

EIGHTH REGIONAL MEETING OF
PACIFIC HEADS OF AGRICULTURE AND FORESTRY SERVICES (PHOAFS)
(Nadi, Fiji, 09 March 2023)

UPDATE FROM REGIONAL PUBLIC GOODS
Progress of implementation of the CePaCT Investment Plan 2019-2029

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Title	Progress of implementation of the CePaCT Investment Plan (2019-2029)
Action	For information

Purpose

1. This paper provides an update on the progress of CePaCT's Investment Plan implementation to date and builds on the updates noted by the PHOAFS in its August 2021 virtual meeting.

Background

CePaCT – Pathway to excellence as a regional public good

2. The 2016-2020 SPC Strategic Plan focused on supporting programmes and projects that were defined under the framework for Pacific Regionalism and the SAMOA Pathway, as services that can be most effectively and efficiently provided through cooperation at the subregional or regional level. These services should support national priorities, complement national capacity, promote a regional issue, position or norm, and result in economies of scale and increased sustainability. CePaCT's dynamic work on the conservation and sustainable use of the Pacific's plant genetic resources for food and agriculture was identified as one of SPC's Regional Public Goods. In its new Strategic Plan (2022-2031), SPC continues to recognise the importance of its Regional Public Goods like CePaCT to delivering SPC's services in response to its member countries' priorities.

CePaCT's Business case – the process and the purpose

3. As a regional public good, SPC committed to transforming CePaCT into an area of excellence for the Pacific community. This resulted in the development of CePaCT's first business case, a process that was initiated in 2017 and included an external review of the Centre by the Global Crop Diversity Trust and a number of bilateral and regional consultations with key stakeholders from government, private sector, universities, international development agencies, non-governmental organisations, and donors. These reviews and consultations identified key operational and technical gap areas for CePaCT's improvement and consolidated the region's priorities on plant

genetic resources focus now and into the future – critical components that informed the business plan.

4. The main objective for CePaCT's transformation is based on global standards on quality management systems, so that it can better address the needs of the Pacific region in having facilitated access to and availability of high quality, nutritious and resilient crop and tree diversity which can support regional and national efforts in climate readiness and combatting non-communicable diseases (NCDs).
5. CePaCT's Business Plan was finalised in 2018 and was further refined into an Investment Plan document in 2019 ideal for donor uptake. A donor roundtable meeting was held in March 2019 to communicate the investment plan and gather financing support for the implementation of the investment plan.
6. The CePaCT Investment Plan (IP) assumed a long-term focus of 10 years however, implementation took a stepwise approach focusing on two 5-year terms with the first 5 years focusing on (1) improving CePaCT's operational and technical capacities in alignment with international genebank standards, and (2) addressing key gaps in institutional and technical areas to facilitate and accelerate collaborative work on the efficient utilisation of plant genetic resources in countries. Whilst undertaking these improvement efforts, CePaCT continues to deliver its routine services on the conservation, distribution and health testing of accessions including complementary research activities. The implementation of CePaCT's Investment Plan started in late 2019 and was greatly impacted by the COVID-19 pandemic in 2020 and 2021.
7. PHOAFS in their October 2019 meeting (Apia, Samoa) welcomed the further development of CePaCT into a Centre of Excellence and supported the aims of CePaCT in its August 2021 virtual meeting hosted by the government of Fiji.

CePaCT's Investment Plan – the change theory

8. Contributing to regional goals of enhancing resilience and wellbeing of Pacific people, CePaCT aspires to make impact in the region through increasing '*consumption of diverse, nutritious, domestic food thus ensuring healthy diets and sustainable livelihoods for the Pacific communities.*' To realise this impact, CePaCT's Investment Plan Theory of Change, outlined below, provides the roadmap for short-to-medium-to-long term outcomes and interventions.
 - Long term outcome:
Increasing production and domestic supply of safe and nutritious agricultural and forest products using profitable, sustainable production systems based on climate-smart crop varieties
 - Medium-term outcomes:
 - 1) **Germplasm of major Pacific crops and trees safely conserved at CePaCT and available for distribution, and**
 - 2) **Increase in utilization of highly nutritional, disease-free, and climate-resilient crop and tree varieties.**

9. CePaCT observes the indicators of the Global Crop Diversity Trust for global genebanks under its mandate to meet its genebank performance targets. These indicators are closely aligned to the Food and Agriculture Organisation (FAO) Genebank Standards. For utilisation performance targets, CePaCT follows the indicators developed based on regional priority gaps and needs.

