura laboratory has been written, ensuring that all processes are documented in detail to provide rigidity to the klin kaukau scheme in the long term and to assist in training of new lab staff.

Achievements against project objectives

Objective 1: To develop and strengthen market oriented sweetpotato supply chains

Value chains connecting sweetpotato growers to supermarkets have been supported by the project through supply of higher quality roots from use of clean planting material. Growers are adopting grading and washing of roots prior to transport to higher value markets and are testing alternative packaging to reduce the damage to roots caused by

packing into 100kg bags. Growers are implementing new practices they observed during the 2018 visit to Australia, with irrigation systems in place at several farms. Research outcomes have been published including a research paper on farmer-to-farmer education: learnings from an international study tour and a systematic review of literature on local value chain interventions, along with a conference paper presented at the 2018 International Horticulture Congress.

Objective 2: To build capacity of sweetpotato value chain players

The capacity building component of the project has focusses on enhancing the extension service capacity within Fresh Produce Development Agency (FPDA) and demonstrating a community-driven model for community engagement. This has involved targeting the PNG National Standard for Community Development Workers to train and assess and accredit FPDA extension officers, hosting National Apprenticeships and Trade Testing Board (NATTB) workplace assessor training, policy development within FPDA, and working with national Government and peak bodies to develop national policy and technology associated with the Standard. The objective of community development training (CDT) is to coordinate inputs to strengthen the community resolve for addressing technical problems identified by themselves and documented in their 'Community Development Plan'. The non-technical support the project delivers to farmer groups follows an organisation cycle and builds the capacity of farmer groups to follow an organisation cycle themselves. This training has assisted the commercial growers engaged in the project to develop their businesses and for their communities to develop plans incorporating commercial sweetpotato production. A new technical training package covering business development skills was produced in 2019/20. This training has been adopted by National Development Bank as a requirement for farmers intending to apply for loans through the PNG Government agriculture assistance program. A series of twelve fact sheets have been developed for klin kaukau farmers in PNG. The fact sheets cover a range of topics outlining best practise handling and maintenance of klin kaukau planting material. A Clean Seed Scheme Laboratory Manual for managing processes at the NARI Aiyura laboratory has been written, ensuring that all processes are documented in detail to provide rigidity to the klin kaukau scheme in the long term and to assist in training of new lab staff.

Objective 3: To develop a 'clean seed' scheme to increase availability of clean planting material of sweetpotato

The project has delivered access to virus-free clean planting material (klin kaukau) for farmers in the three main commercial sweetpotato (kaukau) production regions in the PNG Highlands. The foundation elements of a clean seed scheme for PNG are established and functioning, with six varieties (Gimani, Wanmun, Wahgi Besta, Beauregard, Korowest and Rachel) being produced by fourteen commercial seed propagators for distribution in their communities. Supplying growers with clean vines is a new agricultural business that is generating returns of PGK500-PGK1,000 a month for the fourteen farmers. Promotion of the klin kaukau scheme through the project Facebook page has generated considerable interest throughout PNG, and opportunities to expand the scheme into more provinces are being progressed by FPDA.

Upcoming

- Consumer surveys in the open market and supermarkets in major cities to identify value attributes, feeding into value chain developments to better match product quality to consumer expectations.
- Advanced crop production and postharvest management training for commercial growers, including demonstrations of irrigation technology and washing/grading/packaging techniques applicable to PNG production systems.
- Implementation of quality assurance protocols for the clean vine multiplication and supply scheme
- Delivery of business development to commercial growers to better equip them to capture opportunities in emerging markets such as the supermarkets in major urban centres.

ASEM/2014/095 Family Farm Teams – concluded in March 2019

Women farmers are key to the livelihoods of Papua New Guinea's families. They produce essential subsistence crops and generate income from surplus crops. Women play significant roles in the informal economy, in community networks and as caregivers for children, the elderly and the ill. However, these social protection roles often impact on their ability to pursue income-generating activities. Typically, women farmers face limited access to productive resources, restricted mobility, unequal divisions of labour, and low levels of schooling.

To address these challenges, the Family Farm Teams (FFT) program was developed in ASEM/2010/052 to encourage more effective, sustainable and gender equitable farming and business practices. The program used a peer education approach: local farmers were trained as Village Community Educators (VCEs) to train others in their family and community. This project investigated the expansion of the ASEM/2010/052 strategies, by out-scaling into five areas of PNG and focusing on new commodity crops:

- Highlands Hub (Eastern Highlands, Jiwaka, Western Highlands), with a focus on sweet potato, coffee and vegetables
- Islands Hub (Autonomous Region of Bougainville, New Ireland), with a focus on canarium, cocoa and traditional vegetables.

