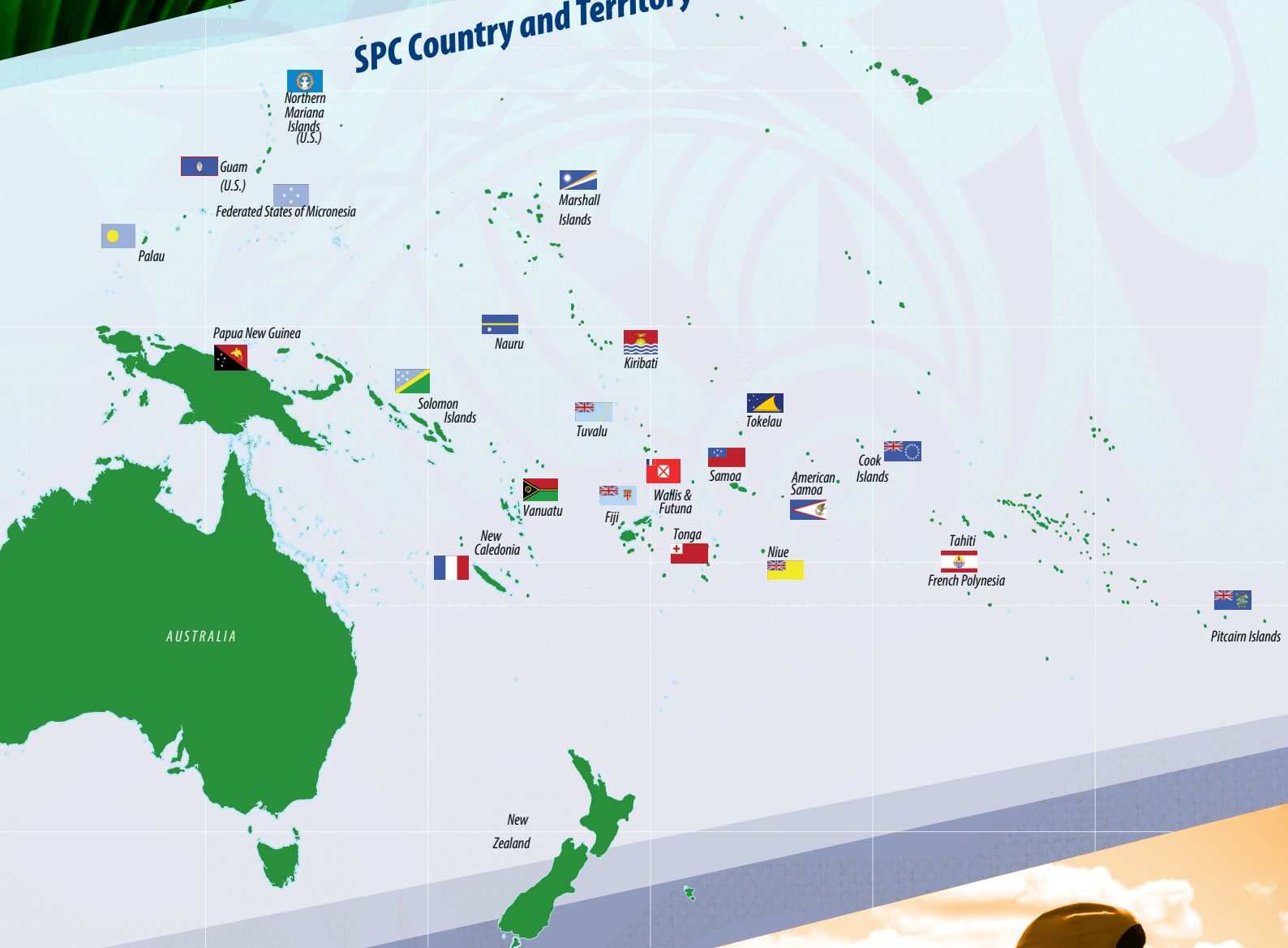




Pacific
Community
Communauté
du Pacifique

Land Resources Division
ANNUAL REPORT
2022

SPC Country and Territory Partners in the Pacific



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FOREWORD

Connection is vitally important in the Pacific, where our island states must work together, calling on their traditions, values and vision to build a resilient future that lifts all communities in the region. In 2022, reconnection was the priority of the Pacific Community and its partners, with the Land Resources Division offices reopening in March after the two-year cloud of COVID-19 disruption finally began to recede.

Though the LRD team stayed well-connected via electronic pathways throughout the pandemic, getting on the ground in the countries and talking with partners in face-to-face settings again was an indispensable component of our forward progress throughout the year.

The re-opening of international borders meant increased regional trade in 2022, making our biosecurity team particularly busy, holding five trainings and surveillances, including a webinar, for over 256 biosecurity officers and related individuals. Seed systems were also a priority, and trainings on mutation breeding, seed technologies and other important seed concerns were organized for six countries by our CePaCT team.

CePaCT also reached a number of milestones during 2023, opening both a new molecular laboratory and a new quarantine greenhouse in April. In July, New Zealand Prime Minister Jacinda Ardern visited the CePaCT lab on the LRD campus to announce new funding for CePaCT's genebank, which will play a vital role in preserving the Pacific's genetic resources in an uncertain climate change future. In May, CePaCT won the Island Innovation award for innovative island research, given to individuals and organizations driving positive change for remote island communities.

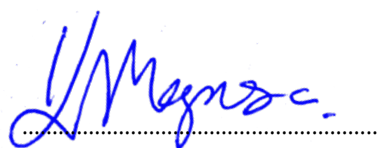
Genetic resources and seeds are interconnected with the Pacific's soils, and here LRD also scaled up its outreach during the year, producing three publications aimed at soil health and management. When the Hunga Tonga Hunga Ha'apai volcano erupted in Tonga in January, LRD collaborated with Tongan and Australian partners to collect soil samples that will help equip Tongan farmers with the knowledge they need to improve their agricultural productivity.

LRD also released a series of factsheets after the eruption that provided guidance on biosecurity risks and plant and animal health.

People cannot recover from disasters such as the volcano eruption and the COVID-19 pandemic without engaging all parts of the community, and here LRD continued to stride forward with its ambition to integrate women and underserved communities into all of its work. From training 40 women and 100 youth in Fiji on seed propagation and financial literacy, to agroecology training for 36 farmers in Nauru and the Solomon Islands that included 26 women, LRD inclusivity was evident throughout its 2022 in-person activities. In October, the POETCom released a gender and organic value chain analysis toolkit that will help integrate gender considerations into the organic sector, and in a first for Fiji, LRD also completed a survey on women and youth participation in the coconut industry that will take gender roles into account for coconut sourcing in agricultural communities.

Reconnecting Pacific food systems remained a high priority during the year. As an SPC flagship initiative, food systems and their growth benefited from LRD expertise, from germplasm distribution in Fiji, Samoa and Tonga and planting material distribution to Kiribati and Tuvalu to assisting the Federated States of Micronesia and Kiribati in including organic agriculture into their national policies. LRD brought on board a food systems lead during the year that is working across all SPC divisions to drive dialogue and action on this critical theme.

The LRD team was also looking forward to catching up with Heads and Ministers of Agriculture and Forestry in-person in 2022 during their meetings at the biggest event of the year – the Pacific Week of Agriculture and Forestry. Though the event was eventually postponed, its occurrence early in 2023 in March will serve as a springboard for an even more ambitious and resourceful year in a more open region energized again by personal contact. As we look beyond reconnection to cementing deeper collaborative relationships in 2023, LRD remains open, focused and determined so that agriculture and forestry flourish and thrive.



Karen Mapusua

Director - Land Resources Division

The Pacific Community



The Pacific Community partners with Pacific peoples to realize a series of objectives that are ambitious, insightful, and responsive for communities in the region. The following is an overview of advances and successes in our five main objectives in agriculture and forestry in 2022.

