



Transformative Agriculture and Enterprise Development Program

TADEP+ Update

September + October 2019

Key program activities

2020 and beyond

Planning has commenced for the final stages of TADEP+ and how to best showcase the program. PNG Country Manager, Doreen Iga, and Program Coordinator, Elizabeth Brennan, travelled to Canberra the week before last to meet with a number of ACIAR staff to consider program activities, budgets and communications. The discussion points and ideas have been circulated with the Project Leaders and a biannual Steering Committee meeting has been proposed for mid-February 2020. Elizabeth will also be travelling to Canberra in early December 2019 to meet with our DFAT colleagues to ensure broad engagement and input.

TADEP+ website

If you're looking for historic info on any of the TADEP+ projects or the program, all the previous TADEP+ Updates are collated and uploaded to the TADEP+ website. [Click here](#) to view all TADEP+ Updates.

Social media

Here are a few relevant Facebook pages and groups you might like to follow or join:

- [ACIAR](#) (page)
- [Australian High Commission PNG](#) (page)
- [Bougainville Chocolate Festival](#) (page)
- [AROB integrated cocoa and goat project](#) (group)
- [Supporting Sweetpotato production in the Highlands](#) (page)
- [PNG Family Farm Teams](#) (page)
- [Galip Nut community](#) (group)

Mark these dates in your diary and calendar:

- PNG Impact Conference, Port Moresby: Tuesday 3 and Wednesday 4 December

Key project activities



Bougainville Cocoa

Chris Poto, from Hahon Family Farm, was awarded the Best of Show at the 2019 Bougainville Chocolate Festival. Chris's prize was a cash grant to enable him to advance his cocoa business. Chris submitted his business plan to Mr James Butubu, the Bougainville Cocoa Project Manager. It included rehabilitation of his fermentary and drying facilities, and aspects of wet bean buying. Plans for the rehabilitation of the fermentary and drier have been approved, and most of the necessary cladding and piping has been ordered and delivered. Saw millers are in the process of delivering the necessary timber to start construction. The plan is to extend the drier to the right of the pad, build a new drier, and shift the fermentary boxes about five metres away from the drier. Chris intends to use 3-1 box system, that is, have three fermentary boxes but only fill two. Then each day transfer the beans to the empty box.

[Click here](#) for the full Bougainville Cocoa project update

PNG Cocoa

The project team travelled to Open Bay in remote New Britain and established nurseries with cocoa hybrid crosses, totalling approximately 2,000 seeds across three locations.

A successful field day was held near Aitape in West Sepik and demonstrated all phases of cocoa development from nursery management, seed germination and bud grafting, to block pegging, lining, field management, food crop integration and post-harvest processing including fermentation, drying, and taste profiling.

Family Farm Teams training was delivered by Josephine Saul and Robert Taula to over 30 participants over 2.5 days, mostly



husband/wife teams who stayed overnight in Karimui township. DAL staff and John Kohani attended throughout the training.

A refresher training with provision of notes on production of clonal cocoa by budding (including pods selection, seed preparation, types of budding, and materials used for budding) was conducted for DAL officers in New Ireland.

[Click here](#) for the full PNG Cocoa project update



Sweetpotato

The kaukau growers who travelled to Australia earlier in the year have implemented a number of the production strategies observed in Australia, most notably the use of seedbeds to multiply klin kaukua vines. Photobooks documenting the growers visit to Australia were presented to each of the growers, and generated widespread community interest.

A paper examining the impacts of the grower visit, including the enhanced standing within their communities that was evident when the photobooks were distributed, is being prepared for the PNG Impact Conference in December.

A training module to assist growers in understanding markets and preparing a business plan to secure finance has been finalised and will be rolled out to project participants.

[Click here](#) for the full Sweetpotato project update

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. The program initially had five component projects, of which two have concluded. The program now comprises of the following:

- **Bougainville Cocoa** - HORT/2014/094 Developing the Cocoa value chain in Bougainville
- **PNG Cocoa** - HORT/2014/096 Enterprise-driven transformation of family Cocoa production in East Sepik, Madang, New Ireland and Chimbu Provinces of Papua New Guinea
- **Sweetpotato** - HORT/2014/097 Supporting commercial Sweetpotato production and marketing in the Papua New Guinea highlands

TADEP is co-funded by the Australian Centre for International Agricultural Research (ACIAR) and the Department of Foreign Affairs and Trade (DFAT).



Australian Government
Australian Centre for
International Agricultural Research



Whilst two of the initial five TADEP projects have concluded, they have evolved into an ACIAR Small Research Activity (SRA) and another ACIAR project, respectively, and both have keenly agreed to continue to contribute to TADEP. The following updates demonstrate this continued collaboration across research disciplines, sharing useful and relevant insights.

Family Farm Teams

The final report for the Family Farm Teams project has been completed. [Click here](#) for the report.

The Family Farm Teams project's work in PNG will continue with a project *Gender equitable agricultural extension through institutions and youth engagement in Papua New Guinea* led by Jo Caffery from the University of Canberra in partnership with the Pacific Adventist University. This project's aim is to adapt and apply the Family Farm Teams model for institutions (churches) and youth engagement in PNG.