The research explored the family, cultural and gender factors that impact on the economic development of women semi-subsistence farmers.

In the five areas, a total of 266 farmers were trained as VCEs (165 F, 101 M). These VCEs trained 2,491 other farmers (1,622 F, 869 M). A further 98 people (45F, 53 M) – from FPDA, Oxfam and other agencies funded by Pacific Women Shaping Pacific Development and Pacific Governance Facility – were trained as FFT trainers. At the time of the report, they had trained a further 1,271 farmers (592 F, 679 M).

The project identified that, for maximum impact and the modelling of gender equity;

- VCE teams should have a gender balance, and
- FFT training is the most effective when attended by both women and men from a family.

These factors are recommended as key components of future delivery.

FST/2014/099 Galip Nut – concluded in December 2019

Nuts have huge potential to improve the livelihoods of rural poor in developing countries and can help to eradicate poverty and hunger. Many indigenous nut species have great commercial potential, however only five species of nuts make up 90% of world trade. Major constraints to commercialising indigenous nut trees are the need for available technology, private sector investment and developing markets.

This project aimed to enhance private sector investment for an indigenous nut species *Canarium indicum* (galip) in East New Britain, Papua New Guinea. The project adopted a transdisciplinary research approach with scientists, social researchers, markets specialist, and nut industry experts to address the processing challenges, set up a demonstration factory and create new markets for *Canarium indicum* nuts. The project trialled a range of interventions including market research, technical advice, capacity building, business mentoring and access to infrastructure for both private and public sector stakeholders.

This project created new markets for processed galip nut products in East New Britain and New Ireland. A new industry has emerged as a result of this project, improving livelihoods for smallholder farmers, and creating new opportunities for entrepreneurs and SMEs in Papua New Guinea.

Program Performance Framework

Purpose of the Program Performance Framework

A performance framework allows a program or project to reflect on the desired research outputs and outcomes or helps defines “what will success look like” and to plan how to monitor progress towards those development outcomes and impacts.

Inputs	Activities	Outputs	Outcomes or impacts
<i>what resources go into a project</i>	<i>research activities the project implements</i>	<i>the direct product of those activities</i>	<i>the changes or benefits that result from the activities or outputs</i>
funding, staff, equipment	surveys, field experiments, PRAs, adaptive research trials, extension efforts	publications, varieties identified, workshops held, people trained, policy engagement events held	net change in farmer income, changes in labour allocation, reduced incidence of disease in aquaculture systems

Figure 5: Typical elements of project monitoring and evaluation.

For the research projects, it is especially important to define clearly the area in an impact pathway over which the project team has direct influence (Figure 11). This is generally limited to the footprint of the project (the area bounded by the blue circle) plus the managed relationships with ‘next users’. For research projects, ‘next users’ might typically include government extension services, NGOs, private sector, and a small group of end users.

This impact pathway concept was introduced the TADEP Annual Meeting in May 2016 and reiterated as subsequent Annual Meetings. It is especially useful to note the concepts of the *Area of Control*, the *Area of Influence* and the *Area of Aspiration*. The projects have direct influence over their *Area of Control* in the impact pathway. Beyond the area under the direct control of the research teams, the projects have a broader area of influence, in which the demonstrated benefits of the research are sustained and promoted on a larger scale by the commitment of the ‘next users’. Finally, the Program has higher level impact goals to which each of the projects contributes to – the Program’s *Area of Aspiration* on the impact pathway. These impacts are the broad changes that, in the longer term, might be impacts on the lives of the target beneficiaries at a large scale. The further from the project’s area of control, the more external influences affect the delivery of these aspirational impact.