Objective 1: Land, agriculture, forestry and genetic resources are sustainably managed and conserved

More countries opening borders in 2022 provided more opportunity for the LRD team to share genetic resources and seeds during the year, as well as increase its training opportunities. CePaCT increased its accessions in 2022, and was able to safely send and receive seed accessions as well.

CePaCT also took major strides forward for the future of genetic resources after Fiji re-opened its borders to allow visitors and in-person activities. It opened new facilities, and the CePaCT team was able to get into the field in other countries in the region during the year for a number of vital trainings. Demonstration farms were once again viable, and the LRD team helped establish them in multiple communities in Fiji to increase adoption of sustainable land management practices.

Accessions

To maintain the availability of plant genetic resources and support member countries' priorities on food security, conservation, and sustainable resource management, CePaCT (Centre for Pacific Crops and Trees) continues to conserve vegetable and tree crop accessions. In 2022, CePaCT conserved 2,374 accessions, an increase from the 2021 figure of 2,231.

Approximately 92 percent (2,180) of the accessions are conserved in vitro, with 7 percent as seeds and 1 percent in the field. Up to 66 percent of the in-vitro collection (1,453 accessions) were contributed by 15 participating PICTS (Pacific Islands Countries and Territories). A full 35.5 percent (776 plants) of the CePaCT collection has been verified as pathogen-free and is available for distribution.

CePaCT continued to distribute nutritious and resilient crop varieties to support food security in the Pacific. A total of 21 accessions (2,087 plant samples) of *Alocasia*, banana, breadfruit, cassava, pineapple, potato, swamp taro, sweet potato, *Xanthosoma*, yam, taro, vanilla and coconut embryos sourced from CePaCT collections were distributed to Belgium, Fiji, Federated States of Micronesia, Nauru, Samoa, Tonga and the University of Queensland in 2022.

Also during the year, a total of 16 crop varieties were screened for water stress response and potential drought tolerance. The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) water stress (drought induction) protocol was evaluated for the screening of the CePaCT taro collections for drought tolerance traits. The CePaCT collection of more than 1,200



taro accessions accounts for 70 percent of global taro diversity and the screening will help identify drought-tolerant varieties for the region.

In July of 2022, New Zealand Prime Minister Jacinda Ardern visited the LRD campus and announced NZ10 million in new funding to support the Blue Pacific seed bank and genetic resources at CePaCT. “This funding will enable CePaCT to increase operational efficiencies, enhance our research capabilities and outreach programs to continue to build the resilience of our agriculture and food systems against climate change and in parallel, ensure that our Pacific people consume a diversity of highly nutritious food,” said Prime Minister Arden.

Seed conservation and distribution

During the year, CePaCT collected, processed and packed seeds from 30 native species to be shipped to the Millennium Seed Bank (MSB) in Kew Gardens, UK. These will be added to the existing 43 tree species (61 accessions) from Fiji that are already conserved in the MSB from previous years. In addition, 124 seed accessions of 16 vegetable crops were received from the World Vegetable Centre and 4 new drought-tolerant taro landraces were received from the University of Madeira, Portugal.

The Land Resources Division also supported the ongoing development of seed systems in three PICTs – Samoa, Tonga and Vanuatu – in 2022 as part of efforts to increase and improve the safety and availability of planting materials for farmers.

Seed production guidelines were developed and distributed during the year to 6 Pacific countries – Fiji, Kiribati, Samoa, Tonga, Tuvalu and Vanuatu – for comments. An updated draft of the guidelines will be validated in upcoming training. The guidelines provide comprehensive information on best practices for seed production, storage, and distribution, with a focus on local plant species.

Additionally, a scoping mission in Samoa for the Pacific Seeds for Life (PS4L) project resulted in agreement on the selection, collection, and conservation of local taro varieties. Human capacity development in Entomology and Botany was also agreed as a priority for Samoa.

Research, trainings and capacity development

LRD stepped up its research and trainings for the year, spreading throughout the Pacific for work on the ground and the face-to-face contact that is vital for sound research and strong community relations. In Fiji, CePaCT facilitated a regional training on mutation breeding, seed technologies, molecular diagnostics, coconut tissue culture techniques, and allometric protocols for 48 participants (25 women and 23 men) from Fiji, Marshall Islands, Papua New Guinea, Samoa, Solomon Islands and Vanuatu.

LRD also brought crop, business and resources training to communities in Sigatoka, Fiji, with 40 women and 100 youth trained in seed propagation, nursery management, financial literacy and exchange programs to support natural resource management and biodiversity conservation efforts.

Other capacity development activities undertaken during the year included the establishment of 4 Sustainable Land Management (SLM) demonstration farms in multiple communities in Fiji to adapt to the increasing adoption of SLM practices. Also in Fiji, the community on Rabi island received support for their land-use surveys, including data collection, gender assessment for value chains and awareness of the Organic Participatory Guarantee System.

LRD also participated in a cocoa marketing tour of Australia that included 14 representatives from private organizations, NGOs, and government agencies across 4 countries – Fiji, Samoa, Solomon Islands and Vanuatu. The tour enhanced participant knowledge and understanding of the cocoa value chain.

In Fiji, livestock officers participated in a surveillance training supported by LRD that enhanced their knowledge on disease surveillance work, particularly on sample packaging and transportation. This improved knowledge will contribute towards disease prevention and control efforts in the country.

Programme development and technology

CePaCT enhanced its Quality Management System (QMS) on Crop Trust and FAO Genebank Standards by developing two Standard Operating Procedures for conservation and distribution operations during the year, in addition to publishing instruction sheets for laboratory rules and all key laboratory equipment. Protocols for aroids health testing were also developed and validated.

CePaCT won the Clinton Foundation's 2022 award for Innovative Island Research. The award, given by Island Innovation, a global network that connects island stakeholders through digital communication and events, was presented to CePaCT online in a ceremony held in April 2022. The Island Innovation Awards recognise individuals, organisations and projects driving positive change for remote and island communities globally.

Biodiversity conservation and natural resources management

LRD continued its work in communities in 2022 to improve natural resources management and enhance biodiversity conservation for agriculture production and forests. In Fiji, over 665 hectares of forest plantations were established in four communities with major water catchments over the course of two years, including 2022. The LRD team also kept up its ongoing maintenance of Dilo trial plots at Sigatoka sand dunes on Fiji's largest island Viti Levu.

In Vanuatu, the focus was on soil health. Soil samples were collected from 8 sites for assessment. LRD also returned to its work on cocoa in Vanuatu during the year, completing 4 fermentation audits for cocoa bean samples at 3 sites, in addition to conducting an assessment of cocoa germplasm replication sites.

During a scoping mission in Samoa for the Pacific Seeds for Life (PS4L) project, it was agreed that conservation of local taro varieties was an important priority for the country, in addition to the development of human capacity in Entomology and Botany

Work was also done to expand the biodiversity knowledge base in Fiji during the year. Several reviews were conducted in collaboration with the Ministry of Forestry and ACIAR. These included:

- (1) Review of forest product training capacity
- (2) Review of the existing veneer processing and engineering wood product manufacturing industry capacity
- (3) Review of existing coconut resource literature
- (4) A survey on *Women and Youth participation in the coconut and timber industry*. A first for Fiji, the survey addressed gender perspectives on natural resource sourcing based on experiences and learning in rural agricultural communities. Findings will inform decisions on the differences in gender roles when sourcing senile coconut stems from agricultural communities.

During the year LRD also supported the Fiji government in the review and development of three policies and regulations relating to natural resources management that included:

- (1) Review of Fiji Forest Harvesting Code of Practice
- (2) Review of Fiji Sawmilling and Treatment Plant Regulations
- (3) Development of a draft Fiji Rural and Forest Fire Strategy



Success Story – Strengthening cocoa value chains in Fiji, Samoa, Solomon Islands and Vanuatu

Cocoa is an important export for Fiji, Samoa, Solomon Islands and Vanuatu. In Vanuatu, 25 percent of rural households are involved in cocoa production, and in the Solomon Islands, cocoa is the biggest agricultural export earner, generating approximately AUD \$20 million per year.

