Solutions

Pacific Soils: Final Review

(Objective 1 & part of Objective 3)

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Australia's National Science Agency

Australian Government
Australian Centre for International Agricultural Research

Where our journey started

Research question

What are the barriers to adopting improved nutrient management systems?

Our Response

Solutions

Exploring barriers & piloting solutions to facilitate enhanced soil knowledge and adoption of soil technology.

Project Objective: Solutions

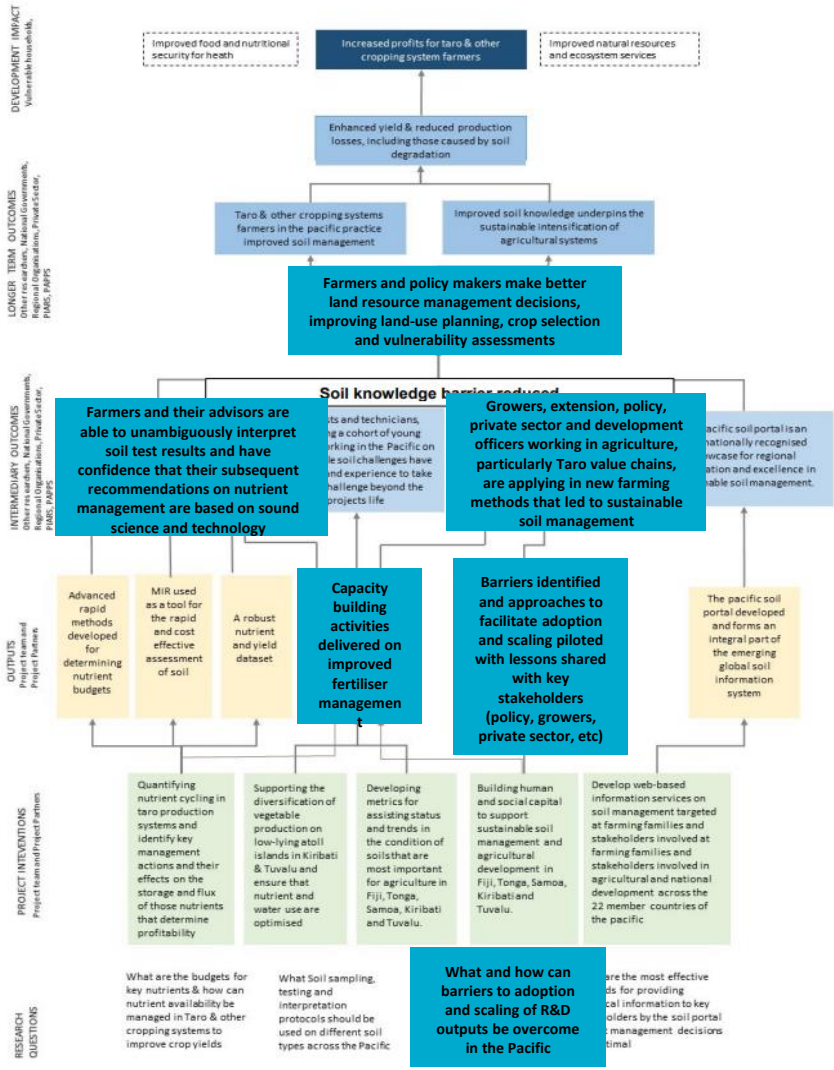
Identify past and *overcoming** current barriers.

*At the mid-term review as part of the monitoring and evaluation process the project team with ACIAR decided to shift focus from identifying barriers to adopting improved nutrient management systems to implementing an extension strategy that overcomes the barriers. This change was made to ensure greater project impact.