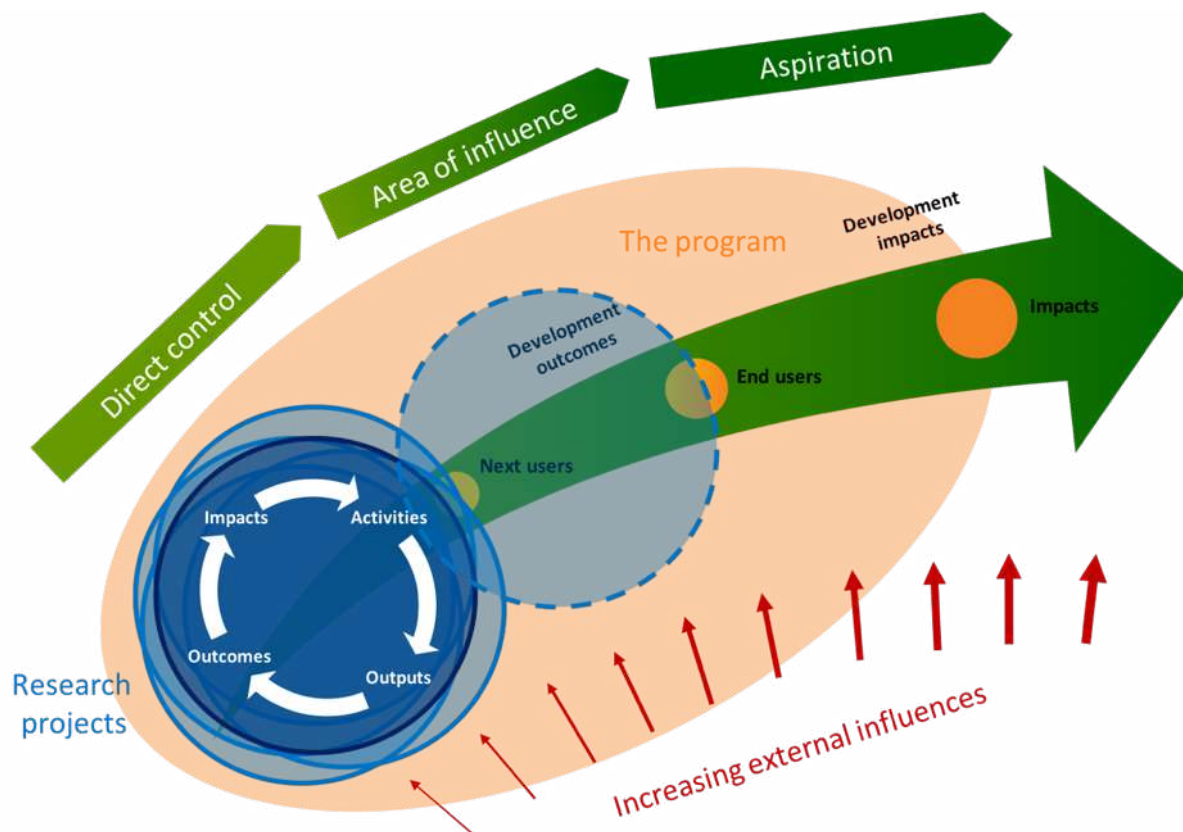


Figure 6: Impact pathway for research projects and TADEP.

In the context of TADEP+, the five projects are part of an overall program which has five aspirational goals. It is intended for each of the projects to have their own M&E plan which monitors and reports both (i) outcomes and impacts within the direct control of the project and (ii) the relationship management and some outcomes of the 'next users'.

As the program has progressed, the projects have shifted their focus from implementation of their respective research activities and outputs to research outcomes. As we come toward the end of the program, impacts will begin to emerge and by its conclusion, the evidence provided by the projects will be to demonstrate program level development impacts.

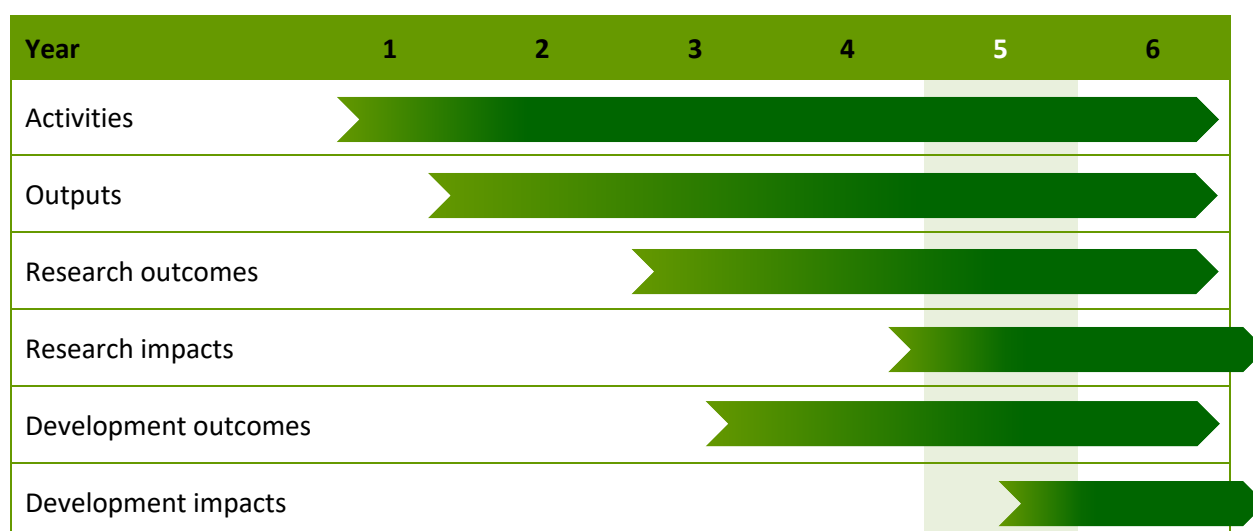


Figure 7: An example of anticipated timing of outcomes and impacts for a research for development (R4D) project or program.