Though cocoa is significant to agriculture throughout the Pacific, the volume of it produced in the region is small by global standards, making up less than two percent of total global production. Many farmers, the majority of them small holders, lack access to training, financing for expansion, and improvement of export-orientated infrastructure to support the production and export of quality cocoa.

LRD partnered with ACIAR (Australia Centre for International Agricultural Research), the University of Adelaide and QDAF (Queensland Department of Agriculture and Forestry) for the project *Aligning genetic resources, production, and post-harvest systems to market opportunities for Pacific island and Australian cocoa to strengthen cocoa value chains and improve livelihoods*. The project collaborated with communities in Fiji, Samoa, the Solomon Islands and Vanuatu to improve several vital components for growing and processing cocoa, including genetic variety, propagation, tree and farm management, soils and heavy metal testing, pest and disease management, bean fermentation and drying, and food safety.

Building connections with cocoa farms and chocolate producers and distributors to address these production components led to a number of important changes and milestones, including identification of best cocoa varieties, better and faster propagation – with many grafted cocoa seedlings producing cocoa pods at 18 months, compared to three years from seeds – and new methods of tree pruning and fermentation for healthier pods and better beans.

Farmers were provided the tools, training and infrastructure improvements to add more value to their cocoa, allowing them to continue producing and marketing it during shocks, such as COVID-19. In one example, cocoa farmer Moli from Malo island, Vanuatu used his knowledge, training and new refining methods to collaborate with a country-based NGO to make and package chocolate locally that sold very well and produced a steady revenue stream during the COVID disruption.

This key finding, in addition to others on growing, processing and value adding, heralds growth and resilience for the future of Pacific cocoa and indicates that it is also well-placed to compete in high-value, low-volume markets based on fine flavour, unique genetic resources and novel 'single origin' branding. Though the project wrapped up in 2022, a proposed second phase would continue training, infrastructure improvement and cocoa distribution and marketing to secure the livelihoods of the Pacific's cocoa farmers, processors and distributors.

Objective 2: Enhanced ability to meet local and international market requirements for agriculture and forest products

Trade in agriculture and forest products during the year once again became vitally important in the region as markets began to revive in slowly expanding economies. The LRD team provided support to this revival through training and boosting the agroecology skills of farmers in Nauru and the Solomon Islands.

Newly revived trade also translated to increasing biosecurity challenges, and the biosecurity team was busy during the year, holding a number of trainings on vital biosecurity topics throughout the region. Biosecurity and plant health also led to progress on phytosanitary measures for the region. Not forgetting animal health, LRD also made contact with potential partners to enhance collaborative efforts.

Training and Capacity Development

Increased in-person contact in 2022 produced more trainings focused on markets for agriculture and forest products. A workshop held with participants from four countries – Fiji, Samoa, Tonga and Vanuatu – that included 10 women and 12 men focused on enhancing knowledge on micro, small and medium enterprises (MSMEs). Participants learned from current MSME operators.

Agroecology knowledge and skills were the focus for 36 farmers (26 women, 10 men) from Nauru and the Solomon Islands that took part in the Pacific Organic Learning Farms Network (POLFN) Project sessions.

Individuals from 9 countries – Cook Islands, Fiji, Kiribati, Nauru, Papua New Guinea, Samoa, Solomon Islands, Tonga and Tuvalu – attended the International Plant Protection Convention (IPPC) Regional Workshop in 2022, where the focus was on the draft International Standards for Phytosanitary Measures. The standards aim to enhance biosecurity measures in the region. Participants were also offered training on the Pacific Pest List Database, a knowledge resource hosted by SPC that offers information and resources on pests and diseases in the region.

The LRD biosecurity team was very active in 2022, completing a number of trainings aimed at enhancing biosecurity capacity that included:

(1) A general phytosanitary surveillance and specific surveillance for the Fall Armyworm and Coconut Rhinoceros Beetle that included 40 participants (13 women, 27 men) from 6 countries.



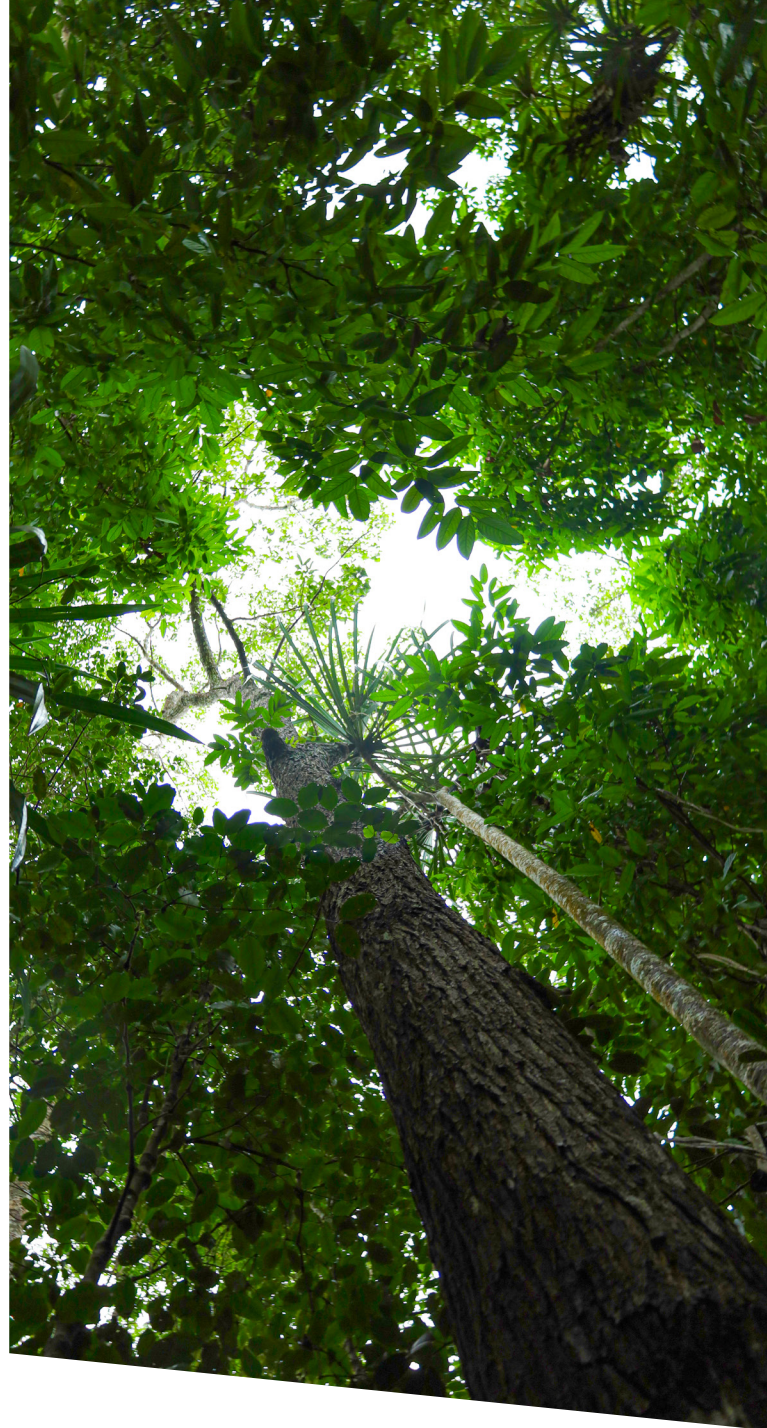
(2) An ePhyto (electronic phytosanitary certificate) training for 27 participants (11 women, 16 men) from 10 countries.

(3) A Sea Container Hygiene System webinar attended by 132 people (48 women, 84 men) from 14 countries that focused on country biosecurity and export opportunities.

