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1 Executive summary

Program activities for Improving Plant Biosecurity in the Pacific Islands, GP-2018-109, began on November 30 2018, with the Australian Centre of International Agricultural Research (ACIAR) as the main funding agency and the Department of Agriculture Water and Environment (DAWE) and the Crawford Fund as co-funders.

Broad objectives of the program included: 1) To strengthen the technical capacity of biosecurity practitioners in the Pacific; 2) To improve the communication, negotiation and advocacy skills of biosecurity practitioners in the region; and 3) To initiate regional institutional capacity building (over the medium- to longer-term). Despite drastic changes to the planned activities due to the COVID-19 global pandemic these objectives have been met.

From 29 April to 31 May 2019, 19 Pacific Island participants (Fellows) from 9 countries and 1 regional organisation (The Pacific Community's Land Resources Division, SPC-LRD) completed five weeks of workshops and placements in Australia. These workshops were a mix of technical skills as well as a hands-on communication master class. The Fellows were selected through an application process with set criteria and with support from their organisations with the understanding of their responsibilities.

The planned Pacific regional workshops scheduled for 2020 to follow up the Australian placements had to be cancelled due to COVID-19. However, the first workshop had been prepared in full so the program pivoted to develop an online Learning Management System (LMS). Each day of the prepared workshop was organised into a learning path with courses that flowed into each other. Pilot activities for the LMS were completed over 6 months. Following this consultation with Fellows was undertaken and feedback was aligned with literature on eLearning best practice. The most useful courses to Fellows were redeveloped taking on board suggested updates.

The planned next steps required the online learning to be distributed to a wider audience with access given to all relevant staff members of National Plant Protection Organisations (NPPOs). SPC-LRD act as the secretariat for the PPPO and have responsibilities to 22 member countries in providing information, support and training to NPPOs. For the online learning to be distributed effectively it is crucial to have the endorsement and support from the PPPO and to communicate and disseminate through the existing regional channels. It took longer than expected likely due to the COVID-19 working environment but an agreement was reached to host the online learning with SPC-LRD's own LMS. The relevant courses have been transferred in a compatible format and content experts have been connected with the SPC-LRD's online learning team. Initial discussions indicate the courses will be launched to coincide with other content that SPC-LRD has prepared in the second half of 2021.

The Whatsapp messaging group created for Fellows while in Australia continued to be an effective tool to support the pivot to online learning. Feedback received was that the informal discussion at this level in their organisation was extremely useful with many Fellows not having contact with their neighbouring organisations previously. Trending topics included: Timor-Leste's African Swine Fever (ASF) response; PICs preparedness actions for ASF; fall armyworm incursions and associated action; container hygiene models and changing conditions in New Zealand; and of course, preparedness for COVID-19.

Importantly, the regional organisation responsible for biosecurity related activities within the region the SPC-LRD Pacific Plant Protection Organisation (PPPO) Secretariat has agreed to house and resource future delivery of the PPBP, beyond the end of the program, to continue to build on the successful biosecurity platform established during the program. This is a strong indication of the usefulness and popularity of the program within the region and provides a key sustainability outcome for the program.

2 Background

Food security and trade are essential to promoting sustainable economic growth and stability in the Pacific region and, under Objective 1 of its 2016–2020 Strategic Plan, the Pacific Community (SPC) is working to:

"Improve pathways to international markets by facilitating the mobility of learners and workers, assisting private enterprises to access international markets, and providing support to PICs to improve their capacity to meet phytosanitary and biosecurity (SPS) standards to safeguard trade" (SPC, 2015).

Access to international markets, food security and thus the economies of many Pacific nations are threatened by invasive pests and diseases. These include a wide range of both established and emerging pests and diseases with country specific and regional impacts. The general consensus is that these threats are growing because of increasing trade in agricultural commodities, increasing tourism and international travel and the impacts of climate change that enable new pests and diseases to spread across agricultural systems. All countries in the Pacific region are working hard to mitigate existing threats and potential future risks, but more can be done in terms of capacity building for biosecurity staff and strengthening biosecurity institutions across the regions, as well as increasing biosecurity capacity in the private sector.

Over the years many PICs have benefitted, and continue to benefit, from donor-supported national and regional sanitary and phytosanitary (SPS) - and biosecurity-related capacity building programs which have a focus on crop production and protection, trade and market access.

Donors and supporting agencies have included the SPC, Australian, New Zealand and other government foreign aid programs, FAO/IPPC and the WTO/STDF¹. Plant biosecurity related programs and projects supported have helped build institutional disease diagnostics, surveillance, inspection and risk analysis capacity, to facilitating market access for specific agricultural products.

Despite these biosecurity programs and projects, many agencies and the region as a whole are challenged when addressing pest and disease problems that impact on food production and limit trade and market access opportunities. These limitations are often ascribed to the diverse natural environments and highly variable agricultural capacity in the Pacific region, their geographical isolation but also the high movement of people and goods and limited institutional and private sector resources and capacity to address existing and new pest and disease challenges.

Efforts to enhance plant biosecurity capacity in the PICs are however continuing with, for example, new and continued activities under the Pacific Horticulture and Market Access (PHAMA Plus) program focusing on value chains. The regional Pacific Agreement on Closer Economic Relations (PACER Plus) trade agreement will also provide funds for capacity building.

The program delivered here contributes to and enhances these capacity-building efforts, both through improving technical skills and by strengthening skills in communication, negotiation and advocacy that will build support for strengthened plant biosecurity among decision-makers and the wider community.

¹ The Food and Agriculture Organisation of the United Nations (FAO); International Plant Protection Convention (IPPC); World Trade Organisation (WTO); Standards and Trade Development Facility (STDF). Example programs include SPC-BATS; Australia -PHAMA, ACIAR and Department of Agriculture; NZ-Pacific Biosecurity; EU-FACT/IACT; and USDA-APHIS Quarantine Training.

3 Objectives

Within the broader development goal of promoting the sustainable and equitable development of agribusiness and agricultural commodity trade in the Pacific Islands, the **specific aim of this program is to increase the level of agricultural plant biosecurity achieved by partner countries in the region.**

Specific objectives of the program are:

Objective 1: To strengthen the technical capacity of biosecurity practitioners in the Pacific.

Following preparatory activities to identify organizational partners and candidates, as well as their needs and priorities, this objective uses experiential learning, through various forms of placements within relevant organisations in Australia and New Zealand (pre COVID 19) and LMS (post COVID 19) to build specific technical biosecurity skills relevant to the candidates' role in the national and regional biosecurity 'system'.

Objective 2: To improve the communication, negotiation and advocacy skills of biosecurity practitioners in the region.

Focusing initially on the candidates who have undergone individual skill-building placements (Pacific Biosecurity Fellows) and then extending to a wider pool of colleagues, this objective will focus on building skills in communication, market access negotiation and advocacy – again, tailored to the needs of participants. Negotiation skills relating to biosecurity issues affecting agricultural commodity trade will be one important focus but the importance of communicating the importance of biosecurity issues to the wider public (including working with the media) and to decision-makers (especially advocacy relating to specific biosecurity issues) will also be important areas for capacity-building.

Objective 3: To initiate regional institutional capacity building (over the medium- to longer-term).