Development of the Program Performance Framework

The development of the Program Performance Framework has been an iterative process and incorporates feedback from within the program via the projects and from external stakeholders including DFAT and ACIAR. The Performance Framework draws from each of the TADEP+ Project Proposals and is informed by development priorities of the PNG and Australian governments.

The Program objectives align with the draft TADEP Umbrella Document and the each of the Visions of Success articulate 'what success will look like' to provide a narrative and context to the Program Objectives.

Success of the program will be measured by (i) the extent to which it adds value beyond the sum of the component projects and (ii) the extent to which the projects contribute to the program level performance indicators.

The purpose of this performance framework is therefore to:

- Ensure projects are aware of and contribute to Program objectives (including higher level targets of the Australian aid program) and that these objectives/targets are effectively integrated into project level monitoring and reporting.
- Improve communication mechanisms between and among projects and the program and with program stakeholders.
- Provide effective monitoring and evaluation to support adaptive management at project and program level.
- Provide evidence of potential policy options flowing from the program to relevant government agencies.

This Performance Framework does not prescribe specific M&E practices necessary for monitoring inputs, outputs and outcomes within each of the projects. Rather, each project team is responsible for its own detailed M&E practices in order to ensure that program objectives and higher-level targets of the Australian aid program are effectively integrated into project level monitoring and reporting.

The Verifiable Indicators developed for this Performance Framework were discussed by all projects at the TADEP Annual Meeting in May 2016 and reviewed at the TADEP Annual Meeting in June 2017 and June 2018. Each project subsequently provided feedback on how each contributes to some or all of these indicators (Table 2).

Projects will continue to report progress towards each of the Verifiable Indicators annually as part of their annual reporting process.

The Program Performance framework – contributions from each project

The following table describes the contributions of each of the individual projects to the overall Program Performance Framework. As the program progresses, more evidence will emerge of how each project is contributing to the overall project objectives and higher-level development goals.

Project contributions are highlighted as per the following:

- (B)** HORT/2014/094 Developing the Cocoa value chain in Bougainville (Bougainville Cocoa)
- (P)** HORT/2014/096 Enterprise-driven transformation of family Cocoa production in East Sepik, Madang, New Ireland and Chimbu Provinces of Papua New Guinea (PNG Cocoa)
- (S)** HORT/2014/097 Supporting commercial Sweetpotato production and marketing in the Papua New Guinea highlands (Sweetpotato)
- (F)** *ASEM/2014/095 Improving opportunities for economic development for women smallholders in rural Papua New Guinea (Family Farm Teams)
- (G)** *FST/2014/099 Enhancing private sector-led development of the Canarium industry in Papua New Guinea (Galip Nut)

*As aforementioned, both the Family Farm Teams and Galip Nut projects have formally concluded as part of TADEP, in March 2019 and December 2019, respectively. The contributions they have made to the Performance Framework will be up until those points.

Figure 8: Contributions to the Program Performance Framework.

Program goal: To improve livelihoods of rural men and women in Papua New Guinea

Program objective	Vision of success	Verifiable indicators	Evidence
To stimulate and strengthen inclusive private sector-led development in agriculture	The private sector is engaged and actively contributing to economic development in partnership with government in the agricultural industry. Poverty in PNG is being addressed through local economic development driven by new and innovative private sector engagements with a focus on women and youth participation. The strengths of current private sector partnerships in PNG are built upon and new ways to support inclusive business models are explored.	SME development.	(B) An SME processing cocoa powder, cocoa butter and chocolate.
			(B) More 100 farmers in Hahon linked to a VEW that have previously neglected cocoa blocks now re-engaged and earning income. There has also been overall improvement to many old plantations through pruning and rehabilitation.
			(B) 33 VEWs and linked families and women's groups producing fresh produce with surplus being sold in local markets.
			(B) Multiple cocoa and vegetable nurseries have been established, enabling on selling of seedlings.
			(B) Goat manure production and composting for organic fertiliser in four locations. Goat breeding in one location.
			(P) A CMFT in East Sepik is also now functioning as a commercial nursery, supplying cocoa seedlings to the World Bank managed Productive Partnership in Agriculture Project (PPAP).
			(P) The Yekimbole CMFT group have established a successful wet bean buying and fermentary business.
			(S) The sale of <i>klin kaukau</i> vines is a new business to PNG. As awareness of the benefits of use of clean planting material grows, demand for the vines has increased. One grower has reported sales exceeding PGK4,000 over a 4-month period.
			(G) The project has created employment for approximately 40 people.
		Partnerships brokered with private sector.	(B) Bougainville Export and Marketing Company Ltd (BEMCO) now supplying cocoa samples from farmers for

