

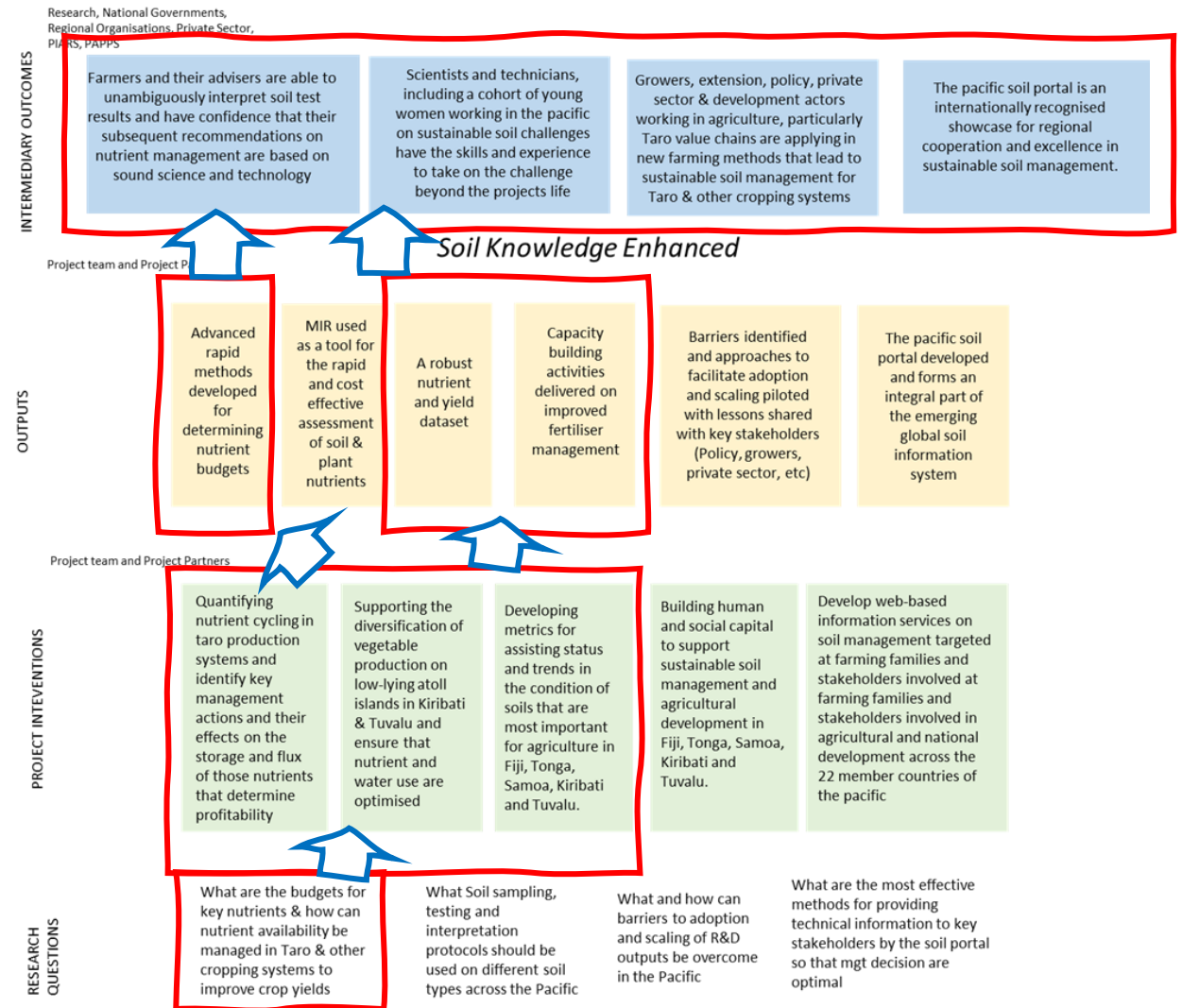
Pacific Soils

Objective 2 To quantify nutrient cycling in island agricultural and taro production systems and undertake field trials to highlight the importance of budgeting for soil fertility management and increasing yield

Mike Webb, Dio Antille, Ben Macdonald

Objective 2 Impact Pathway

Field trials and extension activities were used by the project to enable interventions and provide outputs to increase soil knowledge