A second project will begin in 2020 to further develop the Family Farm Teams model in the Solomon Islands. This will be led by Deborah Hill also from the University of Canberra.

We are in the planning process for a Family Farm Teams Masterclass for TADEP+ project staff in the second half of 2020 - for further information about FFT, please contact Barbara Pamphilon Barbara.pamphilon@canberra.edu.au

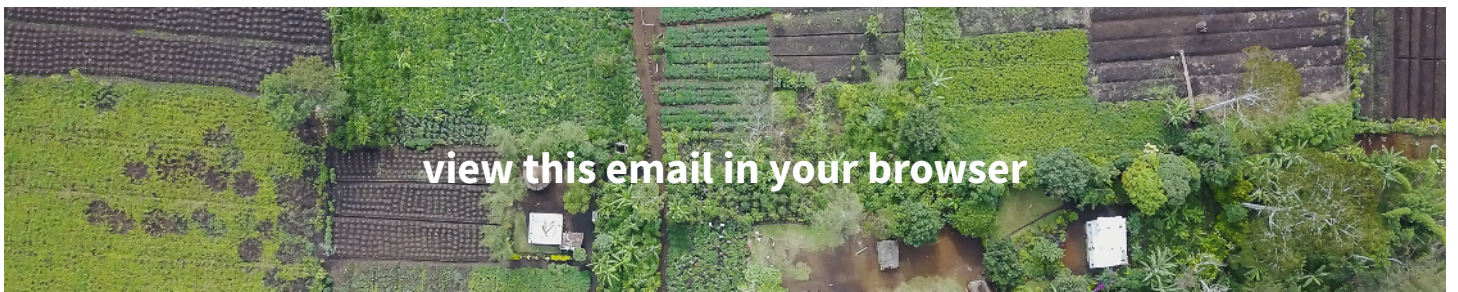


Galip Nut

The current Galip Nut project is in its final stages, before transitioning to the next project. Nut volumes this year are low and only a few tonnes have been sold to the NARI factory so far. The project team is trialling buying nut-in-shell in the hope of increasing the volumes. The new project is currently being finalised and is planning to commence in December 2019.

[Click here](#) for the full Galip Nut project update

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Key dates

- Visit to Bougainville week commencing 6 February 2020 to meet with in-country project teams and monitor field activities.
- Taste and Tell tentatively proposed for week of 16 February 2020.

Lessons learnt and challenges

- Communications between regional team members and between Australia and Bougainville remains an ongoing issue due to poor network quality and intermittent connection. We have established a WhatsApp group which has proved to be more effective than emails, but we still face difficulty contacting our counterparts.
- We have wound down many operations due to the Bougainville Peace Referendum to be held in November and the impacts this has on project partners and communities.

Recent and upcoming project activities

Mid-term review

- A report from the ACIAR Mid-term Review held 2-9 July 2019 was received on 14 October 2019. The project team is now evaluating the report, has prepared a response report and discussed with Mid-Term Reviewers and ACIAR Horticulture RPM, Irene Kernot.

Staffing

- Borgia Sinato has joined the team as Village Resource Centre Coordinator to support and monitor the work on establishing the 33 Village Resource Centres. He will work with ABG-DPI and be based in Buka.

Fieldwork

- Village Extension Workers (VEWs) Benjamin Tatou, Martin Masen (with Malasang Women) and Chris Poto (Chocolate Festival ‘Best of Show’ winner) in North Bougainville were assisted with funds for their 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, poultry and vegetables. All the other VEWs will be encouraged and assisted to do the similar activities when required depending on their progress.
- Visits to Chris Poto’s farm and Asples Holding’s cocoa farms (Kunua District) were a success as we were able to get their cocoa dry bean samples for marketing purposes and had a discussion on areas for improvement on their farm.
- Yield (dry bean/ha) was estimated using ripe and mature pods and cherelle counts for 25-year-old small cocoa clones in Kubu, 12 and 18 months after rehabilitation (see Figure 1). Released clones 34-13/2, 73-14/1 and 63-7/3 maintained their yielding potential higher than non-released clones 24-7/1, 24-4/4, 23-6/1, and 17-7/4 (separate article to be produced later) in the preliminary observations. Rehabilitation training on old hybrid and clones were initiated in farmers’ fields and will continue.

