



Pacific
Community
Communauté
du Pacifique



Soil sampling, testing and interpretation protocols used in Pacific Islands

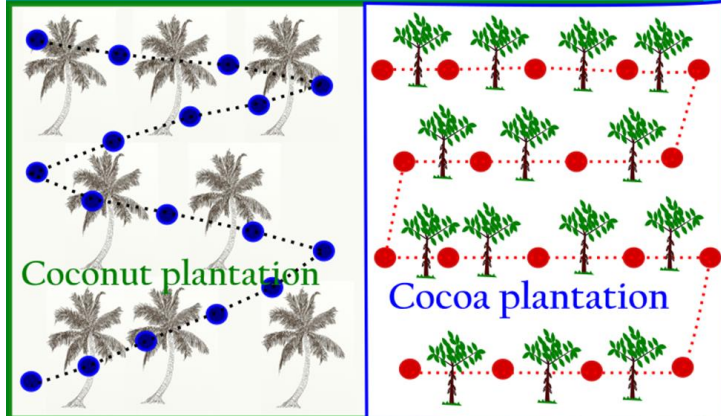
Pacific Soils: Final Review
(Objective 3.1)

Ellen Iramu & Gibson Susumu
November 2021

Australia's National Science Agency



Australian Government
Australian Centre for
International Agricultural Research



Why review soil sampling, testing in PICTs?



- Addressing soil fertility problems in the Pacific Islands requires effective nutrient management, therefore needs accurate measurement and interpretation
 - There are many challenges in developing practical systems of soil sampling, measurement, and diagnosis, especially for complex smallholder systems such as those in the Pacific Islands
 - Lack of guidelines on soil sampling or outdated soil analysis protocols
 - Agricultural research and extension officers have limited knowledge to undertake correct soil sampling and analysis, thus need to be assessed and addressed
-

Where our journey started

Research question

- What **soil sampling**, testing and interpretation protocols should be used on different soil types across the Pacific?

Objective

- Identify problems with current soil sampling, testing and interpretation protocols
 - Review soil test manuals used in laboratories in Pacific Islands
 - Survey government and commercial labs and testing agencies to review approach
 - Identify gaps in current approaches and develop suitable testing and interpretation protocols suitable for Pacific soils

Response

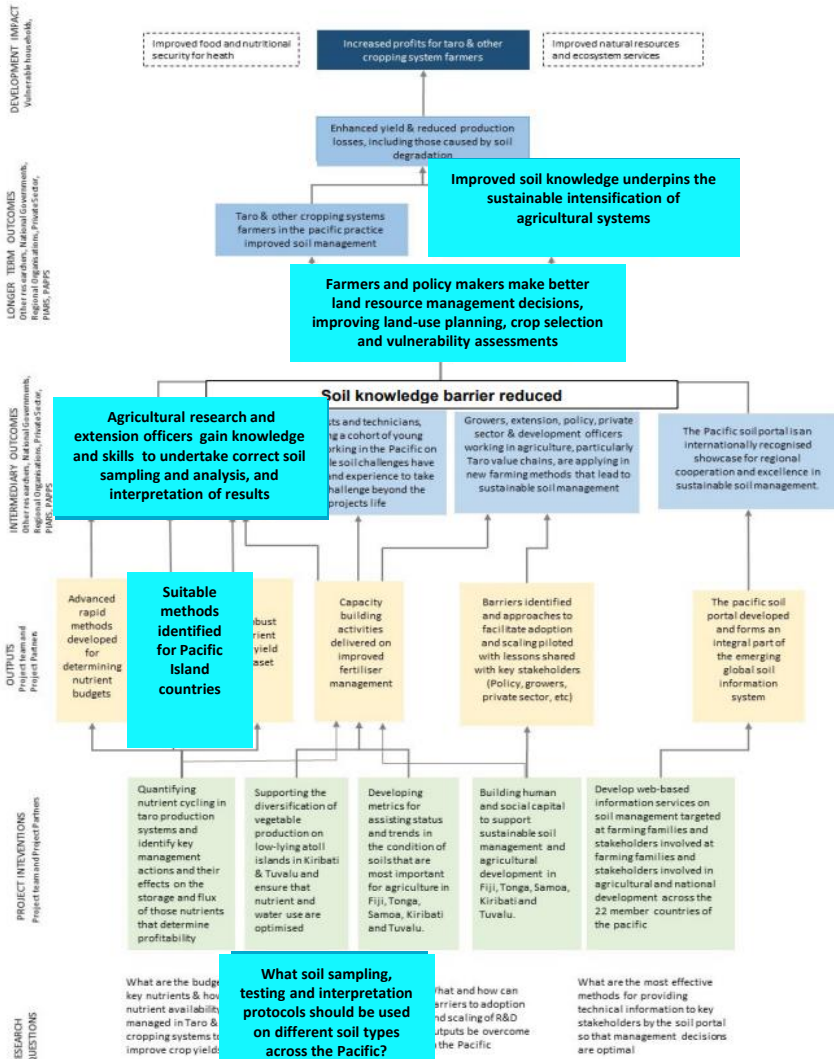
Develop soil sampling, testing and interpretation protocols suitable for Pacific Island countries (impact pathway).