Three biggest achievements

- Impact on capacity building in collaborators, extension officers, youth and farmers
 - Trial design, soil and plant sampling, soil analysis, interpretation of results, installation of interpretation of soil water monitoring equipment



Three biggest achievements

- Nutrient budgets at national and local levels



Three biggest achievements

- Crop response to various nutrient treatments

These will be detailed in the individual country reports next week

(some reports also reference the ACIAR Soil Health project in Samoa, Kiribati and Tuvalu)



Original - Feb 2019



Preparing nutrient additions
Pandanus, fire ash, pigsty soil



June 2019

The COVID impact

- No international
 - Lack of personal interaction with colleagues (capacity)
 - Lack of ability to visit trials for design, setup, fertilisation, harvesting and measurements
- Solutions:
 - Regular emails (staff well-experienced)
 - Telephone calls
 - Conference calls

How we have progressed against our planned activities

If an activity was cancelled/change discuss why this change happened.

Activity	Progress
2.1 Calculate supra-national scale soil nutrient balances for Fiji, Tonga, Kiribati, Tuvalu, and Samoa. PC	Completed
2.2 Set-up field sites and train staff in nutrient management measurements Fiji, Tonga, Samoa, Kiribati, Tuvalu.	Completed
2.3 In Fiji (volcanic) and Tonga (raised atoll with volcanic ash) (main sites) ~3 plots will be selected within 2 soils types and detailed nutrient budget undertaken (yrs1-4).	Fiji: 2 sites (one relocated) Tonga: 3 sites
2.4 In Samoa (volcanic) and Kiribati and Tuvalu (atolls) (satellite sites) 3 plots will be selected on 1 soil type (3 locations total) and a detailed nutrient budget undertaken (yrs1-4)	Samoa: 2 sites Kiribati: 2 sites Tuvalu: 1 site in conjunction with the Soil Health project

How we have progressed against our planned activities

If an activity was cancelled/change discuss why this change happened.

Activity	Progress
2.5 Measure biological function, water flux and nutrient losses	Water front detectors and soil moisture probes have been set up in each country. The success of these was variable – some very successful, others not so
2.6 Calculate nutrient constraints for each soil type using data collected Activities 2.1-2.4. PC; Fiji and Tonga	Completed
2.7 Research extension to farmers, extension, and policy makers	Highly successful
2.8 Assess the epidemiology of the root rot diseases based on O’Sullivan (2010) or soil ecological processes as a function of soil type and farming practice	Not done – optional - no suitable student found
2.9 Assess the current taro yield gap and impact of climate change on a range of soil types.	Not done – optional - no suitable student found

Results and Key Findings

- Most farming systems are nutrient depleting (example below)
- Rapid soil tests deployed (and used) in most countries (but see Obj 3)
- Strong extension
 - see country reports
 - See training reports

Results and Key Findings

Tonga – water melon

Nutrient Input
(g/mound)

Farm	Name	Location	N	P2O5	K2O
1	Vaini	Vaini	69.3	32.5	52.5
3	Anitoni	Fahefa	116.1	19.5	31.5

Nutrient Balance
(g/mound)

Farm	Name	Treatment or control	Location	N	P2O2	K2O	MgO	CaO
1	Vaini	Control	Vaini	43.0	25.0	5.5	-11.8	-46.1
1	vaini	treatment	Vaini	41.9	24.7	3.5	-12.2	-48.0
3	Anitoni	Control	Fahefa	80.5	9.3	-32.1	-15.9	-62.4
3	Anitoni	treatment	Fahefa	77.9	8.6	-36.8	-17.1	-66.9