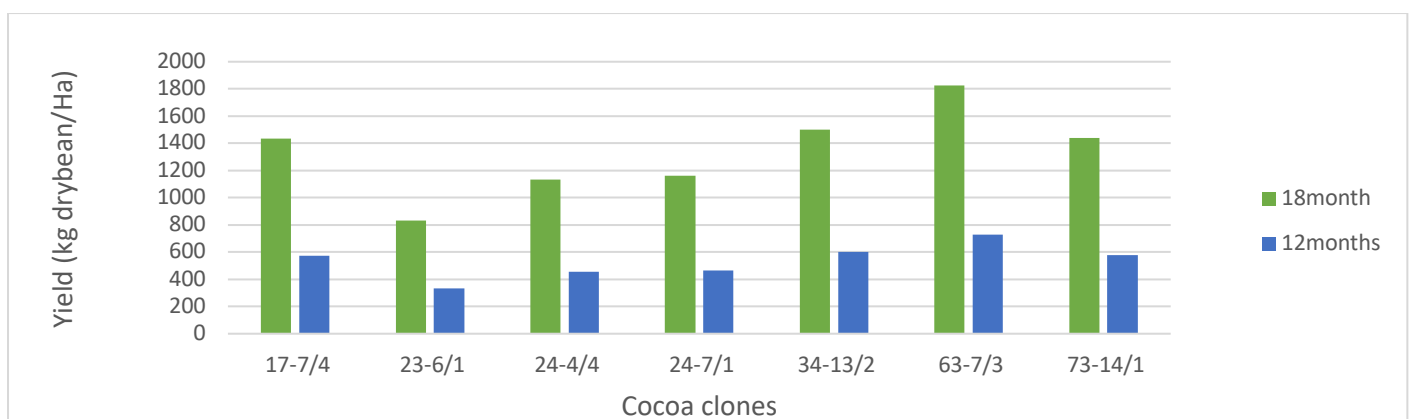


Figure 1: Yield estimates for cocoa clones 12 months and 18 months after rehabilitation

- There has been ongoing communication and engagement with key stakeholders. Grant Vinning met with the Cocoa Board officer Mr Joe Yabom in Kokopo to discuss how to assist other Provinces with chocolate machines, chocolate processing trainings and chocolate festival hosting in the future. The Cocoa Board has also provided support to project staff in the North with use of their vehicle during trainings and field trips. The Commodity Support Facility (CSF) of the Bougainville Partnership continues to engage with us during consultative meetings, updates and reviews.

Chocolate festival

- A meeting was held in Arawa on 3 October to review the 2019 Bougainville Chocolate Festival. The meeting was attended by representatives from ACIAR, DPI and growers from Siwai, Buin and Arawa regions. The review looked at issues associated with grower involvement as well as the festival itself.
- Festival Steering Committee held on 8 October.
- 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.

Year	Total samples	Bean sample quality assessment data	Location of Samples assessment	Chocolate processing
2016	unknown	Unknown Low data collection capability	DPI-External assessors No capacity at DPI department	Paradise Food (Queen Emma)
2017	41	Unknown Low data collection capability	DPI-External assessors- No capacity at DPI department	Paradise Food (Queen Emma)
2018	126	<ul style="list-style-type: none"> •26.2% (33/126) high quality •60.8 % poor quality (13.5% low smoke + 47.3% high smoke tainted, under or over fermentation, poor bean flavor/odour) •47.3% Rejected –being for high smoke tainted, under or over fermentation, poor bean flavor/odour <p>Other detail physical assessment available but not included</p>	<p>Training of over 20 on cocoa bean Assessment (DPI and exporters) with ACIAR Project at Buka</p> <p>Bean Quality Assessment done in DPI by trained officers Chocolate lab set up</p>	Local processing in DPI/ACIAR Lab in Buka
2019	78	<ul style="list-style-type: none"> •53.8 % (42/78) high quality •46.2.8 % poor or low quality (13.5% low smoke + poor bean flavor/odour) •0 % Rejected –being for high smoke tainted, under or over fermentation, poor bean flavor/odour 	Assessment done by trained staff at DPI-Buka chocolate Lab	<p>DPI/ACIAR Lab in Buka DPI/ACIAR Lab in Buka</p> <p>Developing high capability with Chocolate festival improvements & Government decisions to develop and control the Cocoa industry AROB</p>

Figure 2: Bean quality assessment and progression on cocoa quality improvement, cocoa sample assessment and capacity building.

Chocolate laboratory

- Laboratory equipped with a fryer for roasting and grinder for making chocolate powder.
- Discussions held with Joe Yabom on his interest to acquire cocoa processing equipment

Goats

- Medicines procured from RSPCA by UNRE, still to be administered.

Workshops/events

- Merrilyn Walton and David Guest attended a University of Sydney/GAIN Public-Private Workshop on Workforce Nutrition in Utrecht, Netherlands from 19-20 September. We are working with GAIN (Global Alliance for Improved Nutrition) to better understand how chocolate companies can support the livelihoods of smallholder cocoa farmers. We developed a proposal to investigate the impact of farmer family health and nutrition on living incomes based on our research in Bougainville.

Cocoa marketing

- Grant Vinning developed and distributed the October #19 Cocoa Report.

- Grant Vinning met with colleagues from the Department of Economic Development to discuss the economics of exporting cocoa.
- Samples collected to be taken to Cocoa of Excellence Exhibition in Paris where beans from PNG are competing in the final.

Research dissemination

- The team is currently in the process of writing a series of articles based on the livelihood survey data.

