

Report of the joint FAO/SPREP/SPC technical session on: Soil Biodiversity – An important topic for the Pacific Islands

12 May 2021, 13.00-14.30 Fiji local time. Zoom Platform



Contents

1. Background	3
2. Welcoming Remarks:.....	3
3. Objectives of the session	4
4. Presentations	4
5. Recommendations from the discussion	6
6. Closure	8
Annex 1 – Programme	9
Annex 2. List of Participants	10
Annex 3. Survey Monkey on Soil Biodiversity in the Pacific.....	13

1. Background

Fighting loss of soil biodiversity is key to global food security and the achievement of more than half of the Sustainable Development Goals. The critical role soil biodiversity has globally, and particularly here in the Pacific cannot be emphasised enough. A healthy soil is uniquely capable of providing essential terrestrial ecosystem services including carbon sequestration and water quality.

The Pacific Community (SPC) and the Secretariat of the Pacific Regional Environment Programme (SPREP) together with the Food and Agriculture Organization of the United Nations (FAO) have facilitated a technical session on the importance of soil biodiversity in the Pacific. Participants from 13 Pacific countries, including National Focal Points to the Convention on Biological Diversity (CBD) and to the Global Soil Partnership were engaged in an on-line dialogue on the regional priorities and needs to conserve soil biodiversity in the Pacific.

The outcome of this session has informed Pacific's countries statements at the twenty-fourth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA 24) formal session held between 3 May and 13 June 2021. The technical session was held on the Zoom platform. The program is provided in Appendix 1.

The session recording is accessible [here](#).

2. Welcoming Remarks:

The opening remarks were delivered by Ms Easter Chu Shing, Deputy Director General, SPREP and Dr. Stuart Minchin, Director General, SPC.

Easter Chu Shing, Deputy Director General, SPREP noted that:

- It was not often that joint sessions bring experts from the Environment and Agriculture Sectors together to discuss specific key issues on soil biodiversity in the context of the Pacific islands.
- A similar meeting on mainstreaming ecosystem services and biodiversity into agriculture production and management in the Pacific was also jointly hosted by SPREP, FAO and SPC under the previous phase of the ACPMEAs Programme.
- Soil biodiversity is often undervalued and is not given the same recognition as other biodiversity topics such as forestry, invasive species, protected areas and others. Yet, we all know that soil biodiversity provides the essential services to national food security, healthy diets, culture, ecosystem services and economic development in the Pacific Islands.
- This session will discuss challenges, gaps and key priority actions that are essential for the conservation and sustainable use of soil biodiversity in the Pacific islands.
- The outcome will inform the priorities for the Pacific island countries at the Twenty-fourth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA 24) as well as the Fifteenth Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 15).

Dr. Stuart Minchin, Director General, SPC noted that:

- Soil is a natural system that supports human wellbeing and critical for the life of the Pacific agriculture communities.

- Soil biodiversity helps sustain life above ground and maintains healthy landscapes remains under researched and under promoted issue in the Pacific.
- Soil biodiversity is under threat by unsustainable agriculture practices, land degradation, deforestation, urbanization, pollution and climate change.
- Soils are a finite non-renewable resource and cannot be replenish within a human lifespan.
- SPC is committed to supporting soil health with key development partners such as ACIAR, CSIRO, Landcare New Zealand etc and the Pacific through various projects.
- Previous focus of soil fertility in the Pacific was on increasing the levels of soil mineral nutrients through the inputs of synthetic fertilizers with little focus on the role of soil biodiversity in maintaining the soil health and fertility.
- Need to encourage discussions and the implementation of real actions carried out by the Pacific researchers, extension workers, policy makers to promote the conservation, protection and sustainable use of soil biodiversity in the Pacific region.

3. Objectives of the session

Ms Amanda Wheatley, Biodiversity Adviser, SPREP explained the objectives of the session and indicated that the Biodiversity CBD Focal Points and SPREP will have the opportunity to contribute and provide the Pacific's priorities to the SBSTTA-24 meeting. The specific objectives of the workshop were:

- Raise awareness on the benefits associated with soil biodiversity, including for food production and nutrition, carbon sequestration, water quality and human health
- Discuss regional priorities and needs on soil biodiversity in the Pacific and prepare for a regional intervention at SBSTTA 14 and COP 15.

