Food and Agriculture Organization of the United Nations

LEADERSHIP GUIDE:

Agriculture Extension Officers

Sustainable land management for small-holder farmers in Solomon Islands

Leadership Guide: Agriculture Extension Officers
Sustainable land management for small-holder farmers in Solomon Islands

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The Food and Agriculture Organization of the United Nations (FAO), supported by the Global Environment Facility, embarked on a project to improve sustainable forest management in the Solomon Islands. The project components included (i) development of the terrestrial protected area network, (ii) integrated land management, and (iii) capacity building for the management of forest carbon. FAO engaged Live & Learn to address part the second component, focussed on the outcome 'poor land-use practices reduced or reversed in and around protected areas.' This technical manual is one of the outputs of that work.

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ENVIRONMENTAL EDUCATION

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CHAPTER 1

Introduction

Sustainable Land Management and the Solomon Islands

Sustainable land management (SLM) involves the use of land, soils, water, animals and plants for production in a way that ensures these resources can continue to be used into the future and that they can continue to keep the environment healthy. SLM is important in developing countries such as the Solomon Islands where commercial forestry threatens biodiversity conservation.

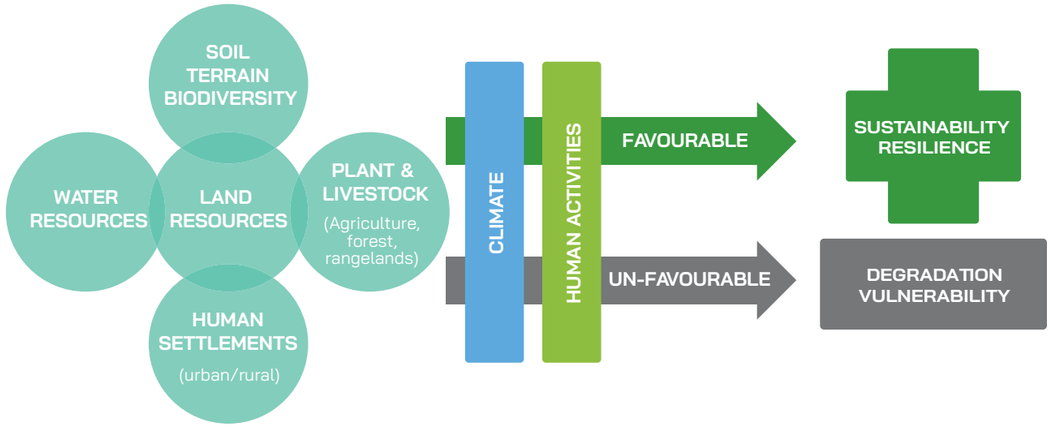
In the Solomon Islands, it is important that we look after the land. There are pressures on land from a growing population. This can result in land being overworked, or productive agricultural land being taken over for housing. There are threats from a warming climate, which results in more unpredictable weather and sea level rise, which can affect the health of the soil, or erode it, and the yields of crops. And in many places in the Solomon Islands, soil quality has declined from shorter crop rotations.

Sustainable land management practices are part of sustainable development. They are supported by the Solomon Islands government and promoted in policy, government activities, and regulations. SLM practices can help to increase agriculture productivity, enhance livelihoods and improve the health of native forests. The direct benefits of SLM practices include more forests, improved soil fertility and better water quality. To gain widespread application of SLM, we need leaders who understand SLM practices and techniques, and the pathways to their adoption in communities.

The productivity and sustainability of an agricultural landscape depends on a combination of what resources are available in that landscape, the climate, and what people do on the land. It is important to choose the methods of using the land that best suit both the natural conditions of the land and the income that can be derived from it, applying SLM practices. This will ensure land is not degraded, already-degraded land is rehabilitated, and resources such as soil and water are conserved. This is especially important as climate change brings stronger variability into the agricultural sector.

The diagram below shows how climate and human activities can have favorable and unfavorable impacts on sustainability.

(Source: http://www.fao.org/land-water/land/sustainable-land-management/en/)



Purpose of this guide

The key purpose of this guide is to support agriculture leaders to adopt sustainable land management techniques and practices where they live and work, and to help prepare farmers for improved use of the buffer zones of protected areas. This will enhance the livelihood security of communities while maintaining the diversity of the natural environment, enhancing human and environmental health and wellbeing.

The manual helps government, NGOs and communities to:

IDENTIFY SLM practices that can build on existing knowledge, skills and materials to resolve agriculture problems, improve productivity and enhance livelihood security

UNDERSTAND their role in building momentum for SLM

IMPLEMENT methods for sharing knowledge about SLM in a way that is sensitive to men's and women's experiences (gender sensitive approach)

DEVISE ways for ensuring SLM practices are ongoing after projects and training end.

Leaders will be equipped with information and tools to facilitate the adoption of SLM practices and techniques.

We consider 'leaders' to be those who work in the field with farmers and/or have a leadership role in the community. They might be

- community leaders
- provincial agriculture extension officers
- NGO field workers
- innovative farmers and/or farmer group leaders.

