



Land Resources Division

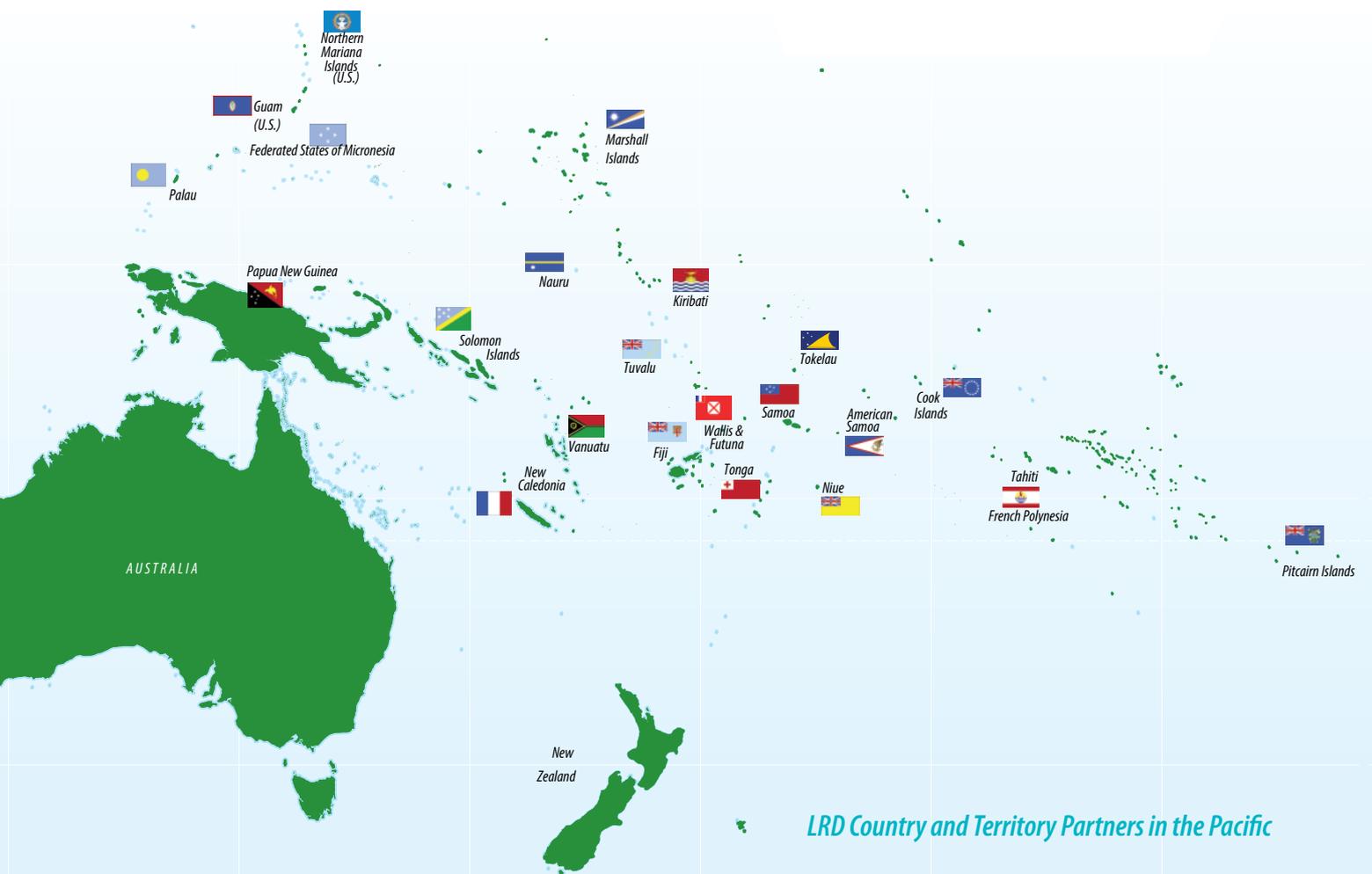
# ANNUAL REPORT

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## Foreword

As the Land Resources Division grows with the Pacific and its communities, we welcome you to our annual report, covering an exceedingly active 2019. This year was marked by expansion and reinforcement, as our programmes and projects grew roots in more Pacific communities, and our trainings and knowledge advancement found new audiences.

From the soil to cyberspace, where an increasingly connected region welcomed our co-developed apps such as a new version Pacific Pests and Pathogens, LRD's achievements for the year were characterized by innovation – a steady progress that remained people-centred.

This people-centred momentum was realized to a great extent through LRD's focus on underserved communities, including women and youth. The vast majority of agriculture related trainings and development during the year featured women, and though there is still considerable distance on the road to equal representation, our events in 2019 looked more and more like the communities in which they were held. A partnership with the women of Nadroumai, Fiji on agroforestry, for example, resulted in not only expansion of the forest plot, but reinvestment in the community and seed planting for other livelihood opportunities.

People were at the heart our holistic focus in 2019. Success came not only from consideration of the individual, but the deeply embedded culture that person held as well. Crops and seed systems that are a vital part of community heritage were emphasized through analysis, trainings and food chain development.

Values and traditions were also further integrated into LRD's science foundations throughout the year. This led to 550 traditional crop varieties collected, distributed or DNA fingerprinted. LRD's science-based expertise continued to benefit farmers and agriculture-related livelihoods, leading to additional trainings on topics that included biosecurity, organic certification, pest response, plant health, veterinary care and more, as well as manuals on organic certification and hazard analysis certification.

As we increased our numbers and strengthened our alliances in these areas in 2019, we kept an ever-present eye on climate change and its swelling impacts in the Pacific, including disasters. Climate change mitigation and adaptation and disaster risk reduction were strong themes woven into all of our activities and will continue to gain prominence as we traverse our rapidly changing region.

These LRD footprints are already making a mark on an even more challenging 2020, and we are confident this year's accomplishments will carry us forward, ensuring our lands flourish to provide sustenance and prosperity for our Pacific communities. This annual report embodies this spirit, and the LRD team anticipates your partnership and engagement in the coming year.