This objective will be achieved through the establishment of a 'peer network' linking biosecurity professionals and practitioners in the Pacific region, which is intended to be self-sustaining beyond the life of the program, with a view to sustaining and multiplying the impact of the program's investment in capacity building. The network will not be just 'communication for its own sake' but is intended to help the members to draw on the expertise of their mentors and regional peers, to solve specific problems that they encounter and more broadly continue their professional development.

It should be noted that post COVID 19 and the associated travel restrictions, direct interaction with Fellows in participating countries was not possible. Fellow's motivation to engage and participate in program activities was impacted as the planned face-to-face workshops were cancelled and remote learning and interaction is relatively new and not the preferred option for many of the Fellows. They had to devote time outside of their work and family obligations with dedicated time purely to focus on program activities.

4 Methodology

From December 2018 until late April 2019 the project team put all efforts into completing the exhaustive checklist for the logistics for 19 Pacific Island participants (Fellows) from 9 countries and 1 regional organisation to complete five weeks of workshops and placements in Australia beginning Monday 29 April 2019.

4.1 Australian Workshop 1

Two workshops and three weeks of placement activities within Australia were completed. The biosecurity training and market access simulations workshop, delivered by Dr. Sabine Perrone and Mr. Bill Magee was delivered in Brisbane from April 29 to May 3, 2019. The interactive lectures included: (i) the principles of plant biosecurity; (ii) monitoring, inspection and surveillance; (iii) control and eradication strategies (iv) diagnostics and (v) community engagement. These sessions were a combination of lectures followed by open discussion on actual examples of these themes – in both the Australian and the Pacific context. The participation of Fellows from a wide range of organisations and diverse fields of expertise, was a constant reminder to all participants that achieving good biosecurity outcomes, for both imports and exports, requires cooperation and information exchange between regulators and commercial parties.

In addition to the planned lectures the project team allowed a degree of flexibility in the agenda. This allowed each country group to give a presentation about their organisation and the context that they operate in, as well as allowing several guest speakers to present on their relevant specialist topics.

- International Coconut Community Update - Dr. Uron Salem, Executive Director of the International Coconut Community (ICC)
- Plant Health Australia Introduction - Mr. Greg Fraser, CEO of Plant Health Australia (PHA)
- Solomon Islands Biosecurity Development Program - Mr. Daniel Beard, DoA
- International Plant Health Surveillance Program - Ms. Melissa Dodd, DoA
- CRB-G In Solomon Islands, Management Response - Mr. Andrew Piper. NRE People
- Information is Power and Kalang's Pacific Engagement - Mr. Patrick Duthie

In the afternoon sessions, the Fellows worked together in four teams on a market access simulation exercise, which comprehensively develops skills in risk assessment, pathway analysis, application of phytosanitary measures and most importantly, negotiation of phytosanitary measures between trading partners. The market access simulation exercise drew directly on the technical content of the modules presented in the morning sessions. The exercise involved the risk assessment and development of phytosanitary protocols for trade in fresh tomatoes, tomato seedling, tomato seeds and various forms of processed tomatoes. This required the Fellows to study the pests associated with these different pathways of trade but most importantly to base their phytosanitary protocols on the relevant international standards set by the International Plant Protection Convention. The goal of the market access simulation exercise was to accurately simulate the complex negotiating environment between nations to resolve the biosecurity issues that prevent or restrict trade. Traditional training approaches for improved market access have been narrowly focused on the theory and principles of international standards but have lacked any actual skills needed to negotiate commercially viable terms of trade. The market access simulation exercise offers an alternative to traditional training techniques by reinforcing the key elements of the international standards and then converting the theory into practice. The exercise also highlights the need to develop strong personal relationships necessary to support real market access negotiations in the future.

4.2 Australian Placements

Each potential Fellow of the program filled out an application form which was broken in to two sections. Part 1 included eight short answer questions focusing on existing skills and experience, and Part 2 had five long answer questions focusing on the needs of the potential Fellows' organisations as well as personal skill development priorities.

It was requested that each PIC organisation submit at least three applications with candidates adhering to the set of criteria seen below:

1. Experience (minimum 3-5 years) in an area of plant biosecurity, (i.e. plant pathology, entomology, weed science or quarantine treatment practices and procedures).
2. Demonstrated understanding of SPS related institutions in the Pacific region and the role of plant biosecurity in regional trade processes.
3. Experience in the application of plant biosecurity measures to improve regional and international trade and market access.
4. Demonstrated capacity to implement a program of organisational change, or improved phytosanitary practices, resulting from this program.
5. Experience in advocacy and highly developed representational skills to promote future investment in plant biosecurity.
6. Demonstrated capacity to work in collaboration with the private sector to improve plant biosecurity practices with a common goal to enhance production and trade opportunities for plant industries.
7. Demonstrated capacity to train and mentor junior plant biosecurity staff.

The program's informal steering committee then determined the most appropriate candidates, an example of the application form can be provided upon request. The information provided in these applications became the basis for aligning appropriate Australian host organisations that would provide the experience needed to build the identified skills needed. The application forms also allowed each Fellow to nominate their own specific indicators to track capacity development outside of the program's capacity tracking templates.

Wherever possible participants from the same country would be split into different placements to foster greater networking between countries and to expose Fellows to a broader range of experience. Table 1 below provides a summary of the host placements.

Table 1 Host Placement Summary

Fellow	Country	Host Organisation	Location
Ms. Anano Seumalii-Vaii	Samoa	Department of Agriculture – Plant Science and Risk Assessment	Canberra, ACT
Ms Talei Fidow-Moors	Samoa	Department of Agriculture – Plant Health Policy	Canberra, ACT
Mr. Nitesh Datt	Fiji	AusVeg (Industry Representative Body)	Glen Iris, VIC
Mr. Saimone Delabaka	Fiji	Department of Agriculture – Plant Export Operations	Canberra, ACT

Fellow	Country	Host Organisation	Location
Ms. Nukate Teaotai	Kiribati	Queensland Department of Agriculture and Fisheries	Cairns, QLD
Ms. Tekataake Oromita	Kiribati	Northern Territory Department of Primary Industries and Resources	Darwin, NT
Ms. Keasi Afu	Tonga	Murdoch University – Plant Biosecurity	Perth, WA
Mr. Semi Hausia	Tonga	La Trobe University - AgriBio	Melbourne, VIC
Mr. Matio Lonalona	Tuvalu	La Trobe University - AgriBio	Melbourne, VIC
Mr. Fakapoga Fakapoga	Tuvalu	Queensland Department of Agriculture and Fisheries	Brisbane, QLD
Ms. Sylvie Boulekouran	Vanuatu	CSIRO - Northern Invasive Species and Ecology and Management Group	Brisbane, QLD
Ms. Touasi Tiwok	Vanuatu	Plant Health Australia	Canberra, ACT
Mr. Gideon Suda	Solomon Islands	CSIRO - Northern Invasive Species and Ecology and Management Group	Brisbane, QLD
Ms. Julianne Mose	Solomon Islands	Plant Health Australia	Canberra, ACT
Ms. Nelly Paul	PNG	Northern Territory Department of Primary Industries and Resources	Darwin, NT
Mr. Noah Saruwa	PNG	Queensland Department of Agriculture and Fisheries	Cairns, QLD
Mr. Abel Ximenes	Timor-Leste	New South Wales Department of Primary Industries	Orange, NSW
Ms. Adalgisa Alvares	Timor-Leste	New South Wales Department of Primary Industries	Orange, NSW
Ms. Ana Buli	SPC-LRD	Department of Agriculture – Surveillance and Operational Science	Canberra, ACT Melbourne, VIC

All Fellows completed their three weeks of placement in an Australian host organisation in full. The specific activities to be undertaken during this time was discussed with hosts prior to the Fellows arrival in Australia with varying levels of detail and response given from each host organisation. The project team used a combination of phone calls, social messaging through the WhatsApp group, email and homework journals to keep track of the activities completed in each placement.