Impact pathway

Key assumptions

- Next users of research outputs will be growers, extension and policy makers
- Lack of knowledge contributes directly to inefficiencies and prevents effective management to increase yields and sustain soil fertility in both low and high input systems of PICT
  (Intergovernmental Technical Panel on Soils (ITPS), 2015; Dalal-Clayton & Dent, 2001, & Soil conference Nadi, 2015)
- Adoption is limited by ignorance rather than neglect – information counters ignorance but needs to be provided in a way that recognises economic and individual drivers
  (Dalal-Clayton & Dent, 2001))
- Adoption will be improved through more participatory models of action involving farmers , agronomists, government & businesses
  (Craswell, et al 2013))



Key partners

CSIRO

Pacific Community
Communauté du Pacifique

USP
THE UNIVERSITY OF THE SOUTH PACIFIC

Approach

Diagnose → **Experiment** → **Analyse and Reflect**

ACTIVITY 1.1: Identify the barriers, incentives and opportunities for improving the knowledge transfer & adoption of soil technology for improved sustainable agriculture

Pivot

RESULT:
A map of key actors and sources of soil knowledge and information in Tonga and Fiji

REVISED ACTIVITY: Identify partners to experiment with different approaches to overcoming the barriers identified

RESULT:
Different approaches to knowledge transfer piloted

REVISED ACTIVITY: Assess impact of different approaches and potential scalability

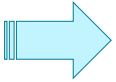
RESULT:
Insights from implementation of pilots

Challenges and impacts from Covid-19

- Travel restrictions for CSIRO staff based in Australia
- Lock down and travel restrictions within Fiji
- Virtual meetings/ trainings affected by internet connectivity
- Finding appropriate local partners from a distance
- Administration delays with USP contract
- Delays in start date for SPC soil scientist
- Assessment of pilot effectiveness high-level only (step 3)

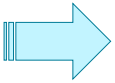
Response to challenges and Covid-19 impacts

- Focused activities to project main sites (Fiji and Tonga)



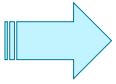
Tonga activities progressed, but
Fiji was impacted by inter-island travel & ultimately lock-down restrictions

- Budget moved from travel to external contractors to enable partners based in countries to be engaged



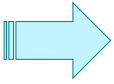
Sub-contracted a soil expert in Tonga to deliver trainings and facilitate workshops, and
SPC and MAF worked together to develop training in Fiji

- USP added as a key delivery partner for the project



Sub-contracted by SPC to develop the Dr Soil Protocols used for training

- Developed virtual training plan



The Australian team developed online training to supplement the technical support normally provided in person

What we delivered…

Results by planned output

OUTPUT:

Capacity building activities delivered on improved fertiliser management

- More than 775 farmers, extension officers, youth, researchers, NGOs, religious groups, agribusiness and USP students participated in training activities were supported by project, including trainings on:
  - 2 x trainings delivered to over 50 participants delivered on soil health on soil health in Fiji *(Beqa Island)*
  - 5 x trainings delivered to a total of 229 participants delivered on soil health and pest management in Tonga *(Tonga tapu)*
  - 4 x training delivered to approximately 40 participants on Soil Health and Soil testing in Samoa *(Apia and Savaii)*
  - 1 x workshop for a total of 25 participant on soil for National Soil Day in Tuvalu
  - 3 x trainings delivered to a total of 434 participants on soil management, soil sampling and testing, irrigation and crop management in Kiribati

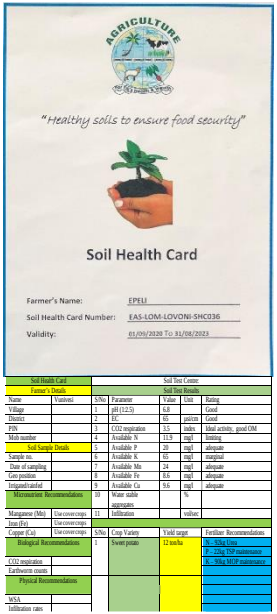
- Delivered 2 online workshops to:
  - FAO KJWA Pacific Chapter Webinar on Improved nutrient use and manure management towards sustainable and resilience; using soil test results to guide fertilizer use, and Nutrient balance sheets in a Tongan cropping systems
  - FAO SPC and SPREP members on the Importance of Soil Biodiversity for the Pacific Islands

Results continued

OUTPUT:

Barriers identified and approaches to facilitate adoption and scaling piloted with lessons shared with key stakeholders (policy, growers, private sector, etc)