**Karen Mapusua**

Director - Land Resources Division  
Pacific Community

The Land Resources Division partners with Pacific peoples to realize a series of objectives that are ambitious, discerning, and responsive for communities in the region. The following is an overview of advances and successes in our five main objectives in 2019.

## Objectives

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

In 2019, LRD expanded its training and technical support, increased its accessions for conservation and distribution, re-affirmed its commitment to a gender focus in its programmes and projects, sourced and launched new crops and further fine-tuned its focus on seeds, leading on processing, packaging, saving and dispersal. Its targeted community-based action for farmers and the wider community resulted in furthering knowledge and action for Pacific peoples and the land, soil and forests that provide their livelihoods and is deeply embedded in their culture.

#### **Technical Support**

LRD contributed to a one-week technical exchange with a CIP (International Potato Center) Genebank Information Management Expert on integrating a barcoding system into CePaCT (Centre for Pacific Crops and Trees) gene bank activities. The exchange led to recommendations on sourcing and training in barcoding equipment, labels and software. It additionally produced an overview of a data management system in the context of frequently used gene bank databases, and practical exercises for designing a basic database in Microsoft Access for use in barcoding and label printing.

In Vanuatu, LRD provided technical and advisory support to the Department of Agriculture and Rural Development for the development of the new tissue culture laboratory. The laboratory will focus on the production of clean planting materials of selected priority crops for farmers and relevant stakeholders. Technical and financial support was also provided in Fiji for the plant material propagation, biosecurity approval facilitation and shipping of plant materials to countries.

LRD technical expertise was also tapped during the year to help in drafting two key documents, including the Forest Genetic Resources Action Plan for Fiji and the standard operating procedures for four key gene bank operations: conservation, distribution, database and documentation and nucleic acid extractions.

LRD staff also focused on capacity development during the year. Seven females, including five youth, and three males were trained in characterisation and tissue culture techniques. After the departure of its Genetic Resources Programme Head in October 2019, the CePaCT

team completed two weeks of expert advisory and programme support that focused on gene bank workflow progress for the development of its final standard operating procedures.

#### **Accessions**

LRD's continuing success in collecting and distributing crop varieties reached new heights in 2019, ensuring communities from a wide range of Pacific nations benefited. In Vanuatu, new accessions collected for conservation in the CePaCT collection included 61 for taro, 14 for xanthosoma, 10 for cassava, 11 for bele and 12 for sweet potato. LRD provided funding and technical support under the Crop Trust and the SPC Pacific Seeds for Life project to collect, characterise and transfer plant materials from Vanuatu to CePaCT.

In the Cook Islands, 18 banana accessions were identified, collected and characterised in collaboration with the International Transit Centre and Bioversity International. Accessions that were identified, characterised, collected and transferred to CePaCT for long term conservation included 46 of taro, 2 of sweet potato and 4 of banana. LRD coordinated the missions with its Cook Islands counterparts and facilitated material transfer agreements amongst all concerned partners.

Bananas were also a key crop for Samoa, with 16 accessions identified, collected and characterised in collaboration with the International Transit Centre and Bioversity International. LRD coordinated the missions with its Samoa counterparts and facilitated material transfer agreements amongst all concerned partners.

LRD additionally distributed 122 accessions of 11 crops – banana, breadfruit, cassava, sweet potato, swamp taro, taro, pineapple, ginger, potato, yam and Xanthosoma – to Kiribati, Fiji, Samoa and Papua New Guinea for research and evaluation purposes, as well as direct utilization.

Other related work during the year included DNA fingerprinting of 194 accessions of sweet potato and the collection of 40 tree species on Vanua Levu, Taveuni, Nadarivatu and Waidina islands in Fiji. The LRD team completed a phenology survey on the species.

### **Seed training, distribution and conservation**

As the kernel of life for all agriculture in the Pacific, seeds were a distinct ambition for LRD in 2019. Seed trainings featured throughout the Pacific, including in Tonga, where 44 people, including 27 males and 17 females – 10 of which were youth – were trained on seed evaluation plot establishment, seed saving, seed processing and seed packaging. Trainees were also engaged in seed production.

Individuals in other countries were also trained in evaluation and plot establishment, saving, processing, and packaging, in addition to seed production. In Fiji, 100 individuals, including 66 males and 34 females, of which 27 were youth, participated. In Vanuatu, the total was 40, with 28 males and 12 females, including 10 youth. In the Cook Islands, 32 were trained, including 18 males and 14 females, with 16 youth.

LRD also advanced seed initiatives during the year. In Vanuatu, it led to the establishment of a 6 acre open pollinated seed centre consisting of trial plots at Vanuatu Agriculture Research and Technical Centre. LRD also established an OP seed production plot in the Cook Islands. Two community-based seed distribution centres were also established, in Nasalia and Matawailevu villages in Fiji.

### **Plant and crop development and distribution**

LRD continued to focus on improving plants and crops in 2019, helping to ensure what was grown was tasty, nutritional, marketable and pest resilient. In Fiji, two taro leaf blight resistant lines and one orange flesh sweet potato variety sourced from CePaCT were evaluated and launched for wider distribution to farmers. In Vanuatu, new yam hybrids developed from CePaCT materials were launched at the national level for wider distribution to all farmers.

Plants and crops that have been grown and distributed to farmers and others were released through LRD technical and financial support. LRD has also led the facilitation of Fiji biosecurity approvals before shipping to other countries.

### **Focus on women and youth**

In 2019 LRD took further steps to integrate women and youth into every aspect of its work, ensuring that these traditionally underserved communities are brought into the conversation and have equal access to agriculture, forestry and related livelihood opportunities. LRD partnered with the women of Nadroumai, Fiji to start an agroforestry project during the year. Forty women participated in the project and expanded the plot from one hectare to three hectares between July and November 2019.

LRD continued to bring women and youth into its trainings and capacity development activities in 2019, ensuring they were well represented in its seed initiatives during the year. In Fiji, 34 women and 17 youth were trained in seed evaluation and plot establishment, as well as saving, processing and packaging. A similar training in Tonga included 17 women and 10 youth. In Vanuatu, 12 woman and 10 youth were trained, with 14 women and 16 youth trained in the Cook Islands.