			<p>quality checks and mobilising farmer groups to improve bean quality. BEMCO now willing to aggregate and export farmers' beans to its buyers overseas. Discussion were held with BEMCO to import small chocolate making machines which has a potential to turn the industry around in terms of downstream/local processing over 50 requests from Bougainville and a bit more from farmer groups, Provincial Groups, Cooperatives and Member of parliaments in other parts of PNG.</p> <p>(B) Discussions were held with eDidiman SME group for online marketing. This creates pathway for sales to markets for fresh produce in other centres of PNG</p> <p>(S) Growers now directly supplying supermarkets rather than open markets, reducing price variability that is noted by growers as a major issue for them.</p> <p>(G) The project team and NARI worked closely with Equanut, a NZ based investor, co-funded by MFAT in New Zealand. After the departure of this company due to COVID-19, another processor has since expressed an interest in sharing the factory on a similar arrangement, bringing the number of processors investing in galip nut processing to four; DMS, Bisi Trading, Niugini Organics and the new entity. These were sourcing and producing their own value-added product separately to the NARI factory.</p> <p>(G) CPL, a PNG based company, has partnered with the project team to act as a distributor for the product for the market testing phase in Port Moresby.</p>
		Partnerships brokered with Provincial Governments.	<p>(P) The externally-funded Provincial Government cocoa projects in New Ireland and East Sepik are buying clones from the CMFTs originally set up in the ACIAR project and this is contributing to the viability of nurseries.</p>

		<p>Women are actively engaged in family farms.</p>	<p>(P) The aim was to recruit an equal number of men and women but in nearly all cases spouses attended the training with their partners and so CMFTs are nearly always husband/wife teams.</p> <p>(F) “Module 2: Planning your family farm as a family team” delivered to VCEs in Eastern Highlands (34 F, 3 M), Jiwaka (20 F, 15 M), Western Highlands (42 F, 8 M), ARoB (33 F, 20 M) and New Ireland (36 F, 28 M).</p> <p>(F) VCEs delivered “Module 2: Planning your family farm as a family team” to farmers in Eastern Highlands (272 F, 211 M), Jiwaka (88 F, 62 M) and Western Highlands (213 F, 50 M).</p>
--	--	--	--

Program objective	Vision of success	Verifiable Indicators	Evidence
To sustainably increase agricultural productivity, quality and value	The livelihoods of rural men and women are transformed through improvements in and adoption of production technologies in agriculture.	Increased agricultural productivity.	(B) 33 VEWs have received training and, to varying extents, have adopted cocoa management best practice techniques.
			(B) The utilisation of goat manure as compost or direct application to crops looks promising as shown by growth parameters such as leaf size (length x width, and weight) of Chinese cabbages in small trials in Kubu, North.
			(P) 81 CMFTs (27 Madang, 26 East Sepik, 21 New Ireland, 7 Chimbu) have received training and, to varying extents, have adopted cocoa management best practice techniques.
			(S) Data from trials conducted in farmers' fields and at NARI Aiyura research station. Yield increases of 10-30% from use of clean planting material.
			(G) Increase from 65 tonnes to 207 tonnes between 2017 and 2018 seasons. In 2019 there was little supply as other processors had entered the market coupled with a smaller production season.
		Increased quality of agricultural produce.	(B) Increasing number of cocoa farmers are improving processing techniques, as evidenced by the chocolate competition at the Bougainville Chocolate Festival.
			(S) Anecdotal evidence from growers is of higher yield, earlier crop maturity (shorter cropping duration), better product shape and superior product taste.
		Increased agricultural value.	(S) Increased demand for clean sweetpotato in markets due to superior appearance and taste. Anecdotal evidence from growers is of higher yield, earlier crop maturity (shorter cropping duration), better product shape and superior product taste.

			(G) The emerging industry has an estimated farm gate value of PGK300,000 to PGK400,000 per annum, in addition to the demonstration factory.
		New technology and systems adopted and maintained.	(B) Cocoa nurseries, budwood gardens, composting facilities and solar driers are being established in the 33 target village assemblies, with others also requesting assistance at their own expense.
			(S) The 14 core farmers in the project have embraced the technology. Each of these farmers is actively promoting it in her/his community, with 1 farmer reporting that he has mobilised 100 other farmers in his region to adopt clean kaukau.
		Farming families are operating commercially.	(S) The 14 core farmers in the project have embraced the technology. Each of these farmers is actively promoting it in her/his community, with 1 farmer reporting that he has mobilised 100 other farmers in his region to adopt <i>klin kaukau</i> .
			(G) Over 2,000 smallholders are now participating in the emerging canarium industry in PNG and there are currently four active processors in 2020.

