Darwin Initiative
Final Report

*To be completed with reference to the Reporting Guidance Notes for Project Leaders (http://darwin.defra.gov.uk/resources/) it is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)*

Darwin project information

Project reference	23-008
Project title	Upgrading and broadening the new South Pacific International Coconut Genebank
Host country/ies	Fiji, Papua New Guinea, Samoa
Contract holder institution	Bioversity International
Partner institution(s)	Kokonas Indastri Koporesen (KIK-part of Papua New Guinea (PNG) Gvt); Gvt of Fiji; Govt of Samoa, the Asia Pacific Coconut Community (APCC[1]), *Centre de Coopération Internationale en recherche agronomique pour le développement* (CIRAD), Pacific Community (SPC), the Global Crop Diversity Trust, and the International Treaty for Plant Genetic resources for Food and Agriculture (ITPGRFA)
Darwin grant value	£317,884
Start/end dates of project	1st June 2016 - 31st March 2019
Project Leader name	Vincent Johnson
Project website/blog/Twitter	project webpage (ongoing projects / news at http://www.cogentnetwork.org/
Report author(s) and date	Vincent Johnson, (Alexia Prades, Luc Baudouin, Alan Aku) 9th September 2019

1 Project Rationale

Although coconut provides significant nutrition and multi-million dollar income for more than 8 million Asia-Pacific households, there is scant support for conserving its endangered genetic diversity. In many Pacific islands, this diversity is seriously threatened by climate change, potential sea-level rise, soil salinization, and other challenges such as pests and diseases. Not all representative coconut diversity is adequately conserved in the International Coconut Genebank-South Pacific (ICG-SP) in Papua New Guinea (PNG). Moreover, the existing PNG genebank is currently threatened by a lethal disease[2]. It is currently being transferred to a safe site in PNG, with a duplication back-up planned in Fiji and Samoa (Figure 1). The proposed Darwin Initiative-supported work was aimed at complementing this transfer with **prospecting missions** in the three countries and **building capacity** for the three new Pacific genebanks. For

[1] Now the International Coconut Community see https://www.apccsec.org/
[2] See http://www.cogentnetwork.org/bogia-syndrome-disease

the new ICG-SP sites, international and local experts have been helping to **identify promising, un-conserved cultivars**. It was proposed that the most-endangered areas would be explored for collecting and conserving threatened new coconut germplasm, taking into account local uses, resistance to cyclones and diseases along with gender-disaggregated trait preferences. This project also aimed to help in training young scientists in coconut breeding and GR conservation. It aimed that all data should be accessible in the Coconut Genetic Resource Database[3] (CGRD). It had been proposed that selected cultivars would then be safely moved to one or more of new PNG, Fijian or Samoan genebank sites. The new multi-site ICG for the Pacific was to have been placed under the International Treaty for Plant Genetic resources for food and Agriculture (ITPGRFA) to benefit the regional and global community. COGENT's recently updated *Global Strategy for the Conservation and Use of Coconut Genetic Resources*[4] highlights the need to conserve Asia-Pacific diversity, following extensive feedback from country-members, and coconut industry stakeholders. Indeed the Darwin Initiative funded work has helped in updating the final version of above-referenced global strategy.

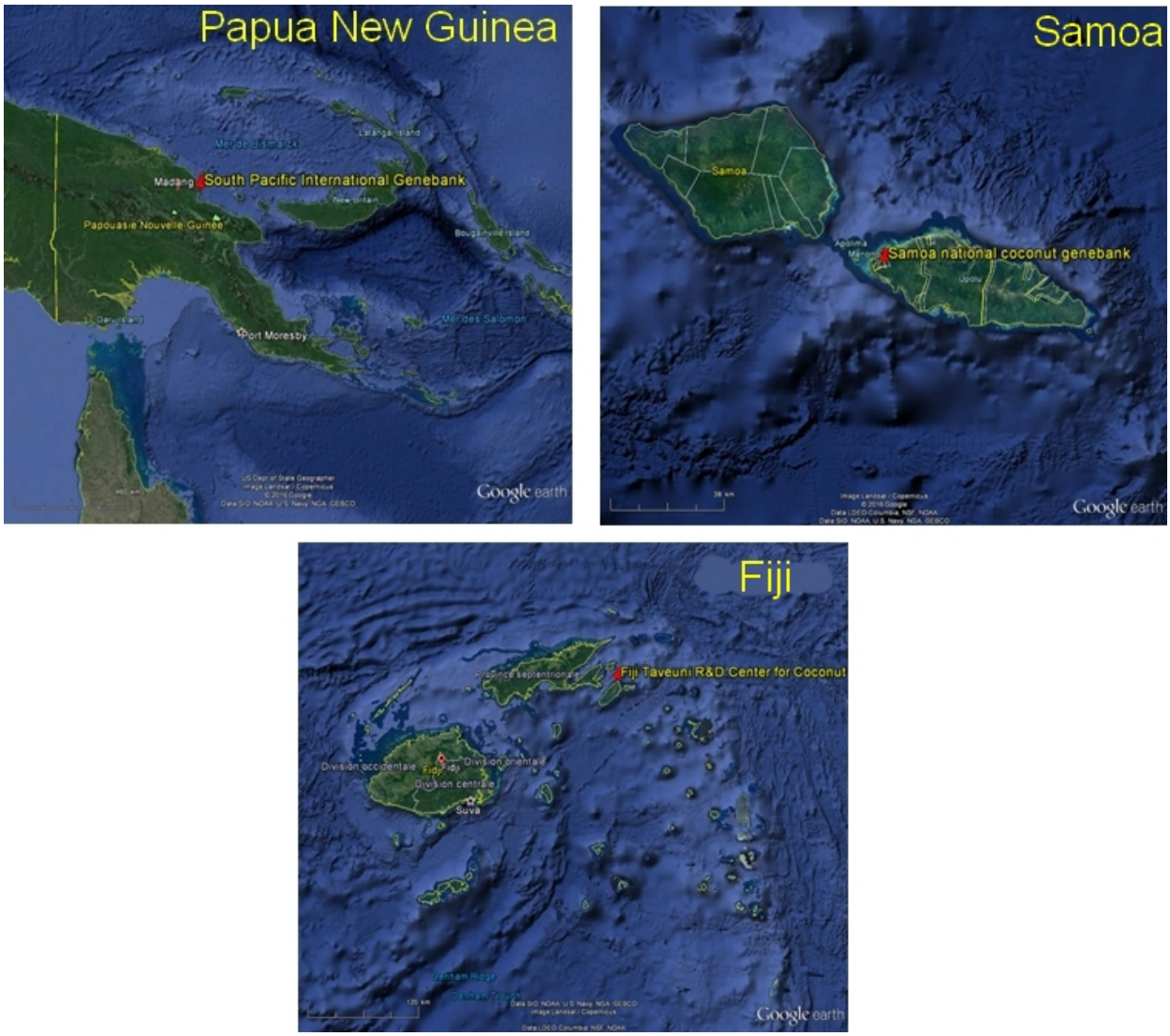

Figure 1: South Pacific International Coconut Genebank in Madang, Papua New Guinea, National coconut genebank in Olemanu, Samoa, and National Coconut R&D Center in Taveuni, Fiji.

[3] See http://www.cogentnetwork.org/cgrd-version-6-0-test-version

[4] See https://www.bioversityinternational.org/fileadmin/user_upload/Cogent_bourdeix_2018.pdf

2 Project Partnerships

Project partners included:

- Along with Cirad, the 3 Governments of Papua New Guinea (PNG-KIK)), Fiji and Samoa were the main partners tasked with implementing the project in the field. Main tasks were to prepare the genebank sites, participate in prospecting missions for threatened germplasm and contributing to the development of the germplasm characterisation guidelines.
- Bioversity International, CIRAD, SPC, APCC, the Global Crop Diversity Trust and the ITPGRFA (added end year 2) were tasked with bringing their expertise and knowledge from the global level.

Overall the project interactions have strengthened relationships between all project partners listed. Particularly stronger relationships are described in emerging relationship opportunities below. All project partners remain in touch, and KIK and Cirad have been the main contributors to compiling this report, which has been reviewed by all partners.

Changes in Partnership/ grant management:

In December 2017, project leadership was transferred from the CIRAD member of staff seconded to Bioversity (Dr Prades) to a full time Bioversity staff member (Mr Vincent Johnson) aiming at tighter management of activities and partnerships. The change addressed key recommendations from the review of year one report, and aimed at improving the overall timeliness and quality of project implementation. The project had been designed to be managed by a Steering Committee composed of one representative of each partner, aiming to hold meetings and make decisions also through a remote consensus process by email. During the second year, there was one SC meeting held in Samoa in November 2017.

An ongoing challenge to effective partnership was to keep everybody actively engaged in the project. The number of partners was rather high and they are from different types of organizations, working differently with varied rules. Also the 9-13 hour time-zone difference added a logistical constraint, as finding a time to interact virtually also continued to prove challenging. Finally, budget allocations to main governmental partners were relatively low, and as such proved less of an incentive to engage.