LRD's women and youth focused engagement will continue to expand in 2020 as it brings these communities to the forefront of its efforts to ensure their voices are heard and that their invaluable contributions to livelihoods benefit all.

## **Objective 2: Enhanced ability to meet local and international market requirements for agriculture and forestry products**

Expanding markets and increasing threats to agriculture products throughout the Pacific in 2019 required LRD enhance its market knowledge and connections during the year. LRD collaborated with its partners to expand its series of trainings on markets, biosecurity, phytosanitary measures and organic certification. LRD also worked with governments and partners on market assessments and technical support, in addition to regulation compliance.

### **Trainings and capacity development**

LRD developed a Training Manual on Hazard Analysis Critical Control Points certification and provided training on this topic to 34 technical representatives from 15 Pacific ACP Countries (Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor Leste, Tonga, Tuvalu and Vanuatu), including 17 Females and 17 Males of which 23 were youth. The manual and paired training aimed at knowledge enhancement, business process improvement and access to markets.

An additional Training Manual on Organic Certification and Internal Control Systems was completed during the year. The manual and accompanying training aimed at knowledge enhancement, establishing control systems and access to markets. Training was completed for technical representatives from 15 countries, with 22 people, including 6 females and 16 males, of which 11 were youth.

LRD increased its organic certification numbers during the year. In Fiji, it trained 524 people, including 114 women and 410 men in the Participatory Guarantee System for organic certification. System training was also done in the Solomon Islands, and included 19 officials, 17 male and 2 female, from the Ministry of Agriculture and the Organic Farmer Organisation. Another training in Solomon Islands featured 18 people, 8 male, 8 female and 2 sex unreported, from the government and Jeddom Organic Farms. In Palau, 12 officials from the Bureau of Agriculture and Palau Organic Growers Association were trained, including 6 male and 6 female. The Republic of Marshall Islands training included 14 officials, 6 male and 8 female.

Biosecurity is another area where LRD focused its trainings during 2019. Several successful trainings were completed in Vanuatu. Six people, including 4 males and 2 females, were trained on laboratory techniques on mass multiplication of the metahrizium fungus. Ten people, including 6 males and 4 females, were additionally trained in Vanuatu on CRB (coconut rhinoceros beetle) response, symptoms spotting, delimiting surveys, early warning systems, trap set ups and data field collection. Another training for 20 volunteers on biosecurity issues around CRB response included delimiting surveys and breeding site destructions, CRB trap installation and data collection.

LRD also collaborated with partners during the year on biosecurity. Work with SPREP (Pacific Regional Environment Programme), included training on international, regional and national biosecurity for 10 biosecurity and 12 environmental officers. The officers were also trained on early detection and rapid response at pre-border, at-border and post-border operations.

The Pacific Plant Protection Organization, (PPPO) were active training partners during the year. PPPO members were trained on the Online Commenting System and inputs into the draft of the International Standards of Phytosanitary Measures (ISPM) that is critical for the member countries. LRD also worked on building the capacity of PPPO member countries on the importance of electronic phytosanitary (ephyto) and how it will add, and continue to give, a level of assurance on the export of perishable commodities as well as prevent fraudulent practices on manual certificates.

Throughout the year LRD also focused on the emerging Coconut Rhinoceros Beetle pest in the Northern Pacific Territories including Federated States of Micronesia, Marshall Islands, Palau, Guam and the Northern Mariana Islands. Knowledge enhancement and skills upgrade were provided to 49 participants in response to this tenacious pest.



## New yam hybrids result in bounty for Pacific farmers

Seed serves as the basis of life and the foundation for food and nutrition security in the Pacific.

Developing seed is vital for the promotion of diverse, resilient and nutritional food systems. Crop improvements through access to new and improved crop diversity and breeding are integral parts of a seed system that is crucial for a resilient, healthier crop diversity.

Yam is a perennial herbaceous vine that is cultivated for the consumption of its starchy tuber in many parts of the Pacific. It is an important food and nutrition security crop in the region and a cultural crop in Vanuatu and other Pacific islands such as the Federated State of Micronesia, Tonga, Samoa and Fiji.

Over the period 2004 – 2018, LRD's CePaCT – the only regional gene bank dedicated to conserving the Pacific's important crops – distributed over 80,000 plant samples of 15 crops, including yams and other root crops to over 50 countries worldwide. Through CePaCT, the Pacific Seeds for Life (PS4L) initiative provides Pacific Island Countries and Territories the tools and capacities to develop seed policies and operationalize their seed systems initiatives.

CePaCT acquired African yam varieties from the International Institute of Tropical Agriculture that were selected primarily for their tolerance to the anthracnose disease that affects yam in most tropical regions, as well as for their high yielding traits. Ms. Marie Melteras of the Vanuatu Agriculture Research and Training Centre acquired five accessions specifically to increase their local diversity, their tolerance to harmful diseases

(mainly yam anthracnose or dieback) and their high yielding properties.

One of the newly bred hybrid yams was called 'white waelu' named after the champion farmer White Sailas of Santo, Vanuatu. The yam proved adaptable to climate change and was disease tolerant and high yielding. In July 2019, Mr. Sailas realized the fruits of this yam initiative by harvesting 20 tonnes of yams, of which 50 percent comprised the new white waelu hybrid yam.

Other new yam hybrids introduced in Vanuatu generated a lot of interest from farmers, resulting in increased coordinated efforts, facilitated through Pacific Seeds for Life. Ms. Melteras concluded, "These African yams develop flowers very early, and develop a lot of flowers as compared to our local varieties." This key feature made it possible for successful breeding.

The Vanuatu yam success highlights the critical role of gene banks like IITA and CePaCT in conserving and facilitating people's access to the gene diversity being conserved for future use. Developing a fully functional seed system in the Pacific requires coordinated efforts among all actors along the seed systems chain, and sharing and having access to new crop diversity is critical to the development of new fit-for-purpose (e.g. resilient to climate change, pests and diseases), nutritious and high performing crop varieties.

Empowering local people is also a critical component for seed systems development. The success of the yam seed system model in Vanuatu is deeply rooted in the empowerment of its people along the system.