How to use this guide

This guide includes two sections:

Sustainable land management

This section (Chapter 2-4) introduces key principles and benefits of SLM, and introduces key techniques in the SLM Toolbox, with a focus on climate-smart agriculture that addresses prevalent crop management issues in the Solomon Islands.

Building and sustaining sustainable land management

This section (Chapters 5-8) focusses on facilitating SLM adoption. It discusses the roles of SLM leaders, the importance of knowledge sharing and ways for sustaining SLM practices. It provides guidance on how to ensure SLM leadership is gender-sensitive.

The manual covers principles and techniques for SLM, but focuses on how to support their adoption at the community scale. An SLM farm technology manual, crop sheets and best practice materials have been developed that provide additional technical detail.

Each chapter has practice activities leaders can use to gain more insights on the topic. You can pick and choose these training activities to fit your needs.

What is Sustainable Land Management leadership?

Being a leader means you try to coordinate others to help meet the needs and wants of the community. Leadership for sustainable land management means working towards enhanced agriculture production, improved livelihoods, and better health of the environment and the community members who rely on it. As a leader, a critical skill is the ability to listen and acknowledge all of the views of the community and identify where there are opportunities to work together. A leader has to earn respect from others and show vision, skills and the ability to give direction.

SLM leaders need to be able to identify opportunities for improving agriculture and livelihoods that will also benefit the natural environment. They need to build networks for sharing resources and knowledge and skills, and they need to create opportunities for people in that network to learn from each other, acknowledge barriers to change and find innovative solutions to them.

Five key points to strengthen leadership are as follows:

1. **A leader plans.** A key leadership skill is being able to create a plan. Good leaders discuss options with others, analyse the information, and allocate tasks along a timeline. Good leaders also adapt their plans to unexpected changes and to take advantage of new opportunities.

2. **A leader has a vision.** Leaders need to have a vision of what they and the community are trying to achieve. A vision provides direction and a goal to work towards.

3. **A leader's vision is co-owned by the community.** Sharing your vision with the community allows others to have input and shape a plan. A leader faces less resistance when a community can see how the vision could benefit them and that it reflects the issues they have identified. Ownership of a vision helps to grow it and build momentum for action.

4. **A leader manages.** SLM leaders need to be experts at finding knowledge, skills and materials to achieve a vision. They also need to delegate tasks to the right people.

5. **A leader inspires through example.** A good leader acts in the same way they would like others to. Listening to others and having genuine concern for their needs will be rewarded with respect. A respected leader has the trust of others.

CHAPTER 2

What is SLM?