Collaborative Research Grant: “Examining ways to improve nutrition and food security in ‘at risk’ villages in Bougainville”

- There have been significant delays in village monitoring due to heavy rains and flooding, causing some villages to be inaccessible. First round of monitoring has been completed and uploaded into CommCare for the Central and North; South to be completed this month.
- Some of the food diaries have been collected for North, Central and South; the remainder will be collected during the next month’s monitoring visit.
- Family Farm Teams training is tentatively scheduled to commence in December or early next year. Family Farm Team trainers are yet to submit budget estimates so that funds can be released.
- We have developed budgeting and reporting templates for our in-country partners to use for updating on activities.
- Compost production and vegetable production are slowly being adopted as training continues for the with VEWs and farmers as well as in Vegetable Nutrition program. See Figures 3, 4 and 5 below.



Figure 3 and 4: One and three-month-old composting heaps

Figure 5: Vegetable seedlings raised on compost media

New Britain

- Trevor made a 4-day extension and cocoa planting trip from 15 to 18 October to the Sabali Care Centre in Open Bay where about 2,000 people from Ulamona Village are refugees from the eruption of Uluwun volcano and are living under harsh conditions. On the 15th, he drove from Kokopo to Matanakunai Village, Open Bay where he dug a nursery and planted 60 seeds of each of the latest 10 hybrid crosses and met with a group of farmers led by Jacob Maui. About 25 groups have expressed interest in planting cocoa. He also planted cuttings of kava from NARI Keravat as a potential new crop. On the following day he travelled by dinghy to the Sabali Care Centre in West New Britain where he had a meeting with farmers at Ambrose Vetata’s block at Kabaia. Many farmers expressed interest in planting cocoa in preference to Oil Palm. They consider Oil Palm work too hard for a small return, and have found that soils are depleted under the palm. Trevor planted a nursery of the 10 hybrid crosses as at Open Bay, and also planted kava cuttings and gave out numerous vegetable and fruit seeds. He visited Balima area further west towards Kimbe where one farmer, originally from Pangia in CHP, has 1,700 cocoa trees. On the return boat trip to Open Bay, he visited Baia Village and repeated the planting of hybrid cocoa seed and kava cuttings on the block of Tony Lagisa, although the visit was limited because of a *haus krai*. Altogether 2,000 special latest hybrid seeds were planted in the three locations. This is a collaboration with the Cocoa Board, although board staff were unable to accompany Trevor on this trip.

- Trevor has continued regular discussions with David Yinil, the Administrator of the Research Extension and Development Services (REDS) section of the Cocoa Board.

East and West Sepik

- Project Coordinator Timothy Sam attended the 1-week Cocoa Board internal review at Kokopo until 4 September and then returned to Wewak to meet Trevor, David Yinil and Chris Fidelis to drive them 6 hours to Aitape in West Sepik to attend a successful Field Day held by Wilson Miroi at Awareh Poro Block 137 on 5 September. On the way they had to wait for flood waters to subside, but were picked up by Wilson for the 2-hour drive to Poro and were able to visit one of Wilson's cluster group nurseries and the first cocoa block that has been prepared for the Aitape-Lumi Cocoa Project.
- Stations prepared at the field day site demonstrated all phases of cocoa development from nursery management, seed germination and bud grafting, to block pegging, lining, field management, food crop integration and post-harvest processing including fermentation, drying, and taste profiling. Speeches were made by David, Trevor, Wilson and the Administrator of Aitape-Lumi District, John Anep. About 500 people, including many women and young people, attended. Wilson was very impressed by the attendance and interest shown and intends to hold two per year from now on.
- Wilson has 42,000 budded clones in the nursery at Poro, half for sale by bare rooting to PPAP in the Maprik area of East Sepik and half for distribution to farmers in his groups. He plans to begin metal fabrication of kiln pipes, and needs a roller of the type Trevor developed in Bougainville. The ACIAR project will supply roles of plastic for building of Solomon types solar dryers.
- Wilson's project supervisor, Grace Klembasa, did an excellent job of organising the crowd to the different stations and vetting cocoa samples of cocoa which is being sold through Outspan at present. She has again won the cocoa excellence award in the Lae show organised by the Cocoa Board and was to go to Paris for the awards in late October, but the Cocoa Board has again reneged on funding her trip, which was promised as the prize for her award.
- On 7 and 9 September Trevor, David, Chris and Timothy drove to Yekimbole and met with Nola and Chris Sasingian and Thompson Fafungian to discuss the soil fertility trial on kunai grassland and the use of solar fans in the solar dryers. They are getting 36% recovery of dry from wet beans, compared with 27% for Agmark. The ripper has been brought from Ambunti to Pagwe by canoe and will be available for the trial. They also visited the goat project at Niumindogum and observed that the goats have not been well fed. In fact, one has died and it was suggested several should be sold to the farmer group at Passam.
- The team then visited CMFT Moses at Burue and suggested relocating the budwood garden to a better drained site and the planting of a wide range of trees such as kamerere, acacia, swam mahogany, galip and mango to lower the water table near the village. Many trees are growing well around the village. It has been suggested that seedlings in the nursery be budded with material from Blamda budwood garden. They visited CMFT Kenny Nako at Blamda, accompanied by DAL Senior Crops Officer Angela Gossiba. 6,000 seedlings in nursery, to be budded by 8 trained budders. Each of the 26 group members has received 200-300 clones from the nursery already and a further 20 each to be delivered. A further 50 households have received bud wood from the budwood garden (BWG). About 5,000 bud sticks have been sold out at 80 toea each, helping group income. The nursery and BWG have been certified by the Cocoa Board. The group was advised to use cheap glad wrap budding tape.
- Then the team drove to East Yangoru and visited CMFT Xavier Manijembi at Kwaian. He has done impressive work on rehabilitating old cocoa blocks using chupon budding with members of the group. The BWG needs extending to all 18 CCI clones. He does not seem very interested in the nursery and was advised to give a youth group or women's group an opportunity to establish a commercial nursery and sell clones and seedling to PPAP, the Governor's Cocoa Program or the new EU program. So far Xavier has distributed bud sticks to about 200-300 farmers in the surrounding communities and taught them how to do chupon budding for rehabilitating old trees, including budding at the jorquette to give a mixture of genotypes on the one tree. Trevor, David and Chris returned to Kokopo on 11 September.
- REDS staff have constructed a new nursery at Hawain and seedlings are being established for budding.
- The CMFT at Bararat, Scott Rambanare, has been an outstanding success in establishing the project in his home village and in many surrounding villages. The project will support him with a motorbike so that he can more readily travel to the satellite villages, and Timothy has been teaching him to ride.
- On 25 September, Timothy travelled by canoe to Kambrimdo village to inspect a new fermentary/dryer built by the farmer group. This was followed on 30 September by a trip by banana boat to Mushu Island, Wewak District, where a farmer group has taken the initiative to begin establishing clonal cocoa and paid for the extension visit. Training was conducted in all aspects of clonal cocoa planting and management.