Program objective	Vision of success	Verifiable Indicators	Evidence
To improve access to markets and strengthen value chains	Smallholder farmers and their families are connected to business opportunities and markets in PNG and internationally that can improve livelihoods and provide employment opportunities around all links in the value chain.	Increased capacity to access markets.	<p>(B) Improved cocoa quality through training, VEW peer learning model and partnerships with international chocolate makers.</p> <p>(B) Many presentations and workshops on cocoa quality are held in conjunction with the annual Chocolate Festival and during the year at the request of village assemblies.</p> <p>(B) School cocoa curriculum to be rolled out in 2020.</p> <p>(B) With the Enactment of Commodity Regulation Act 2020 by the Bougainville House of Representatives, the establishment of Bougainville Agriculture Regulatory Authority (BACRA) has been permitted. One functional division of this new Authority will be research and development into local downstream processing and packaging of commodities to finished products. This will enable BACRA, as a subsidiary of DPIMR, to explore opportunities for processing cocoa produced in Bougainville into chocolates and other products. Technical advice and expertise from other organisations such as the Bougainville Partnership's Community Support Facility (CSF), ACIAR and chocolate makers in Australia.</p> <p>(P) Improved cocoa quality through training, CMFT peer learning model and partnerships with cocoa exporters.</p> <p>(S) Community development training across four communities.</p> <p>(S) Grower study tour to Australia.</p> <p>(S) Supermarket trial and subsequent support for growers to maintain supply to the new markets.</p> <p>(G) The supply of high-quality fruit by farmers has greatly increased, and the sales of shelf-stable nut products at premium prices has substantially expanded.</p>

	Improved post-harvest handling, processing and marketing.	(B) Training on cacao harvesting, fermentation and drying in 33 sites and 10 additional extended farmer groups conducted and this number is rapidly increasing to potential 100s or more.
		(B) Chocolate Festival raising awareness of Bougainville as source of fine flavour cocoa. Chocolate competition to increase farmers' knowledge of cocoa quality.
		(B) Encouragement in using direct sun drying or a combination with kiln pipe drying were possible and most farmers are now adopting this method. Evidence of improvement is shown in data collection at the mini chocolate lab.
		(P) With the support of Agmark, models for more cost-effective solar dryers using rolls of plastic have been developed. The CMFT group at Yekimbole has built a successful business around these dryers, and similar dryers have also been built at in New Ireland, East Sepik and Madang.
		(S) Establishment of Facebook page to communicate with project partners and value chain.
		(F) Training delivered to VCEs in ARoB and New Ireland include all four Family Farm Team Modules plus IATP training (sustainable livelihoods, record and book keeping, poultry, piggery, soil management, vegetable production) and Nationwide Microbank training.
	New markets identified.	(B) Several chocolate makers in Australia now produce and sell chocolate from Bougainville beans.
		(P) A CMFT in East Sepik is also now functioning as a commercial nursery, supplying cocoa seedlings to the World Bank managed Productive Partnership in Agriculture Project (PPAP).

			(P) The Yekimbole CMFT group have established a successful wet bean buying and fermentary business.
			(S) Supermarkets, catering companies and a potential export market to Micronesia.
			(G) Retail presence in East New Britain and Port Moresby.
		New markets developed.	(B) Direct relationships between cocoa farmers and chocolate makers in Australia.
			(S) Growers now supplying directly to Tininga and CPL supermarkets.
			(G) Repeat orders from CPL in Port Moresby and private and retail purchasers in Kokopo, Kerevat, Lae and Rabaul.

Program objective	Vision of success	Verifiable Indicators	Evidence
To promote gender equity and women's empowerment in rural communities	Gender equity is evident in farm, financial and decision-making in families, SMEs and rural communities. Men and women have equal access to economic opportunities, information and leadership development or representation.	Activities specifically targeted towards women's decision-making capacity, leadership and representation	(B) Family Farms Team training has been undertaken in three VAs with more to follow in September 2020. A typical workshop included 13 women and 12 men, reflecting the importance of gender balance in engaging both men and women.
			(P) All training sessions include training to support the involvement of women in cocoa production. This training is led by Dr Josephine Saul-Maora who is working in collaboration with the Family Farm Teams project ASEM/2014/095.
			(S) Community development training (family focussed) across 4 communities – 10 modules delivered for each community.
			(F) Leadership training delivered in conjunction with Family Farm Teams training to Eastern Highlands (6F, 1 staff), Jiwaka (7F, 2 staff) and Western Highlands (7F, 1 staff). Each woman led a team of six VCEs who delivered the peer education activities in their own village.
		Activities specifically targeted towards women's economic opportunities	(B) Vegetable and food crop production and marketing training is directed towards women. The 33 VEWs and linked families and women's groups producing fresh produce with surplus being sold in local markets.
			(P) Most of our CMFTs have developed as husband and wife teams, and some have been led by women, and one group is considered an all-woman group (supported by their husbands).
			(F) Aside from the four Family Farm Teams training modules, financial literacy training has been delivered by Nationwide Microbank in ARoB (46 F, 34 M) and New Ireland (26 F, 34 M).