## **Collaboration and investment**

LRD provided guidance and invested in a number key projects during the year, connecting to partners for the advancement of agricultural products and related knowledge. Grafting trials were initiated during the year to explore and study dwarfism in breadfruit. These trials were expected to continue in 2020.

LRD also collaborated with 9 private sector coconut enterprises in Samoa and Vanuatu to purchase machines and equipment for product diversification, intensification of production and improvement of quality in order to access new markets. Technical support for this project was also provided. Another collaboration involved the New Zealand Ministry of Public Information (MPI) and the PPPO to roll out an MPI export plan to Fiji and Samoa.

Other collaborative efforts during the year included help addressing biosecurity non-compliance on used heavy machinery and equipment that was exported to Niue. The LRD biosecurity team worked with colleagues at the Biosecurity Authority of Fiji in treating the machinery, inspection and documentation, and ensuring that all equipment was cleaned and free from biosecurity related threats.

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

Economies and communities continued to expand throughout the region in 2019, necessitating a growing agricultural and forestry resource base to meet increased food and forest product demand. The impacts of disasters and climate change make this demand even more essential. LRD's focus during the year was on crop variety, nutrition, and resistance to disasters such as drought and salt water intrusion.

#### **Crop procurement, distribution, and promotion**

In Tonga, LRD distributed 5 high vitamin orange flesh kumala varieties and 6 drought resistant (3 kumala and 3 banana) varieties, along with 3 salt water resistant varieties and 2 fusarium resistant varieties. Another 320 tissue cultured plantlets of new resilient crop varieties of sweet potato, banana, and pineapple were distributed to MORDI-Tonga. Three communities were involved in establishing 6 acres of evaluation plots to MORDI and Hango Agricultural College. Three of the distributed sweet potato varieties were screened, selected, and promoted to 6 lead farmers in Tonga, resulting in farmers establishing 72 acres of fields.

Other root crop advancements during the year included the evaluation of 5 sweet potato, 2 taro and 2 cassava varieties in Kiribati. Additionally, 1 taro, 1 cassava and 1 sweet potato variety were selected and promoted in Tuvalu and Kiribati.

Vegetable crops continued to be a focus in 2019, with 100 kg of open pollinated varieties (tomato, eggplant, capsicum, watermelon, cucumber, corn) procured and distributed to Tonga, Vanuatu, Fiji, Cook Islands, Kiribati, Tuvalu and Samoa. Another 22 kg of 6 open pollinated varieties of 6

vegetable crops were procured and distributed for evaluation in Tonga, Vanuatu and Fiji.

Other food and nutrition security actions in Tonga and Vanuatu included the establishment of 6 acres of open pollinated evaluation plots, with evaluations ongoing. Seed support for Samoa resulted in sufficient quantity of vegetable supplies for the Pacific Games. Samoa also benefited from 125 accessions (1301 samples) of banana, breadfruit, cassava, pineapple, sweet potato, xanthosoma and yams. These accessions also were distributed in Papua New Guinea and Samoa.

#### **Capacity development**

LRD strengthened its agriculture and forestry resources capacity development efforts during the year, most notably through development of the Pacific Seeds Systems Roadmap and PAPGREN draft charter aimed towards reinforcing the network's mandate and activities. The CePaCT Business Plan (2019 - 2023) that went into force during the year of identified key regional partnerships for a decentralised seed system in the region.

**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.**

LRD heightened its focus on gender, social inclusion and cultural heritage and human rights in 2019 through initiatives where these vital issues for a thriving, resilient Pacific are interwoven. LRD sought to further build its gender, social inclusion and cultural heritage and human rights awareness and action into all of its work during the year. Some prominent examples are included below.

Wild turmeric, ginger and bananas are important part of peoples' cultural heritage in Naitasiri, Fiji. LRD supported training of 524 people (114 women and 410 men) for the development of value chains in the Naitasiri region, in addition to drafting a value chain analysis for the three listed commodities.

Seed systems are also a vital part of community heritage throughout the Pacific. LRD completed a needs assessment for seeds systems that involved 14 countries, identifying capacity gaps and priority needs, in addition to guiding the development of a Draft Pacific Seed Systems Framework.

The Framework will guide regional collaboration on strengthening seed systems in countries, in addition to guiding national seed policy development. LRD used the Framework to support the development of a draft Vanuatu Seed Policy Framework.

Across all of the 2019 objectives the LRD team built the participation of women, youth and underserved communities into all of its activities. Numbers of women, youth and underserved communities trained are shown in the overviews of the other objectives in this report. See also the *Focus on women and youth* section under Objective 1.



## **Objective 5: Integrated farming systems and services strengthened**

LRD advanced its training, assessment and evaluation, and technology expertise during 2019 to ensure integrated farming systems and services in the region built solid foundations for growth and progress. As the LRD team trained individuals on the ground, it also moved into cyberspace, driving online networks and apps focused on plant health and plant pests. Assessments and evaluations also played a role, ensuring that communities and countries have valuable information for current and future agricultural challenges.

### **Knowledge investment and management**

Trainings, evaluations, and assessments all featured throughout 2019, ensuring that farmers and the systems in which they are integrated attained, and put into practice, new knowledge. In Palau, a summer school “paravet” course for animal veterinary care was completed for 11 participants, 6 of which sat for final exams, with the other 5 attending practical sessions.

In Fiji, a vulnerability assessment for the Naitasiri Ra Provinces documented key challenges and production constraints. Another vulnerability assessment completed in Tuvalu led to new project formulation. In Kiribati, targeted compost trials and a wicking system evaluation were completed, resulting in findings that the wicking system is a promising technology to address soil and water challenges to grow diverse roots/tubers and vegetables for atoll countries. Factsheets on the new soil technologies were planned for release in 2020, and the technology is now being promoted in Tuvalu.

Plant Health Clinics were rolled out to Fiji, Samoa and Tonga, and expanded to the Solomon Islands’ Western province. Fiji’s first ever plant clinic was attended by 36 farmers. The Fiji Road Show in Navosa included more than 40 farmers, 25 percent of which were female. Clinics were also held at the Fiji National Agriculture Show in Valelevu, Suva, which included plant protection trainings as well. In Tonga the clinic was held at Alakifonua with 16 farmers and 20 diagnoses made.