A brief summary of activities undertaken by each country during placements can be seen below in Table 2. More in depth information can be provided upon request all information below is using the specific wording from the Fellows' homework journals wherever possible.

Table 2 Host Organisation Activity Summary

Group	Week 1 Activities	Week 2 Activities	Week 3 Activities
Fiji	<ul style="list-style-type: none"> • Field demonstration for lettuce and brassica crops • Training in the Plants Export Management System • Learning about ePhyto 	<ul style="list-style-type: none"> • Meeting with Agriculture Victoria about surveillance • Learning about policy and legislation for Aus exports • Tour of accredited facilities in Melbourne 	<ul style="list-style-type: none"> • Post Entry Quarantine facility tour • Meeting with Grain Market representatives • Working with the Authorised officers program
Kiribati	<ul style="list-style-type: none"> • Fusarium wilt tropical race 4 surveillance • Research on citrus canker • Culturing of FF 	<ul style="list-style-type: none"> • Learning about ant trap variations • Worked with citrus canker eradication team • Culturing FF 	<ul style="list-style-type: none"> • Fruit fly trapping and inspections • Vegetable Integrated Pest Management Trials
PNG	<ul style="list-style-type: none"> • Preparing for FF cold treatment tests • FF rearing • Market access negotiation 	<ul style="list-style-type: none"> • Detecting electric ants with dogs • Systems approaches to biosecurity • Fusarium wilt tropical race 4 surveillance 	<ul style="list-style-type: none"> • Ant diagnostics • FF lure variations • Border surveillance processes
Samoa	<ul style="list-style-type: none"> • PRA - Taxonomic identities • Preparedness and response processes 	<ul style="list-style-type: none"> • PRA - Biology and ecology • Surveillance and diagnostics processes 	<ul style="list-style-type: none"> • Visited Port Kembla loading facilities • Examination of relevant Australian policies under review
Solomons	<ul style="list-style-type: none"> • RIFA collection and identification • FF identification • Response processes 	<ul style="list-style-type: none"> • Fresh produce inspection • Inspection of accredited facilities • Farm biosecurity programs working closely with industry 	<ul style="list-style-type: none"> • Biocontrol for weeds • Mass rearing of insects for biocontrol • Emergency response operations

Group	Week 1 Activities	Week 2 Activities	Week 3 Activities
SPC-LRD	<ul style="list-style-type: none"> • Attended the National Science Exchange conference • Developing basic training packages for new biosecurity staff 	<ul style="list-style-type: none"> • Visit to Melbourne's Post Entry Quarantine facility • Farm surveillance for pests and diseases • Airport inspections and accessing BICON 	<ul style="list-style-type: none"> • Vector surveillance • Emergency response planning • Inspection at accredited facilities
Timor-Leste	<ul style="list-style-type: none"> • FF identification • Aphis DNA extraction • Isolating tissue cultures 	<ul style="list-style-type: none"> • Field visits to nearby farms • Divisional presentations from NSW DPI • Weed ecology 	<ul style="list-style-type: none"> • Visit to the Elizabeth Macarthur Institute • Testing samples of bacteria, fungi and aphid • Meet with citrus pathology program
Tonga	<ul style="list-style-type: none"> • General diagnostics • Molecular testing • Insect collections 	<ul style="list-style-type: none"> • Lamp testing FF DNA • Morphological identification • Sterile Insect Technique 	<ul style="list-style-type: none"> • ELISA testing potatoes • Beehive surveillance • Monitoring FF lifecycle stages
Tuvalu	<ul style="list-style-type: none"> • ELISA and PCR testing tomato and cucumber seeds • Learning appropriate laboratory processes • Trapping RIFA 	<ul style="list-style-type: none"> • Fungi and bacterial extraction • Medium preparation for growing microorganisms • Baiting and plotting for ant surveillance 	<ul style="list-style-type: none"> • Pest collections • Diagnostics of ants and nematodes • RIFA plotting and sampling • Visit to a port
Vanuatu	<ul style="list-style-type: none"> • Learning about how PRA's and Implementation plans complement each other • Developing a surveillance info sheet 	<ul style="list-style-type: none"> • Risk assessment models for fruits and seeds • Trapping for various ant species 	<ul style="list-style-type: none"> • Networking with ACIAR and the DoA • Importance of the partnerships between industry and government

4.3 Australian Workshop 2

A key message from the consultations as part of the detailed design was that often the skills and experience are all present within each countries' National Plant Protection Organisations. However, a lack of organisational capacity exists which stems largely from not being able to communicate the importance of plant biosecurity to the broad range of key stakeholders (farmers, ministers, development partners etc.). Each component of the five weeks of Australian placements included aspects of improving communication skills in

presentations, speaking, writing, informal communication and group work. The fifth and final week brought communication skills to the forefront of the program.

Having the final week as a Communication Master Class allowed the Fellows to become more accustomed to their surroundings, each other, and the project team as most had never met before and many hadn't left their own countries prior to this program. Reuniting in the fifth week after three weeks apart it was clear that both the PPBP network had successfully been forged, and that all Fellows were much more confident and able to get the full benefit from the Communication Master Class.

The Communication Master Class was delivered by Ms. Cathy Reade of the Crawford Fund and Ms. Jenni Metcalfe and Mr. Toss Gascoigne of Econnect Communications along with representatives from Kalang Consultancy Services, ACIAR and DAWE.

Interactive lectures were delivered on (i) reporting; (ii) communication planning; (iii) social media; (iv) presentations and posters; (v) networking; and (vi) traditional media interviews. These sessions were a combination of lectures followed by open discussion on actual examples of these themes.

A stakeholder panel was organised to reflect key stakeholder groups for Pacific professionals in plant biosecurity. The panel included Dr. Denis Persley, Senior Principal Plant Pathologist with the Department of Agriculture and Fisheries in Queensland, representing a partner organisation that the Pacific specialists may want to contact for assistance; Dr. Bosibori Bett from ACIAR representing a funding agency that they may need to report to or approach; Mr. Bill Magee, who has been a project leader and consultant for both the Africa and Pacific biosecurity champions, who represented a bureaucrat to whom the participants may need to advise of a serious outbreak; and Cathy from the Crawford Fund to represent an NGO with whom the participants may want to partner.