Depending on the project roles of the partners, different letters of agreement (LoAs) were prepared for the partners. During the second year, we again succeeded in signing LoAs with 2 out of the 3 Governments involved. APCC, SPC and the Trust remained on board. Because of delays in implementation, following the 2017 SC meeting, the budget and activities, were rescheduled for all partners in 2018. A change request (see supplementary annex 1) and grant extension request were submitted in February 2018, and the project activities suspended pending Defra's decision, as project stakeholders were uncertain of what funds could be disbursed in any endorsed carryover. After more than a year, at the end of March 2019, Defra informed us of its decision not to allow budget carryover or grant extension.

Specific Partner Changes

- In the second year, from March 2018 Dr Luc Baudouin of **CIRAD** took overall responsibility for CIRAD's overall technical liaison, with other participating CIRAD staff under his coordination, and remained the leader of the International team of experts (ITeX) that was guiding the germplasm prospecting missions (ITeX 1).
- The **SPC** had requested we provide separate LoAs for the coconut mapping work and the ITeX 2 Genebank legal work, as the two members of staff were working in different departments. Most of the scheduled SPC work never started.
- **KIK of PNG** remained very active in their support for validating the draft prospecting guidelines (see supplementary annex 2) developed earlier in year 2 and during the training session in Samoa, and subsequent validating mission to PNG
- **Samoa**'s government representative was changed from Misa Konelio to more pro-active David Tilafono Hunter, who strengthened project expertise by engaging Tolo Iosefa as

coconut germplasm specialist. The government provided in-kind hospitality for the 2017 SC meeting which was inaugurated by the Samoan Prime Minister and Minister of Agriculture.

- The Government of **Fiji** did not sign LoAs for years 1 and 2. It seems that the relatively low amount of allocated grant funding is below a floor-level that would trigger prompt interaction for LoA signature. However, they participated in all the SC meetings and interactions, were present and very active at the inception meeting, and had been active in preparing the Fijian genebank site and for germplasm prospecting.

Emerging Partnership Opportunities

- Project interactions with ITPGRFA, initiated during the 6th governing body meeting in 2015, and reinforced during the 7th governing body meeting 2017, thanks to the project have helped revive communication channels regarding coconut germplasm conservation and use, promoting a more active dialogue, and collaborative ethos. This has partly led to the articulation of 5 new tripartite agreements between ITPGRFA, COGENT and the respective International Coconut Genebank host government (see supplementary annex 6 for agreement template). We are planning to sign these agreements at the ITPGRFA 8th Governing Body Session in November 2019.
- Towards the end of year 2, following interactions with the **ITPGRFA** for the SC meeting, Francisco Lopez of the Treaty offered to co-lead the team of experts that would guide the legal framework and agreements development for the new Genebank (ITEx 2). However, ITEX 2 could not really begin its work until prospecting missions were underway, so work never began. However, project partners collaborated in developing a successful bid for the ITPGRFA benefit sharing call submitted in February 2018, led by **SPC**, to provide funds for follow-on work for transferring germplasm and further developing the Genebank sites. This was designed as a part of project exit strategy (see supplementary annex 3).
- Holding the 18th COGENT SC meeting and workshop in Fiji (end 2017) back-to-back with our Samoa SC meeting provided economies of scale and networking opportunities to develop synergies with a new SPC-led, EU-funded Asia Pacific coconut value-chain project entitled: *Coconut Industry Development for the Pacific* (**CIDP**)[5]. **ACIAR** funded the COGENT workshop and these interactions have strengthened our partnership with them, leading to offers of further support for the COGENT network, including financial support for network coordination and an invitation to submit a proposal for AUD 0.5 million to support the transfer of COGENT's secretariat to its new host.
- The **Asia Pacific Coconut Community** (APCC), (now the **International Coconut Community**-ICC) opted to participate in this project as a partner, and as a result has now assumed responsibility of hosting COGENT, rather than Bioversity International. This will dynamize the network, now being hosted within the world's principle coconut producing zone. Project interactions have also forged a strong alliance between Bioversity and ICC that will promote more collaborative initiatives along the coconut value chain from genomics and breeding through to efforts to strengthen nutrition and food security. Provisions are underway to sign a memorandum of understanding between ICC and Bioversity, as well as the transfer agreement for hosting the network (see supplementary annex 4).
- The **Global Crop Diversity Trust** also participated in the SC Meeting in Samoa in 2017, providing insights into how the multilateral system of exchange should work, and expressing support for building capacity in the region.

[5] See https://eeas.europa.eu/delegations/fiji_en/29646/Value%20chain%20workshop%20to%20propel%20growing%20coconut%20industry%20in%20the%20Pacific

3 Project Achievements

For a summary of progress against the project logframe, see annex 1.

3.1 Outputs

The project achieved many of its intended outputs as follows:

3.1.1 Output 1. *Maps and models of current and future threatened coconut cultivated areas in the Pacific have been made available on the COGENT and SPC Websites*.

The responsibility for output 1 was originally allocated to a Cirad mapping expert, who was unable to assume project responsibilities at inception, so a new mapping expert was identified within SPC. The SPC-based expert published some key inventory information in the Pacific Islands GIS&RS Newsletter[6]. No maps were produced by this expert, partly because the budget allocated was said to be insufficient to pay for the tasks required. However the expert provided an outline of Pacific Islands GIS & RS Mapping activities and published some key inventory information in the Pacific Islands GIS & RS Newsletter (see link below[7] and supplementary annex 8, attached as separate pdf).

3.1.2 Output 2. *An effective coconut germplasm management plan for the Asia Pacific developed*

The regional coconut germplasm management plan had six main components:

i. **Establishing two teams of technical experts:** During the first year two teams of international experts were identified: i) a technical team possessing expertise on coconut conservation and diversity (ITEx 1), and ii) a legal and governance team to help establish the framework for managing the germplasm that was to be assembled (ITEx 2). During year 1 the terms of reference for both teams were established, agreed and validated by the project steering committee. Individual nominations and team compositions were agreed. ITEx 1 was quickly established and began working on some other components of the germplasm management plan (see below)

ii. **Developing Coconut germplasm characterisation guidelines:** for characterising and selecting Pacific cultivars to be preserved (also relevant to cultivar choice elsewhere). The guidelines have been produced (see supplementary annex 2) and will support field staff in effectively collecting coconut germplasm characterisation data according to an agreed set of descriptors, during germplasm prospecting missions.

The project developed the use of tablets to collect the data for individual palms *in situ* as a key innovation for genetic resources mapping and characterization of the Pacific, and this was validated in PNG (see supplementary annex 9b). A six-person team was trained to perform and record phenotypic observations on coconut according to a newly developed protocol. The use of tablets to record data was easily adopted. The guidelines and its appendices were found to be convenient. The size of the team (six persons) and a target number of five palms observed per site are realistic.

Section 3.5 of COGENT's updated *Global Strategy for the Conservation and Use of Coconut Genetic Resources* focuses on collecting and filling gaps in ex situ collections. The global objective of COGENT for filling gaps in ex situ coconut collections within the next decade is **to collect up to 500 well-chosen populations or varieties and**

[6] http://www.picgisrs.org/wp-content/uploads/2018/11/PGRSC_Newsletter_Issue_2_20181123.pdf

[7] http://www.picgisrs.org/wp-content/uploads/2018/11/PGRSC_Newsletter_Issue_2_20181123.pdf

successfully transfer them in ex situ genebanks. Once characterised, the coconut diversity can then be prioritised for conservation. The diversity that is thus characterised by relevant criteria descriptions (morphometric, biochemical…), will be further described with more precise DNA 'fingerprinting' molecular analysis. This will provide firm corroboration of observed diversity, and help pinpoint which germplasm should be prioritised for conservation. These guidelines provide a precise protocol whereby all data is collected in the same way. Within the framework of this project we had aimed to identify important diversity which is not yet conserved, and is threatened by climate change or some other significant threat.

iii. **Drafting a cultivar list describing endangered regional coconut diversity**

ITEx n°1 was unable to publish a comprehensive list of the endangered diversity prioritising that needing to be preserved because the mapping was not implemented. Current regional accessions of 55 accessions- 14 dwarf and 41 tall cultivars- are listed in supplementary annex 5). Samoan and Fijian registered diversity is available in the Coconut Genetic Resources Database (CGRD[8])

iv. **Preparing an overall coconut germplasm diversity collection plan** (3 country subsections)

Collection was a potential activity that depended on complementary funds. The project aimed to prepare for collection that would be done thanks to another project or thanks to country funding support (like in PNG). The coconut germplasm collection plan was to have been designed by ITEX n°1 based on the results of the mapping and the list approved by the SC. In the absence of mapping information, the team drafted plans for two prospecting missions in PNG and Samoa. There was a possibility to begin collecting (in PNG) thanks to the Government support, but this was highly dependent on the availability of complementary funds. PNG collected 8 accessions which they put in Misima Island. We had already adjusted down the plans to identify candidate germplasm in prospecting missions, that could be transferred later using ITPGRFA funding we secured.

v. **Moving 5 - 10 threatened accessions to one of the 3 identified new ICG-SP genebank sites**

Logistical constraints outlined in previous reports and project extension and budget carryover decision delays have not allowed the project to implement identifying, conserving and registering new accessions. However, the main genebank in PNG has moved 12 accessions to its new site, collecting these from the original sites to avoid BCS phytoplasma transfer.

vi. **Developing, finalising and signing MOUs and MOA for multi-site genebank governance**

Because the planned prospecting missions for threatened material were never implemented (as no funding carryover allowed into Y3), although ITEX n°2 team members were identified, the team did not advance any formal governance plans. However, interactions have helped establish what governance measures will be needed. Indeed, catalysed by Darwin project interactions, new article 15 tripartite agreements COGENT, the International Treaty (ITPGRFA-FAO) and the five ICG host governments have been drafted (see supplementary annex 6). It is hoped these will be signed at the upcoming ITPGRFA 8th Governing body meeting in Rome (November 2019). The ICG-SP in PNG will include provisions for the multisite operation to include Fiji and Samoa.