- Surveyed farmers, and key advisory service provides in Fiji and Tonga to better understand the actors involved in the soil knowledge and information systems in Fiji and Tonga
  - *Over 30 people participated in data collection (via interviews and small group discussions)*
    - *Including farmers, government extension officers, private sector, donor funded programs, government research officers, farmer groups, government policy officers, & NGOs*
  - A map of soil knowledge and information system actors (refer to mid-term review)
  - Key barriers identified
    - *Limited awareness across numerous system actors (e.g. farmers, extension, policy agribusiness, NGOs, etc) about the value of soil health for sustainable production,*
    - *Multiple sources of knowledge about soil health and sustainable soil management practices (both traditional and scientific),*
    - *A fragmented agricultural knowledge ecosystem with pockets of well-connected actors that facilitates knowledge transfer and adoption.*



Barriers identified and **approaches to facilitate adoption and scaling piloted** with lessons shared with key stakeholders (policy, growers, private sector, etc)

At a regional level

- Collaborated with local university (USP) to developed 2 manuals on a soil sampling and soil analysis and interpretation for use by different actors across the region including USP students, Government extension officers, private sector, NGOs, etc
- Developed a Dr Soils training guide to create a community of Soil Doctors (agriculture extension and research officers) to train farmers

At a country level

- Connected rapid soil testing technology with Soil Health Cards implemented by the Fijian Government's and Farmer Field Schools (FFSs) in Tonga
- Provided advice to inform development of a soil sampling protocol in Tuvalu for use by government research and extension departments
- Engaged a knowledge broker to lead extension activities and connect with key actors across the soil knowledge and information system in Tonga
- Agreements with a few online platforms were brokered to include results from the Pacific Soils project with its users / farmers, exporters, etc in Tonga.

Results continued

Output:

Barriers identified and approaches to facilitate adoption and scaling piloted with **lessons shared with key stakeholders (policy, growers, private sector, etc)**

Region

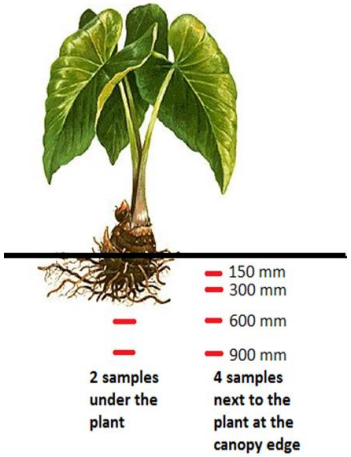
- 1 x Regional Heads of Agriculture and Forestry Services (HOAFS) in the Pacific
  - Discussions with policy makers at the Pacific Week in Agriculture 2019 on National Nutrient Budgets and Soil Health in the Pacific and the Pacific Soil Portal

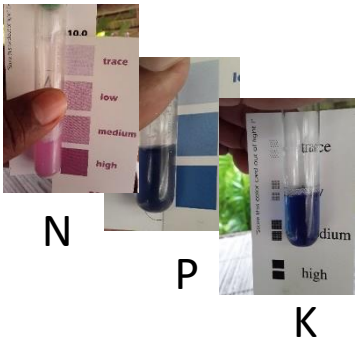
Tonga

- 3 x National workshop on Sustainable soil health and fertiliser practice for 78 policy makers, private sector and NGOs (Tonga Tapu, Haápai, and Éua)
  - Catalysed a discussion on the implications and potential responses to the issue of under fertilisation and declining soil fertility from the farm to the national level
  - Agreed next steps develop a policy brief on Sustainable Soil Management including how to handle all issues affecting soil health and the roles of key stakeholders in sustainable soil management
- 1 x Paper on Improving Public Agricultural Extension Delivery in Tonga
  - Includes a history of public extension in Tonga

Fiji

  - Advice from our partner in MoA Fiji Agricultural Chemistry Laboratory in the MoAs Research Department influenced National Fertiliser Policy based on soil analysis and interpretation.