			(G) Workshops to improve productivity, value-adding and market access have been delivered to 529 farmers, SMEs and micro-enterprises plus factory demonstrations to several hundred people, a large majority of whom are women.
	Activities specifically targeted towards improving women's skills and access to information		<p>(P) Growing cocoa as a small tree and with more intensive management facilitates, and even requires, the involvement of women and youth.</p> <p>(S) Female project team member from NARI is undertaking a research higher degree in a project related area. Female project team member from NARI is undertaking a research higher degree in a project related area.</p> <p>(F) 266 farmers were trained as VCEs (165 F, 101 M). These VCEs trained 2,491 other farmers (1,622 F, 869 M).</p> <p>(F) 98 people (45 F, 53 M) from Fresh Produce Development Agency (FPDA), Oxfam, Pacific Women Shaping Pacific Development/Pacific Governance Facility funded agencies were trained as FFT trainers. At the time of the report, they had trained a further 1,271 farmers (592 F, 679 M).</p> <p>(G) Workshops to improve productivity, value-adding and market access have been delivered to farmers, SMEs and micro-enterprises plus factory demonstrations to several hundred people, a large majority of whom are women.</p>
	Number of women and men actively involved as members of research teams		(B) Multiple project team members are women. Three female VEWs. Julie Rereve who is the cocoa extension officer in North and mini-chocolate quality testing and chocolate making. Tekla is lab assistant and undertakes quality testing and chocolate making. DPI officers Jilian Peniai, Yvonne, and 4-6 Health nursing officers attached to nutrition and vegetable cultivation project. One of

			three Regional research and Development Hub Coordinators is female.
			(P) Of our initial 75 CMFTs, about 65 involve both husband and wives. One unmarried CMFT is supported by his mother, who attends training sessions with him.
			(F) UniTech (2F 2M), PAU (2F 1M), NARI (2F 1M), Baptist Union (2F), Voice for Change (1F), FPDA (1F), New Ireland DPI (1F 2M) and CARE (1F).

Program objective	Vision of success	Verifiable Indicators	Evidence
To build individual and institutional capacity	The sustainability of the agricultural industry in PNG has been transformed through targeted capacity building of individuals and institutions across geographically and socio-economically diverse locations. At the conclusion of TADEP, the Project research outcomes have translated into long-term Program development impacts that respond to the Program goal.	Activities targeted towards building the capacity of farmers, SMEs and micro-enterprises	(B) 33 VEWs have received training in nursery and budwood garden establishment, integrated pest and disease management (IPDM), cocoa pod borer (CPB) management, budding of clones, sustainable livelihoods and two business modules in small enterprises and record keeping and decision making.
			(P) 75 CMFTs have received training in nursery and budwood garden establishment, integrated pest and disease management (IPDM), budding of clones and sustainable livelihoods.
			(S) Community development training (CDT) has been delivered in Wimbika village (WHP), Gusam village (Jiwaka Province), Kasena village (EHP) and Matiyufa village (EHP).
			(F) 266 farmers were trained as VCEs (165 F, 101 M). These VCEs trained 2,491 other farmers (1,622 F, 869 M).
			(G) Workshops to improve productivity, value-adding and market access have been delivered to 529 farmers, SMEs and micro-enterprises plus factory demonstrations to several hundred people, a large majority of whom are women.
		Activities targeted towards building the RD&E capacity of institutions	(B) Cocoa Board and ABG DPIMR and Department of Health staff are engaged directly by the project and have received ongoing training and mentoring.
			(S) Training of NARI staff on virus diagnostics NARI and FPDA staff visit to Australia on study tour.
			(F) 98 people (45 F, 53 M) from Fresh Produce Development Agency (FPDA), Oxfam, Pacific Women Shaping Pacific Development/Pacific Governance Facility funded agencies were trained as FFT trainers. At the time