Site Locations





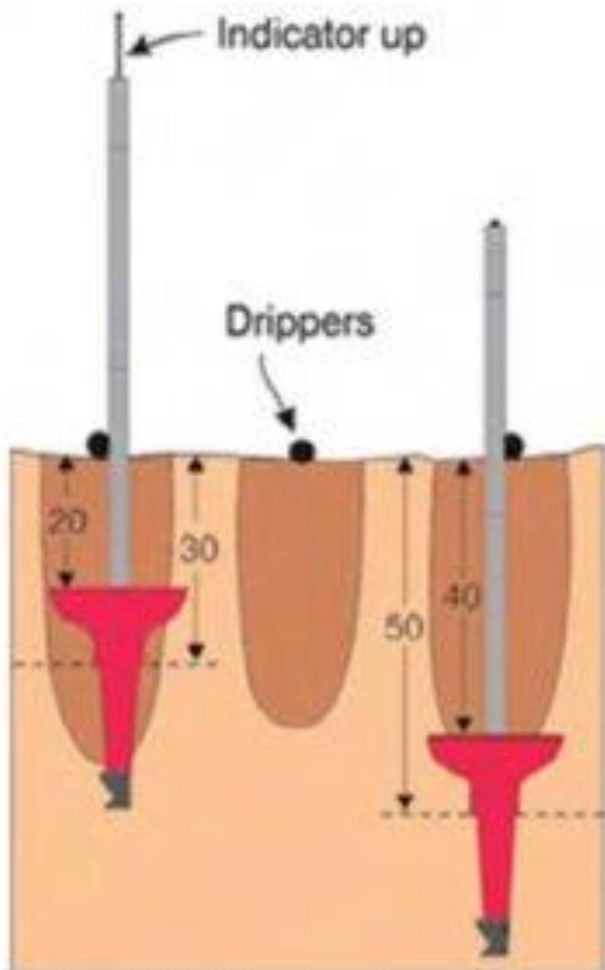




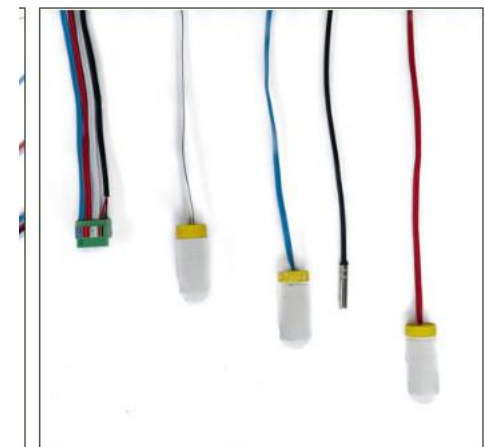
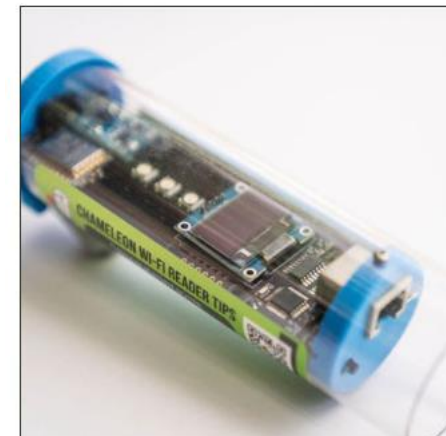
Nutrient Budgets and Soil Fertility

Capacity Impacts

- Strongly represented in the country talks
- Impacts on me – short presentation at the end of the presentations



Fullstops



Chameleon

Capacity Impacts – Nuera Tikauee

Farmer :	Nuera													
Location :	N.Tarawa.													
Farm Name :	ACIAR- Kiribati													
Irrigation bay :	Tearinibai: village													
Sensor array :	2D34/D3A0/E061/7147													
DATE	TIME	RAIN	CROP	Chamelon	TOP	MIDDLE	BOTTOM							
11/02/2020	1600 hrs	heavy rain		Chamelon	Top	Middle	Bottom	Irrigation	rep 1	rep 2	rep 3	rep 4		
		last night and		Sensor	B/G/R	B/G/R	B/G/R	Flow meter (S)						
		it showering		2D34				Flow meter (F)						
		till 1116hrs		D3A0				Rain gauge (mm)	30 mm					
				E061										
				7147										
				Full stop										
					flag up (Y/N)	Vol (ml)	Nitrate(mg)	Nitrite(mg)						
				30cm (A)	Y	54 ml	10 mg	0						
				60cm (A)	Y	23 ml	0 mg	0						
				30cm (B)	Y	44 ml	10 mg	0						
				60cm (B)	Y	20 ml	25 mg	0						

I didn't irrigate because the colour are still blue and that means it still have much water for the plant.also it shows that it has heavy rain that day and the full stop are all pop up.