- From 3 to 12 October, Timothy collaborated with Kanika Singh and Chris Fidelis to lay out the soil fertility trial at Yekimbole and collect initial soil samples. From 21 to 27 October other project sites were visited to assess progress. All four tyres on the project vehicle had to be replaced, indicating the tremendous amount of travel involved in the project.



Figure 6: Setting up soil fertility trial at Yekimbole



Figure 7: Group of farmers at Poro Field Day, West Sepik



Figure 8: David Yinil alongside the solar-powered fans inside solar dryer at Yekimbole



Figure 9: Timothy Sam alongside pigeon pea at Yekimbole

Madang

- Cocoa Board/ACIAR Extension Staff and the assigned districts DAL officers visited project sites to assess BWGs and nurseries. Seven nurseries holding more than 14,000 rootstock seedlings (over 1,000 budded) were visited at Nuku, Erima, Gumaru, Rempi, Sualu, Amiten and Laiden. Over 400 bud sticks were supplied and five casual budders were engaged to carry out budding and train farmers. A total of 18 BWGs are being established and 5 (Rempi, Mabonob, Tamane, Balama and Kumisanger) have been completed ready for certification by the Cocoa Board. Thirty-five farmer's blocks were visited and advice given on maintenance.

- Visits to more remote project sites were limited because coordinators as were spent two weeks producing submission papers to the National Planning Department for the European Union Funding (EU) allocation for Madang Province.
- On 3 September, Bofeng made a 3-day visit to Usino field sites (Nuku, Danaru, Korona, Dumpu, Maono), with usually about 3-8 farmers (one female) being contacted. 5 out of the 8 goats at Korona had died. A visit was made to farmers at Rempi where Chris Anton camped overnight to survey blocks (11 blocks surveyed, 8 female, 21 farmers, 15 female contacted); confirmed a total of 15 farmers still involved in the project with over 600 clones planted. Rempi group is building a commercial nursery with help from the project staff. Visits were also made to Balama (5 farmers, 2 female) and Erima (5 farmers, 2 female, 5,000 rootstocks budded and over 2,000 clones raised; interest in a solar dryer), Tamane (8 farmers, 2 female), Mabonob (6 farmers, 2 females), Amele (5 farmers, 2 female).
- Problems encountered – cost of fuel is limiting field visits and both project vehicles need a full service; farmers have a ‘free-handout’ attitude which can’t be met by the project and reduces farmer involvement; DAL district officers lack resources to assist with project activities. Limited project funds cannot support DAL district officers for field activities, pay CMFTs monthly wages as planned, nor provide additional materials and tools for the extension sites.
- The office at Didiman No.2 requires urgent repairs and maintenance but funding has been the constraining factor for many years. All casuals including the office secretary, field staff and budders are currently being paid by ACIAR only. While originally 22 sites were selected, extension groups have been formed bringing the number to almost 50 groups, with a current farmer population over 1,000 farmers. Each of these sites consists of a Cocoa Model Farmer Trainer (CMFT) and 24 member farmers (disciples), a budwood garden (BWG) and Nursery and a Model Block. These facilities are located in the CMFTs area on customary land. The CMFTs have been targeted to receive trainings on all cocoa activities and received all tools/equipment and materials he/she then trains the disciple farmers. Several groups such as Iku, Bunu and Igruwe were omitted as a result of non-performance.
- Many groups abandoned nurseries after producing and field panting of clones. The groups still operating nurseries afterwards are (Rempi, Mabonob, Gumaru/Gohe, Balama, 4mile, Amele, Erima, Bom, Bang, Kumisanger, Amiten, Sualu, Laden, Aiom and Jitibu). Nurseries set up previously were simple ones only for the purpose of training. If farmer groups interested in establishing commercial nurseries have been advised to do so at their own costs as the project has no funds to build permanent commercial group nurseries.
- At the start of the project, the main central nursery was operated at the Stewart Research Station at Murnas where all clones for BWG were produced and supplied. After the split of KIK and Cocoa Board in 2017, the cocoa nursery operation was stopped as the station was handed over to KIK. Relocation and establishment of a new nursery is not possible at this stage due to lack of Cocoa Board funds although several potential sites have been identified.
- Nineteen BWGs were visited and maintained at Mabonob, Tamane, Balama, Erima, Kumisanger, Galeg, Dumpu, Korona, Maono, Danaru, Nuku, Rempi, Karkum, Kaviak, Klumlang, Amiten, Sualu, Apengan and Amele. Six BWGs ((Rempi, Mabonob, Tamane, Balama, Kumisanger and Korona) are ready for certification. More than 1,000 bud sticks were harvested from established BWGs this quarter for nurseries and chupon buddings in rehabilitation blocks. Most farmers are more interested in planting budded clones than seedlings and so the project is emphasising budding. Since the loss of Murnas station, hand pollinated hybrid seed is now quite expensive as seeds have to be ordered from the Cocoa Board station at Tavilo in East New Britain.
- Farmers are very enthusiastic about solar dryers but need funding support for their construction, possibly from the provincial government. The farmer, Anthon Higuai, who was awarded second prize for cocoa bean quality at the Cocoa Board Cocoa Festival at Lae is currently constructing a solar dryer using materials obtained from Agmark Ltd as his prize.
- Two radio broadcasts on cocoa project activities were made on NBG Radio Madang. This an effective way of delivering ideas and knowledge to farmers who rely on local radio broadcasts for important news and information