Impact pathway

Key assumptions

- Soil sampling, testing and interpretation issues will be identified to assist in developing suitable testing and interpretation protocols
- Soil sampling and analysis protocols will enhance the knowledge and skills of agricultural research and extension officers
- Accurate measurement and interpretation of soil testing results will improve soil nutrient management in Pacific Islands



Approach & Challenges

Research question:

What **soil sampling**, testing and interpretation protocols should be used on different soil types in the Pacific?

ACTIVITY 3.1: Review current soil sampling, testing and interpretation protocols used in Pacific Islands

Challenges:

- Covid-19 impacts –relocation to work base station
- Delay in signing of USP subcontracting agreement

USP subcontracted to conduct review



Discussions/ questionnaire developed



Survey and consultation with Pacific Island labs



Protocol similarities & differences identified



Soil sampling and testing guidelines developed



Training on soil sampling, testing and interpretation protocol



Output: Soil sampling guidelines and soil analysis and interpretation manual

What we identified ...

1. Soil Sampling

- The three Pacific Islands labs surveyed (FACL, SROS, USP) have their own soil sampling protocols which resulted in both similarities and differences in sampling

Similarities

- Soil is sampled from the surface horizon only at 0-15 cm depth for determining soil fertility for field/ root crops
- When sampling soil from a field, the rooting depth of crops for subsequent planting are not considered

Differences

- Number of subsamples that make up a composite sample (< 10 soil samples – FACL, and >10 soil samples – SROS and USP)
 - The metadata information recorded and inconsistencies in the label of soil samples (e.g. field history, crop information, name of village, name of farmer or researcher are not included by FACL)
-

What we identified ...

2. Soil testing

- The labs (FACL, SROS and USP) analysed their soil samples following methods in a manual written under SPACNET, a Pacific regional network formed in the 1990s
 - None of the laboratories followed the soil analysis methods of Rayment and Lyons (2011)
 - Those procedures can only be adopted if written in simple English that can be easily understood by Pacific Islands lab technicians
-

What we identified ...

3. Interpretation of soil analysis results

- Staff of FACL and USP labs have knowledge and skills, however, SROS staff lack knowledge and skills on interpretation of soil analysis results
 - SROS staff had requested for training on interpretation of analysis results
 - Currently, interpretation of soil analysis results in the Pacific Island labs is done using interpretation values in the manual developed in 1990s
-

Key milestones delivered



SOIL SAMPLING GUIDELINES

STRENGTHENING REGIONAL
COLLABORATION ON
SOIL ANALYSIS



- Soil sampling guidelines developed for distribution to PICTs
- Soil analysis and interpretation manual developed for PICTs
- Training conducted on soil sampling, testing and interpretation in the Soils Project partner countries

Soil sampling trainings

Fiji farmers training



Soil sampling, testing & interpretation training

Samoa agricultural officers training



So what did we learn?



Insights and lessons

- *“I’m very grateful to attend this training, it is very helpful to me and my field as an Agriculture Researcher at SROS. From the beginning of presentation is clear and helpful to me to improve my skill and knowledge to do my job.”*

Ms Hemly Sasulu, SROS

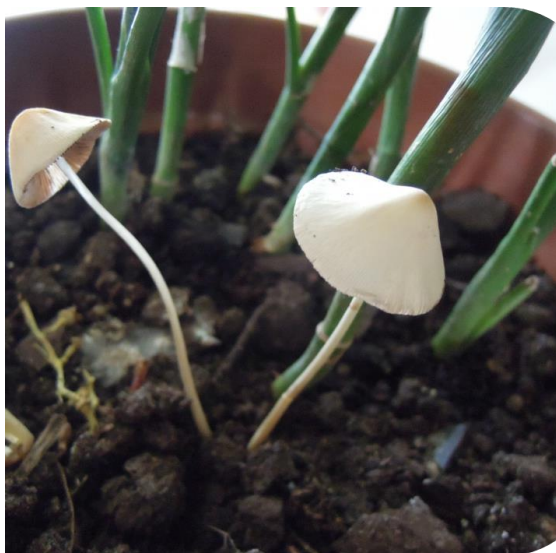
- *“Very useful. As a Lab Technician Scientist, this training has refresh/remind me of the important of collecting soil samples. Palintest kit is something new so this training has upgrade me especially in the field to analyse soil samples.”*

Mr Philip Reti, SROS

So what's next ...

- Address the differences in soil sampling protocols in the Pacific Islands
 - Reinforce the importance of consistent metadata information collection during soil sampling, including the recording of the sample's geolocation (particularly during regional soil surveys)
 - Organise training of technicians of Pacific Soil Laboratories, where and when required
 - Document standard methodologies for soil and plant analysis and quality control
 - Strengthen soil and plant exchange network in Pacific Islands
 - Develop links with a laboratory in a metropolitan country to support the quality assurance programmes
-

THANK YOU



Ellen Iramu

SPC Land Resources Division

elleni@spc.int

<https://lrd.spc.int>

Gibson Susumu

gibsons@spc.int

<https://lrd.spc.int>