[8] see http://www.cogentnetwork.org/cgrd-version-6-0-test-version

3.1.3 Output 3. *Training and capacity building provided to the staff of the 3 genebanks and to young scientists*

Training the genebank staff by ITEX 1 was implemented in conjunction of International Coconut Community capacity building programme, the project Inception meeting in Fiji (June 2016); the mid-term project and Steering Committee meeting in Samoa (Nov. 2017), and the back to back 17th COGENT SC capacity building workshop (Nov. 2017). Further ICG staff capacity building was provided in the Cirad visit to validate the characterisation guidelines in PNG in 2018.

A PhD student was recruited and began his thesis work during the first year of the project. He went on to become a key member of PNG's coconut breeding team. However, he delayed registering with University of the Philippines for personal reasons until too late

The project proposal had envisaged engaging 6 MSc students (2 for mapping, 1 for Policy, 2 for breeding and 1 for database) to trained in coconut conservation. One MSc (male) in breeding was engaged for PNG. He did not complete the MSc but was provided with extensive technical training. the remainder were not engaged as their fields of study could not be offered until project implementation had reached a certain stage. We had interviewed for and offered a place to the coconut database MSc, but he accepted and then declined. The afore-mentioned delays prevented engaging the remaining masters students. Had we received endorsement to carry over into year three, and to extend the grant for a further year, there would have been time to engage MScs, and complete much of the PhD thesis.

The project proposal had also planned training at least 9 persons (30% female) of the planned staff of the ICG-SP. 29 participants coming from Fiji, Samoa and PNG (17.2% female) were trained on how the multilateral system of germplasm exchange operates. They were also trained in coconut germplasm characterisation during COGENT and Darwin SC meetings in Oct/Nov 2017. A six-person team was trained in PNG to perform and record phenotypic observations on coconut, using an electronic, tablet-based data capture system, according to a newly developed protocol (see 3.1.2 point ii above). Further trainings had been planned virtually/ in situ, during year 3, including a special training on controlled hand pollination (see supplementary annex 7), including back-to-back training with the ACIAR-funded Coconut Industry Development (CIDP) project to generate economies of scale. Logistical constraints had forced the team to move the trainings into year three but the decision for budget carryover into year 3 was delayed until the end of year 3, so the team was unable to run the trainings. ICC also ran trainings in 2018 and 2019 for coconut technical officers on conservation. The delay in budget carryover decisions prevented implementing training plans.

3.1.4 Problems in achieving outputs:

As our change requests indicated, the Project encountered a number of serious problems during the two year grant implementation period (third year suspended).

Timing/ scheduling:

As detailed in previous reports and change requests, the project was subject to a number of delays including a delay in grant inception until June 2016. In particular, delays in registration of the PhD and the recruitment and registration of MSc students, as well as in engaging with some project partners and signing Letters of Agreement with them, have had a long-lasting, domino effect on implementing the project schedule. Also, our retrospectively synchronising the project workplan with the UK fiscal year, caused some stakeholder confusion regarding project timelines.

Implementation delays meant that in February 2018, we were obliged to apply for a budget carryover and 1-year grant extension. The decision not to endorse the request and to close the grant was only made in April 2019, having been subject to a concomitant grant implementation suspension since 1 April 2018. We therefore lost a whole year of implementation time.

Project management:
The original project manager was seconded from Cirad and the extra institutional link in the administrative chain severely inhibited what may otherwise have been smoother management. The manager was also initially based in Europe, so interactions with partners in the Asia-Pacific time zones proved to be a serious constraint. The manager relocated to Asia, but was then recalled, and so finally in response to change request review, a member of Bioversity staff was nominated to assume management at the end of 2017. During the grant period, Bioversity's official grant management contacts, project officer and programme administrative support, including changes to procedures for LoAs. This created some confusion and constrained smooth running, that was compounded by delays at CIRAD in the treatment of LoA for signature.

At the project meeting at the end of 2017, the workplan was rescheduled and partners agreed that we should apply for a budget carryover and 1-year grant extension (see above). Partners had finally agreed to allocate Project Leadership to SPC for the third year, which was never executed.

Capacity building:
We had not anticipated needing to work within the university academic timetable/ calendar across the region, and because of this we were unable to initiate the postgraduate involvement until entering into year 2. We were unable to complete most of the MSc student recruitment as we needed active liaison in the regions and an ongoing body of work being implemented before we could assign students. We had scheduled further capacity building on controlled hand pollination for year 3 but as activities were suspended this was not possible.

Map production and germplasm prospecting:
For the mapping, a CIRAD/ SPC co-supervision was initially proposed, but SPC was then asked to solely assume the task, although the LoA signature was delayed because of ToR changes. Although the SPC-based expert published some key inventory information, no maps or publications were produced by this expert, partly because the budget allocated was said to be insufficient to pay for the tasks required. The prospecting missions were never completed (scheduled for year 3), so no geographical coordinates of any new accessions could be generated for the mapping output.

The delay in recruiting two MSc students is attributable to a delay in finalizing Letters of Agreement with CIRAD and SPC to identify an expert to lead the work on the mapping targets. As a result, partners in Fiji and Samoa could not start performing their work under CIRAD and SPC's supervision – this work included mostly the identification of the MSc students to conduct the research.

The coconut prospecting missions in Fiji, Papua New Guinea and Samoa had been rescheduled for May 2018. This delay is due to weather conditions in the South Pacific (seasonal typhoons in the early months of the year hamper travel to islands and collection/characterisation measurements), to the complexity of prospecting for novel/un-conserved germplasm (accessing locations, organising paperwork and travel), and to the availability of staff from partners in the three countries.

None of the four MSc relating to coconut mapping, germplasm characterisation, data management and legal documentation could begin their work until the prospecting missions were underway, which were rescheduled for year 3, and then had to be suspended.

***Communications, M&E and legal work*:** these elements were rescheduled for years three and four due to the delay in the prospecting missions and in the finalization of the guidelines. These are all activities that need to be implemented after completion of all prospecting missions as they build upon their results. We did some communication at the beginning of the project (on CIRAD and Bioversity Internet pages) and at the inception meeting (project cited in newspapers following our press release, thanks to SPC). There was also, during the SC Meeting in Samoa, a "press release" to media. Journalists were also attending as the project was honoured by the presence of the Samoan Minister of Agriculture who came to officially open the meeting.

Partner Engagement:
As we wrote above, an ongoing challenge to effective partnership was to keep everybody actively engaged in the project. The number of partners was rather high and they are from different types of organizations, working differently with varied rules. It was also the first time these partners attempted to work together. Also the 9-13 hour time-zone difference added a logistical constraint, as finding a time to interact virtually also continued to prove challenging. Weak internet links, and relatively low budget allocations to the key partners in the Pacific region also proved a disincentive for them to fully engage. At the inception meeting we ran a session on using Skype as a means of remote interaction. This was before the more recent increase in social media use.

The complexity of this project context was not well-articulated within the project logframe assumptions. Probably, the project was too ambitious compared to the estimated and finally allocated budget. Due to the financial Brexit issue, the budget was reduced by around £50,000. The management, the difficulty to stabilize administrative support (in different institutions), including some key project country contacts in Samoa and Fiji changing during the project, and scheduling problems created a kind of domino effect, and it was challenging to manage this.

3.2 Outcome

The intended project outcome was that *critical knowledge, capacities and approaches will be developed to conserve endangered, critical coconut germplasm from Fiji, Samoa, and PNG, ensuring a stable future for coconut breeding and production*

The project partially achieved this intended outcome in i) building local capacities and awareness of the multi-lateral system of germplasm exchange, and how it should operate, and ii) in participatorily developing guidelines for consistent characterisation of coconut germplasm, to allow more meaningful description and identification of germplasm with traits of interest for breeders.

Outcomes are usually expressed as a change in state or behaviour, therefore going beyond building skills and capacities. PNG genebank staff and other stakeholders were involved with validating the coconut germplasm characterisation guidelines that were participatorily developed by the project. The staff are in the process of rehabilitating the genebank, and as a result of capacities built in the project are in a better position to do this more effectively:

- Although no maps of the most endangered zones for coconut cultivars in Fiji, Samoa and PNG regarding sea-level rise and climate change were produced, SPC provided some outline of Pacific Islands GIS&RS Mapping activities. Some key inventory information was published in the Pacific Islands GIS&RS Newsletter[9].
- The standardized methodology was produced to collect, identify, characterize and register new accessions for COGENT members (at a global level), and will be uploaded on the COGENT website, as soon as content is endorsed, before the end of 2019. In PNG, the guidelines were validated using an innovative tablet-based version of the guidelines with data templates, so that accession and individual palm data and location details could be uploaded in situ and in real time. (see supplementary annex 9b for the report)
- Project delays have not allowed the project to identify, conserve and register new accessions, but the main genebank in PNG has moved 12 accessions to its new site, and the genebank is being upgraded for more effective conservation and use of its conserved genetic resources.
- 29 participants (17.2% female) were trained on the multilateral system of germplasm exchange and on germplasm collection and characterisation during project meetings and workshops.