A panel of Australian senior journalists was organised providing the Fellows an opportunity to practice the skills they had been learning throughout the week through video, radio and print interviews. The panel included Dominique Schwartz, ABC's National Rural and Regional reporter who had previously been the ABC's Pacific correspondent; Robyn McConchie, one of Australia's most experienced radio journalists; Melody Labinsky, editor of Queensland Country Life and the North Queensland Register; and Laura Dymock, Channel 7 news journalist.

Each Fellow was assisted in (i) writing a trip report using the Crawford Fund's blog webpage; (ii) creating a communication strategy to be employed in their respective organisations after the five weeks away; and (iii) creating plant biosecurity advocacy posters targeting a range of different stakeholders. Each of these outputs is available upon request but left out of the body of this report. Each Fellow was also provided with two resource manuals created by Econnect Communication:

1. *Planning Communication into Science* – this 43 page manual outlines a seven-step process for effectively planning communication activities into research or technical activities;
2. *Presenting Science* – this 38 page manual takes the reader through all necessary steps across the four broad categories of planning your presentations, using visual aids, delivering your presentation and evaluating

4.4 Pacific Week of Agriculture 2019

The 2019 Pacific Week of Agriculture (PWA) was held in Apia, Samoa, and although it wasn't part of the program proposal, it presented a great opportunity to showcase the value and benefit of the network that the program is supporting. ACIAR's proposal for a side event was successful and in reiterating the message of cooperation

and collaboration the PPBP partnered with the Pacific Horticultural and Agricultural Market Access Plus (PHAMA Plus) program to deliver the side event.

There were presentations from four of the PPBP Fellows about their experiences with the program and how it had impacted their workplace; a joint presentation from Mr. Semy Siakimotu and Mr. Tagaloa Eddie about public private partnerships; an update on behalf of SPC-LRD from Mr. Visoni Timote, the PPPO Secretariat, about regional biosecurity challenges and initiatives; and joint opening remarks from ACIAR CEO Prof. Andrew Campbell and MAF CEO Tilafono David Hunter.

The side event was structured around the experiences and ideas from the Fellows. They shared stories from their respective workplaces and collaborated in listing priority topics for both PWA and the upcoming Pacific regional workshops. The side event was an excellent working example of a whole of government approach with participation from ACIAR, DA and the DFAT led PHAMA Plus program in addition to strong representation from the private sector which is too often lacking.

4.5 PPBP Online Learning

The first of the planned Pacific regional workshops was planned to take place in Port Vila, Vanuatu, in order to take advantage of the opportunity for experiential learning regarding Vanuatu's May 2019 Coconut Rhinoceros Beetle (CRB) incursion. The project team travelled to the venue the week before the workshop to finalise last minute preparations, this was at the very beginning of COVID-19's escalation in the Australian and Pacific media. The project team received emails outlining concerns from multiple NPPOs and made the tough decision to cancel the workshop, and as the situation escalated the second planned workshop also had to be cancelled.

The Pacific regional workshops were a key part of the PPBP program as they were intended to support the Fellows who took part in the Australian placements to assume a trainer role, within the workshops and afterwards, and deliver the program's learnings to a wider in country audience.

After a rapid appraisal of available options, it appeared that the most appropriate action to keep up the momentum with Fellows was to use online e-learning software, more specifically the use of an existing Learning Management System (LMS) model. A scoping study was performed and iSpring Solutions was selected as an LMS and authoring tool provider that best fit the program's goals and the Pacific context. Over the next 3 months the workshop's content was developed into eLearning content following the framework that the planned workshop provided, Table 3 provides details of the courses created.

Table 3 Details of Pilot Courses

#	Courses	Modules	Details	Duration
1	Welcome to PPBP Online	Welcome to PPBP Online	Article Course: 3 pages; 2 quizzes	0h 15min
		PPBP Vanuatu Workshop Agenda & Details	eBook: 5 pages	0h 15min
2	Surveillance & Communication	Surveillance Part I	Slide Course: 35 slides; 7 quizzes	2h 0min
		Surveillance Part II	Slide Course: 35 slides; 5 quizzes	2h 0min
		Planning Your Communication	Article Course: 7 pages; 4 quizzes	1h 0min

#	Courses	Modules	Details	Duration
		Planning Your Presentation	Slide Course: 30 slides; 5 quizzes	1h 0min
		Assignment: Country Update	Graded Assignment	0h 30min
		Online Discussion	Survey Weblink	0h 15min
3	Coconut Rhinoceros Beetle & Pest Risk Analysis	Coconut Rhinoceros Beetle (CRB)	Slide Course: 18 slides; 5 quizzes	1h 0min
		CRB Field Guide	eBook: 36 pages	1h 0min
		Pest Risk Analysis (PRA)	Slide Course: 37 slides; 8 quizzes	2h 0min
		Group Assignment: Express Regional CRB PRA	Graded Assignment	2h 0min
		Online Discussion	Survey Weblink	0h 15min
4	Ants and African Swine Fever	Biosecurity and Ants in the Pacific	Slide Course: 36 slides; 6 quizzes	1h 30min
		Introduction to African Swine Fever (ASF)	Slide Course: 30 slides; 7 quizzes	1h 30min
		Assignment – Impromptu Speaking	Graded Assignment	0h 30min
		Online Discussion	Survey Weblink	0h 15min
5	Networking, Planning and Partnerships	Public Private Partnerships	Article Course: 6 pages; 1 quiz	0h 45min
		What is Next for the PPBP Program?	Article Course: 1 pages; 1 survey	0h 30min
		Online Discussion	Survey Weblink	0h 15min

The aims of the developed online modules are aligned with the original workshop aims and the added benefits include:

- The number of participating individuals and agencies can be greatly expanded from the constraints of a costly regional face-to-face workshop
- Learning content can be tailor made and easily shared by the PPBP program team, Fellows, and other relevant stakeholders; and
- The timeframe isn't constrained to the length of a week-long face-to-face workshop.

These first round of courses developed were released with an understanding that they were part of pilot activities for the LMS and could be improved upon with feedback from Fellow's who had experienced the system. After 6 months of pilot activities all the data from the LMS was analysed, there is an extremely high level of detail available for user statistics. The date and time, number of attempts, the results and the duration of time a user takes for each quiz and item in each module is tracked. This information combined with comprehensive surveys and interview with Fellows, and a literature review of

eLearning best practice created a framework of updates that could be made to the courses that the Fellows rated as most useful for their workplaces.

These course updates were completed and included recording narration, creating scenario-based assignments applicable in Fellows' workplaces, and restructuring the presentation and delivery mechanisms, more detail is available in additional reports upon request. Table 4 below provides an overview of the updated delivery mechanisms.