An additional plant health initiative resulted in the drafting of a plant health doctors training manual, which was field tested in Fiji, Samoa, the Solomon Islands and Tonga. Throughout the year LRD also continued its regular vegetable crops screening and evaluation under its protected structure.

### **Emergency response**

The LRD team responded to the Coconut Rhinoceros Beetle outbreak in Vanuatu during the year by providing farmers and communities pheromone trapping materials and chainsaws, as well as providing technical advisory services on surveying and GPS coordinated reading and recording. Support for the outbreak was also provided to the Vanuatu Ministry of Agriculture and Livestock, including labour, transport and additional trapping materials.

### **Technology and innovation**

LRD moved further into the e-agriculture environment in 2019, with additional expansion and innovation planned for 2020. LRD provided support for the plant doctor network in the Pacific on WhatsApp that was launched by the Ministry of Agriculture in Fiji. The network attracted over 100 members, and a total of nearly 1,000 diagnostics were completed with management advice on the network. LRD also provided support and partnered with the developer for Version 7 of the Pacific Pests and Pathogens app, released by PestNet. The app added 57 new factsheets on pests and diseases during the year.

# Nadroumai Women improve soil health through Agroforestry



Erosion, flooding and drought events were on the rise in the Nadroumai catchment near Sigatoka, Fiji due to unsustainable agriculture and resource exploitation, but thanks to the dedication of women and youth in the area, the future is starting to look brighter.

SPC's Sustainable Forestry and Landscape Management Programme played a key role in this transformation by implementing the four-year project *Enhancing value-added products and environmental benefits from agroforestry systems in the Pacific* from 2015 to 2019. The project focused on women and youth and aimed at promoting sustainable agriculture and agroforestry to replace unproductive and degraded land, as well as creating alternative livelihoods through agroforestry in Fiji, Solomon Islands and Vanuatu.

Agroforestry, the integration of trees into farming, has many environmental benefits, such as biodiversity conservation and soil health enrichment that help mitigate some of the problems encountered around Nadroumai. Managed agroforestry systems can also offer new livelihood options for communities.

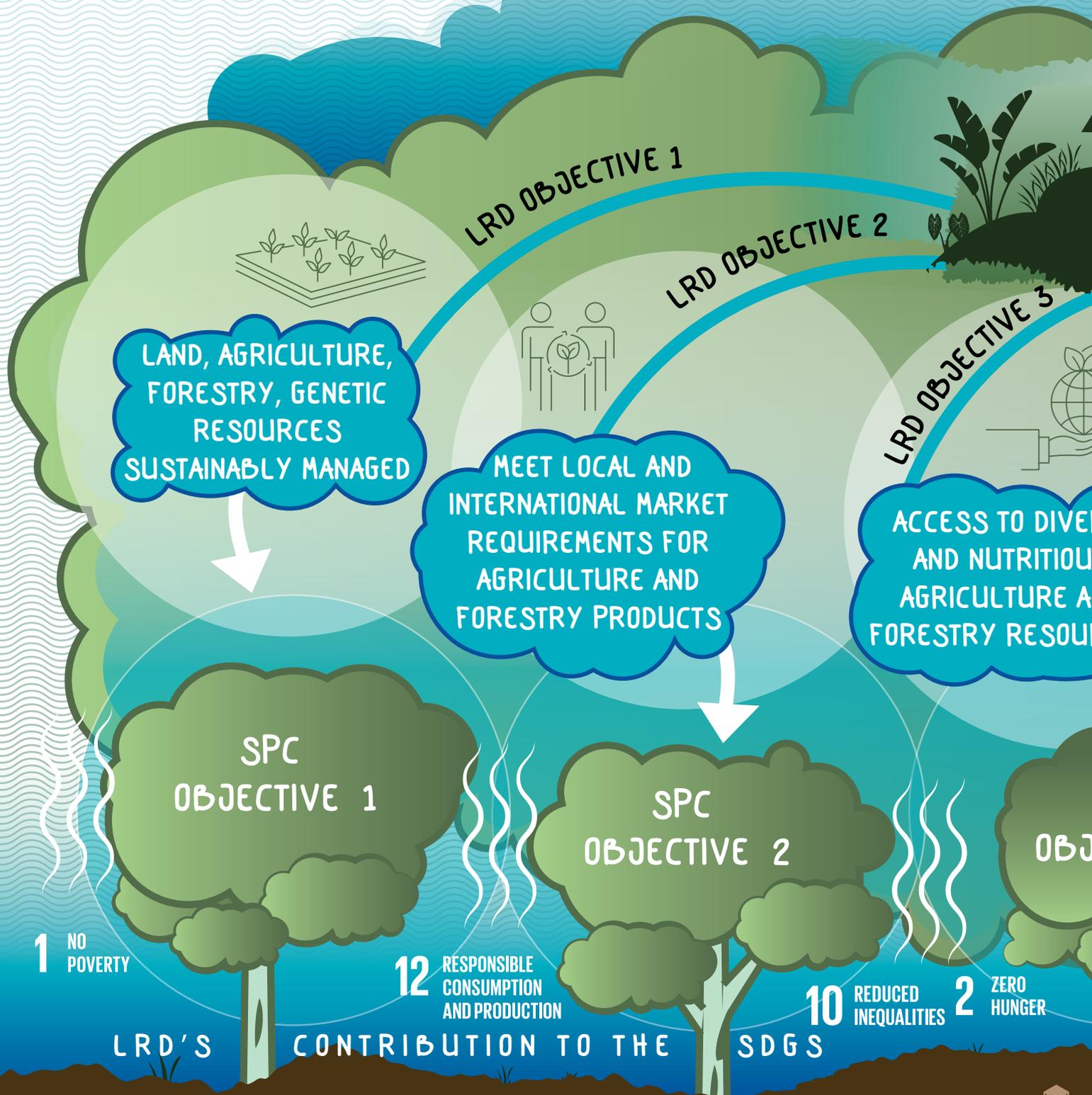
In Nadroumai, the project began with community awareness activities, and learning about community decision-making processes. The Nadroumai Women's Club (NWC) agreed to set up and manage a tree nursery. SPC helped establish the nursery and organised training in nursery management, tree propagation and essential business skills. SPC also facilitated the development of business by-laws with a clearly laid out benefit-sharing mechanism that allowed

the women to reap the benefits of their activities.