(4) A Pre-Border, At-Border and Post-Border biosecurity risk mitigation, emerging pest threats and sample collection training held for 22 biosecurity officers (8 women, 14 men) from the Solomon Islands.

(5) A total of 35 biosecurity and plant protection officers, Ministry of Agriculture representatives and development partners from 9 countries – Cook Islands, Fiji, Kiribati, Nauru, Papua New Guinea, Samoa, Solomon Islands, Tonga and Tuvalu – participated in the *Pacific Plant Protection Organisation (PPPO) ePhyto Regional Workshop and Training* to discuss the gaps, progress and lessons learned from the ePhyto Project. Key outcomes from the training included improved knowledge and skills to implement national ePhyto systems, increased awareness of ePhyto implementation in the region and review of the ePhyto implementation plan for 2020-2022.

Finally, with LRD's technical advice and support through Participatory Guarantee System (PGS) certification, the women's group from Rabi Island, Fiji are now producing two value added organic products: hand sanitizer and lip balms. With POETCom approval for use by farmers using the Pacific Organic Standard, and LRD support, 16 new organic compliant value added input products were being produced in 2022 by the Fijian business and POETCom Member Sea&Soil.



Collaboration and project investment

LRD continued to collaborate with partners and through its technical organizations in 2022 to improve plant protection and biosecurity in the Pacific. During the year it conducted a gap analysis on the emergency response and early warning systems of 17 National Plant Protection Organizations (NPPOs) from 10 Pacific countries and territories. The analysis sought to identify biosecurity concerns and areas for improvement.

Also during the year, the Pacific Plant Protection Organization (PPPO) conducted two meetings aimed at supporting and strengthening biosecurity and plant health efforts in the region. The Regional Draft for Internal Standards for Phytosanitary Measures that aligns with the expectations of the International Plant Protection Convention (IPPC) was finalized. The phytosanitary measures were developed through a consultative process involving all 19 member countries of the PPPO and are currently awaiting endorsement by the Phytosanitary Measures Commission and IPPC Standards Committee.

Following the endorsement of the PAHPF (Pacific Animal Health and Production Framework), and recommendations from the Pacific Heads and Ministers of Agriculture and Forestry meetings in 2021, the Chair and Vice Chair of the Pacific Heads of Veterinary and Animal Production Services (PHOVAPS) for the Asia Pacific Steering Committee were formalised. PHOVAPS has a mandate to support member countries with PAHPF implementation.

Additionally, a Memorandum of Understanding (MOU) between SPC and the World Organisation for Animal Health (WOAH) is now being discussed, with the aim of enhancing collaborative efforts. Further steps to formalize this collaboration will be taken in 2023.

LRD'S CONTRIBUTION TO THE
KEY FOCUS AREAS OF THE
SDG BY 2030

GOAL 1: ALL PACIFIC PEOPLE BENEFIT FROM SUSTAINABLE DEVELOPMENT

GOAL 2: ALL PACIFIC COMMUNITIES ARE EMPOWERED AND RESILIENT

KFA 2: NATURAL RESOURCES AND BIODIVERSITY

KFA 4: EQUITY, EDUCATION, AND SOCIAL DEVELOPMENT

KFA 5: SUSTAINABLE ECONOMIES AND LIVELIHOODS

KFA 1: RESILIENCE AND CLIMATE ACTION

LRD'S CONTRIBUTION TO THE SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY

3 GOOD HEALTH AND WELL-BEING

2 ZERO HUNGER

5 GENDER EQUALITY

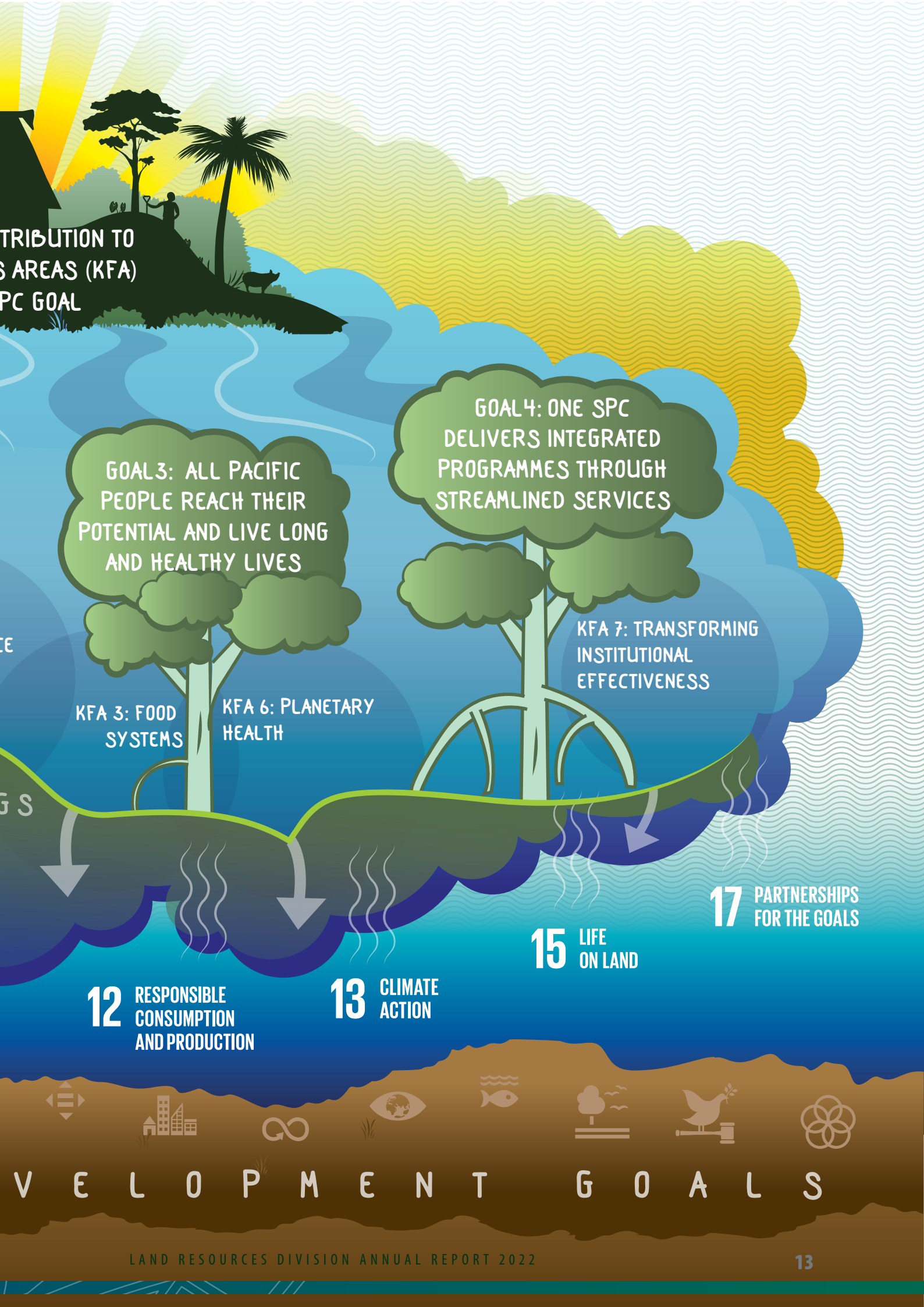
8 DECENT WORK AND ECONOMIC GROWTH

10 REDUCED INEQUALITIES



S U S T A I N A B L E D E

CONTRIBUTION TO
SUSTAINABLE DEVELOPMENT
GOALS (KFA)
SDG GOAL



GOAL 3: ALL PACIFIC
PEOPLE REACH THEIR
POTENTIAL AND LIVE LONG
AND HEALTHY LIVES

KFA 3: FOOD
SYSTEMS

KFA 6: PLANETARY
HEALTH

GOAL 4: ONE SPC
DELIVERS INTEGRATED
PROGRAMMES THROUGH
STREAMLINED SERVICES

KFA 7: TRANSFORMING
INSTITUTIONAL
EFFECTIVENESS

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION

13 CLIMATE
ACTION

15 LIFE
ON LAND

17 PARTNERSHIPS
FOR THE GOALS

V E L O P M E N T G O A L S

Objective 3: PICTs have access to diverse and nutritious agricultural and forestry resources resilient to the impacts of disasters and climate change

LRD sharpened its focus on food systems and organics during 2022 to help ensure agriculture and forestry resources are resilient as climate change and disaster impacts grow throughout the Pacific. Plant distributions played a role in this sharper focus, in addition to building stronger links with partners and stakeholders in areas that include plant genetic resources and organic policy.