Updates on the Progress of implementation of the CePaCT Investment Plan

10. The following updates are based on the medium-term outcomes of CePaCT's IP and attempt to quantify CePaCT's progress towards its performance targets using baselines recorded prior to the start of implementation.
 - a. **Medium-Term Outcome 1:** Germplasm of major Pacific crops and trees safely conserved at CePaCT and available for distribution.
 - **Conservation: collections status**
11. A total of 2,261 accessions of 18 crops and 47 forest trees are conserved in CePaCT collections as of August 2022. Ninety seven percent (97%) of the collections are maintained as tissue cultures, 2% as seeds and 1% in the field. Sixty-seven percent (67%) of total accessions originate from 16 Pacific countries and 33% from outside the region. Ninety-eight percent (98%) of total accessions are for long-term storage (tissue culture and field collections) while 2% (seed collections comprising of exotic and native tree species) are for short-to-medium storage. CePaCT recorded less than 1% loss in accessions since 2019 with highest numbers recorded during the 2020-2021 period when 60% of staff could not access the lab due to COVID-19 restrictions. Despite this, CePaCT has been able to meet the target of maintaining annual accession losses at below 5%. In addition, CePaCT received an additional 93 accessions for conservation since September 2019 which accounts for 22% of the 430 targeted acquisitions under the first 5-year implementation cycle.
 - **Health Testing**
12. As of August 2022, 31% of total collections have been tested clean of known viruses of biosecurity concern and are therefore available for access. CePaCT's specific target is to have 90% availability for aroid and yam collections based on the Crop Trust indicators. Since 2019, 24.62% of total aroid collections and 11.21% of yam collections have been tested clean and made available for distribution. These figures show an increase of 10% availability for aroids and 5% for yam in the past 3 years. Progress has been rather slow in this area due to the need to first optimize and validate existing and/or develop new pathogen diagnostic protocols for both aroid and yam collections. By the end of 2021, these protocols improvement works were completed for aroids and similar efforts are underway for yam health testing. With optimised protocols in place, the testing of aroid collections is expected to accelerate. Additional gains will be achieved with the two new and/or upgraded CePaCT facilities including the new molecular diagnostic lab¹, and the upgraded biosecurity approved greenhouse² as well as the high-throughput labs at Manaaki Whenua Landcare Research, New Zealand.

¹ <https://www.spc.int/updates/news/2022/04/opening-of-new-molecular-lab-boosts-pacifics-crop-research-capabilities>

² <https://fijionenews.com.fi/new-greenhouse-facility-set-to-increase-pacific-plant-research-and-quality-assurance/>

Altogether, these interventions are expected to increase current testing capacity by 50%.

- **Molecular work**

13. Genomic characterization of aroids collections has been a key target to meet by the end of 2022 and this work is in progress with key delays owed to the unavailability of external partners. Work to genotype yam collections has been initiated this year and expected to be completed by mid-2023. A key achievement in line with targets is the establishment of a molecular facility within CePaCT which was launched in April 2022. In addition, 2 staff are onboard to support molecular activities. Five CePaCT staffs have undertaken intensive training on phenotyping, genotyping, molecular diagnostics, and the use of sequence analysis software.