4. Presentations

Soil Health and Soil Biodiversity: Status and Way Forward from Global to the Pacific, Mr Ronald Vargas, FAO – Secretary of Global Soil Partnership provided an overview on the elements of soil biodiversity from the [State of Knowledge of Soil Biodiversity Report](#) and the [Global Soil Symposium](#) that took place on 19-22 April 2021 from soil biodiversity.

- Challenges and gaps identified includes:
 - Lack of data/information on soil biodiversity at local, national, regional and global levels.
 - Soil science are focused on how to increase agriculture productivity and fertility.
 - Many countries and regions had lacking data on soil biodiversity, as well as national soil information systems that is important to guide decisions.
 - Protocols and tools to measure soil biodiversity is also limited.
 - Recognition of soil biodiversity in the 2030 discussions and post-2020 Global Biodiversity Framework (GBF).
 - Ecosystem restoration does not build on soil health and biodiversity.
 - Soil microbiome is a new important area which looks at connections with human health
 - Need to invest in new research areas including soil borne diseases.
 - Need scale up bioremediation to address soil pollution.

Conservation and sustainable use of soil biodiversity in the Pacific: Status, good practices and opportunities, Dr. Ellen Iramu, Soil Scientist, Sustainable Agriculture Programme, SPC provided an overview of the challenges, opportunities and good practices on soil biodiversity in the region.

- Pacific traditional agriculture systems are complex and a combination of sequential cropping and intercropping. Some cropping patterns include root crops grown in a sequence with whole crops eg, bananas and trees.
- Complex farming systems protect soil biodiversity, improve soil quality, control weed/pest infestation and increase net return when a piece of land is farmed.
- Soil biodiversity is important to enable development of relevant adaption measures that will sustain the complex agriculture systems.

The main threats to soil biodiversity are:

- Population growth and urbanization
- Commercialization of agriculture – monocropping eg, taro
- Land/ecosystem degradation
- Deforestation
- Climate Change and high frequency of natural disasters/events – droughts, cyclones
- High infestations of pest and diseases

Challenges:

- Limited research on soil biodiversity with lack of promotion and awareness
- Lack of political commitment to support conservation and protection of soil biodiversity
- Unsustainable land use planning
- Indiscriminate use of pesticides – only notice effects of pesticides above ground but not impacts below ground

Good practices:

- Ecological soil management eg, agroforestry – leguminous/timber trees species
- Contour barrier to reduce soil erosion along riversides using vetiver grass/pineapple
- Mucuna in taro production systems to increase in Organic Matter Content
- Crop rotations of root crops and vegetable legumes, intercropping/mixed cropping – traditional practice in the Pacific. However, this is lost to a certain extent.
- Fallow system (average of 3 years)
- Mulching using crop residues
- Composting/small livestock manure (pig and poultry)
- Terracing in baibai/pulaka pits in Kiribati – promoting the use of 4 levels of crops in the pit to help the nutrient of soil and raise production on limited space/land.
- Organic farming – inputs of compost, organic matter, crop rotation
- no pesticides use

Opportunities:

- SPC launched a Soil Portal in 2021 which has digitized maps and soil information for Pacific countries to help in land use planning and soil information that can facilitate sustainable agriculture in the region.

- Pacific Organic and Ethical Trade Community (POETCom) – membership body within SPC
- Pacific farmer networks eg. PI Farmers organization Network (PFON)
- Pacific Soil Partnership (PaSP) within the Pacific with Australia and New Zealand. Membership includes Ministry of Agriculture in PICTS, CSIRO, USP, Manaaki Whenua Landcare Research (MWLR), SPC. The PaSP links the Pacific to the FAO's Global Soil Partnership.

5. Recommendations from the discussion

The main points discussed, and the contributions made by speakers and participants in the chat function are summarised below.