Crop procurement, distribution and promotion

A total of 14 distributions of accessions and plants were carried out in 2022. The accessions totaled 212, with 2,087 plantlets distributed to 7 countries: Australia, Belgium, Fiji, Federated States of Micronesia, Nauru, Samoa and Tonga.

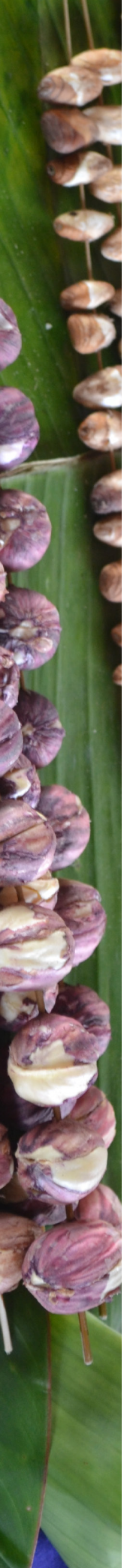
Food systems work was also strengthened during the year through the distribution of germplasms to 4 countries – Australia, Fiji, Samoa and Tonga – to support research efforts in collaboration with local farmers. Food systems were enhanced in Kiribati and Tuvalu through the adoption of planting material. In Tonga, 25 crop species were distributed for characterisation.

Collaboration and investment

PAPGREN – the Pacific Agricultural Plant Genetic Resources Network – took steps toward its restructuring in 2022 to establish appropriate linkages with key stakeholders in the region.

Two countries – Federated States of Micronesia and Kiribati – saw progress during the year in regard to opportunities for the inclusion of organic agriculture in their national policies. In FSM, development of a draft for a national agriculture policy was completed. The draft is now awaiting government approval. In Kiribati, a draft national organic policy is also currently in development, with a situation analysis for the policy finalized.





Objective 4: Regional and national policies, programmes and services in agriculture and forestry are gender responsive, socially inclusive, and promote and protect cultural heritage and human rights

In 2022 LRD and its community partners had the opportunity to not only strengthen gender participation and balance and social inclusion in agricultural activities, but also look at new initiatives where it can be integrated into the project design from the beginning, or is the main focal point.

LRD teams focused on gender balance in a series of trainings throughout the region. Social inclusion was part of drafting and socialising policies that cast a wide net for stakeholders, including for national organic policies, veterinary needs and pesticide registration.

Gender and youth investment and support

The opening up of communities in 2022 allowed LRD to augment its investment in gender and youth, in several cases taking this investment directly to the community. In Fiji and Palau during the year, LRD supported 50 rural women to strengthen value chains in their communities. Approximately 20 women in the Ngarauang Women's group in Fiji that are part of the DeMOK value chain benefited, as well as 30 women from Butaritari lands in Kiribati that are part of the VCO value chain.

During the year LRD undertook a *Women and Youth participation in the coconut and timber industry* survey to identify gender roles, who makes decisions, what works well, and ultimately promote support for development of coconut senile stem sourcing and coconut rehabilitation with women and youth communities. Draft report findings have been completed and are scheduled to be finalised by SPC partner ACIAR in 2023.

Women and youth were a specific focus in trainings held in Sigatoka, Fiji for seed propagation, nursery management, and financial literacy and exchange programmes. A total of 40 women and 100 youth were trained. The resulting knowledge will support natural resource management and biodiversity conservation efforts in the area.

Women were also a focus for Pacific Organic Learning Farms Network (POLFN) project sessions, comprising 26 of the 36 farmers from Nauru and the Solomon Islands that took part.

Gender balance played an important role in the CePaCT training held during the year on mutation breeding, seed technologies, molecular diagnostics, coconut tissue culture techniques and allometric protocols. Women made up 25 of the 48 participants from six countries: Fiji, Marshall Islands, Papua New Guinea, Samoa, Solomon Islands and Vanuatu.

Social Inclusion

Though many governments and communities were still not operating at full power during the year, LRD ensured its collaborative efforts remained open and inclusive. The Federated States of Micronesia and Kiribati, with LRD's guidance, progressed in their vision for the inclusion of organic agriculture as part of their national policies. In FSM, a draft National Agriculture Policy has been completed and is awaiting government approval. In Kiribati, a draft National Organic Policy is currently in development after completion of a situation analysis.

Regionwide, a capacity plan aimed at meeting the veterinary needs of Pacific Islands and Territories was developed and finalised. The plan will be submitted to the Pacific Heads of Agriculture and Forestry, in addition to country agriculture and forestry ministers, for endorsement.

Efforts were also underway in 2022 to strengthen pesticide registration knowledge in the region to support the launch of the Pacific Regional Pesticide registration Scheme (PRPRS). A new technical cooperation programme for the PRPS from LRD partner FAO has been finalised, and an MOU has been prepared and reviewed by SPC's legal team for signing with the implementing countries. In 2023, a pesticide coordinator and an intern will be brought on board.



Success story – Local community engagement helps Ifira Island address Coconut Rhinoceros Beetle pest

The coconut industry in Vanuatu has unique community-level value and is the second largest contributor to foreign exchange earnings, contributing 45 percent towards Vanuatu's GDP. However, the Coconut Rhinoceros Beetle (CRB) and its new strain the Guam biotype (CRB-G) has the potential to devastate the country's coconut industry as well as the livelihoods of the tens of thousands of people that depend upon it.

In March 2022, CRB-G was detected on Ifira, a small island with a population of approximately 1,000 located near the coast of Vanuatu's capital city, Port Vila. With the incursion happening close to Vanuatu's largest shipping port, the Vanuatu government is treating the outbreak as a national security issue. The beetle has no natural enemies, and can rapidly spread into new areas.

Given the highly invasive nature of CRB-G, and the fact that uncontrolled infestations can kill most palms within a year, the outbreak on Ifira became an urgent emergency for local coconut growers.

The SPC Land Resources Division Pacific Awareness and Response to Coconut Rhinoceros Beetle (PARC) project sprang into action, visiting the island and working with the Vanuatu Biosecurity team in carrying out pheromone trapping, creating biological control agents, growing cover-cropping and applying insecticide, as well as physical killing of beetles. PARC partners with Ag Research NZ and is supported by the New Zealand Ministry of Foreign Affairs and Trade (MFAT).

The PARC team collaborated with the Vanuatu biosecurity team on consolidation of CRB data through Kobo Toolbox. Kobo is a free data collection, management and visualization platform that supports open source data systems and technology. On the island, the PARC team also worked with partners on sanitation and community awareness and training.

The Ifira efforts led to a number of successful interventions in the battle against the destructive pests, including establishment of an effective biocontrol virus in coconut plantations six months after its release, and the trapping of large numbers of beetles. Community awareness efforts led to Ifira residents taking control of the eradication initiative after the PARC team had left the island. The team also did training, providing knowledge and skills to 17 staff from the Vanuatu Biosecurity team to help ensure the long-term sustainability of the initiative.

The PARC team and LRD have recognized that community ownership and involvement is critical for effective initiative implementation. The team continues to do bi-weekly Zoom catchups with Biosecurity Vanuatu, and plans follow-up visits to Ifira in 2023. CRB and CRB-G are also spreading rapidly in Papua New Guinea and the Solomon Islands. The PARC team will visit these countries as well in 2023 to assist governments and local communities in curbing the outbreaks.