[9] http://www.picgisrs.org/wp-content/uploads/2018/11/PGRSC_Newsletter_Issue_2_20181123.pdf

- The proposed multi-site genebank has not yet been ratified with signed MOUs between the 3 countries and Bioversity International/COGENT or SPC and FAO/ITPGRFA. Whilst government willingness is secured, ratification was not possible under the curtailed circumstances.
- The engagement of KIK, as the PNG government and the main genebank host, and of the Samoan government through its Ministry of Agriculture and Fisheries were particularly encouraging outcomes, as a mark of renewed commitment to coconut conservation and use. Both the Samoan and Fijian governments were exemplary in hosting the project inception workshop, training workshops and two project SC meetings.
- Significantly stronger collaborative relationships have developed between Bioversity and most of the project partners, especially with i) the ICC who have now assumed hosting responsibilities for COGENT; ii) Cirad especially for the germplasm characterisation and data management, iii) the ITPGRFA, helping us to improve some aspects of the MLS with regard to coconut germplasm and PNG-KIK enabling more effective collaborations for capacity building and genebank improvements.

3.3 Impact: achievement of positive impact on biodiversity and poverty alleviation

The agreed project impact was that coconut stakeholders and scientists will have used and have had better access to wider genetic diversity, facilitating new breeding outputs, benefitting at least 10 million people within the Asia-Pacific.

During the project period, Fijian, PNG and Samoan Governments have been preparing new sites for the multi-site *ex situ* coconut genebank to receive transferred coconut accessions. The PNG government has leveraged its association with the Darwin Project in securing further support to help transfer the threatened collection for a safe site. So far 12 accessions have been transferred to quarantine, sourced from their original locations of collection, rather than the possibly infected old genebank site. SPC has leveraged its involvement in the Darwin-funded work to secure funding from ITPGRFA and ACIAR for linked work to protect regional coconut diversity (see supplementary annex 3 for endorsed proposal).

Because of the long-term nature of diversity conservation and use, especially in perennial tree crops such as coconut, there are no direct contributions to human development (poverty alleviation) and wellbeing manifest at this stage.

4 Contribution to Darwin Initiative Programme Objectives

Through the Darwin Initiative, the project aimed to support both the UK Government's commitment[10] to protecting and improving international biodiversity, and three developing countries (Fiji, PNG and Samoa) in managing a key part of their biodiversity (coconut). In line with the Darwin Initiative aims, the project has helped build local capacity to manage local biodiversity and the natural environment for the future, that would eventually secure the benefits of some natural resources for local people.

For the reasons already stated, the project has not achieved all of its intended objectives. However it has catalysed the Asia Pacific coconut community to collaborate more closely for more effective conservation and use of regional coconut genetic resources.

If the skills, knowledge and capacity developed under this project are applied, this will help the three countries meet their commitments under the following conventions:

[10] UK 25-Year Environment Plan, (January 2018)

4.1 Contribution to Global Goals for Sustainable Development (SDGs)

Over the longer term, if the knowledge, skills and capacities developed by the project are effectively applied, the work should contribute to achieving SDGs 1 (poverty), 2 (hunger), 3 (health), 5 (gender), 12 (sustainable production), 13 (climate action), 15 (terrestrial life), and 17 global partnerships, and more specifically to SDG2 target 2.5 " *By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species*".

4.2 Project support to the Conventions or Treaties (CBD, CMS, CITES, Nagoya Protocol, ITPGRFA))

In the longer term, project outcomes should help ensure long-term coconut genetic diversity conservation and thus contribute to **CBD** objective 1: *(Biological diversity conservation)*, especially implementing the CBD Agricultural Biodiversity programme and achieving Aichi Biodiversity target 13[11].

The project will also contribute to making more and safer coconut genetic diversity available through the multilateral system (MLS) and thus contributing to **ITPGRFA** objectives. The ICG-SP is part of the MLS via agreements between ITPGRFA's Governing Body, Bioversity and PNG, whereby coconut stakeholders can better access genebank germplasm. Funds from their use partly flow back to the conservation community, including farmers. The project also contributes to ITPGRFA articles 5 (conservation) and 6 (sustainable use).

Fiji and Samoa participate in the **Nagoya Protocol** (NP). Access to any new coconut germplasm in the ICG-SP will be subject to NP provisions. In the medium to long term, regional stakeholders aim to include this material in the MLS, simultaneously ensuring that original providers' interests and rights are addressed. This offers opportunities to support Samoan and Fijian organizations to implement the NP in line with the ITPGRFA.

4.3 Project support to poverty alleviation

The future of global coconut production and livelihoods critically depends on the availability of and sustainable use of its broad genetic base to breed improved varieties. Harnessing and conserving agrobiodiversity are critical to sustainably boosting productivity and livelihoods, and addressing important challenges including those posed by climate change or pest and disease epidemics, and serving emerging markets such as virgin coconut oil.

Because of the long-term nature of diversity conservation and use, especially in perennial tree crops such as coconut, there are **no direct contributions to human development (poverty alleviation) and wellbeing manifest at this stage**. It is too early in the impact pathway, but in the longer term, if the knowledge, capacity and skills acquired in the project are applied they should contribute to benefiting Asia-Pacific coconut-dependent stakeholders who can access improved, more resilient and productive coconut cultivars, or those which provide a source of high-value coconut products (HVCPs) such as virgin coconut oil and coconut water. Many Pacific Island small and medium enterprises (SMEs) produce HVCPs, and indeed many are run by women. Since 2016 when the project began, global income and prices for coconut-derived products, including virgin coconut oil and water have increased substantially, so the future is promising.

4.4 Gender equality

The project had little overall impact on gender equality, although we had built targets into the project design (see logframe). We aimed to ensure that the international teams of experts (ITEx) would be equitably balanced (e.g. gender, public/private sector participation, and civil society). In preparing the MOU to organize the governance within the 3 sites of the genebanks by the middle of year 3, we had planned to adopt gendered considerations, but we were not able to

[11] *By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity*)

implement developing the MoU/ governance structure, due to project curtailment. In our capacity building initiatives we had targeted 50% or above participation by women, but in reality it was nearer 30%. Training registers helped corroborate.

4.5 Programme indicators

Indicator	Status
Did the project lead to greater representation of local poor people in management structures of biodiversity?	No
Were any management plans for biodiversity developed?	partially
Were these formally accepted?	n/a
Were they participatory in nature or were they 'top-down'? How well represented are the local poor including women, in any proposed management structures?	n/a
Were there any positive gains in household (HH) income as a result of this project?	No
How many HHs saw an increase in their HH income?	n/a
How much did their HH income increase (e.g. x% above baseline, x% above national average)? How was this measured?	n/a

4.6 Transfer of knowledge

The project has transferred knowledge on coconut germplasm characterisation and raised awareness on the operation of the multilateral system of exchange. Once the project germplasm characterisation guidelines have been properly laid out we will publish the guidelines in open access which will be freely downloadable. The information relating to the project will be made available on the new COGENT website once it has been rehabilitated, by mid2020.

Did the project result in any formal qualifications?

A male postgraduate from PNG was selected for PhD and conducted the required fieldwork, but did not register for the PhD in the Philippines. He is now working as part of the PNG genebank breeding team. He will register for a PhD as soon as conditions allow.

The project supported another male graduate, already experienced in breeding to attend different meetings and training sessions to increase his knowledge in coconut tissue culture[12].

4.7 Capacity building

Both of the individuals mentioned in 5.6 now have higher professional status within their team in PNG.

5 Sustainability and Legacy

Given the partner relationships that have been strengthened or forged during the project, and the extra capacity built, particularly in PNG, and the developments in strengthening COGENT, partly arising from this, the capacity for coconut conservation in the Asia Pacific and beyond has improved.

As a new programme within the International Coconut Community, COGENT and the international community are better placed to support sustained efforts in coconut conservation through use.

[12] See https://www.actahort.org/books/1234/1234_45.htm and also meeting report for Korean Project, Juhee Rhee et al. (2018) D*eveloping cryopreseservation protocols for subtropical crops and establishing a cryogenebank at RDA in coordination with Bioversity International*. National Biodiversity Centre, Rep of Korea, ISBN 978-89-480-5735-5 93520

Now the project funding has ceased, project staff will continue working in their national programmes, with new awareness and commitment.

6 Lessons learned

Some project elements worked well, particularly the development of local capacity on germplasm characterisation and management, the development of the germplasm characterisation guidelines and the strengthening of relationships between Bioversity; Cirad; ICC; ITPGRFA; KIK, PNG, and SPC. An important spin-off has been the stronger relationship with ICC who have now taken over the hosting of COGENT, and how the new arrangement is better positioned for implementing the global strategy. Funding from the ITPGRFA and from ACIAR have been leveraged as a result of this project.

The report has also already articulated several challenges encountered by the project (see section 3.1.4). The table below outlines the main challenges and proposed solutions.