Global frameworks

- There is a need to connect the Soil Biodiversity Plan of Action to the post-2020 global biodiversity framework. FAO has submitted a Soil Biodiversity Plan of Action. The Plan focuses on clear tasks and targets that can be achieved by Parties. The post-2020 Agenda however does not properly address soil biodiversity.
- The Koronivia Joint Work on Agriculture (KJWA) should also be connected to the global biodiversity framework discussions. There is an opportunity for biodiversity and climate change dialogue to come together to improve soil carbon, soil health and soil fertility under grassland and cropland as well as integrated systems, including water management. This is a huge advantage for the Pacific region which was a main driver of the Koronivia joint work, time to bring this to action!

Extension and good practices

The region lacks technical capacity in the area of management and conservation of soil biodiversity.

- Retrain extension officers and farmers who have been trained on the conventional methods of farming which include use of inorganic pesticides and fertilizers. Initiative should look at retraining
 - The Soil Doctors programme for farmers provides tools to monitor the soil health
 - POETCom assisted countries to improve soil biodiversity practices through training and organic farming in the region.
- Make a better use of the many endogenous fertilizing sources from the marine environment.
- Include studies on micro-organisms and their importance on soil biodiversity in school curriculum. There is need for more in-depth knowledge on the role of beneficial micro and macro organisms.

Monitoring and information exchange

- Establish a network of soil biodiversity experts.
- Establish an observatory and soil information systems to support countries in assessment, monitoring and mapping of soil biodiversity.

The Pacific Soil Partnership can play a more active role in facilitating action to boost soil health in Pacific countries.

Legislative and policy needs

- Need for political will and commitment from Pacific Leaders
- Need to mainstream the FAO voluntary guidelines into national policies and legislation
- Importance of mainstreaming soil biodiversity into sectoral plans of key Ministries that work on soil biodiversity, including Agriculture, Environment and Infrastructure.

Laboratories and analytical capacity

- Need to build soil biology analytic capacity.
 - Global Soil Partnership focuses also on strengthening soil laboratory analytical capacity through the Global Soil Laboratory Network (GLOSOLAN) initiative.
 - One of the main objectives of GLOSOLAN is to harmonize Standard Operating Procedures to be adopted by laboratories to measure soil chemical, physical and biological parameters. Three procedures on soil biological parameters will be published in 2021. For more information please visit: <http://www.fao.org/global-soil-partnership/pillars-action/5-harmonization/glosolan/en/>

Pesticides and chemical pollution

People are aware of the impacts on soil biodiversity at the macro-level less at the micro-level. Most of the over-use of pesticides and fertilizers by farmers is market driven - driven by demands from the commercial sector to meet export demands. This attitude has deep roots which needs to be addressed through intensive awareness and training for farmers to appreciate that soil has its own ecological mechanism to provide nutrients for their crops.

Samoa is slowly phasing out paraquat, however, the use of pesticides completely until there is an economic solution that can be developed.

- Raise farmers awareness on the impact of pesticides on soil biodiversity.
- Training on assessment of contamination from the application of chemical pesticides and fertilizers

Research and development needs

There is need for strong and comparable soil data, including on soil biology, to properly develop and promote sustainable soil management

- More data/research that link soil biodiversity to soil health (functions), crop growth, water quality etc.
- More research with marine scientists on the links between soil biodiversity and marine and coastal environment.
- More facilities for cultures of farming beneficial microorganisms and beneficial arthropods.
- Adapted nurseries to the agroecology transition.
- More scientific data on impacts of inorganic fertilizers and pesticides needs to be explored.

6. Closure

Ms Xiangjun Yao, Sub-regional Coordinator for the Pacific, FAO, in her closing remarks, commended speakers and participants for their engagement in this important discussion. She emphasised the importance of raising more awareness on the role of soil biodiversity especially with the public and with farmers. The biggest challenge lies in balancing the trade-offs between immediate benefits and long-term sustainability goals. Economic viability underlines farmers' management decisions. She encouraged to document good practices and to create an enabling environment to support the scale up of these practices. In closure, Ms Xiangjun thanked the participants, and the partner organisations, SPREP and SPC, for engaging in the joint organisation of this session, setting the scene for future regional dialogues and exchanges on the need to protect, restore and sustainably use all biodiversity in the region.