Table 4 Proposed Delivery Approach

1	Enrol Participants	<ul style="list-style-type: none"> • Provide the option for learners to choose which courses to enroll in. A week-long call for sign up can be distributed through email groups and social messaging with the course to begin at the end of this duration; • With pilot activities for the PPBP LMS completed the number of users from Pacific biosecurity agencies can be broadened and not every course will be relevant for every learner; • Each course will be delivered one at a time in alignment with the collective momentum approach that fosters stronger collaboration and networking.
2	Launch Course	<ul style="list-style-type: none"> • Suggested course length, approximately 2 hours cumulative time for all components (i.e. combination of slides, quizzes, survey or assignment). In alignment with segmentation principle. • Suggested course duration 2 weeks, this allows ample time for completion around learner commitments. Setting deadlines and scheduled availability sets parameters for learner's time management; • Full support will be provided within this 2-week window by project staff through the LMS, via email, social messaging, and calls if needed.
3	Discussion Sessions	<ul style="list-style-type: none"> • Scheduled discussion sessions midweek during the second week, at an appropriate time for the most users. Once the timing is decided it would be best to keep this same time consistently; • Questions will be submitted in advance as part of the course, this will allow others to benefit even if they can't attend at the time; • Discussion sessions will be structured consistently. With the host reading through the course slides to begin; then answering submitted questions; and then an open discussion; • Discussion sessions will be recorded and uploaded as part of the course for anyone that isn't able to attend; • Using this approach, we could aim for just one comprehensive discussion session, however more are possible depending on availabilities and demand.
4	Course Completion	<ul style="list-style-type: none"> • Learners will receive a certificate, gain points and progress on the leader board; • Each course has a "Rate & Review" tab which learners are encouraged to complete, allowing course improvement; • Once completed, the course will reside in the "Course Catalog" this is viewable by any learner enrolled in the LMS at any time. Learners can self-enroll and use all of the content at any time, however support and guidance for the course from project staff won't be active until it is run again. The course catalog will be a categorized repository for all training • If popular and there's a demand, the course can be rerun in the future with any relevant improvements made.

The planned next steps required the online learning to be distributed to a wider audience with access given to all relevant staff members of Pacific Island National Plant Protection Organisations (NPPOs). SPC-LRD act as the secretariat for the Pacific Plant Protection Organisation (PPPO) and have responsibilities to 22 member countries in providing information, support and training to NPPOs.

Prior to COVID-19, discussions were ongoing with SPC-LRD/PPPO with agreements made that the PPBP program would sit under the mandate of the PPPO and continue past the lifetime of the program. Having an SPC-LRD staff member involved in all aspects of the program was extremely useful for both the Fellows as well as the project team. While the agreement was made in essence that the program would continue under the PPPO, the practical aspects of this decision weren't forthcoming in discussions. Post COVID-19 these practical aspects became easier to account for with the network created and resources available through a central platform. Without international travel for the foreseeable future these tools developed by the PPBP program will be extremely useful with minimal additional work or resources needed.

For the online learning to be distributed effectively it is crucial to have the endorsement and support from the PPPO and to communicate and disseminate through the existing regional channels. It took longer than expected likely due to the COVID-19 working environment, but an agreement was reached to host the online learning with SPC-LRD's own LMS. The relevant courses have been transferred in a compatible format and content experts have been connected with the SPC-LRD's online learning team. Initial discussions indicate the courses will be launched to coincide with other content that SPC-LRD has prepared in the second half of 2021.

5 Achievements against activities and outputs/milestones

Objective 1: To strengthen the technical capacity of biosecurity practitioners in the Pacific.

No.	Activity	Outputs/ milestones	Completion date	Comments
1.1	Application process that outlines strengths and weaknesses for each Fellow	All Fellows filled out applications which prioritised the areas they wish to improve on and areas of strength they could share with the group	April 22, 2019	Information provided in the applications was used as part of the baseline to develop appropriate online learning content
1.2	Biosecurity training and market access simulations workshop	All Fellows successfully completed the workshop	May 3, 2019	Further details of workshop activities can be seen in the 2019/20 Annual Report.
1.3	Development of a mentoring relationship with Australian host organisation	All Fellows completed 3 weeks of placement in host organisations	May 24, 2019	The Australian placement component of the program has concluded however nurturing the relationships formed through the comms network is a focus for the rest of the program
1.4	Networking with biosecurity professionals from other Pacific Island Countries and organisations and learning new approaches and skills from them	Five weeks of constant communication and groupwork with reps from 9 PIC NPPOs, 1 Pacific regional organisation, and 2 Australian government departments	May 31, 2019	The Australian placement component of the program has concluded however nurturing the relationships formed through the comms network is a focus for the rest of the program. Several of the hosts were able to accommodate two Fellows from different countries which created strong and enduring bonds for future regional collaboration on plant biosecurity.
1.5	Completing online learning modules, taking part in online group discussions.	Fellows worked individually and cooperatively on a range of technical courses which included assignment submissions	Aug 31, 2020	Fellows progressed through learning content at different speeds.

PC = partner country, A = Australia

Objective 2: To improve the communication, negotiation and advocacy skills of biosecurity practitioners in the region.

No.	Activity	Outputs/ milestones	Completion date	Comments
2.1	Biosecurity training and market access simulations workshop	All Fellows successfully completed the workshop	May 3, 2019	A more comprehensive account of the workshop can be found in the 2019/20 Annual Report
2.2	Development of a mentoring relationship with Australian host organisation	All Fellows completed 3 weeks of placement in host organisations	May 24, 2019	The Australian placement component of the program has concluded however nurturing the relationships formed through the comms network is a focus for the rest of the program
2.3	Networking with biosecurity professionals from other Pacific Island Countries and organisations and learning new approaches	Five weeks of constant communication and groupwork with reps from 9 PIC NPPOs, 1 Pacific regional organisation, and 2 Australian government departments	May 31, 2019	The Australian placement component of the program has concluded however nurturing the relationships formed through the comms network is a focus for the rest of the program
2.4	Communication master class	All Fellows successfully completed the workshop	May 31, 2019	Further details of workshop activities can be seen in the 2019/20 Annual Report.
2.5	Pacific Week of Agriculture, Side Event	The side event was structured around the experiences and ideas from the Fellows.	September 4, 2019	Fellows shared stories from their respective workplaces and collaborated in listing priority topics for both PWA and Pacific biosecurity in general.
2.5	Completing online learning modules, taking part in online group discussions.	Fellows worked individually and cooperatively on a range of technical courses which included assignment submissions	Aug 31, 2020	Fellows progressed through learning content at different speeds.

Objective 3: To initiate regional institutional capacity building (over the medium- to longer-term).

No.	Activity	Outputs/ milestones	Completion date	Comments
3.1	Five weeks of workshops and placements with 9 countries from the region and 1 regional organisation	A network of individuals with established relationships	May 31, 2019	The Australian placement component of the program has concluded. Follow up Pacific regional workshops will reiterate the knowledge gained with Fellows taking leading roles in these workshops.
3.2	Establishment of the PPBP WhatsApp group	Since returning to their own countries all Fellows are actively sharing in the comms group	April 22, 2019	Updates from the Fellows have included first-hand accounts of the CRB outbreak in Vanuatu and PACER Plus consultations in Tonga, African Swine Fever incursion, Fall Armyworm incursion.
3.3	Online learning and collaboration during COVID-19	Development of a LMS and online courses. Agreement with SPC-LRD that they will continue using these tools.	May 25, 2021	Online learning and interaction is fast becoming the new reality as travel restrictions remain. The PPBP program was very quick to pivot towards this option and has developed useful tools and guidance for the Pacific biosecurity space where there was none previously.