Highlands

- On 1 September, John Konam supplied shade cloth and polybags to DAL, Eastern Highlands Province, and advised on cocoa development. From 2 to 6 September, he flew into Karimui to supervise the project and visit CMFTs. As cocoa production has steadily increased, with weekly flights carrying 15 bags of dry beans to Goroka, farmers are wanting their own fermentation boxes and are frustrated by Norman Mondo’s failure to provide the boxes as originally arranged and paid for by the project. Norman, the CMFT in Ward 5, has not

been mentoring other farmers, often working with the Cocoa Board independently of John. He was one of the winners at the Board's Cocoa of Excellence Show in Lae and his cocoa sample is one of the two or three from PNG nominated for the Cocoa of Excellence Festival in Paris in late October. A new CMFT should be identified to work with farmers in Ward 5.

- John Konam and John Thomas decided that the CMFTs should work through their 25 disciples to identify and mentor a representative of every clan to trial the 18 CCI clones, building up their own trial clonal gardens by budding from the material produced by tipping in the budwood gardens already established by the CMFTs. A key criterion to identify the clan representatives is that they should already have budding skills that can be used for field budding following lining, shade establishment and field raising of cocoa seedlings.
- From 23 to 26 September, Family Farm Teams training was delivered by Josephine Saul and Robert Taula to over 30 participants, mostly husband/wife teams who stayed overnight in Karimui township for the 2.5 days of training. DAL staff and John Konam attended throughout the training.
- Trevor flew to Goroka and with John Konam had an enthusiastic meeting with the head of Eastern Highlands Province DAL, Bubia Mose, and staff on 30 September. They visited the resource centre on Okapa Rd and plantings of clones at Bena with Mr Naisman, showing how to manage clones and providing cocoa seed of known crosses as well as mixed seed from Karimui for testing. They then drove to Kundiawa and had a meeting on the following day with Simbu Provincial Administrator, Michael Tenai, then with senior staff including Deputy Administrator Economic Services, Essi Welkai Kaima, and Provincial Advisor, Steven Show, and agriculture staff including Chris Mondo, Provincial DAL Secretary and Eric Gore Crops Officer. Simbu DAL has not been regularly paying their casual staff in Karimui, creating jealousies against the ACIAR technical officer, John Thomas, in Karimui. Funds have been allocated for the road into Karimui, but delays have been caused by disagreement over allocation of funds between the two MPs concerned. The road still has 14 km to go. The main barrier is the crossing of the Waghi River, for which use of flying foxes was suggested. After the meeting the team drove to Banz in Jiwaka Province, and visited a farmers group in Banz with Anthony Kerue (Coordinator Economic Services). The group was filling 10,000 polybags and had already planted half with cocoa seed, with seedlings intended for the Upper Jimi area.
- About 1,000 seeds were given to a women's and youth group, a private initiative led by Jessy Kamb. It was suggested that the seedlings be bare rooted for transport to planting sites. The group is also interested in food processing and had shown initiative in fertilizing their cocoa nursery with pig manure.
- On 2 October, Trevor and John drove to Mt Hagen, met WHP Provincial DAL Secretary Martin Pitt, and travelled to the lower Mul Baiyer area with Crops Officer Libai. There has been tribal fighting in the area where the cocoa nursery was previously established and so seed was given for another site near the Mul Baiyer District Office, where we met Peter Komseai, DAL District Officer. Another site was visited at Kaunsel Kanga's home a couple of kilometres from the office. The climate is coastal type and cocoa is expected to grow well.
- The sites are also on or not far from a sealed road, making it easy to market cocoa.
- In the afternoon they drove to Pangia, Southern Highlands Province where they spent the night.
- On 3 October, they drove to Kumiani Village with District Ag Officer, Alex Aiyopi, where he has a successful nursery and has already planted out about 300 cocoa seedlings in his block.
- Tephrosia, the temporary shade often used for coffee, is being used along with bananas, while and other food crops have been planted and drains dug. They later drove to Ialibu and met Nelson Yamba, second in charge of Provincial DAL for SHP. Also present was Meli Kunua, research officer SHP and Alex from Pangia. It was agreed that SHP has great potential for cocoa with lower altitude areas including south Pangia, Erave, Samberigi, Sugu, Komo, Lake Kutubu, and Bosavi, where it is expected cocoa would do well. Up to 50% of the province could be suitable. Eddie Wep in charge of the Kutubu area should be kept informed. The main problem is a lack of vehicles to service these areas. They then drove to Mendi to meet Kulex Igibu from Kutubu who had been ringing regularly asking for seed. Seeds of the 11 latest hybrid crosses were given to him, plus unselected seed from Karimui making over 1,000 seeds.