Photos from training in Fiji

Training participants practicing soil sampling

Training participants

Photos from the training in Tonga

Training materials

Vuni – Pacific Soils Project leader in Tonga

Siua – Contracted knowledge broker

Hango students

National Workshop

Nichi Trading Farmer Group

Photos from Samoa trainings

Workshop with MAF and SROS technicians by CSIRO

Workshop with Farmers by CSIRO

Hena soil test training by USP October 2021

Hena soil testing training by USP October 2021

Hena soil testing training by USP October 2021

Photos from Soil Day in Tuvalu

How these activities contributed to the project outcomes …

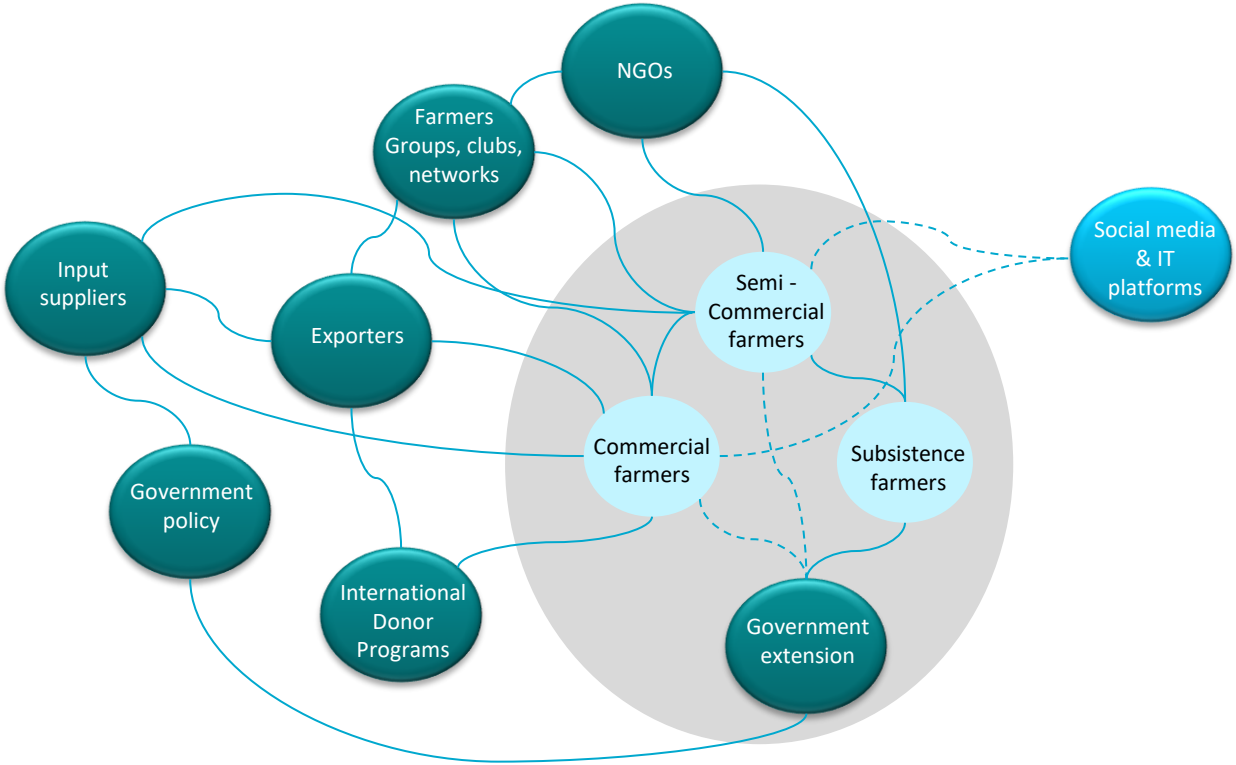
Progress towards planned outcomes

OUTCOME	COMMENTARY	EVIDENCE
Farmers and their advisors are able to unambiguously interpret soil test results and have confidence that their subsequent recommendations on nutrient management are based on sound science and technology.	Training reports from all countries indicate that participants who attended the training both found it valuable and increased their knowledge as a result of the information, tools, and techniques shared. Early results from the pilot Dr Soils program in Samoa indicate that it will enable farmers to interpreting soil test results and apply recommendations for sustainable soil management practices Reports from Fiji & Tonga indicate that the Soil Health card being rolled out are supporting farmers and their advisors to interpret and apply soil test results to improve soil nutrient management practices.	*"I can help some farmers in the future on how to identify particular nutrient deficiencies in the field and provide them with advice and recommendations on the type of nutrient they require to be added to the soils in terms of management"* *–Project officer, Tonga* *"We learnt that different crops have different needs in terms of fertiliser, we thought every crop has the same needs"* *– Commercial Farmer, Tonga* *"Learn a lot especially in collection of soil sampling and using the Palintest. It's useful to understand the nutrients available and not available in the soil. It really helps my work as extension to assist farmers to know and understand the situation on their land before farming."* *– Advisory Officer, MoA Fiji*
Growers, extension, policy, private sector and development officers working in agriculture, particularly Taro value chains, are applying in new farming methods that led to sustainable soil management.	Reports from Tonga highlighted that following the soil testing, analysis and interpretation training, a commercial farming group decided to experiment with single nutrient fertilisers. It is too early to tell if this new practice was effective and/or maintained. Monitoring data from soil health cards is expected to help understand soil health over time to determine if farmers are a) applying new farming methods and/or b) if their soil management is leading to improved, maintained or degraded soil health.	• *An input supplier committed to providing alternative or complementary fertilisers to current NPK fertilisers, e.g. single nutrient fertilisers and micronutrient sources for growers to use based on results of soil testing* • *Soil health cards for farmers are based on results of rapid soil testing*