6 Discussion

All activities completed through the program to date have been evaluated by the Fellows who have provided both qualitative and quantitative information. The following is a selection of lessons learnt:

BIOSECURITY TRAINING & MARKET ACCESS SIMULATION WORKSHOP – BSASP

- More focus on simple diagnostics and procedures that are implementable in all PICs participating in the program;
- More Pacific examples and case studies;
- More analysis on decision making following the mock trading exercises;
- More natural light in the meeting room;
- Any lecture over an hour could use a small break half way;
- The Fellows have a very broad range of experience from country to country which makes it difficult to keep the entire audience engaged on certain module topics as well as engaged in mock trading exercises; and
- Each country group giving a presentation on their organisation and giving context to their operations was a very worthwhile inclusion that all Fellows and the project team benefitted from.

THREE WEEKS PLACEMENT IN AN AUSTRALIAN HOST ORGANISATION

- Despite having the same experience different participants will inevitably have a differing opinion for better or worse;
- The timing of the Easter public holidays and ANZAC day public holiday made communication with hosts quite difficult leading up to Australian placements;
- Differences in scale of economy and the associated fields of experience between target countries is a very important consideration when negotiating planned activities with hosts;
- Future programs should encourage host organisations to take Fellows in pairs as this avoids potential concern or anxiety by Fellows over individual placements. The project team recognises that this may not always be possible but the experience from this program supports hosting Fellows in pairs wherever possible and practical.
- Having the larger WhatsApp group and 7 additional location-based WhatsApp groups was invaluable in problem solving day to day issues across Australia (public transport, technology, accommodation issues, host organisation changes etc.);
- Ensuring that all the Fellows had the correct level of travel insurance that also covered emergency medical was a very worthwhile investment; and
- Setting up prepaid credit cards with a weekly allowance and the ability to track spending was a big factor in risk minimisation for the three weeks of placements.

COMMUNICATION MASTER CLASS – THE CRAWFORD FUND & ECONNECT

- The contracted parties delivering the Communication Master Class need to liaise with the project team more closely for information on the Pacific context and cultural sensitivity;
- Each group of Fellows was assisted in designing a fit for purpose communication strategy for their respective organisations. This was extremely valuable especially with different PICs assisting each other;
- Fellows would appreciate their own copies of the agenda for the week;
- A culturally aware presentation style is important to ensure confident and robust participation;

- Timing for group activities could have been better organised;
- Activities integral to the Communication Master Class, such as blog writing using a specific platform, should be tested for usability prior to commencement;
- Preparation for media interviews could have been better organised; and
- Evaluation surveys are more accurate when designed for anonymous responses.

ONLINE LEARNING

There were many comments from the surveys and additional information gained through the interviews, which formed project staff thinking on necessary updates in essence these comments fall into three categories:

- The PPBP LMS is a very welcome development however, transitioning to online activities is difficult at first if there is limited experience;
- The initial sign up process was the most difficult aspect of the online platform for most Fellows, once enrolled the LMS was straightforward to follow;
- Time management is the biggest impediment to course progress. This can be improved by increased regular face-to-face (webinar, video or voice call) interaction between Fellows and project staff; scheduling deadlines and course availabilities; and providing certificates as incentives

Some of the fundamental themes identified in the initial planning workshops have impacted the development and progress of the PPBP LMS. This includes high staff turnover in biosecurity agencies; agencies having competing priorities and are often under resourced; and agencies being vulnerable to external threats such as COVID-19, weather events, and emerging biosecurity threats. These points may not directly contribute to an updated LMS design however are important to note for the broader context.

In addition to the information provided directly by the Fellows the project staff have analysed the details of the user statistics and have come to the understanding that the original framework allows for too much learner control.

Learner Control

There are multiple trade-offs of learner control including learner satisfaction, the experience profile of the target learners, and the level of importance of skills being taught. One of the most consistent research findings is that learner control has little positive benefit for novice learners but may promote learning, or at least do no harm to those with high levels of domain-specific experience. The variation between both the Fellows' skills and experience in their professions; and also metacognitive skills, is extremely broad.

The original framework aimed to put Fellows in a high degree of control of pacing course progress; scheduling availability for group discussions; and parameters for deliverables. The intent was to make courses as unobtrusive as possible for under resourced biosecurity agencies facing national biosecurity threats and a pandemic. However, for the courses to be most effective to the most learners, minimising the degree of learner control is important.

Structured For Learners

Also of importance is focusing on structuring courses specifically for the benefit of Fellows learning online and minimising elements that would have been most effective in a workshop setting. Meaning that online learning will be more effective broken down into more manageable chunks with clear segmentation between modules, and a consistent and relatively short duration of time needed to complete individual modules.

Each component of the original course structures can be paused and returned to at the will of the learner however making this more explicit in the structure and presentation allows learners to better manage the required essential cognitive processing and most likely improve engagement with the courses.

The proposed details for future online course delivery combine the effective elements of the original design, with both the feedback from the Fellows and research based guidelines for e-learning developed by Richard Mayer and associates at the University of California. In essence the changes made to the courses focused on:

- Updating the communication and course release strategy. Moving away from the learn at your own pace approach, to a collective momentum approach;
- Scheduling course availability and setting deadlines and due dates with certificates as an incentive; and
- Opt-in scheduled zoom discussions rather than relying on Fellows to elect best availabilities and initiate guidance discussions.

7 Impacts

7.1 Scientific impacts – now and in 5 years

No direct scientific impacts were gained from the program and aren't anticipated in the future.

Through the lifetime of the program such impacts, if any, will relate mainly to an understanding of the effectiveness of different approaches to capacity building. If the approach currently being undertaken proves successful – and is convincingly shown to be so – it might be reasonable to hope that such carefully targeted, experiential learning, might be more widely used in biosecurity capacity building and in other fields of agricultural research and development.

7.2 Capacity impacts – now and in 5 years

Taking care not to confuse outcomes with impacts there are very few measurable impacts that have occurred.

Two impacts that have been made apparent through the WhatsApp group are that the Vanuatu and Tongan Fellows have returned home from Australian placements and were immediately provided opportunities in leading roles for high priority tasks within their NPPOs. For Vanuatu this includes a Fellow leading the operational response to a Coconut Rhinoceros Beetle outbreak, and another Fellow playing a key role in regional communication surrounding the response. The Tongan Fellows have taken part in consultations with industry regarding Australia and New Zealand's development-centred trade agreement PACER Plus.

Whilst the program did not have sufficient resources (or time) to track career developments of the Fellows several positive career changes were noted at the time of finalising this report that may, partially at least, be contributed to participation in the PPBP.

One of the Samoan Fellows, a senior biosecurity officer, had accepted a position with NZ Ministry of Primary Industries as Senior Pacific Biosecurity officer and will be responsible for progressing NZ Pacific regional biosecurity and market access initiatives and programs.

One of the Vanuatu Fellows, a senior biosecurity officer, had accepted a position as Vanuatu National Coordinator for the Australian and NZ funded PHAMA Plus program and will be responsible for delivering market access and biosecurity program related outcomes on behalf of the program in Vanuatu.