By 2019, the NWC nursery was successfully producing tree seedlings, which the project was purchasing and using to rehabilitate the catchment. Some of the women took the initiative forward, also growing their own seedlings and selling them to the NWC. The project improved NWC and women's incomes and supported longer term environmental outcomes. Club savings increased in 2019 as a result of the project and will be used towards village development projects.

Veniana Devu, Nadroumai Women's Group President, said "Every Monday, the women in the village come together and plant trees in the land that was given to us for our nursery. The income we will receive from our nursery will go towards funding some development projects in the village. This project will not only benefit us, but our future generations."

By the end of the project a total of 10 hectares were planted under agroforestry, an extension of the original one-hectare plot. The project ended in 2019, but SPC is continuing to work with the Nadroumai Women's Group, with a focus on building links with the tourism industry along Fiji's Coral Coast. Through the project, Nadroumai was able to achieve Sustainable Development Goal 15, which aims to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss, in addition to enabling local women to create income opportunities for their community.

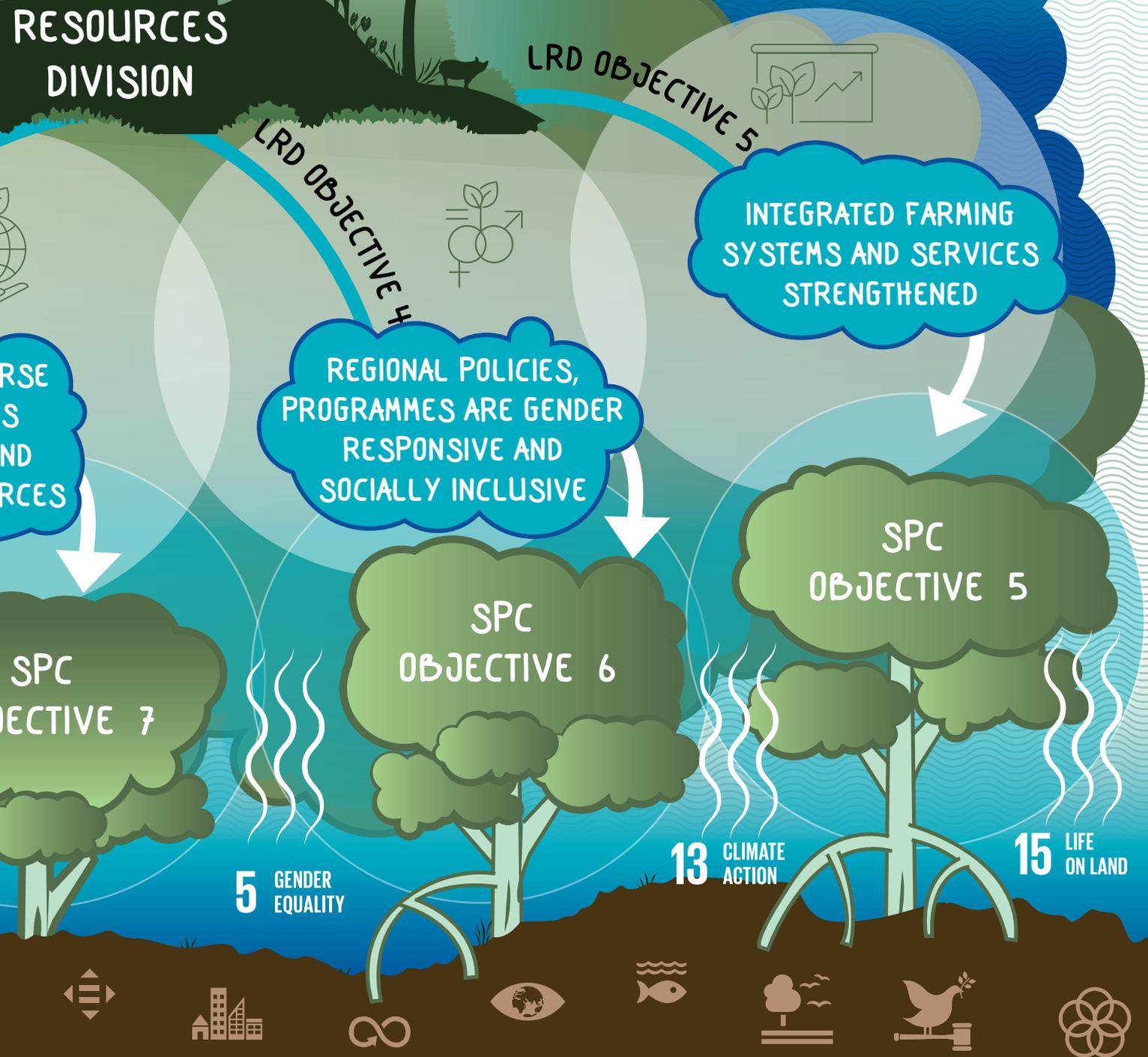


LRD'S CONTRIBUTION TO THE SDGS



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

# LAND RESOURCES DIVISION



# DEVELOPMENT GOALS



# Contributing to the SPC Objectives and UN Sustainable Development Goals

## SPC Objectives

In 2019, LRD worked to further integrate its work into the SPC's overall development goals. The SPC Strategic Plan 2016-2020 has nine development objectives that fall under SPC's three main goals. LRD's mandate within SPC empowered it to contribute to five of the nine objectives, which have been marked in bold below.