Challenge	***Solution***
Project context complexity not well-articulated within the project log frame assumptions. The management, administrative support and scheduling problems outlined below created a kind of domino effect, and it was challenging to manage this.	ensure project complexity fully accounted for in log frame and prepare all the partners to run their tasks. Accelerate the decision by SC to reframe the project and/or reassess a partnership if he is not in capacity to be fully involved
Timing/ scheduling:	
the project was subject some delays to:	
grant inception until June 2016.	• Defra to facilitate starting 1st April in fiscal year 1. • line up provisional project inception meeting arrangements even before or at least as soon as endorsement
recruitment/ registration of PhD and MSc students, work within the university academic timetable/ calendar across the region	• identify institutions and candidate post-graduates (or at least their posts), or at least liaise with university /college faculties much earlier, even at the near final proposal stage; • ensure the academic year periods are built into the time line; • active liaison in the regions and an ongoing body of work being implemented before we could assign students.
engaging with some project partners	• ensure project partners are briefed with provisional information, and partner actual contacts are confirmed • develop continency plants to engage with a backup contact if the primary contact is not available
signing Letters of Agreement	• provide draft partner agreements to partners ready for signing at inception meeting. • Ensure that signatories are identified and lined up well in advance, • Secure and reconfirm institutional agreement before and during the inception meeting

Challenge	*Solution*
implementing project workplan.	• ensure project partners participate fully and actively in developing timeline at proposal stage, so the project has their ownership and buy in. then involve them fully during subsequent iterations and in monitoring
retrospectively synchronising the project workplan with the UK fiscal year, caused some stakeholder confusion regarding project timelines.	• highlight that partners all aware year 1 is 1st April to 31 March and not a calendar year. Be sure to circulate the information among all the key resources persons (from the project but also all the accounting officers and other financial staff of the institutions)
Implementation delays meant applying for a budget carryover and 1-year grant extension.	• ensure budgetary management tighter and funds are more promptly disbursed, this will be easier if partner agreements signed promptly; • ensure all potential reasons for delay are identified in the log frame, and contingencies developed
decision to close the grant was made in April 2019, with concomitant grant implementation suspension since 1 April 2018. Losing a year of implementation time.	• Defra, to provide more timely decision on carryover/ extension.
further capacity building on controlled hand pollination for year 3 but as activities were suspended this was not possible	• as above
Project management:	
The original project manager seconded from Cirad - the extra institutional link in the administrative chain constrained project management.	• manage the grant within the primary institution- a member of Bioversity staff was nominated to assume management at the end of 2017.
The project manager was initially based in France, so interactions with partners in the Asia-Pacific time zones proved to be a serious constraint.	• manage the grant based within the time zone of grant implementation….. The manager relocated to Asia, but was then recalled for reasons beyond our control. We had recommended that SPC assume management for this reason.
Map production and germplasm prospecting:	
Implementation originally allocated to a Cirad mapping expert, who failed to assume project responsibilities at inception,	• new mapping expert was quickly identified within the Pacific Community (SPC).
Although the SPC-based expert published some key inventory information, no maps or publications were produced by this expert, partly because the budget allocated was said to be insufficient to pay for the tasks required.	• ensure ToR clear and agreed with partners and maintain tighter dialogue to ensure implementation of allocated tasks is underway, and that the budget is sufficient and the tasks are realistic according to available resources
The prospecting missions were never completed (scheduled for year 3), so no geographical	• as above, taking also into account the climatic and seasonal constraints

Challenge	Solution
coordinates of any new accessions could be generated for the mapping output.	
The delay in recruiting two MSc students is attributable to a delay in finalizing Letters of Agreement with CIRAD and SPC and to identify an expert to lead the work on the mapping targets. As a result, partners in Fiji and Samoa could not start performing their work under CIRAD and SPCs supervision	• finalise LoAs sooner,
The coconut prospecting missions in Fiji, Papua New Guinea and Samoa had been rescheduled from Y2 to Y3 - May 2018. This delay is due to weather conditions in the South Pacific (seasonal typhoons in the early months of the year hamper travel to islands and collection/characterisation measurements), to the complexity of prospecting for novel/un-conserved germplasm (accessing locations, organising paperwork and travel), and to the availability of staff from partners in the three countries.	• ensure these kinds of assumptions for fieldwork implementation are built into the log frame, including climate, seasonality, accessibility, resources available, including personnel.
None of the three MSc relating to germplasm characterisation, data management and legal documentation could begin their work until the prospecting missions were underway, which were rescheduled for year 3, and then had to be suspended. Also The mapping work was supposed to begin before the prospecting mission because the result of the mapping was supposed to help in choosing the geographical zones to be prospected	• if the adequate resources, planning and risk management as mentioned above are in place we could have avoided some of these challenges.
Communications, M&E and legal work:	
these elements were rescheduled for years three and four due to the delay in the prospecting missions and in the finalization of the guidelines. These are all activities that need to be implemented after completion of all prospecting missions as they build upon their results. Bioversity planned to hire a half-time communications expert, but we were unable to initiate recruitment until the project had gained more traction	• project monitoring could more explicitly highlight when milestones have not been achieved. • We interacted directly with ITPGRFA representative to move things forwards, even if governance arrangements could not be fully developed until the prospecting arrangements and gene banks sites had been further advanced • For communications positions ensure some individuals/ organisation identified even at the proposal stage
Partner Engagement:	
keeping partners actively engaged in the project	• Allocate proportionally more of budget to key partners budget, • increase frequency of interactions and instil ownership
The number of partners was rather high	• reduce number of partners
9-13 hour time-zone difference added a logistical constraint, as finding a time to interact virtually also continued to prove challenging. Weak internet linksstrict communication rules and relatively low budget allocations to the key partners in the Pacific region also proved a disincentive for them to fully engage.	• improve management of virtual meetings; • manage the grant from within the main time zones; • ensure minimum internet bandwidth/ speed,

Challenge	*Solution*
	• set up social media groups and ensure stakeholders all trained in using these communications • check the communication rules of the different institutions and try to find a consensus on the tools to be used at the proposal stage.
partners from different types of organizations, working differently with varied rules	• understand better in advance how partners operate…. Stipulate more firmly institutional familiarity

6.1 Monitoring and evaluation

There were no major changes in the project design (see Annex 1 for narrative report against the final logframe and Annex 2 is the full final logframe, including criteria and indicators).

Looking back over the life of the project, the M&E system was not robust enough perhaps to capture the delays, partner unresponsiveness and flaws in scheduling the mapping and prospecting missions. This all stems from the project's remote management, several changes in the supporting staff during the first year, as well as serious changes in partners institution's rules during the first year

During the project period, there has been no internal or external evaluation of the work, although by the end of 2020, COGENT is planning to evaluate all five of the international coconut genebanks, including the ICG-SP in PNG.

6.2 Actions taken in response to annual report reviews

We received feedback from our annual reports, and our communications record would provide evidence that we responded to all issues raised in the reviews. We had been planning to hold a partner debriefing at the end of project meeting but due to the curtailment of the grant we have not had the opportunity to do this. We will be including this as an agenda item in the next COGENT SC meeting in March 2020.

There are a number of outstanding issues, but these have all been articulated in the table above.

7 Darwin identity

As a distinct project, this work has acknowledged and publicised the Darwin Initiative wherever possible, on the COGENT and ICC websites, during international stakeholder meetings and workshops, in Bioversity's annual reports, and in publications, including the updated Global Strategy on Conservation and Use of coconut Genetic Resources and the germplasm characterisation guidelines. The work and mission of the Darwin Initiative is more widely and commonly known within the whole of the COGENT and ICC community.

8 Finance and administration

8.1 Project expenditure

Current Year's Costs	2018/19 Grant (£)	2018/19 Total actual Darwin Costs (£)	Variance %	Comments (please explain any variance)	
Staff costs (from Section 5)			-80%	We applied for budget carryover in February 2018 and a one-year grant extension from 31 March 2019 to 31 March 2020. Defra delayed their decision until March 2019, so we were not in a position to spend any funds during this period apart from reporting and some communications costs.	
Consultancy Costs			-100	As above	
Overhead Costs			-88%	As above	
Travel and subsistence			-100%	As above	
Operating Costs			-100%	As above	
Capital items (from Section 7)			0		
Monitoring and Evaluation			-100%	As above	
Others (from Section 8)			-100%	As above	
Audit costs			0%		
			Claimed So Far	**Claim for this period**	**Surrender Amount**
TOTAL					

Staff employed (Name and position)	Cost (£)
JOHNSON, Vincent – Project Coordinator	
TOTAL	

Other items – description	Other items – cost (£)
TOTAL	

8.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
Bioversity	
KIK	
CIRAD	
SPC-Fiji	
Samoa MAF	
TOTAL	

Source of funding for additional work after project lifetime	Total (£)
ITPGRFA Benefit-Sharing Fund (4th Call)	
ACIAR (pending) support for COGENT transfer and ICG appraisals	
TOTAL	

8.3 Value for Money

In the coming decades climate change is expected to seriously compromise regional coconut production through sea-level rise, salinization, and increased typhoon and other abiotic stress damage.

In 2016 the three focus countries produced around 1.5 million T coconuts estimated to be worth around US$1.1 billion. South East Asia and Oceania produced 16.5 million T worth around US$ 6.5 billion (FAOSTAT 2019). This indicates the potential value of what is at stake, and thus the level of threat for millions of livelihoods.