			of the report, they had trained a further 1,271 farmers (592 F, 679 M).
			(G) Increased capacity of NARI Kerevat staff.
		Project participants whose knowledge, attitudes, skills and aspirations have specifically benefited through involvement in Project team	(B) More than 12,450 household surveys have been conducted, providing individuals and policy makers key data and insights into the factors affecting cocoa production in Bougainville.
			(P) With each of the 25 CMFTs having groups of 75 farmers each, of which have an average of 5 family members, it is anticipated that 9,375 individuals will have benefited from the project.
			(S) Positive feedback from the 14 lead sweetpotato farmers about grower visit to Australia, and examples of practice change adopted in return to PNG as shared on project Facebook page.
			(G) Factory manager (1F), processing line (3F 10M), social sciences (1F), agribusiness and market development (2M) and agronomy (1M).
		Training events and post-graduate training opportunities	(B) Training workshops (budding, IPDM/CPBM, nursery management, lining and planting) across three regions of Bougainville.
			(B) 33 individuals trained to undertake household surveys.
			(B) Julie Revere was awarded a Certificate IV level short term Australian scholarship on Agri-Business in November 2019- February 2020.
			(B) Wendy Sawa received iJDF training.
			(B) Students from the University of Natural Resources and Environment and from the Highlands Agricultural College (3 Northern Hub and 3 Southern Hub) participated in the industrial training program. Their training covered cocoa technologies including grafting, nursery practices and management, rehabilitation techniques, pollination,

			farmer trainings, and vegetable production. Students were also involved in conducting small projects and data collections.
			(P) Each of the 25 CMFTs have undertaken specific training, which will be imparted to the respective farmer groups. The training of farmers will be on-going via the permanent presence in villages of CMFTs.
			(S) Grower visit to Australia.
			(S) NARI staff member enrolling in research higher degree study in Australia.
			(F) 266 farmers were trained as VCEs (165 F, 101 M). These VCEs trained 2,491 other farmers (1,622 F, 869 M).
			(F) 98 people (45 F, 53 M) from Fresh Produce Development Agency (FPDA), Oxfam, Pacific Women Shaping Pacific Development/Pacific Governance Facility funded agencies were trained as FFT trainers. At the time of the report, they had trained a further 1,271 farmers (592 F, 679 M).
		Activities undertaken in geographically and socio-economically diverse locations	(B) Village assembly were specifically chosen for their geographic diversity across the three regions of Bougainville.
			(P) CMFT sites are geographically diverse across the four provinces involved.
			(F) Family Farm Teams and Leadership training have been delivered in Eastern Highlands, Jiwaka, Western Highlands, ARoB and New Ireland.
			(G) Training was extended to New Ireland and Bougainville in addition to the core training in East New Britain.

Glossary

ABG	Autonomous Bougainville Government
ACIAR	Australian Centre for International Agricultural Research
ARoB	Autonomous Region of Bougainville
BP	Bougainville Partners
BU	Baptist Union
CBO	community-based organisation
CCI	Cocoa Coconut Institute
CDW	community development worker
CPB	cocoa pod borer
CMFT	Cocoa Model Farmer-Trainers
CRG	Collaborative Research Grant
CSF	Community Support Facility
CUG	Closed User Group (Digicel service)
DAL	Department of Agriculture and Livestock
DEO	district education officer
DFAT	Department of Foreign Affairs and Trade
DPI	Department of Primary Industries
EHP	Eastern Highlands Province
ENB	East New Britain
FFT	Family Farm Teams
FPDA	Fresh Produce Development Agency
IFAD	International Fund for Agricultural Development
IPA	Investment Promotion Authority
HEW	Health Extension Worker
LAMP	Loop-Mediated Isothermal Amplification
MAD	Mobile Acquired Data
MDG	Millennium Development Goal
MFAT	New Zealand Ministry of Foreign Affairs and Trade
MTDP III	Medium Term Development Plan III
M&E	Monitoring and Evaluation
NARI	National Agricultural Research Institute
NAQIA	National Agriculture Quarantine and Inspection Authority
NATTB	National Apprenticeships and Trade Testing Board
NDB	National Development Bank
PD	professional development
PAU	Pacific Adventist University
PMV	pubic motor vehicle
PPAP	Productive Partnerships in Agriculture Project
PSD	private sector development
PT	pathogen tested
R4D	research for development
SD card	secure digital card
SME	small-to-medium enterprise
SRA	Small Research Activity
TADep	Transformative Agriculture and Enterprise Development Program

TADep+	Transformative Agriculture and Enterprise Development Program, including the formally concluded Family Farm Teams and Galip Nut projects
TEAM	Technology Evaluation and Marketing
ToT	Training of Trainers
UNRE	University of Natural Resources and Environment
VCE	village community educators
VEW	village extension worker
VRC	Village Resource Centre
WHP	Western Highlands Province

TADEP+ 2019/20 Annual Report

A multidisciplinary agricultural research for development program
that aims to improve the livelihoods of
rural men and women in Papua New Guinea

www.tadep-png.com