- On 4 October, they drove to the Bible Mission Station at Paprapuk where cocoa trees were observed bearing pods, with one tree having over 100 pods. They met Lina, Peter Epaina's sister, who teaches there. She is keen to trial a block of cocoa when we are able to assist her. One old man near her house has a tree heavily loaded with pods. John returned to Kundiawa and Trevor returned to Kokopo on 5 October.
- During all the visits to EHP, Jiwaka, WHP and SHP Administrations, partnership arrangements were discussed and the latest eleven hybrid cross seeds and Karimui open pollinated seeds plus Cocoa Farmers Handbooks were supplied.
- In SHP, the possibility of the ACIAR project supporting Peter Epaina's placement for 2020 in his home area of Pangia was discussed and SHP officers agreed in principle and welcomed the idea. SHP will consider taking

on Peter as a cocoa adviser and scientist when their new structure is funded. There is an outstanding opportunity for an experienced cocoa breeder like Peter to guide the selection of cocoa types adapted to highland environments.

- From 7 to 11 October, Peter Bapiwai and John Konam worked in Karimui to assess the clonal trial, from which tipplings will be distributed as budwood to the chosen representatives of clan groups. The project technical officer, John Thomas, who was based permanently in Karimui, has had to be relocated to Goroka.

New Ireland

- A refresher training with provision of notes on production of clonal cocoa by budding (including pods selection, seed preparation, types of budding, and materials used for budding) was conducted for DAL officers.
- Most project sites were inspected except for Murat LLG, which includes Tavol (CMFT Robin Tameriki) and Tarairai (CMFT Charles Aturoro). The patrol trip to Murat LLG was not possible due to bad weather around August/September. Dr and his wife Logie have relocated to Nongo Hospital in East New Britain and have yet to nominate a successor CMFT for Djaul Island (Leon). The following project sites were visited in September and Parafilm was provided to all CMFTs to assist with budding:
 - Manggai – CMFT Arawes Mazemat lacks an outreach program but is being advised to encourage farmers to build site nurseries and do field budding; the fully mature BWG at Manggai will need to be used to encourage new growth of budwood.
 - Panamecho - farmers are still committed to their cocoa activities especially establishment of a commercial nursery by David Kapia. They have two BWGs.
 - Laraibina farmers under the leadership of David Waulas are still committed in their cocoa work, and the nursery and BWG are well maintained. The goat house and enclosure has been completed but the transfer of goats from UNRE Vudal has been delayed due to concern over disease and quarantine.
 - Luapul - CMFT Cathy Miroi is still liaising with her interested farmers and their nursery and BWG are still maintained.
 - Langenia - a land dispute has hindered CMFT Rapheal Kanamale in maintaining his nursery and his BWG. He is still visiting his interested cocoa farmers.
 - Katedan - BWG and nursery are still maintained, and the CMFT is still in contact with his cocoa farmers.
 - Lemeris - 24 farmers are still working on their cocoa and the BWG and cocoa nursery maintained.
 - Karu - maintenance of nursery and replacement of dead clones in the BWG is required, but CMFT Kalu Eliap is still working with the interested cocoa farmers.
 - Komalabuo - BWG still maintained and farmers are still committed but plants in the nursery are overgrown due to delayed distribution.
 - Dampet - BWG and nursery are maintained and interested farmers are still maintaining their blocks.
 - Burau - the excellent BWG and nursery are still maintained, and budding is taking place, but a land dispute is restricting CMFT Subul Hus and his family from performing their work on the land. Mediation on the land is yet to take place.
 - Bo - CMFT Nick Misi's BWG and nursery are well maintained, budding is progressing well and interested farmers are still attended to.
 - Sohun (CMFT David Nason) - progress has been slow and advice on the relocation of the BWG and the nursery has not been heeded.
 - Sena - BWG and nursery are maintained and interested farmers still maintaining their blocks.
 - Marinsoan - BWG has been maintained and farmers are still interested but the nursery requires maintenance.
 - Umbukul and Noipuas CMFT sites on New Hanover Island - BWGs and nurseries have been maintained and farmers are still maintaining their blocks.