It is unrealistic to predict the medium- to long-term contribution of project work to the overall regional value of coconut productivity. Whilst the project did not identify and transfer unconserved, threatened accessions, it has upgraded the local capacity to do so, therefore the project initiatives, including training, the germplasm characterisation guidelines and the tablet data-capture tool have all contributed to being better placed to respond to the threat of climate change. Emerging partnerships including a stronger relationship with ITPGRFA, and a new configuration for COGENT will also greatly assist concerted efforts moving forwards.

The project has invested a relatively modest £158,000 of DEFRA funds, and has leveraged £581,000 in co-funding and donor investments to build capacity for conserving important coconut diversity in the Asia Pacific region. Therefore the project stakeholders believe that the curtailed project represents reasonable value for money, whereby some of the capacities built are already being applied in ongoing efforts.

At the time of submitting this report, a team of experts from the PNG government, the ICC and Cirad are conducting the first official appraisal of one of the five international coconut genebanks (ICGs), in PNG, and a new updated ICG agreement has been drafted that will be presented in the 2019 ITPGRFA 8th Governing Body meeting in Rome. Bioversity aims to publish a freely available first edition of the coconut germplasm characterisation guidelines by December 31 2019.

Annex 1 Project's original (or most recently approved) logframe, including indicators, means of verification and assumptions.

Note: Insert your full logframe. If your logframe was changed since your Stage 2 application and was approved by a Change Request the newest approved version should be inserted here, otherwise insert the Stage 2 logframe.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: (Max 30 words) Coconut stakeholders and scientists have used and have had better access to wider genetic diversity, facilitating new breeding outputs, benefitting at least 10 million people within the Asia-Pacific.			
Outcome: (Max 30 words) Critical knowledge, capacities and approaches developed to conserve endangered, critical coconut germplasm from Fiji, Samoa, and PNG, ensuring a stable future for coconut breeding and production	0.1 One regional and three national maps of the most endangered zones for coconut cultivars in Fiji, Samoa and PNG regarding sea-level rise and climate change are available to coconut scientists and policy makers by the end of year 1 of the project 0.2 There is an agreement by the project SC, on a standardized methodology to collect, identify, characterize and register new accessions for COGENT members (at a global level) at the beginning of year 2 of the project 0.3 The number of conserved accessions in the Pacific Genebank has increased by 10% (between 5 to 10 new accessions have been identified and recorded in the CGRD database) by the end of the project	0.1. Maps published on the COGENT and SPC websites during first year of the project 0.2. Published guidelines for collecting new accessions on the COGENT Website 0.3. Genebank records (# Pacific accessions recorded in the Coconut Genetic Resources Database, (CGRD) before and after the project 0.4a Training certificates /records of staff operating in genebanks (or nurseries to prepare the genebanks) are available online on the COGENT website (page of the regional genebank) 0.4b An MOU is signed within the 3 genebanks to define and agree their governance and collaboration 0.5. MOAs signed and registered at FAO and the Secretariat of the ITPGRFA	•Policy makers, Ministries of Agriculture and private sector bodies have access to coconut production climate-change scenarios and the corresponding risks, so they can better manage/anticipate the protection/erosion of the biodiversity •The maps will help in rationalizing the 5 COGENT ICGs •COGENT member countries will share a methodology to increase the number of accessions in the genebanks network •Trained staff aware of the multilateral system will help in improving the exchange between genebanks at regional and international levels •More comprehensive conservation will lead to wider use and improved coconut livelihoods •The Pacific Region will be more involved in the Global

Project summary	Measurable Indicators	Means of verification	Important Assumptions
	0.4 At least 9 Genebank staff (30% female) from Fiji, Samoa and PNG are trained to manage the genebank according to the rules of the multilateral system, supported by the ITPGRFA and according to the technical guidelines recommended by COGENT in year 3 0.5 The creation of the multi-site genebank is ratified by the end of the project with signed MOAs between the 3 countries and Bioversity International/COGENT or SPC and FAO/ITPGRFA	0.6 List of COGENT members on the Website before and after the project	Conservation Effort for future generations • Assuming fully comprehensive partner engagement beyond the project life • There will be no legal/diplomatic insurmountable constraints regarding the MOAs and MOU preparation and signature • Any phytosanitary risk will be effectively addressed and not impact on germplasm transfer, from collection and distribution.
Outputs: 1. Maps and models of current and future threatened coconut cultivated areas in the Pacific have been made available on the COGENT and SPC Websites	1.a Four Maps and models to predict the impact of future climate change on the target counties' "coconut ecosystem" accessible on the COGENT, CIRAD and SPC websites by the end of year 1 1b 2 to 3 journal publications of new methodology available to predict the evolution of coconut production areas in the future due to climate change by the end of year 2	1a: check COGENT and SPC Websites 1b: article(s) published online in open access	• Maps will be meaningful, accurate, understandable, compatible with local systems, accessible, usable and used • Uncollected diversity in less-endangered zones will not be wiped out before it has been conserved • That the prediction tool will be sufficiently accurate and simple to be used and implemented by a great number of stakeholders such as policy makers, NGOs, private sector
2. An effective coconut germplasm management plan for the Asia Pacific developed	2a: ITEx n°1 – one proposed guidelines for the choice of Pacific cultivars to be preserved by the end of the first year (also relevant to cultivar choice elsewhere)	2a. Guidelines are published, available on COGENT website in several languages during year 2 2b. The cultivar lists for the 3 sites will be published in a scientific article and on the institutions'	• COGENT member countries will have access to the guidelines, methodology and selection criteria and they apply it in their own countries

Project summary	Measurable Indicators	Means of verification	Important Assumptions
	2b. ITEx n°1 publishes one list of all the cultivars currently preserved and to be preserved (not only endangered) in the ICG-SP following the Global Strategy of COGENT. 2c. By early year 2, one overall collection plan (3 country subsections) is designed by ITEX n°1 based on the results of the mapping 2d.Between 5 and 10 accessions moved by genebank staff and/or collecting teams to a nursery at one of the 3 sites of the ICG-SP by the end of the project 2e. ITEX n°2 prepare the MOU to organize the governance within the 3 sites of the genebanks by the middle of year 3, with gendered considerations 2f. ITEX n°2 prepare the MOAs to be signed between the different institutions (local research institutions or Government, Bioversity International/COGENT, SPC, and FAO/Treaty) by the end of year 2, MoAs to include gendered considerations where appropriate.	Websites (about 60 cultivars should be on the list) 2c. A report on the plan (strategy) of collect is published on the COGENT and SCP websites 2c. Mission report of the mixed teams junior/senior experts available on the COGENT and SCP Websites 2d. consultation of the CGRD: at least 5 new accessions are recorded and well documented 2e. MOU signed between the 3 managers of the genebanks 2f. MOAs are signed by the end of the project and published on the COGENT and SPC Websites	• That as much as possible representative diversity has been identified and will be conserved • data are easily accessible and safeguarded • The coconut biodiversity preserved in the 3 sites is secured by the signature of MOAs and the genebanks have a clear governance system at the regional level • That the isolated nature of the genebank locations will not be a disincentive to staff remaining to work there.
3. Training and capacity building provided to the staff of the 3 genebanks and to young scientists	3a. One PhD student is recruited and begins the thesis work during the first year of the project (preferably to become a coconut	3a. A document is describing the thesis topic and workplan + report of the SC of the first year of the PhD student.	• That young breeders will contribute expected breeding outputs • That the breeder will build the capacity of others in the Pacific Region

Project summary	Measurable Indicators	Means of verification	Important Assumptions
	breeder working on one of the 3 sites) 3b. At least 6 MSc (2 for mapping, 1 for Policy, 2 for breeding and 1 for database) are trained in the coconut field by end of project, aiming for 50% or higher gender balance for women. 3c. At least 9 persons (30% female) of the future staff of the ICG-SP are trained by end of project	3b. MSc reports published on COGENT Website (6) 3b. Scientific articles are published in open access journals (1 or 2) 3c. Certificate of training of staff (at least 9 persons)	• Master students will participate in future coconut GR projects and disseminate coconut GR knowledge • That capacity will be effectively built and harnessed • The ICG will begin to put in place internal procedures to share germplasm internationally

Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

Output 1

1.1 Kick-off meeting with the partners, back to back to a first SC meeting

1.2 State of the art on the climate change threats and GIS in the South Pacific countries. Search for climate change and sea level rise forecast in the future 40 years. Search for mapping of current or past coconut palm plantings at any scale. (2 MSc)

1.3 If not available creation of a map of the coconut cultivation area in the countries targeted by the project

1.4 Creation of the maps of the current and future endangered coconut cultivated areas in the Pacific.

Output 2

2.1 Establishment and validation of the ToRs of the 2 International teams of Experts (ITEx) by the SC

2.2 Constitution of the two ITEx and recruitment of the experts (contract's signature with the corresponding institutions (LoAs))

2.3 ITEx n°1 builds a protocol and write guidelines for the identification/characterization/collection and transport of the new accessions (1 PhD). The team also make a list of the current and potentially interesting cultivars for the international collection

2.4 State of the art and revision of the status of the current ICG-SP by the ITEx n°2 and preparation of the documents for collecting missions and subsequent governance (1 MSc)

2.5 Workshop (combined to the 3rd SC Meeting) to communicate, discuss and endorse the results of the mapping, the guidelines, finalize the list of cultivars and design a plan of collect.