- **Safety duplication**

14. Duplication of CePaCT collections remains a key gap for CePaCT. The Crop Trust indicators set a target of 90% accessions of in-vitro collections for safety duplication outside of Fiji with a focus on aroid and yam collections. As of August 2022, 0% of the aroid and about 20% of yam collections have been duplicated. CePaCT will need to make significant progress in this area to guarantee safety of the collections. Partnerships for safety duplication have been explored and secured in 2021, however, recognising the sovereign rights of countries to their materials, CePaCT will need to further consult with the countries on the best strategy for safety duplication. A series of regional consultation with the Pacific Agricultural Plant Genetic Resources Network (PAPGREN) is planned for 2023 where an agreement on safety duplication is expected to be finalised before CePaCT proceeds with its implementation.

- **Genebank Information System**

15. CePaCT is making significant progress on improving its information management systems by implementing a barcoding system for its collections and adopting the GRIN Global (GG) information management system for the management of genetic resources data and its delivery globally. Initial works to source equipment, train key personnel, validate existing data, install and evaluate barcoding equipment, and install and evaluate GG have been completed. With expert technical support from the Crop Trust, a new version of the GG called the GRIN Global Community Edition (GCE) will be trialed out in the Centre in 2023. CePaCT hopes to have this new system fully functional by the end of 2024. This new system will provide a platform for consolidating regional information on Pacific plant genetics resources including those collections maintained in national collections.

- **Genebank Quality Management System**

16. CePaCT is making steady progress in meeting the elements of the evidence-based Quality Management System, set out by the Crop Trust. Significant efforts have been made to review and align Standard Operating Procedures (SOPs) for key genebank operations resulting in the amalgamation of previously identified 10 SOPs into six SOPs. Two of these six SOPs are in advanced drafts and a consultant will be on board from the first half of 2023 to review these and support the development of the remaining 4 SOPs. It is expected that all 6 key SOPs will be submitted for auditing by the end of June 2023. Works have also been completed on developing instruction manuals for all key equipment as well as general laboratory rules and procedures. Other elements of the QMS are directly linked to SPC's overarching systems and procedures and CePaCT is working closely with the Operations and Management Division of SPC on these. As of August 2022, CePaCT estimates that around 30% of the QMS elements have been completed with 20% in the process of development.

- **Cryopreservation**

17. Plans to construct a cryopreservation facility for CePaCT by the end of 2022 did not go ahead due to initial designs not meeting Fiji building standards. A new project management consultant was engaged in April 2022 to manage the construction process of the cryopreservation facility for CePaCT. New designs have been finalised and construction cost estimates developed. The cost of the new designs exceeded available budgets leading to delays in construction as CePaCT consulted with donors for approval of budget variations. With funding variation approved in July 2022, work is now progressing to construct the new facility. CePaCT expects the new cryopreservation lab to be completed by the end of 2023. One CePaCT staff has been undertaking training with external experts on cryopreservation methodologies and cryopreservation research work for coconuts are continuing with external partners.

- **Seed Lab**

18. Key upgrade works to connect the seed lab and the cold storage room as one unit has been completed in early 2022. Works are underway to source key equipment and funding has been secured to establish a seed dry room in 2023. CePaCT's target is to upgrade its seed lab facilities to support the long-term conservation of orthodox seeds in CePaCT. Three Pacific countries have confirmed to send seed materials of both forest trees and horticultural seeds to CePaCT for long-term conservation.

b. Medium-Term Outcome 2: Increase in utilisation of highly nutritional, disease free and climate- resilient crop and tree varieties.

- **CePaCT germplasm distributions**

19. CePaCT has distributed over 95,000 tissue-cultured plantlets and 1,000 kilograms of seeds to over 50 countries including the 22 Pacific countries of SPC from 2001 - 2021. The target to distribute 200 accessions/year, out of which 25% are climate resilient varieties was well achieved with the recorded average distribution of 260 accessions per year in the past 3 years of which 46% were climate resilient varieties. From January – August 2022, CePaCT has distributed over 1,400 tissue culture materials of 78 accessions to 5 countries. Of these 2022 distributions, 67% of the materials were for research purposes and 33% were for direct use.