The second Vanuatu Fellow had applied for a position within SPC-LRD, the results of the application were not known at the time of finalising this report. Finally the SPC Fellow remains with SPC-LRD and now has been tasked with managing the PPBP under the PPPO Secretariat position within SPC-LRD. This will aid immensely in maintaining the goodwill and excellent regional communications platform, established under the PPBP.

Future impacts for a capacity building program such as this with a modest budget and timeframe allocation would typically be measurable five years from now. However, in island nations facing the realities of increased tourism and climate change it will be a complex task to differentiate impacts due to the program or from other external forces.

Nineteen Fellows have successfully completed workshops and placements as part of the Australia based component of the program and have achieved a level of lasting informal communication extremely valuable to their workplaces. These Fellows have contributed to a wider second round of learning with the development of fit for purpose online courses. Once these courses are released to PPPO member countries by the PPPO Secretariat

and SPC-LRD, the figures for information access and therefore usage and impact will rise dramatically.

7.3 Community impacts – now and in 5 years

7.3.1 Economic impacts

No direct economic impacts have yet been gained from this program, future impacts will be difficult to differentiate from other external forces.

By the nature of biosecurity work, it is difficult to identify likely impacts from the specific work undertaken throughout the program. Therefore, an illustration of the nature and scale of the kind of impacts that can be expected – or have been experienced, in association with ACIAR research investments or interventions by partners such as PHAMA in the past, is as follows.

Papaya exports from Fiji to Australia and New Zealand provide an example of an agricultural commodity export that is seriously impacted by biosecurity issues and where biosecurity interventions have had a discernible effect. During the period of ACIAR's 'Fiji Red Papaya project' (2008-2012), 'Solo Sunrise' papayas became Fiji's third-most-important agricultural export (after sugar and taro), with exports (mainly to Australia and New Zealand) fluctuating between around 100 and 500 tonnes per annum, worth between FJD0.26 million and FJD2.5 million (depending on destination and season), and providing a significant source of livelihood for between 150 and 200 farming households (plus additional employment along the value chain. In 2012, the papaya-producing (Western) region of Fiji was hit by two disastrous floods that reduced exports to zero for over six months (approximately the time needed to replant and bring the crop back into production). Just as exports were resuming, allegations surfaced that Fiji papaya was affected by bacterial crown rot (until recently the target of another ACIAR project, in the Philippines); rather than face a possible ban on imports from Australian biosecurity, Fiji's biosecurity service imposed a voluntary suspension of exports, allowing time for an authoritative (third-party) determination of the bacteria involved and sanitation measures to be taken, on and around the affected planting. In this case, the effect on livelihoods was relatively limited because production was low after the floods and most producers had switched to supplying the local market (taking advantage of high prices, pushed up by scarcity of the fruit). In a 'normal' year, each month of suspended exports would represent 30-50 tonnes of fruit, worth between FJD75,000 and FJD250,000 – so that would be the amount saved by every month that a biosecurity service strengthened in diagnostic or negotiating skills would gain through increased capacity.

In terms of livelihoods, taro exports affect a much larger number of producers. Fresh taro exports to New Zealand were Samoa's main agricultural export and main source of foreign exchange (as well as the country's main starchy staple) until, in 1993, taro leaf blight arrived; reducing exports to zero and sending prices of this staple food on the domestic market spiralling. It took almost 20 years and a major investment in plant breeding, extension and rebuilding markets (spearheaded initially by AusAID and subsequently taken up by DFAT's PHAMA program and ACIAR) for the new, disease-resistant varieties to restore local production and re-enter the export market. It is, of course, impossible to say whether heightened biosecurity awareness and measures could have averted the risk in the first place and saved many millions of dollars in lost livelihoods and overseas development assistance.

Profiting from the disappearance of Samoa from the market, Fiji rapidly built up its own fresh taro exports to Australia and New Zealand, reaching a value of some FJD20 million per annum and becoming the country's second-largest agricultural export (after sugar). The industry is estimated to involve over 35,000 farmers and provide a significant source of livelihood for their households, as well as providing employment for numerous additional men and women in the transport and processing of the commodity for export.

The disruption of exports to Australia in 2010 (involving the 're-export' of a series of consignments, worth some FJD0.5 million) was felt at all points along the supply chain (and most heavily in the small island of Taveuni where some 17,000 farm households supplied two-thirds of Fiji's taro exports). While the export pathway was not in this case actually suspended (thanks to the timely intervention of PHAMA and other biosecurity professionals – who undertook an overhaul and upgrade of the entire biosecurity system which was supposed to support the taro export chain; and some ACIAR research that helped to properly diagnose the underlying production problems); however, the disruption to economic development and livelihoods that would have resulted from an actual suspension would evidently have been enormous.

The aim of the proposed biosecurity-strengthening program is to reduce the risks of negative impacts of this nature and scale.

7.3.2 Social impacts

No direct social impacts have yet been gained from this program. Data from the online courses has shown that women have increased access and usage of information in comparison to typical face-to-face workshops in the Pacific. In Pacific agriculture women often play crucial roles throughout the value chain in industry as well as within regulatory bodies. However, this often isn't reflected in advancement opportunities, organisational support, or salaries. This outdated culture has been improving and this program aims to support this necessary change.

As noted previously, the impacts of pest-and-disease incursions and the interruptions of trade in those commodities that depend on smallholder producers (which, in this region, would notably include coffee and cocoa, as well as the crops discussed above) fall particularly heavily on poorer farmers and smallholders, who have limited resources to support them through periods of scarcity and limited options for switching to alternative crops and sources of income. Thus a program that enhances biosecurity and reduces these risks can be regarded as particularly important for the resilience in the livelihoods of the rural poor.

7.3.3 Environmental impacts

No major environmental impacts have yet been gained from this program beyond the analysis and distribution of information relating to invasive species that threaten target PICs.

Given the havoc wrought by invasive species on the fragile environments and biodiversity of small island developing countries, any investment in enhanced biosecurity must be regarded as having a potentially positive environmental and conservation of biodiversity impact.

Another dimension of the problem of invasive species is that incursions of unfamiliar species (into agricultural or natural environments) tend to be met with a barrage of chemical treatments, often untested or inappropriate, because the new pest species is unfamiliar – and this reaction itself has negative impacts on the environment. Again, investments in enhanced biosecurity will help to avoid these negative impacts.