Annex 1 – Programme

Time	Topic	Speaker
20'	Opening of the technical session	Dr Stuart Minchin, Director General, SPC Ms Easter Chu Shing, Deputy Director General, SPREP
	Objective of the technical session	Amanda Wheatley, Biodiversity Adviser, SPREP
10'	Soil health and soil biodiversity: status and way forward (from global to the Pacific).	Ronald Vargas, FAO, Soil Global Partnership
15'	Conservation and sustainable use of soil biodiversity in the Pacific: status, good practices and opportunities.	Dr. Ellen Iramu, Sustainable Agriculture Programme, SPC
40'	Discussion on priorities and needs for the region.	Moderator: Mr William Wigmore, Director, Crop research, Cook Islands Country representatives
5'	Closing remarks	Ms Xiangjun Yao, Sub-regional Coordinator for the Pacific, FAO

Annex 2. List of Participants

Country	Name	Surname	Organization	Email address
Australia	Francesca	Mancini	FAO	francesca.mancini@fao.org
Australia	Ben	Macdonald	CSIRO	ben.macdonald@csiro.au
Cook Islands	Elizabeth	Munreo	National Environment Service, Cook Islands	elizabeth.munro@cookislands.gov.ck
Cook Islands	William	Wigmore	Crop Research	William.wigmore@cookislands.gov.ck
Fiji	Jim	Pierce	POETCom	jimp@spc.int
Fiji	Stephen	Hazelman	SPC NRL - Pacific Organic & Ethical Trade	Stephenth@spc.int
Fiji	Fuatino	Fatiaki	Pacific Community	fuatinof@spc.int
Fiji	Sarlesh	Kumar	SPC – Field Coordinator	sarleshk@spc.int
Fiji	Mark	Ero	SPC – Project Manager	marke@spc.int
Fiji	Viliami	Kami	SPC – Project Manager	viliamik@spc.int
Fiji	Fred	Fuakilau	Fungs Farm Pacific Grow	fred.fuakilau@ds-insight.com.au
Fiji	Visoni	Timote	Pacific Community (SPC)	visonit@spc.int
Fiji	Ellen	Iramu	Pacific Community	elleni@spc.int
Fiji	Simione	Tukidia	Pacific Community (SPC)	simionet@spc.int
Fiji	Gibson	Susumu	Pacific Community (SPC)	gibsons@spc.int
Fiji	Poasa	Nauluvula	Palladium - Consultant	pnauluvula@ymail.com
Fiji	Rohit	Lal	Ministry of Agriculture, Senior Research Officer	rohitlalmpi@gmail.com
French Polynesia	Thierry	LISON DE LOMA	Vaihuti Fresh Farms	vaihutifresh@mail.pf