- Phil Brown, Kirt Hainzer and Cathy O'Mullan travelled to project sites in PNG in September. The growers who had travelled to Australia earlier in the year have implemented a number of the production strategies observed in Australia, most notably the use of seedbeds to multiply klin kaukua vines. Planning for further

project support to promote adoption of practices such as irrigation occurred with the farming communities in order to maintain the momentum for commercial production that has built up through the project.

- Photobooks documenting the growers visit to Australia were presented to each of the growers, and generated widespread community interest. A paper examining the impacts of the grower visit, including the enhanced standing within their communities that was evident when the photobooks were distributed, is being prepared for the PNG Impact Conference in December. Another technology that garnered huge community interest was the HP Sprocket, a small portable printer that connects to a mobile phone via Bluetooth. www.hp.com/Sprocket This allowed the team to leave communities with a photographic record of project events and could be used to generate photos for things like name badges for participants at workshops and focus sessions.
- A training module to assist growers in understanding markets and preparing a business plan to secure finance has been finalised and will be rolled out to project participants through the Community Development Worker program managed by Chris Gard. The PNG National Development Bank has been engaged in the development of the training and have expressed interest in engaging in the program. NDB may play a role in the PM's proposed investment in smallholder agriculture, so training of farmers to prepare them to access loans through that initiative is timely.
- Data collection has commenced in Kirt Hainzer's PhD project, titled *From subsistence to commercial agriculture – capturing the impact of value chain interventions in Papua New Guinea through a decolonising, participatory approach*. Focus group sessions were held with the people from the communities of farmers involved in the project. Views of men and women are collected separately, and the farmers were absent to encourage open discussion of impacts of klin kaukau vine introduction to their communities.
- Cultural barriers affecting the widespread commercial distribution of klin kaukau vines both within the communities where screenhouses are located and to other surrounding communities have been identified. Research has commenced to better understand these cultural factors to ensure appropriate strategies are used as the project scales out access to klin kaukau vine across the Highlands provinces.



Figure 10: Printing with the HP Sprocket



Figure 11: Viewing instant photos

See link in the TADEP+ Update to download the Project Final Report.

Galip Nut

- The current galip project is in its final stages. Nut volumes this year are low and only a few tonnes have been sold to the NARI factory so far. The project team trialling buying nut-in-shell in the hope of increasing the volumes. The new project is currently being finalised and is planning to commence in December 2019.



Figure 12: Trial purchase of nut in shell- Equanut staff sort the nuts at the factory.

- There are now four private sector processors in operation, each producing a range of different products. Two processors, Denis Hill and DMS and are supplying products in Port Moresby and Denis Hill is now selling galip nuts products in supermarkets in Lae. These two processors are sourcing kernel cracked by smallholders in the village. The majority of DMS suppliers are women and children.

Melanesian processors meeting

- Votausi McKenzie from Lapita Café, a processor of Canarium nuts from Vanuatu who has been processing nuts and other products for a decade, visited Kerevat and met with the processors (Equanut, NARI, Denis Hill, Dorothy and Rodney Luana from DMS). There was an information sharing on buying, processing and marketing the nuts.



Figures 13 and 14: Votausi McKenzie from Lapita Café meets with Dorothy and Rodney Luana (DMS) and Dalsie Hannet (NARI)

Collaborative Research Grant

- Galip compost indicated to be high in nutrient content and the galip waste compost at 25 and 35 t/ha had significantly higher nutrient (particularly nitrogen and phosphorus) than control. The paper is under review in Scientific Reports.

- We also applied galip compost with low rates to sweetpotato and the samples are currently analysed.
- Good news: Biochar in Vanuatu, in our compost workshop at NARI last year, we had also demonstrated biochar production. Prof Helen Wallace, Dr Shahla Hosseini Bai and Brett Hodges met Votausi Mackenzie-Reur in Kokopo. Votausi was excited with the concept of using organic waste to produce biochar or charcoal and requested a biochar making workshop in early 2020. She thinks that she can produce charcoal to be sold for cooking and biochar used as soil amendments.



Figure 15 (above): Dorothy's from DMS working kitchen in Kokopo



Figure 16 (right): Shahla measuring moisture content of Dorothy's products



Figure 17 (above): Mathew and NARI team helping to subsample soil for compost project (effects of galip compost on soil nutrient concentration in a sweetpotato farm)

Figure 18 (below): Galip team presented the results of galip compost and draft of the videos and cookbook to UNRE staff and students.