7.4 Communication and dissemination activities

- A website has been established which acts as a repository for all program information. It provides information on all activities completed through the program and easy access to all partner websites involved with the program. The website also provides a mechanism that allows the expansion of the current

communication network through the social messaging app WhatsApp:
<https://kalanq.com.au/ppbp>

- A learning management system has been developed that hosts online learning, and discussion. This is being hosted at www.pbbponline.com and includes a promotional video on the landing page;
- There are 2 WhatsApp groups, one for program staff to post important announcements, information, and surveys; and one for all Fellows and stakeholders to chat informally, ask questions, and keep in touch throughout the life of the program and beyond. The groups have had over 1500 messages sent and almost 600 photos in this first stage of the program, the groups also act as a repository for lectures, documents, and links accessible by everyone. All reporting activities, journaling, capacity testing, and workshop evaluations were conducted through the WhatsApp groups and Google Forms;
- Google Forms has been used for all aspects of monitoring and evaluation, including journaling activities through the 3 weeks placement in Australian host organisations.
- As part of the communication master class in the fifth week all Fellows wrote a trip report blog post summarizing their time in Australia. All Fellows took part in at least two media interviews with senior Australian journalists in print, radio and film. A selection of these interviews were finalized and released through the Crawford Fund with one outlet being a global news agency “Inter Press Service”;
- During the Australian placements the project team wrote directly to NPPO managers updating them on their staff’s learning, and experiences with photo attachments;
- The project team have written comprehensive reports with details on activities, evaluations and lessons learnt for each component of the program. These have been distributed to the funding organisations and are available to relevant stakeholders interested in the logistics of organising a similar program;
- ACIAR Global Programs commissioned 108 drink bottles for the program with partner’s branding 60 polo shirts;
- The project team created all branding and promotional graphics. For consistency with ACIAR’s past program in Africa and simplicity of design the program has adopted the title “The Pacific Plant Biosecurity Partnership (PPBP)”

8 Conclusions and recommendations

8.1 Conclusions

Over the years many PICs have benefitted, and continue to benefit, from donor-supported national and regional sanitary and phytosanitary (SPS) - and biosecurity-related capacity building programs which have a focus on crop production and protection, trade and market access.

Donors and supporting agencies have included the SPC, Australian, New Zealand and other government foreign aid programs, FAO/IPPC and the WTO/STDF². Plant biosecurity related programs and projects supported have helped build institutional disease diagnostics, surveillance, inspection and risk analysis capacity, to facilitating market access for specific agricultural products.

Despite these biosecurity programs and projects, many agencies and the region as a whole are challenged when addressing pest and disease problems that impact on food production and limit trade and market access opportunities. These limitations are often ascribed to the diverse natural environments and highly variable agricultural capacity in the Pacific region, their geographical isolation but also the high movement of people and goods and limited institutional and private sector resources and capacity to address existing and new pest and disease challenges.

The program has contributed to and enhanced capacity-building efforts through improving technical skills; strengthening skills in communication, negotiation and advocacy; and importantly strengthening the regional plant biosecurity network. The establishment of peer networking arrangements linking experienced and early career biosecurity professionals in the region has been a successful strategy for sustaining the gains made through capacity-building investments. This has been seen in the interactions between the countries throughout the program with discussions on commonalities found in strengths and weaknesses in capacity when responding to country-based issues. Incrementally technical discussions have shifted from asking for the project team's viewpoints to informal intraregional discussions which have been effective in preparing for formal bilateral meetings for example between Solomon Islands and Kiribati.

The program has met the expected outputs seen in the proposal of increased individual and organisational capacity of biosecurity stakeholders, along with various organisational arrangements, tools and materials to support that increase in capacity. With the onset of COVID-19 and development of an LMS and online courses for Pacific plant biosecurity officers, the tools and materials first intended have been adapted and developed into something more fit for our current circumstances.

The expected outcome of the program is the improved performance of the biosecurity 'system' in the region, as evidenced by: diversified opportunities for trade in agricultural commodities (both for exports from the Pacific Islands to markets in Australia, New Zealand, North America and Asia, and for trade in such commodities among Pacific Island countries); improved detection of emergent and invasive pest and disease problems and reduced risk of further invasions; reduced disruption to existing agricultural commodity supply chains associated with biosecurity compliance issues, leading to greater profitability and more stable revenues. Eventual impacts should include greater and more stable income for smallholder farmers and communities involved in agricultural commodity production and exports and improved food security. However, as with all capacity building

² The Food and Agriculture Organisation of the United Nations (FAO); International Plant Protection Convention (IPPC); World Trade Organisation (WTO); Standards and Trade Development Facility (STDF). Example programs include SPC-BATS; Australia -PHAMA, ACIAR and Department of Agriculture; NZ-Pacific Biosecurity; EU-FACT/IACT; and USDA-APHIS Quarantine Training.

programs, the outcomes and impacts aren't measurable during the lifetime of the program. Within the Pacific context the outcomes and impacts will be especially difficult to separate from external factors due to the new COVID-19 operating environment.

Importantly, the regional organisation responsible for biosecurity related activities within the region the SPC-LRD Pacific Plant Protection Organisation (PPPO) Secretariat has agreed to house and resource future delivery of the PPBP, beyond the end of the program, to continue to build on the successful biosecurity platform established during the program. This is a strong indication of the usefulness and popularity of the program within the region and provides a key sustainability outcome for the program.

8.2 Recommendations

Many of the activities that contributed to the effectiveness of the program cannot be replicated in the near future due to the worsening conditions of COVID-19 in the Pacific and travel restrictions. The technological divide was a barrier that took a lot of resources (staff time for technical support and guidance) to address during the online learning component of the program, the biggest issues were availability of communication equipment and supporting infrastructure, as well as lack of experience and hesitancy.

It is recommended that the response to the technological divide be adequately resourced in future programs this would include: investigating software/technology familiar to those in country; being aware of bandwidth intensive actions such as videos or downloads; having mobile focused activities as computers aren't always available; having options for participants to interact at times that suit their availability outside of other obligations; having project staff dedicated to technical support and guidance. For further details of considerations for the technological divide see the *Development of an Online Learning Management System for the PPBP – Scoping Report (2020)*.

Allocating adequate time and resources to allow all participating countries to nominate, prioritise and analyse common strengths and weaknesses in the regional biosecurity system and to discuss the results in person during a weeklong workshop provided the foundation for the entire program. With enough preparation this activity could be conducted remotely and is highly recommended. Through these activities NPPOs and regional entities determined a lack of capacity in communication as one of the underlying causes for other common issues and communication skills became a pillar of the program.

Lack of knowledge and experience within NPPOs is often outlined as a central issue, however throughout the program this was consistently disproven. It is recommended that in future capacity building programs systemic organisation level capacity development be a focus of the program design. NPPOs must be able to retain and effectively use skilled and experienced staff, knowledge must be shared readily, and opportunities provided based on merit. Mechanisms that support an effective NPPO should be investigated and strengthened on a case-by-case basis, this would include: standard operating procedures, communication systems and procedures, information storage and processing, and education and training schedules as a starting point.

9 References

9.1 List of publications produced by project

Title	Year	Author
<i>Pacific Plant Biosecurity Capacity Building Program – Planning Workshop Report</i>	2018	P.Duthie
<i>Improving Plant Biosecurity in the Pacific Islands - Annual Report</i>	2019	P.Duthie
<i>Pacific Plant Biosecurity Partnership Australian Placements</i>	2019	P.Duthie
<i>Pacific Plant Biosecurity Partnership Network Progress</i>	2019	P.Duthie
<i>Expanding ACIAR's Pacific Plant Biosecurity Partnership – Concept Paper</i>	2020	P.Duthie
<i>Development of an Online Learning Management System for the Pacific Plant Biosecurity Partnership - Scoping Report</i>	2020	P.Duthie
<i>Improving Plant Biosecurity in the Pacific Islands - Annual Report</i>	2020	P.Duthie
<i>Pacific Plant Biosecurity Online Update</i>	2020	P.Duthie
<i>Development of an Online Learning Management System for the Pacific Plant Biosecurity Partnership – Final Report</i>	2020	P.Duthie