### Goal 1: Pacific people benefit from sustainable economic development

1. **Strengthen sustainable management of natural resources**
2. **Improve pathways to international markets**
3. Strengthen sustainable transport and energy security
4. Strengthen access to and use of development statistics in policy development and monitoring progress

### Goal 2: Pacific communities are empowered and resilient

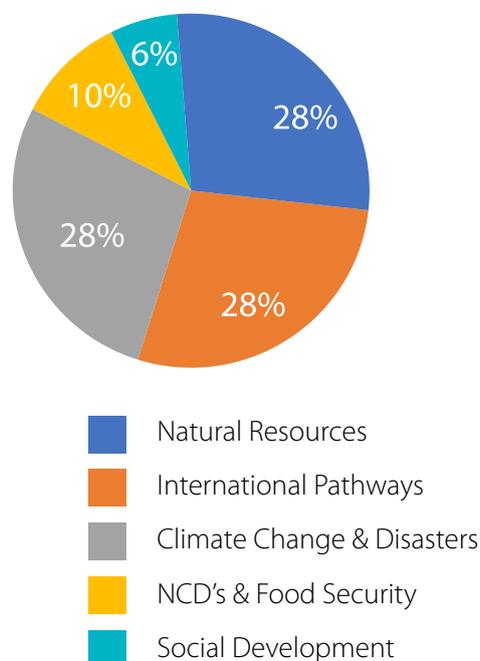
5. **Improve multi-sectoral responses to climate change and disasters**
6. **Advance social development through the promotion of human rights, gender equality, cultural diversity, and opportunities for young people**

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

7. **Improve multi-sectoral responses to noncommunicable diseases and food security**
8. Strengthen regional public health surveillance and response
9. Improve education quality

The LRD business plan 2019-2023 was aligned to the SPC strategic plan 2016-2020 during the year. Year-end evaluation showed that according to the SPC strategic plan, LRD achieved 47 major results during the year. Of the 5 SPC development objectives to which LRD contributed, 39 results of the 47 total were equally distributed (13 results each) amongst Development Objective 1 (Natural resources), 2 (International pathways) and 5 (Climate change and disasters). This is followed by 5 results achieved under development objective 7 (NCDs and food security) and 3 results on development objective 6 (Social development). The figure below breaks down objective category by percentage.

LRD's Contribution to SPC Development Objectives



## Sustainable Development Goals

SPC strengthened its emphasis on contributing to achievement of the UN Sustainable Development Goals in 2019. LRD's contribution to the SDG's were most distinguishable in those focused on hunger, poverty, inequality, life on land, production and consumption and sustainable cities and communities. LRD specifically contributed to the following six SDGs.

**Goal 1: No poverty**

**Goal 2: Zero hunger**

**Goal 10: Reduced inequalities**

**Goal 11: Sustainable cities and communities**

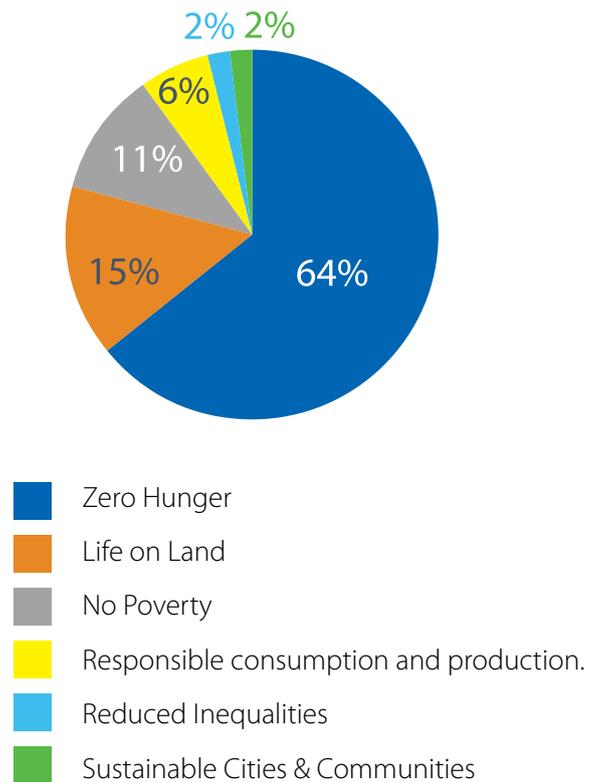
**Goal 12: Responsible consumption and production**

**Goal 15: Life on land**

LRD also contributed to Goal 13 – Climate action – through its overall work. Though climate action is integrated overall into LRD's work, results for 2019 were most visible in LRD's agricultural work towards Goals 1 and 2, No poverty and Zero hunger.

The chart (right) breaks down the contribution of LRD's 47 results to the Sustainable Development Goals for the year by percentage.

**LRD Contribution to the Sustainable Development Goals (2019)**



## Vanuatu tackles coconut palm killer

Protecting coconut palms from coconut rhinoceros beetle (CRB) has been an ongoing battle in the Pacific. Since its first CRB in Mangaliliu in 2019, Vanuatu has stepped up responses to eradicate this pest from its islands with the support of SPC's Coconut Industry Development for the Pacific project.

The beetle, which feeds on the crown of coconut trees, can spread rapidly if unchecked. The incursion had the potential to devastate the Vanuatu's coconut industry, which makes up 45 percent of the national GDP, as well as providing a livelihood for tens of thousands of people in the country.

To tackle this growing threat, SPC, together with Vanuatu's Biosecurity team, mounted a rapid response to support local biosecurity efforts to contain the spread of the pest. Drawing on technical expertise and other resources through the CIDP project, the team carried out mass trapping, breeding site clean-up, and biological control. SPC also supported and strengthened coordination of the field response, which relies on a robust system of communication between people in the field, managers, and up to government level, building Vanuatu biosecurity staff capacity in all areas and activities.

Visoni Timote, SPC's Land Resources Divisions Plant Pathology Adviser explained that, "SPC coordinated information and knowledge sharing on the CRB crisis among stakeholders in Vanuatu, in the Pacific region, and the international arena. Partnership with the Vanuatu Government was paramount. Other local stakeholders, including civil society groups, NGOs and the private sector, were informed and involved as well."

"SPC also coordinated support from regional and international agencies and networks, such as AgResearch NZ, which supported the biocontrol effort, and the Pacific Plant Protection Organisation, which provides regional support for the eradication of CRB and which feeds into the International Plant Protection Convention to ensure international awareness and support," he added.