2.6 Validation of the guidelines, protocols, list and plan of collect by the 3rd SC. Preparation of the workplan for year 2.

2.7 Official presentation of the project at the 7th Governing Body Session of the Treaty

2.9 Preparation of the 3 sites or quarantine areas for the newly collected accessions (nurseries and sanitary issues)

2.8 Different missions by the mixed teams junior/expert for identification/characterization/collection of endangered cultivars (2 MSc and 1 PhD)

2.10 Preparing and recording the accessions in CGRD (COGENT database) (1 MSc)

2.11 Movement of some of the cultivars to the designated 3 sites

2.12 Workshop with ITEX n°2 and project partners back to back the 4th SC meeting of the project to discuss and present the documents to be endorsed by the SC Meeting of COGENT in 2018 (year 3, Q3) and the PAPGREN network in??

2.13 Signature of the MOAs and MOU at the final meeting of the project or at the COGENT SC Meeting in 2018 (which could be held back to back in the same place in PNG?). Official restitution to the Governments.

Output 3

3.1 Training the ICG staff

Project summary	Measurable Indicators	Means of verification	Important Assumptions
3.2 One PhD student to participate to the project and to be employed by the ICG			
3.3 2 MSc students to support the ITEX n°1 (breeding and collection)			
3.4 1 MSc student to support the ITEX n°2			
3.5 2 MSc student to support to mapping			
3.6 1 MSc student to support database CGRD			

Annex 2 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements (traffic light indicates level)
Impact: Coconut stakeholders and scientists have used and have had better access to wider genetic diversity, facilitating new breeding outputs, benefitting at least 10 million people within the Asia-Pacific.		Fijian, PNG and Samoan Governments have provided and begun to prepare for new sites for *ex situ* coconut genebanks for receiving transferred coconut accessions. The PNG government has leveraged its association with the Darwin Project in securing further support to help transfer the threatened collection for a safe site. So far 12 accessions have been transferred, sourced from their original locations of collection rather than the possibly infected old genebank site.SPC has leveraged its involvement in the Darwin-funded work to secure funding from ITPGRFA and ACIAR for linked work to protect regional coconut diversity
Outcome Critical knowledge, capacities and approaches developed to conserve endangered, critical coconut germplasm from Fiji, Samoa, and PNG, ensuring a stable future for coconut breeding and production	0.1 One regional and three national maps of the most endangered zones for coconut cultivars in Fiji, Samoa and PNG regarding sea-level rise and climate change are available to coconut scientists and policy makers by the end of year 1 of the project	SPC provided some outline of Pacific Islands GIS&RS Mapping activities Some key inventory information was published in the Pacific Islands GIS&RS Newsletter (http://www.picgisrs.org/wp-content/uploads/2018/11/PGRSC_Newsletter_Issue_2_20181123.pdf).
	0.2 There is an agreement by the project SC, on a standardized methodology to collect, identify, characterize and register new accessions for COGENT members (at a global level) at the beginning of year 2 of the project	Project stakeholders developed, validated and finalised a standardized methodology to collect, identify and characterize new coconut accessions. The draft methodology will be uploaded on the COGENT website. The project developed the use of tablets to collect the data as a key innovation for GR characterization of the Pacific.
	0.3 The number of conserved accessions in the Pacific Genebank has increased by 10% (between 5 to 10 new accessions have been identified and recorded in the CGRD database) by the end of the project	The delays have not allowed the project to identify, conserve and register new accessions, but the main genebank in PNG has moved 12 accessions to its new site
	0.4 At least 9 Genebank staff (30% female) from Fiji, Samoa and PNG are trained to manage the genebank according to the rules of the multilateral system, supported by the ITPGRFA and according to the technical guidelines recommended by COGENT in year 3	29 participants (17.2% female) were trained on the multilateral system of germplasm exchange during COGENT and Darwin SC meetings in Oct/Nov 2017. Further trainings were planned virtually/ in situ, during year 3, including a special training on controlled hand pollination, including back-to-back training with CIDP project to generate economies of scale. The delay in budget carryover decisions prevented implementing training plans
	0.5 The creation of the multi-site genebank is ratified by the end of the project with signed MOAs between the 3 countries and Bioversity International/COGENT or SPC and FAO/ITPGRFA	Whilst government willingness is secured, ratification was not possible under the curtailed circumstances.

Project summary	Measurable Indicators	Progress and Achievements (traffic light indicates level)
Output 1. Maps and models of current and future threatened coconut cultivated areas in the Pacific have been made available on the COGENT and SPC Websites	1.a Four Maps and models to predict the impact of future climate change on the target counties' "coconut ecosystem" accessible on the COGENT, CIRAD and SPC websites by the end of year 1 1b 2 to 3 journal publications of new methodology available to predict the evolution of coconut production areas in the future due to climate change by the end of year 2	Maps and models not produced, although see linked publication below
Activity 1.1 Kick-off meeting with the partners, back to back to a first SC meeting		Completed and reported on. The relevant staff for mapping (original Cirad delate) did not attend the meeting. Identified replacement within SPC not able to attend inception meeting
Activity 1.2. State of the art on the climate change threats and GIS in the South Pacific countries. Search for climate change and sea level rise forecast in the future 40 years. Search for mapping of current or past coconut palm plantings at any scale. (2 MSc)		MSc students not engaged
Activity 1.3 If not available creation of a map of the coconut cultivation area in the countries targeted by the project		SPC provided some outline of Pacific Islands GIS&RS Mapping activities Some key inventory information was published in the Pacific Islands GIS&RS Newsletter (http://www.picgisrs.org/wp-content/uploads/2018/11/PGRSC_Newsletter_Issue_2_20181123.pdf).
Activity 1.4 Creation of the maps of the current and future endangered coconut cultivated areas in the Pacific.		Maps not produced
Output 2. An effective coconut germplasm management plan for the Asia Pacific developed	2a: ITEx n°1 – one proposed guidelines for the choice of Pacific cultivars to be preserved by the end of the first year (also relevant to cultivar choice elsewhere)	2a: Guidelines produced (see annex and COGENT website)
	2b. ITEx n°1 publishes one list of all the cultivars currently preserved and to be preserved (not only endangered) in the ICG-SP following the Global Strategy of COGENT	2b: List produced, except for new endangered cultivars (see annex)
	2c. By early year 2, one overall collection plan (3 country subsections) is designed by ITEX n°1 based on the results of the mapping	2c. ITEX 1 produced outline collection plan for PNG (see annex)
	2d.Between 5 and 10 accessions moved by genebank staff and/or collecting teams to a nursery at one of the 3 sites of the ICG-SP by the end of the project	2d: Project and carryover decision delays have not allowed the project to identify, conserve and register new accessions, but the main genebank in PNG has moved xx accessions to its new site
	2e. ITEX n°2 prepare the MOU to organize the governance within the 3 sites of the genebanks by the middle of year 3, with gendered considerations	2e&f: Because the planned prospecting missions for threatened material were never implemented, although ITEX n°2 team members

Project summary	Measurable Indicators	Progress and Achievements (traffic light indicates level)
	2f. ITEX n°2 prepare the MOAs to be signed between the different institutions (local research institutions or Government, Bioversity International/COGENT, SPC, and FAO/Treaty) by the end of year 2, MoAs to include gendered considerations where appropriate.	were identified, the team did not advance any governance plans, nor finalise any MoAs
Act.2.1 Establishment and validation of the ToRs of the 2 International teams of Experts (ITEx) by the SC		Completed in year 1
Act.2.2 Constitution of the two ITEx and recruitment of the experts (contract's signature with the corresponding institutions (LoAs))		Completed in year 1
Act.2.3 ITEx n°1 builds a protocol and write guidelines for the identification/characterization/collection and transport of the new accessions (1 PhD). The team also make a list of the current and potentially interesting cultivars for the international collection		Completed protocol/ guidelines in years 1-2
Act.2.4 State of the art and revision of the status of the current ICG-SP by the ITEx n°2 and preparation of the documents for collecting missions and subsequent governance (1 MSc)		Not implemented
Act.2.5 Workshop (combined to the 3rd SC Meeting) to communicate, discuss and endorse the results of the mapping, the guidelines, finalize the list of cultivars and design a plan of collect.		Not implemented
Act.2.6 Validation of the guidelines, protocols, list and plan of collect by the 3rd SC. Preparation of the workplan for year 2.		Validation completed in PNG in year 2
Act.2.7 Official presentation of the project at the 7th Governing Body Session of the Treaty		Completed
Act.2.8 Preparation of the 3 sites or quarantine areas for the newly collected accessions (nurseries and sanitary issues)		Partially completed
Act.2.9 Different missions by the mixed teams junior/expert for identification/characterization/collection of endangered cultivars (2 MSc and 1 PhD)		PhD candidate identified and trained, missions not completed
Act.2.10 Preparing and recording the accessions in CGRD (COGENT database) (1 MSc)		Not completed as no data collected
Act.2.11 Movement of some of the cultivars to the designated 3 sites		Some cultivars moved to new site in PNG
Act.2.12 Workshop with ITEX n°2 and project partners back to back the 4th SC meeting of the project to discuss and present the documents to be endorsed by the SC Meeting of COGENT in 2018 (year 3, Q3) and the PAPGREN network in??		Not done as project terminated before planned extension period
Act.2.13 Signature of the MOAs and MOU at the final meeting of the project or at the COGENT SC Meeting in 2018 (which could be held back to back in the same place in PNG?). Official restitution to the Governments.		Although not completed for the new genebank, we have succeeded in liaising with host government, ITPGRFA and COGENT to draft and prepare signing an agreement for ITPGRFA meeting in Nov 2019
3. Training and capacity building provided to the staff of the 3 genebanks and to young scientists	3a. One PhD student is recruited and begins the thesis work during the first year of the project (preferably to become a coconut breeder working on one of the 3 sites)	3a: PhD student recruited and began the thesis work during the first two years of the project (and is now part of coconut breeding team in PNG)
	3b. At least 6 MSc (2 for mapping, 1 for Policy, 2 for breeding and 1 for database) are trained in the coconut field by end of project, aiming for 50% or higher gender balance for women.	3b: One MSc (male) in breeding engaged but MSc not completed for PNG
	3c. At least 9 persons (30% female) of the future staff of the ICG-SP are trained by end of project	3c: 29 participants (17.2% female) trained on multilateral system of germplasm exchange during COGENT and Darwin SC meetings in