Objective 5: Integrated farming systems and services strengthened

LRD remained busy producing knowledge products related to farming systems throughout the pandemic, and 2022 allowed for more distribution opportunities and wider audiences. Products distributed during the year focused on soil, pests and diseases, protected cropping and plant health. Pest awareness brochures were also distributed during outbreaks.

Open borders allowed for a multitude of in-person training opportunities, and the LRD team completed a number of important knowledge and skills events, some of which had been on hold since the start of the COVID emergency.

Knowledge investment and management

LRD continued to publish guidelines and papers throughout the year to support farming systems. With the threat of African Swine Fever (ASF) growing in the region, the LRD team produced and distributed awareness materials targeting farmers and biosecurity and livestock extension officers in Pacific countries and territories. This included ASF videos, factsheets and pull up banners, as well as rapid test kits for training purposes.

LRD also broadened its soil health efforts during the year, releasing a series of publications aimed at increasing knowledge on soil health management in the region for better informed decisions on soil resilience in the face of climate change:

(1) Collection, analysis, and interpretation of results from soil samples taken at 33 sites in Tonga after the devastating eruption of the Hunga Tonga-Hunga Ha'apai volcano in January 2022.

(2) Regional soil sampling guidelines, published electronically in 2022 with printed copies planned for distribution to six countries – Fiji, Kiribati, Samoa, Tonga, Tuvalu and Vanuatu – in March 2023.

(3) The *History of soil research conducted by the New Zealand Soil Bureau in five southwest Pacific countries* based on historical research in Fiji, Samoa, Kiribati, Tonga and Tuvalu.

LRD continued to invest in knowledge in regard to pests and diseases during the year. It completed Standard Operating Procedures (SOPs) for import risk assessments of specific pests and diseases. The SOPs will help provide appropriate management measures to mitigate risks that may adversely affect crop production in the region.

In Papua New Guinea and Vanuatu, sanitation awareness activities as part of LRD's Coconut Rhinoceros Beetle eradication efforts were held, including sessions on social media posting and video production, with an additional 2,000 copies of Coconut Rhinoceros Beetle awareness brochures distributed. A copy of a CRB video produced by LRD was shared with NBC Papua New Guinea for free airing.



Also in Vanuatu, research focusing on new strains of the CRB virus was conducted to support efforts to reduce infestation. In related work, a CRB haplotype distribution map for partner countries was developed and uploaded to the CRB database.

A Plant Health Clinic manual was also developed during the year through a partnership between SPC, the University of Queensland and the University of Tasmania, in collaboration with four Pacific countries – Fiji, Samoa, Solomon Islands, and Tonga. The manual is part of ongoing efforts to strengthen country capacity for pest and disease diagnostics in the region.

Finally, an additional publication, the *Protected Cropping Farmers Manual* was developed and publicised in 2022, along with an accompanying policy brief to be distributed Pacific-wide.

Training, technical support and documentation

LRD in-person trainings in 2022 focused on topics vital to COVID-19 recovery and a resilient Pacific future, including livestock, plant health and biosecurity. A total of 33 (14 women, 19 men) livestock and biosecurity officers from 14 Pacific countries and territories participated in an IATA (International Air Transport Association) biosecurity and animal health training managed by LRD. Work also progressed during the year on improvements to the animal health lab in Fiji through a partnership with the Biosecurity Authority of Fiji and the Fiji Ministry of Agriculture.

In the Solomon Islands, 16 livestock officers (4 women, 12 men) received training in paravet and livestock disease surveillance to enhance their capacity in animal health.

For plant health, 60 farmers from Sigatoka, Fiji participated in farmer field schools and plant health clinics to enhance their plant health knowledge and capacity. Fiji and Tonga also received support to strengthen integrated crop management. Lab equipment monitoring was completed for Fiji, and 2 laboratory pesticide resistance trainings were conducted virtually for Tonga.

On Ifira Island in Vanuatu, three communities demonstrated improved sanitation practices based on controlled-site experiments. A refresher training on the Kobo Toolbox was also provided to biosecurity officers in Vanuatu. The Kobo Toolbox is a free data collection, management and visualization tool used by NGOs and other organizations worldwide.

Additional technical training in Vanuatu and Papua New Guinea reached 93 government officers (26 women, 67 men) in areas focused on addressing climate change:

- (1) In Vanuatu, 4 participants (1 woman, 3 men) and in Papua New Guinea 4 women attended a training session on the metarhizium bulking and distribution process. Metarhizium is a fungus that can be used to fight some plant pests.
- (2) On Ifira Island Vanuatu, 55 participants (10 women, 45 men) were trained on CRB awareness and sanitation.
- (3) Also in Vanuatu, 15 participants (4 women, 11 men) attended a training on the Kobo Toolbox and QGIS – a free and open-source desktop geographic information system application.
- (4) In Papua, New Guinea, 15 participants (7 women, 8 men) were trained in delimiting survey protocol.





Success story – From the taro patch to the policy table: inclusivity drives the Palau National Organic Policy

In Palau, “a mesei a delal a telid” means “the taro patch is the mother of our life.”

Palau’s matriarchal and matrilineal culture places high importance on taro patches and farm cultivation. Though this traditional knowledge goes back generations, socio-economic changes in the country are leading to a disinterest in farming and a move toward other livelihood opportunities. This growing disinterest limits opportunities for mothers to pass on traditional knowledge and farming methods to their daughters. Organic agriculture is a key contributor to sustaining Pacific cultures and communities, and in Palau’s case, it plays a role in maintaining and passing on women’s traditional knowledge and farming practices.

This knowledge was key to the development of Palau’s national organic policy. The *Building Prosperity for Women Producers, Processors and Women Owned Business through Organic Value Chain* (BPWP) project implemented by the LRD Pacific Organic and Ethical Trade Community (POETCom) project and supported by the Australian Government worked closely with agricultural stakeholders in Palau to develop the policy while incorporating women’s roles and knowledge as the primary growers in Palauan society and facilitating their engagement in the policy and public space.

Palau has a number of challenges and barriers in developing its agriculture sectors, including low national food security, high population dependency on imported foods, declining interest of youth in agriculture, declining soil health, limited domestic and export market opportunities, higher costs of locally produced foods, and the presence of pests such as the oriental fruit fly and the coconut rhinoceros beetle. The organic policy was identified as key to addressing these challenges and barriers.

Through resources such as technical support, consultancies, mentoring, and financial and strategic partnerships, the process was able to bring to the policy table a diversified range of stakeholders, including women leaders and women’s groups transitioning to organics. The participating women’s groups were those undergoing the PGS (Pacific Guarantee System) certification process for organic taro farms.

Once passed into legislation, the hope is that the National Organic Policy will boost the organic sectors, increasing national focus on the agriculture sector, food security, access to healthy food, and the value of agricultural products.

The Palau organic policy development methodology can now be used as a model in other countries participating in the BPWP project, including Republic of the Marshall Islands, Kiribati, Federated States of Micronesia and beyond.