So what did we learn?

Insight #1:

There is no one approach to agricultural extension and advisory services in the pacific



Actors reported to be engaged in soil knowledge and information systems in Fiji and Tonga

Insight #2:

Look for opportunities to build on existing connections between the different actors and existing initiatives to enhance adoption and scale.

Example – Commercial Farmer Group in Tonga

- Farmers are part of an exporter led value chain network
- The value chain is highly integrated with the exporter also importing agricultural inputs
- The exporter connects the farmers to new / novel knowledge and technology available through different donor programs which help them improve their productivity
- The group has close connections with NGO groups, e.g. MORDI which are also sources of knowledge
- The groups challenges and opportunities are represented in policy discussions through the NGO and agribusinesses connections to policy makers
- Farmers have an understanding of market requirements and clear path to market

Why this works:

Famers are part of a cohesive network of different actors across the value chain and knowledge system, helping to create a supporting environment for learning and trailing new practice that help improve productivity and meet market demands.

This includes access to new / novel knowledge and technology, clear market requirements, finance for input costs, and market, etc.

Insight #3:

Insights from pilot implementation can be used as an evidence base to inform implementation and refinement of the Pacific Islands Extension Strategy

So what …
What did we do with these insights?

So what next?

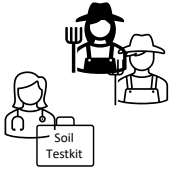
Continue to invest in partnerships and network building to support capability development activities with farmers and advisors

For example:

Continue to experiment with different approaches at a national level to support scaling of new / novel soil knowledge and technology through enabling policies and programs, e.g:

- recommendations from rapid soil testing though Soil Health Cards,
- good soil practices through the Tuvalu Soil Protocol, and
- the fertiliser management advice through the proposed policy brief / voluntary soil management guidelines in Tonga.

Strengthen established connections with existing extension and advisory programs and networks to continue to build farmer capacity, e.g:



- Connecting the Dr Soils program with the Plant Doctor program (ACIAR Integrated Crop Management Project) to create a program tailored to the pacific context, including,
  - Soil doctors that train and mentor farmers to support adoption of the new / novel sustainable soil management practices
  - Soil doctors that partner with Plant Doctors to provide comprehensive advice on crop management (including soil health and fertility)

Ongoing research on the effectiveness of different extension and advisory services approaches to inform policy makers and other stakeholders implementing and revising the Regions agricultural extension policies

Thank you

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