- **Development of protocols and procedures to enhance the use of PGR**

20. Under the Pacific Seeds for Life (PS4L) project, work is underway to develop standard guidelines for crop evaluation under climate change-driven stresses with a focus on identifying crops with drought and salinity tolerance/resilience. In addition, CePaCT is undertaking research trials to develop and/or optimise screen house screening methodologies for drought and salinity tolerance. Crop descriptors are in place for most crops, however, there is a need to develop shorter or 'mini' descriptors for ease of use. Mini descriptors are in place for some crops like bele, kava and breadfruit.

- **Strengthening institutional mechanisms for regional cooperation**

21. CePaCT recognizes the strategic importance of the Pacific Agricultural Plant Genetic Resources Network (PAPGREN) to its work. The region during the Regional Seed Forum held in 2018 in

Nadi, Fiji recommended SPC LRD to formalise the work of PAPGREN for improved coordination and collaboration moving forward. CePaCT is planning a series of PAPGREN meetings in 2023 to finalize the PAPGREN Charter as well as the Pacific Seed Systems Roadmap as strategic frameworks to formalise PAPGREN and guide its work around seed systems in general linking to the conservation and use of plant genetic resources in the region. Through the PAPGREN network, CePaCT will be able to coordinate most of its performance targets under the Outcome 2 of its Investment Plan focusing on capacity building, awareness creation, priority setting, research and development, plant breeding and most importantly, the utilisation of plant genetic resources. PAPGREN is also a vital platform to coordinate regional priorities linking to meeting Pacific countries' obligations under the various international treaties and conventions on plant genetic resources they are parties of including the FAO Commission on Plant Genetic Resources and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), the Nagoya Protocol and the Convention on Biological Diversity (CBD).

22. CePaCT will continue to strengthen its partnerships with key partners including but not limited to the Pacific Ministries/Department of Agriculture and Forestry as member countries, the FAO International Treaty on Plant Genetic Resources for Food and Agriculture providing the overarching policy framework to facilitate the sharing and sustainable use of plant genetic resources, the Global Crop Diversity Trust (Crop Trust) providing long term funding and technical support on the conservation of key collections, the Consultative Group of International Agricultural Research (CGIAR) on germplasm sharing as well as scientific and technical support, the Manaaki Whenua Landcare Research on germplasm health testing and molecular works and the Australian Centre for International Agricultural Research (ACIAR) and universities both in the region and globally such as the University of the South Pacific and the University of Queensland on research for development. CePaCT will continue to seek opportunities to expand its partnerships for mutual benefit.

○ **Capturing feedback on use of CePaCT derived materials**

23. CePaCT is currently reviewing its systems to capture feedback from requesters/users of CePaCT material. Feedback has been slow to come in from requesters and points to the need for the identification of innovative ways to solicit and collect feedback. Online surveys and digital templates are being explored to help improve feedback from requesters.

Key Challenges and Opportunities

○ **Funding**

24. The cost for the transformation of CePaCT into a Centre of Excellence during a first 5-year phase (2019-2023) had been estimated to €1.6 million/year (i.e., €8million/5 years). This covers both routine operations and new targets identified under the Investment Plan. Donor (DFAT, MFAT and Crop Trust) commitment received to support the Investment Plan implementation was estimated at €2million for the 5-years implementation period. Therefore, there was a funding gap of around €6million – a significant gap that had direct impact on the implementation of the Investment Plan and the rate at which CePaCT could meet its performance targets.
25. The government of Australia, the first to provide substantial support of AU\$2.3million in 2019 to initiate the implementation of CePaCT's Investment Plan for 4 years, has a progressive grant agreement with CePaCT. This provides a unique opportunity for additional funding support,

an area that CePaCT and the Department of Foreign Affairs and Trade of Australia has already started discussions since July 2022. The existing Australian grant focuses on supporting critical components to maintain CePaCT core services whilst the Centre continued to explore other funding opportunities.