Contributing to SPC Key Focus Areas and UN Sustainable Development Goals

In 2022, LRD sought to further integrate its work into SPC's overall Key Focus Areas. The SPC Strategic Plan 2022-2031 outlines seven Key Focus Areas that fall under SPC's four main goals. LRD's mandate within SPC empowered it to contribute to all of the seven Key Focus Areas, aligned to the four SPC Goals that are listed below. SPC's seven Key Focus Areas are:

1. Resilience and Climate Action
2. Natural Resources and Biodiversity
3. Food Systems
4. Equity, Education, and Social Development
5. Sustainable Economies and Livelihoods
6. Planetary Health
7. Transforming Institutional Effectiveness

LRD's Contribution to Key Focus Areas by SPC Goal

Goal 1: All Pacific people benefit from sustainable development

- Key Focus Area 2: Natural Resources and Biodiversity
- Key Focus Area 4: Equity, Education, and Social Development
- Key Focus Area 5: Sustainable Economies and Livelihoods

Goal 2: All Pacific communities are empowered and resilient

- Key Focus Area 1: Resilience and Climate Action

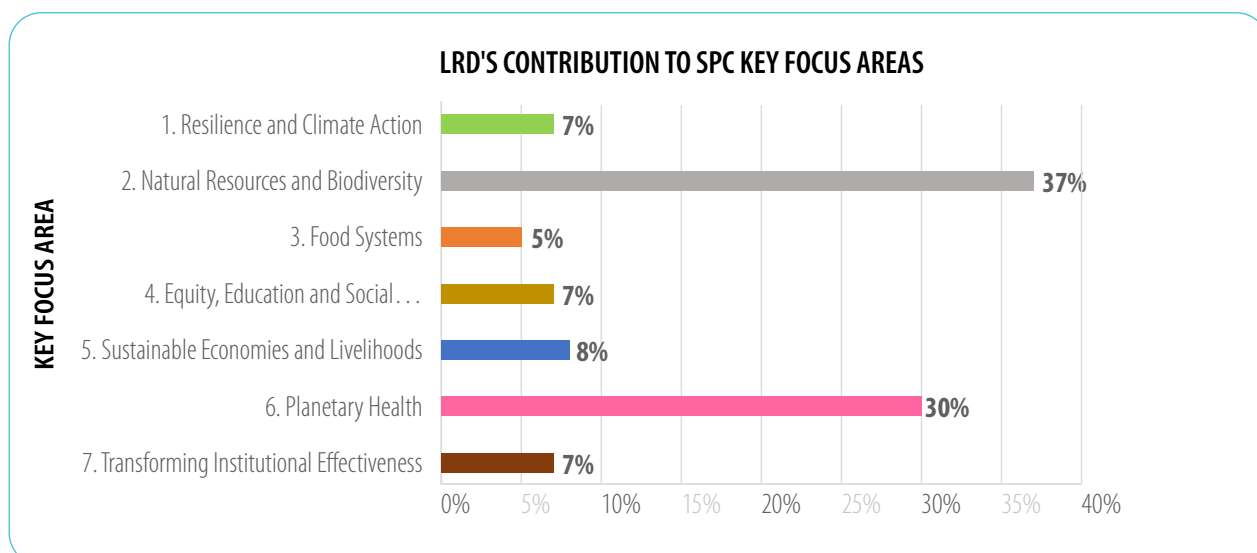
Goal 3: All Pacific people reach their potential and live long and healthy lives

- Key Focus Area 3: Food Systems
- Key Focus Area 6: Planetary Health

Goal 4: One SPC delivers integrated programmes through streamlined services

- Key Focus Area 7: Transforming Institutional Effectiveness

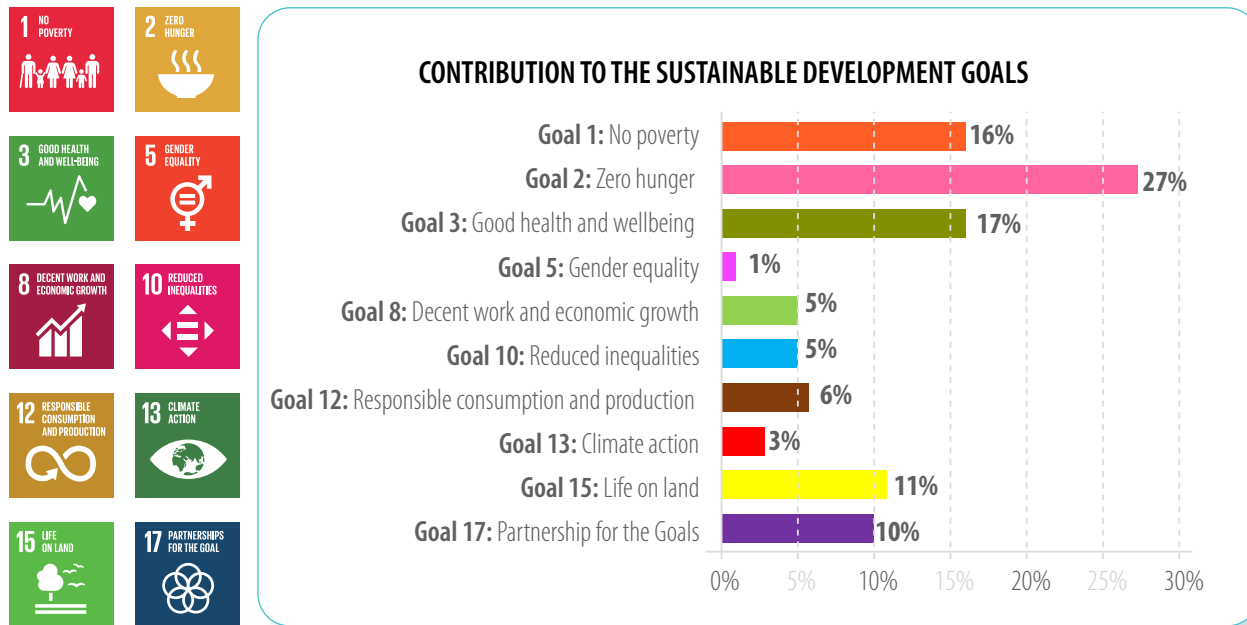
The LRD Business Plan 2019-2023 is aligned to the new 10-year SPC Strategic Plan 2022-2031. An analysis and evaluation of work during the year indicated LRD achieved 60 major results. Of the 7 SPC Key Focus Areas to which LRD contributed, 4 results were reflected under Key Focus Area 1 (Resilience and Climate Action); 22 results under Key Focus Area 2 (Natural Resources and Biodiversity); 3 results under Key Focus Area 3 (Food Systems); 4 results under Key Focus Area 4 (Equity, Education and Social Development); 5 results under Key Focus Area 5 (Sustainable Economies and Livelihoods); 18 results under Key Focus Area 6 (Planetary Health) and 4 results under Key Focus Area 7 (Transforming Institutional effectiveness). Contribution percentages are depicted in the graph below.



Sustainable Development Goals

In 2022 LRD continued to focus on contributing to the achievement of the UN Sustainable Development Goals. Noteworthy contributions were made to goals that include No poverty, Zero hunger, Good health and wellbeing and Life on Land. LRD also contributed to other goals, including Gender equality, Decent work and economic growth, Reduced Inequalities, Responsible consumption and production, Climate action and Partnership for the Goals.

LRD specifically contributed to the following goals in 2022:



Partners and Resources

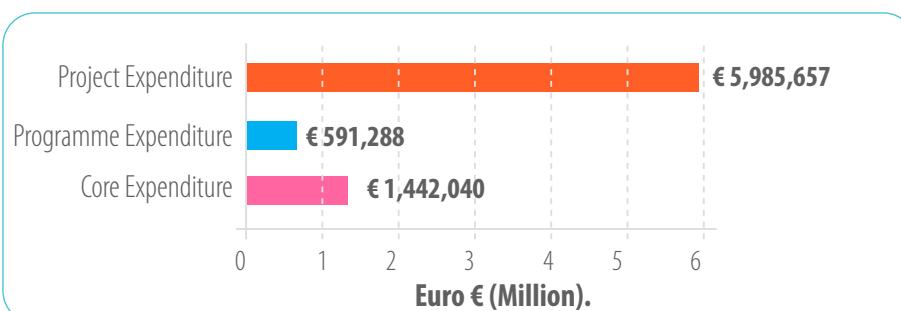
LRD sought to expand its programme and project base in 2022 while also ensuring that resources were better targeted and used more efficiently. Programmes and projects were centred on LRD's four main themes, or Pillars, that are cross-cutting and integrated. The four Pillars are:

- Genetic resources
- Sustainable forests and landscapes
- Sustainable agriculture
- Markets for livelihoods