Project summary	Measurable Indicators	Progress and Achievements (traffic light indicates level)
		Oct/Nov 2017. Further trainings were planned virtually/ in situ, during year 3, including a special training on controlled hand pollination, including back-to-back training with CIDP project to generate economies of scale. ICC also ran trainings in 2018 and 2019 for coconut technical officers on conservation. The delay in budget carryover decisions prevented implementing training plans
Act. 3.1 Training the ICG staff		done in conjunction of International coconut community programme and 17th COGENT SC capacity building work shop
Act. 3.2 One PhD student to participate to the project and to be employed by the ICG		Engaged and employed, and conducted PhD field work, but delayed registering with University for personal reasons until too late
Act. 3.3 Two MSc students to support the ITEX n°1 (breeding and collection)		One breeding MSc engaged
Act. 3.4 One MSc student to support the ITEX n°2		Not engaged
Act. 3.5 two MSc student to support to mapping		Not engaged
Act. 3.6 one MSc student to support database CGRD		Not engaged

Annex 3 Standard Measures

We use these figures as part of our evaluation of the wider impact of the Darwin Initiative programme. Projects are not evaluated according to quantity. That is – projects that report few standard measures are not seen as being of poorer quality than those projects which can report against multiple standard measures.

Please quantify and briefly describe all project standard measures using the coding and format of the Darwin Initiative Standard Measures. Download the updated list explaining standard measures from http://darwin.defra.gov.uk/resources/reporting/. If any sections are not relevant, please leave blank.

Code	Description	Total	Nationality	Gender	Title or Focus	Language	Comments
Training Measures							
1a	Number of people to submit PhD thesis						
1b	Number of PhD qualifications obtained						
2	Number of Masters qualifications obtained						
3	Number of other qualifications obtained						
4a	Number of undergraduate students receiving training						
4b	Number of training weeks provided to undergraduate students						
4c	Number of postgraduate students receiving training (not 1-3 above)	2	PNG	male	Coconut characterisation, tissue culture	English	
4d	Number of training weeks for postgraduate students	4	PNG	male	Coconut characterisation, tissue culture	English	
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification (e.g., not categories 1-4 above)						
6a	Number of people receiving other forms of short-term education/training (e.g., not categories 1-5 above)	29	PNG, Fiji, Samoa	Male 83% male/17% female	Coconut germplasm characterisation,		

					ITPGRFA multi-lateral system		
6b	Number of training weeks not leading to formal qualification	1			Coconut germplasm characterisation, ITPGRFA multi-lateral system		
7	Number of types of training materials produced for use by host country(s) (describe training materials)	2	1. Characterisation guidelines, 2. Mapping resources inventory				

Research Measures		**Total**	**Nationality**	**Gender**	**Title**	**Language**	**Comments/ Weblink if available**
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (ies)						Participatory process?
10	Number of formal documents produced to assist work related to species identification, classification and recording.	1	French	Male	*Guidelines for collecting coconut germplasm characterisation data during prospecting missions*	English	
11a	Number of papers published or accepted for publication in peer reviewed journals						
11b	Number of papers published or accepted for publication elsewhere						Location?

Research Measures		Total	Nationality	Gender	Title	Language	Comments/ Weblink if available
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	1	French	Male	Tablet-based characterisation tool developed	English	
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country						
13a	Number of species reference collections established and handed over to host country(s)						
13b	Number of species reference collections enhanced and handed over to host country(s)	1	PNG	male	See country report Annex 9a	English	

Dissemination Measures		Total	Nationality	Gender	Theme	Language	Comments
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work						
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.						

Physical Measures		Total	Comments
20	Estimated value (£s) of physical assets handed over to host country(s)		
21	Number of permanent educational, training, research facilities or organisation established		
22	Number of permanent field plots established	1 set	Please describe in PNG genebank quarantine centre

Financial Measures		Total	Nationality	Gender	Theme	Language	Comments
23	Value of additional resources raised from other sources (e.g., in addition to Darwin funding) for project work	US$ 163,00			Benefit - sharing, GR conservation		BFS 4th call fund award

Annex 4 Aichi Targets

Please note which of the Aichi targets your project has contributed to.

Please record only the **main targets** to which your project has contributed. It is recognised that most Darwin projects make a smaller contribution to many other targets in their work. You will not be evaluated more favourably if you tick multiple boxes.

	Aichi Target	Tick if applicable to your project
1	People are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	√
2	Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	
3	Incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	
4	Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	
5	The rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	
6	All fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	
7	Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	
8	Pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	
9	Invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	
10	The multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	
11	At least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	
12	The extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	

13	The genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	√
14	Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	
15	Ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	
16	The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	
17	Each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	
18	The traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	
19	Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	√
20	The mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	

Annex 5 Publications

Provide full details of all publications and material that can be publicly accessed, e.g. title, name of publisher, contact details. Mark (*) all publications and other material that you have included with this report

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Nationality of lead author	Nationality of institution of lead author	Gender of lead author	Publishers (name, city)	Available from (e.g. web link, contact address etc)
Technical Guidelines	*Guidelines for collecting coconut germplasm characterisation data during prospecting missions*, **Luc Baudouin**, Roland Bourdeix, Vincent Johnson, Julius Maot, Alexia Prades, Max Ruas. 2019 (pending)	French	Global	Male	Bioversity International, Rome	Bioversity and COGENT websites (to be finalised and uploaded by end 2019)
Newsletter	**Coconut Resource Inventory** -Wolf Forstreuter SPC-GEM Division Pacific Islands GIS&RS Newsletter, Issue 2 (2018) ISSN: 562-4250	Dutch	Regional	Male	Pacific Islands GIS&RS, Suva, Fiji	www.picgisrs.com

Annex 6 Darwin Contacts

Ref No	23-008
Project Title	Upgrading and broadening the new South Pacific International Coconut Genebank
Project Leader Details	
Name	Vincent Johnson
Role within Darwin Project	Acting Project Co-ordinator
Address	
Phone	
Fax/Skype	
Email	
Partner 1	
Name	Dr Alexia Prades
Organisation	Cirad
Role within Darwin Project	Project Manager
Address	
Fax/Skype	
Email	
Partner 2:	
Name	Dr Uron Salum (to be replaced by Dr Jelfina Alou 22/01/2020)
Organisation	International Coconut Community
Role within Darwin Project	Governance and networking support
Address	
Fax/Skype	
Email	
Partner 3	
Name	Dr Logotonu Meleisea Waqainabete < >
Organisation	Pacific Community (SPC), Land Resources Division
Role within Darwin Project	Liaison with germplasm governance team (ITEX 2) and team participating in prospecting missions and developing new ICG-SP sites in three countries
Address	
Fax/Skype	
Email	
Partner 4	
Name	Dr Alan Aku
Organisation	Kokonas Indastri Koporesen (KIK) (ex-Indonesia Copra Marketing Board) Part of PNG GOVERNMENT
Role within Darwin Project	Representing the PNG-ICG-SP genebank collection, Representing the KIK for participation in prospecting missions and new ICG-SP site in PNG
Address	
Fax/Skype	
Email	
Partner 5	
Name	Dr Tilafono David Hunter
Organisation	Crops division, Ministry of Agriculture and Fisheries, SAMOA

Role within Darwin Project	Representing the Samoan Ministry of Agriculture and Fisheries, for participation in prospecting mission and developing satellite ICG-SP site in Samoa
Address	
Fax/Skype	
Email	
Partner 6	
Name	Dr Apaitia MACANAWAI
Organisation	Ministry of Agriculture, Crop research Division
Role within Darwin Project	Representing the Samoan Ministry of Agriculture and Fisheries, for participation in prospecting mission and developing satellite ICG-SP site in Samoa
Address	
Fax/Skype	
Email	
Partner 7	
Name	Daniele Manzella
Organisation	International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) Food and Agriculture Organization of the United Nations (FAO)
Role within Darwin Project	Liaising over governance and genebank Article 15 agreements
Address	
Fax/Skype	
Email	
Partner 8	
Name	Ms Charlotte Lusty
Organisation	The Global Crop Diversity Trust
Role within Darwin Project	Observer organisation supporting capacity building on MLS and germplasm governance
Address	
Fax/Skype	
Email	