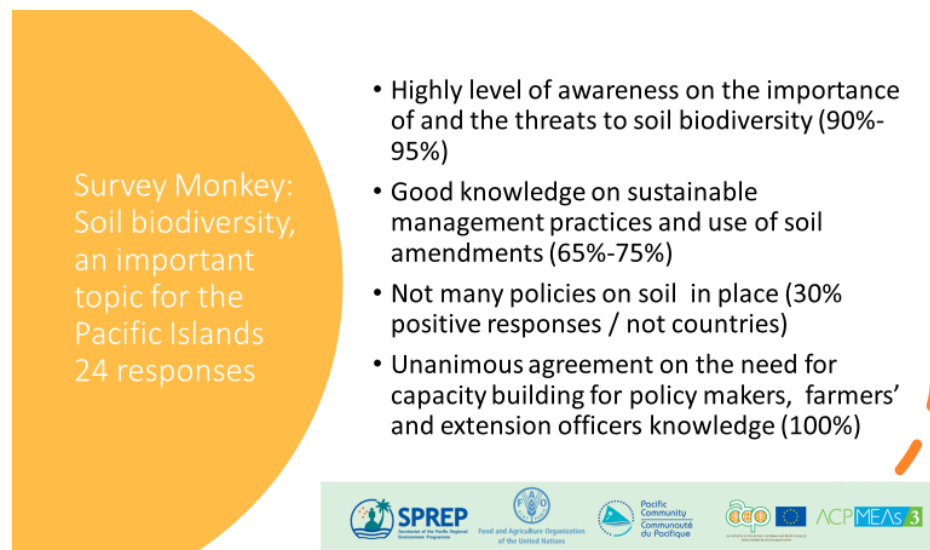
FSM	Nat	Tuivavalagi	College of Micronesia-FSM	nat.tuivavalagi@gmail.com
FSM	Vanessa	Fread	Department of Resources and Development – Assistant Secretary	freadv@yahoo.com
Kenya	Ladu	Lemi	UNEP	ladu.lemi@un.org
New Caledonia	Chloe	Fontfreyde	Chambre d'agriculture	cfontfreyde@canc.nc
New Caledonia	Clement	Gandet	SPC	clementg@spc.int
New Caledonia	Pierre-Louis	Stenger	IAC	Pierrelouis.stenger@gmail.com
New Caledonia	Ilaisaane	Lauovea	Regional Cooperation and External Relations Department – Senior Adviser laisaane.lauovea@gouv.nc	
New Caledonia	Kerhouas	Yoann	Chambre Agriculture	ykerhouas@canc.nc
Niue	Haden	Talagi	Department of Environment, Niue Island	haden.talagi@mail.gov.nu
Palau	Gwen	Sisior	Ministry of Natural Resources, Environment & Tourism	Gsisior07@gmail.com
Samoa	David	Hunter	Ministry of Agriculture & Fisheries	tilafono@maf.gov.ws
Samoa	Seeseei	Molimau-Samasoni Scientific Research Organization of Samoa		seeseei.molimau-samasoni@srosmanagement.org.ws
Samoa	Juney	Ward	SPREP	juneyw@sprep.org
Samoa	Amanda	Wheatley	SPREP	amandaw@sprep.org
Solomon Islands	Shane	Tutua	Zai Na Tina Centre for Organic Systems	Shane.s.tutua@gmail.com
Solomon Islands	Jimi	Saelea	FAO – National Consultant	jimi.saelea@fao.org
SPC	Stuart	Minchin	Pacific Community	stuartm@spc.int
SPC	Amit	Sukal	Pacific Community	amits@spc.int
SPC	Ulamila	Lutu	Pacific Community	ulamila@spc.int
SPC	Alieu	Sartie	Pacific Community	alieus@spc.int
SPC	Matilda	Simmons	Pacific Community	matildas@spc.int

SPC	Rovaroaivalu	Waqanivalu	Pacific Community	rovaw@spc.int
SPC	Elenoa	Salele	Pacific Community	elenoas@spc.int
SPC	Mani	Mua	Pacific Community	manim@spc.int
SPC	Fereti	Atumurirava	Pacific Community	feretia@spc.int
SPC	Logotonu	Waqainabete	Pacific Community	logow@spc.int
SPC	David	Hickes	Pacific Community	davidj.hickes@gmail.com
Tonga	Siosua	Halavatau	Self employed	halavatauj@gmail.com
Tonga	Tahirih	Hokafonu	Ministry of Environment	tfifitahokafonu@gmail.com
Wallis et Futuna	Anaïs	Bichon	Direction des services de l'agriculture	anais.bichon@agripeche.wf
Vanuatu	Alain	JACOBE	VANUATU ORGANIC CERTIFICATION COMITY	al1jacobe@hotmail.com
FAO	Filippo	Benedetti	Soil Scientist, FAO	filippo.benedetti@fao.org
FAO	Ronald	Vargas	FAO	ronald.vargas@fao.org
FAO	Xiangjun	Yao	FAO	xiangjun.yao@fao.org

Annex 3. Survey Monkey on Soil Biodiversity in the Pacific

RESPONSES SHOWED A:

Responses: 24

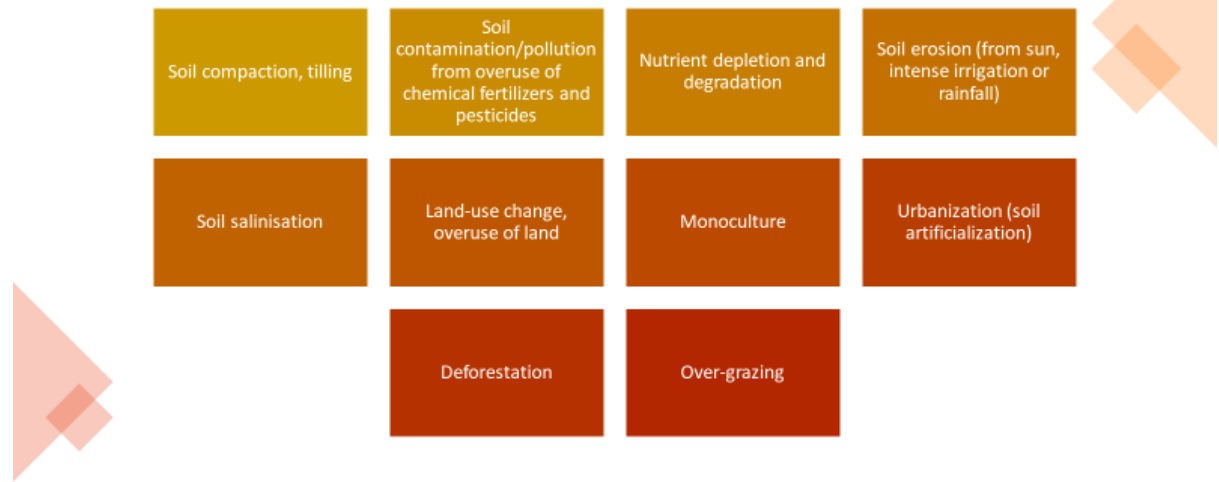


Question 1. Soil organisms play a key role in the provision of essential ecosystem services and functions, are you aware of these key ecosystem services/functions? **90% YES**



Question 2 Can you identify the main threats to soil biodiversity? **95% YES**

Main threats to soil biodiversity in the Pacific



•

Question 3. Does soil biodiversity play a role when planning conservation/restoration strategies in agricultural and forestry sectors at the national level? **66% YES**

- Not yet, or not a lot,
- Biodiversity is something new in the agriculture production
- It should but is less mentioned and less understood
- Vastly overlooked in national strategies
- Not yet unfortunately

Question 4. Healthy soil needs a healthy environment, can you identify the major threats contributing to soil degradation? **95% YES**

Question 5. Are your farming and soil management practices promoting the sustainable use/management of soil biodiversity? **75% YES**

Sustainable management practices

Cover crops, use of compost or other organic matters, mulch, green manure use of mycorrhizae

No pesticide use

Planting biomass high yielding trees or shrub where appropriate + N fixing + especially nutrient rich green manure,

Using var. fish waste tea, brown sea weed, wood ashes

Adapted crops and diversity + appropriate associations

Enrichment of soils through crushed wood charcoal (retaining beneficial microorganisms and optimal moisture ...

Few to no ploughing (i.e. permanent to semi-permanent beds) for market gardening

Question 6. Are you currently using soil amendments to correct and combat soil degradation? **95% YES**

Soil amendments

Compost, fragmented branch wood, mulches, green manures, silicium rich plants

Basaltic rock powder

Shredded wood charcoal

Mycorrhizae, PGPRs

Fish biostimulant

Wastes of water treatments

Lime, gypsum

Question 7. Do agricultural workers and farmers have knowledge on how to assess soil health, considering biological indicators (e.g. biological activity and quantification of biodiversity)? **30% YES**

Question 8. Is there a need to build the capacity of agricultural extension officers and farmers on sustainable management and conservation of soil biodiversity? **100% YES**

Question 9. Does your country have a policy on soil health and soil biodiversity management/conservation? If **yes**, is the current policy still relevant or needs improvements?10. How can you raise awareness to promote sustainable management/conservation of soil biodiversity? **30% YES**

Question 10. Do you need assistance in raising awareness to promote sustainable management/ conservation of biodiversity? 100% YES



Capacity needs

- Raise political awareness in agriculture on the importance of biodiversity and the link to climatic change
 - Technical support, brochures and workshops to build the capacity of famers on soil conservation
 - Research in needed to define soil biodiversity first
 - Tools to measure soil health parameters
 - Sustainable funding
- 