Through this collaboration, the beetle was contained within to its incursion site. More than 10,000 beetles have been collected and destroyed so far, including grubs, pupae and adults. Biological control work with AgResearch NZ also got underway. Beetles inoculated with *Oryctes rhinoceros nudivirus*, which causes severe disease in the CRB, have been released and the team are waiting for results. For fungal control, the team have been investigating the efficacy of *Metarhizium*, a fungus used as a biological pesticide, and plan to trial this method in 2020.

Vanuatu's Biosecurity team now has the capability to manage future pest incursions. As well as improved technical skills and coordination abilities, biosecurity officers say they feel more confident to lead their teams in pest control efforts. Awareness raising around the project allowed people to be generally more aware of the pest, its methods of spread, and how to reduce this risk. Unaisi Turaganivalu, LRD's Plant Pathology Technician applauded the efforts of Vanuatu Government for its quick response to the beetle incursion. "Political will, and commitment of the government, was essential to the rapid and successful response. In particular, by declaring an emergency, the government enabled vital funds to be made available for the work," he concluded. "Managing pest outbreaks is as much about awareness raising and coordination of people and activities as it is about dealing directly with the pest. Both aspects need adequate effort and resources."

## Partners and Resources

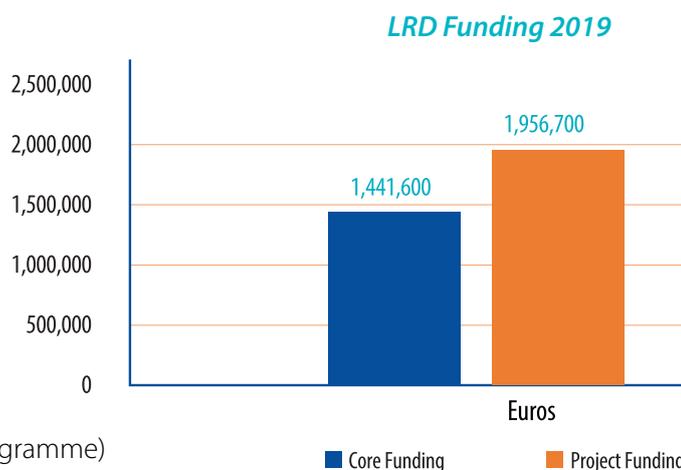
LRD sought to expand its programme and project base in 2019 while also ensuring that resources were better targeted and used more efficiently. Programmes and projects were centred around LRDs four main themes, or Pillars, that are cross-cutting and integrated. The four Pillars are:

1. *Genetic Resources*
2. *Sustainable Forestry and Landscapes*
3. *Sustainable Agriculture for food and nutrition security*
4. *Markets for Livelihoods*

These four pillars benefited from a funding mix that is categorized into two primary components, unrestricted, or core, funding, and restricted funding, which is primarily used for projects. In 2019, project funding totalled 1,956,700 Euros, with core funding totalling 1,441,600 Euros. See graph below.

LRD received its funding for the year from ten major partners.

1. Government of New Zealand
2. Government of Australia
3. European Union
4. Global Crop Diversity Trust
5. IFAD (International Fund for Agricultural Development)
6. SPREP (Secretariat of the Pacific Regional Environment Programme)
7. FAO (Food and Agriculture Organization of the United Nations)
8. GIZ (German Development Agency)
9. UNDP (United Nations Development Programme)
10. KEW Royal Botanic Gardens



New and ongoing programmes and projects funded by these partners also benefited from collaboration with a number of universities and learning institutions. These include the following below, listed with area of collaboration.

1. University of Tasmania, University of Adelaide, CSIRO, LandcareNZ: Soils projects.
2. Southeast Asian Regional Center for Graduate Study and Research in Agriculture: Extension services for smallholder farmers.
3. University of the Sunshine Coast, University of Adelaide: Tree crop systems.
4. Griffith University, Southern Cross University, National Agricultural Research Institute (NARI), University of Adelaide, CSIRO: Forestry.
5. University of Western Australia, University of Sydney, University of South Pacific, University of Auckland: Climate smart agriculture.
6. Central Queensland University, University of the Sunshine Coast, University of Queensland: Vegetable production systems.
7. University of Queensland: Coconuts
8. University of Sunshine Coast: Policy drivers



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 – e.g. French Agricultural Research Centre for International Development (CIRAD), International Atomic Energy Agency (IAEA), Consultative Group on International Agricultural Research (CGIAR), Australian Centre for International Agricultural Research (ACIAR) and national research centres – 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.
- Increased capacities in implementing the concepts of the Voluntary Guidelines on the Responsible Governance of Tenure and participatory land-use planning, and responding to members' requests for assistance in developing effective land-use policies and plans.
- 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.
- Leadership of a youth employment/'agri-preneur' programme, with a focus on equitable access to existing resources and employment opportunities for youth, women and minorities.



## Looking ahead to 2020

Progress on LRD's ambitious spectrum of work was evident in 2019, as we partnered with communities, governments, experts and educators to provide both security and possibility for land resources throughout the Pacific. These forward steps were taken with more women, youth and under-represented communities than ever before, and projects such as our collaboration with the Nadroumai Women's Club in Fiji built a solid foundation for increased integration of these communities in 2020.

The Nadroumai success also revealed LRD's focus on knowledge during the year, with vital trainings and technical advice leading to livelihood protection and strengthening in projects as varied as veterinary training in Palau and coconut rhinoceros beetle eradication in Vanuatu. LRD supported this widening sphere of expertise through action on the ground, reaching a new high in crop collection and distribution.

As our growth stretches into an even more challenging 2020, we are resolute in not only solidifying these gains, but also energizing communities and our partners with new ideas and greater inclusiveness that ensure we contribute to SPC's drive to achieve the Sustainable Development Goals. Resourceful projects such as the planned opening of the Plant Health Lab on the LRD campus in Suva and forest restoration with our partners through the Ridge to Reef programme will supply the energy as we continue to blaze that trail.

The groundwork has been laid for a 2020 that further captures the diversity of the Pacific and its peoples. We will convene people region-wide to sow the seeds and promote the growth of our four Pillars: genetic resources, sustainable forestry and landscapes, sustainable agriculture, and markets for livelihoods. Food and nutrition security, resilient communities and livelihoods in rapport with the environment will carry us forward, and we look forward to your collaborative spirit in 2020 and beyond.