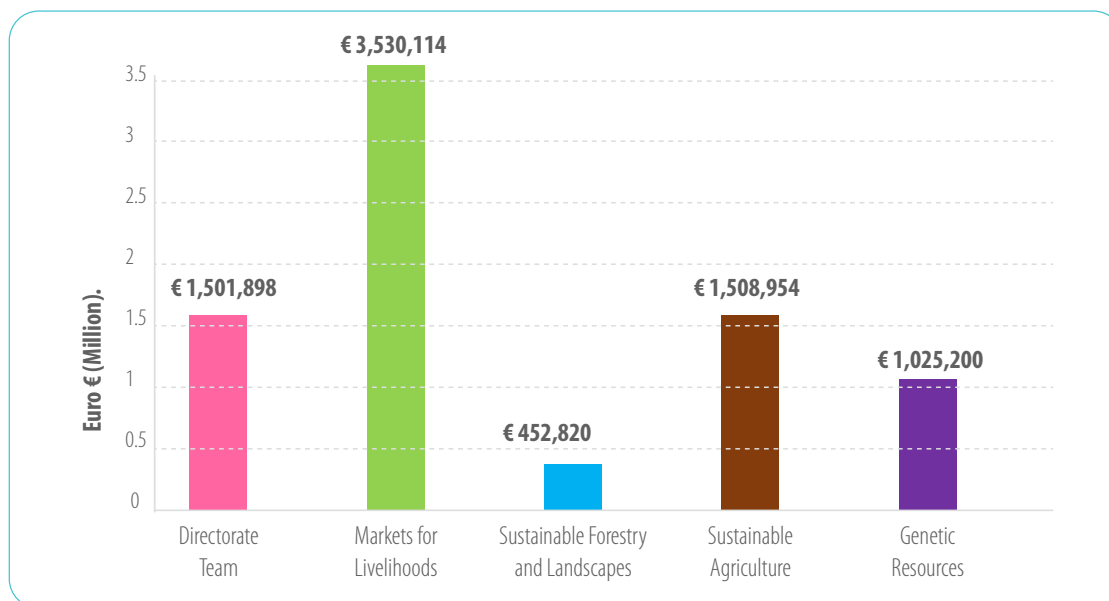
These pillars are connected through five integrated programmes currently under development:

- Pacific Seeds for Life
- Healthy Ecosystems
- Food Systems
- Biosecurity and Safe Trade
- Coconut Integrated Programme

The four pillars benefited from a funding mix that is categorized into three primary components: project, programme and core funding. In 2022, project expenditure totalled 5,985,657 Euros, with programme expenditure at 591,288 Euros and core expenditure totalling 1,442,040 Euros. See the graph below.



Segmented by LRD theme, or Pillar, and including core funding, Markets for Livelihoods expenditure was Euro 3,530,114 followed by Sustainable Agriculture with Euro 1,508,954, the Directorate Team with Euro 1,501,898, Genetic Resources with Euro 1,025,200, and Euro 452,820 for Sustainable Forestry and Landscapes. See the chart below.



Our funding and learning institution partners collaborated with LRD under the four main pillars to work toward the following outcomes.

- Increased availability of, and access to, traditional and improved crop and animal diversity (agrobiodiversity conserved, developed and promoted).
- Development and strengthening of protocols for effective provision of planting materials to national seed networks.
- Development of the Centre for Pacific Crops and Trees (CePaCT) as a Centre of Excellence.
- Further research with international partners to build regional and national capacities in key areas, such as development of gene banks and nurseries, protocols for mass propagation, crop development, evaluation and selection, and pest and disease testing and elimination.
- Increased capacity for sustainable land management and sustainable forest management.
- Development and strengthening of national and regional capacity to mitigate and adapt to climate change impacts, and to respond to the effects of disasters on land, agriculture and forest resources.
- Development, introduction and scale-up of agroforestry models in Micronesia and the smaller atolls in Melanesia and Polynesia to contribute to food and nutrition security, more efficient crop and livestock production, and promotion of markets for high-value tree products.
- Participatory development of agroforestry, crop and livestock productivity-enhancing technologies (development of crops resilient to salinity and climate change; adaptation and mitigation strategies; improved soil health, livestock and agroforestry systems; integrated crop management; and strengthening of extension, research and technology transfer).
- Enhanced divisional awareness and understanding of climate change and other key issues for agriculture and forestry.
- Improved dissemination and adoption of new agricultural production technologies.
- Strengthened division capacity to make evidence-based policy decisions on food security, sustainable resource management and economic growth.
- Increased capacity of PICTs to meet international standards, guidelines and conditions for export and domestic trade, and improved information on plant and animal health status.



- Enhanced smallholder (including women and youth) participation in local, domestic and international markets: sustainable and viable post-harvest technologies developed and promoted; increased production and consumption of local nutritious foods; sustainable, productivity-enhancing technologies for livestock; and participatory practices developed and promoted.
- Development of protocols to enable farming families to establish sustainable food crops (in terms of quantity and quality); assistance for member countries to build social capital in food production, marketing and business ethics; and promotion of participatory guarantee systems and clusters.
- A focus on equitable access to existing resources and employment opportunities for youth, women and minorities.



Looking ahead to 2023

The cautious optimism at the beginning of 2022 to step beyond the COVID-19 disruption and make face-to-face contact with the Pacific communities LRD serves was realized to a large extent during the year. Though COVID has not been entirely defeated in the Pacific, the slowing of the pandemic regionally resulted in LRD programming running at close to full strength by the end of the year.

In 2023, the LRD team is eager to continue expanding its face-to-face work with Pacific communities. The team is also ready to share stories and advance Pacific agriculture and forestry through meeting in-person again for the Pacific Week of Agriculture and Forestry (PWAFF) 2023, during which the Heads and Ministers of Agriculture and Forestry will convene.

The biannual PWAFF event was postponed until early 2023, and LRD is also prepared for close collaboration with the government of the country host Fiji to tackle a number of pressing issues that will chart a future course for the agriculture and forestry sectors. During their gathering, agriculture and forestry heads will, amongst other priorities, address development of a Pacific agriculture and forestry strategy, the launching a regional research agenda (RRA) and contribution to the UNFCCC (United Nations Framework Convention on Climate Change) agriculture workstream as a region to address common regional challenges such as soil health, livestock management and food security.

A fully open Pacific region in 2023 can lead to a surge in agriculture and forestry challenges, and the LRD biosecurity team will look to expand its in-person trainings in 2023, particularly in the Solomon Islands, which will host the Pacific Games in November. More transport and trade can also exacerbate growing emergencies, such as the spread of the deadly Coconut Rhinoceros Beetle. The LRD rhinoceros beetle team is on call, ready to hold more surveillances and trainings for beetle treatment during the year.

Field research will also be a priority in a more open region, and LRD will drive development of the regional research agenda during the year, taking next steps as proposed in the RRA framework that was completed in late 2022 and is due to be endorsed by the Agriculture and Forestry Heads at their PWAFF meeting in March.

As countries look to build resiliency into their land resources planning and programming after the pandemic, LRD will further develop its food systems flagship initiative in collaboration with regional partners and other SPC divisions. Organic agriculture will also continue to play a role in these efforts, and POETCom will look to expand its Pacific Organic Learning Farms (POLFN) network and trainings.

Other major programmes and projects that are vital to LRD operating at full capacity will also progress during the year, including the coconut initiative, and SAFE Pacific (Safe Agriculture trade Facilitation through Economic integration in the Pacific), which will help expand markets and trade access through planned activities such as biosecurity training and a 16 week para-vet training course.

This ambitious slate of programmes and projects will continue to grow throughout 2023. Staff appetite and energy for realizing these projects and confidently moving forward for Pacific communities, however, has not diminished during the long COVID disruption. In 2022, the first “build back better” step was taken, and expectations for 2023 are to move from a step to a sprint. LRD looks forward to reconnecting and re-energizing its face-to-face partner and community collaborative efforts during the year, and recounting next year the successes that the full use of its knowledge and resources will bring.