26. In July 2022, a new funding support of NZ\$10million from the New Zealand (NZ) government was announced³ by the former New Zealand Prime Minister, Jacinda Ardern for CePaCT. Half (NZ\$5million) of this money will come directly to CePaCT and will be used to support the work of CePaCT in the next five years (2023-2027) including the implementation of the current Investment Plan. This funding has a key focus on fulfilling climate change outcomes of the Centre and will secure additional human resources for CePaCT which is key to fast-tracking efforts in meeting the Investment Plan targets now and into the future.
27. The other half (NZ\$5million) of this new NZ funding will go directly to the Crop Trust, an international innovative and sustainable funding mechanism for the world's genebanks. CePaCT has an existing long-term funding agreement with the Crop Trust that started in 2009 and supports the long-term conservation of key CePaCT collections. The new funding will increase Crop Trust's annual funding support to CePaCT from US\$50,000 to approximately US\$270,000. This additional long-term support will increase CePaCT's focus on improving quality standards for safe maintenance of collections and carry out its routine work on collecting and acquiring new diversity for conservation at CePaCT as part of its Investment Plan.
28. Other funding support exists in the form of short-term projects, all contributing towards the Investment Plan targets.
29. Whilst the focus has been to resource the Investment Plan, SPC is also actively exploring opportunities to secure a long-term funding mechanism for the Centre to ensure that interventions made under its Investment Plan are sustained and that CePaCT continues to operate at the highest level expected of them as a Regional Public Good.
 - **COVID-19 Pandemic**
30. COVID-19 has caused many delays to the activities of the Centre thus directly affecting the implementation of its Investment Plan.
31. About 60% of CePaCT staff could not access the lab due to restrictions put in place by the Fiji Government. Whilst 40% of staff were granted access, they were subjected to work in shifts and with reduced working hours, to minimise opportunities for contracting the virus in the facilities. Consequently, CePaCT estimated a 70% reduction in full capacity for technical activities and about 50% reduction in administrative and management capacity for a full 12 months of the 2 years of the pandemic. The safety of the collections was paramount during this challenging period and most activities were collapsed whilst staff focused on the maintenance of collections.

³ <https://www.spc.int/updates/news/media-release/2022/07/new-zealand-announces-10million-in-climate-financing-to-secure>

32. The impacts also affected partner responses, procurement efforts and exchange of plant materials. About 60% of distribution requests could not be met due to unavailability of flights or other means of shipment.
33. Key lessons have been learnt from this pandemic and include the need for CePaCT to prioritise the safety duplication of its collections, invest in cryopreservation for the long-term conservation of the collections complementing the tissue culture methodologies currently being employed.

Conclusion

34. Overall, CePaCT's implementation of its Investment Plan has progressed well despite the many challenges faced. Significant progress has been made under the medium-term outcome one which primarily focuses on CePaCT's internal improvements and activities. Progress under medium-term outcome two on enhancing the utilisation of plant genetic resources has been slow. To a certain extent, this is to be expected given the challenges faced with funding and the pandemic. With additional funding support, CePaCT will need to pay greater attention to its outreach programs under its medium-term outcome 2 to enhance the utilisation of plant genetic resources in the region and PAPGREN will be core to this work. Whilst it is great to have a functional genebank operating at international standards, this alone will not create the impact that CePaCT aspires to see in the region, because of its Investment Plan.

Acknowledgements

35. CePaCT wishes to thank its many partners and collaborators who have helped the Centre with the implementation of its Investment Plan. These include the Governments of Australia and New Zealand, the Global Crop Diversity Trust, the FAO International Treaty on Plant Genetic Resources for Food and Agriculture, the Australian Centre for International Agricultural Research, the French Pacific Funds, Manaaki Whenua Landcare Research, the University of Queensland, the UN-FAO, and UN-IAEA.

Recommendation

36. The PHOAFS are invited to **note** the current progress of implementation of the CePaCT Investment Plan.