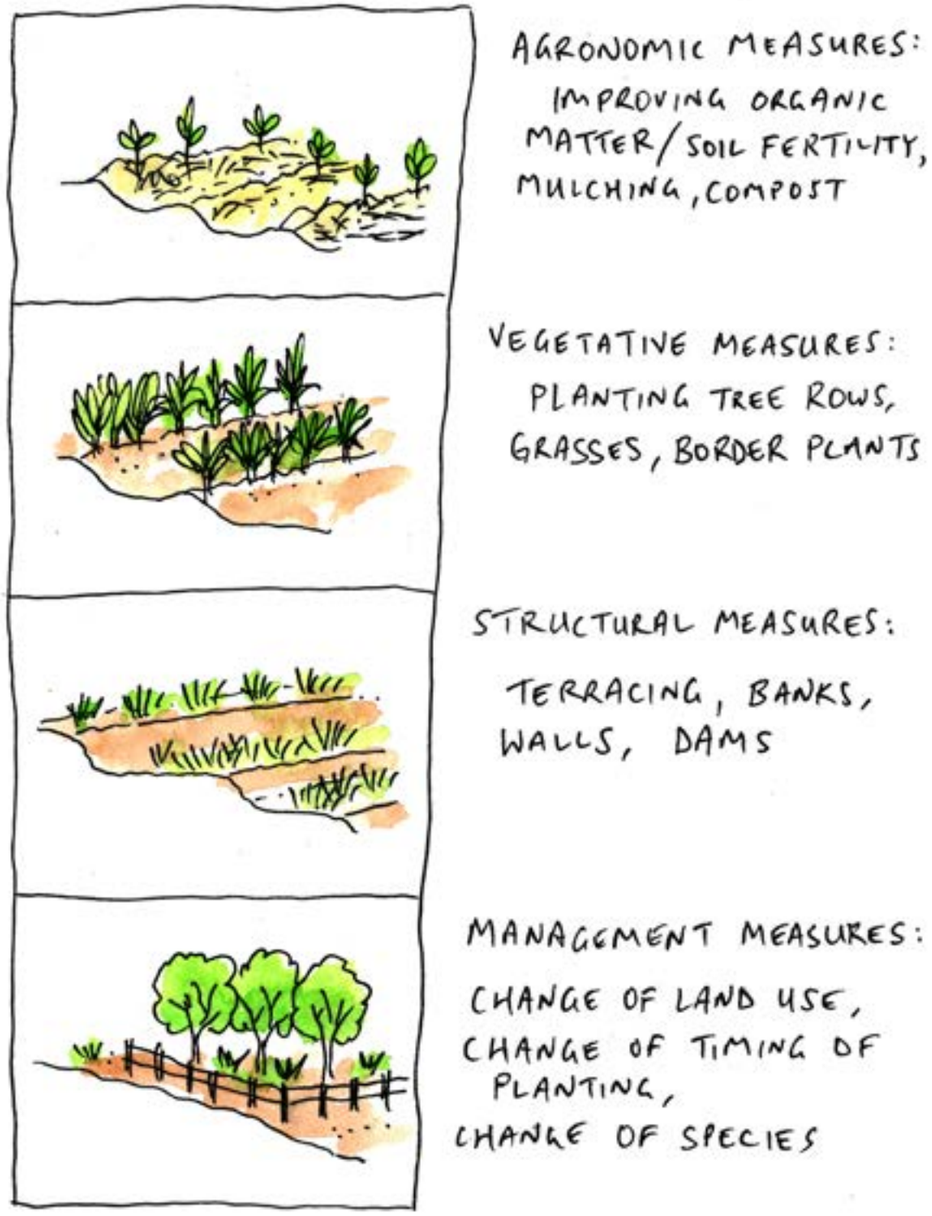
Sustainable Land Management principles

Sustainable land management has two key aspects - making current agricultural land more productive by using techniques that improve soil and crop health, and protecting the environment surrounding agricultural land.

This involves the following principles:

- Understand the land and soil and use appropriate techniques and measures to keep the land productive.
- Think about the whole landscape, such as the watershed area, not just the area where crops are grown.
- Work with neighbours, neighbouring villages, extension workers to improve land.
- Use appropriate structures, such as terraces or dams, to improve soil and water retention.
- Rehabilitate soil that has become degraded, through the use of compost, mulch and cover crops.
- Control pests and weeds, especially utilising chemical-free techniques.
- Use a variety of crops, rotate crops, change planting times to suit conditions.
- Conserve natural resources such as forests and waterways.

There are many ways to improve the productivity of gardens or plantations, and these can be summarised in four categories: agronomic, vegetative, structural and management.



Benefits of Sustainable Land Management

The primary targets for a sustainable land management approach are increased land productivity, improved food security and maintaining the environment. In the Solomon Islands, land expansion has doubled in the past 40 years and often affects areas covered by forests. A better way to improve productivity and food security is through improved soils and diversification to improve yield and the value of produce. Another key issue is to manage soils to reduce the loss of topsoils. The loss of topsoil can reduce agriculture yield by a half!

The environment surrounding gardens and plantations are vital for a thriving life:

- Forests provide resources such as fruits, nuts, timber materials for houses, traditional medicines, firewood, wild pigs and other resources.
- Forests and plantations (coconut, cocoa, etc.) help to keep the soils stable and reduce landslides.
- Biodiversity helps to pollinate plantations and crops and manage pests.
- Native vegetation, biodiversity and soils help to provide nutrients in the soil, clean water and clean air, contributing to human health.
- Rivers provide water for human and animal consumption and habitat for raising fish.
- Forests help to reduce the impacts of disasters, such as storms and sea level rise.

In the Solomon Islands, people depend on these things for their livelihoods and health. Sustainable land management avoids the degradation of the natural environment, improves food security and increases livelihood income opportunities. Sustainable land management helps restore the relationships between people and nature.

Sustainable land management includes the management of forest, soil, water, plant and animal resources. It has the following benefits:

- restoration of forest, which assists infiltration of rainfall
- improvement of soil health, retention of topsoil and reduced erosion, which improves agricultural productivity
- reduces the need for expensive and potentially damaging inputs such as chemical fertilisers and pesticides
- secures livelihoods, thus increasing food security and reducing poverty
- protects traditional foods and culturally important species, which contributes to diversity of diet and better health
- improves water management (more crop per drop), manages excess water and improves water quality.

Opportunities for Sustainable Land Management in the Solomon Islands

Rural communities surrounding native forests in Choiseul, Guadalcanal, Makira, Malaita and Western provinces rely on crops, plantation species and forests for income. We identified the following opportunities for improvements in land productivity. The SLM toolbox (Chapter 3) outlines specific techniques to address these issues.

Issue	Scale of issue	Ways to address issue
Loss of forests reducing ecosystem services to communities, accelerating land degradation and reducing water quality	63% of forests lost 2002-2018	Community protected areas Reforestation Sustainable use of forest resources Improve agriculture productivity Alternative livelihoods
Erosion and loss of topsoil, reducing yield	Yield can decrease by up to 50% from topsoil loss	Increase water availability in soil Increase plant uptake of water
Climate change – flooding, drought, and increased temperatures affecting land stability and crop yield	Farmers identified that flooding, drought and changes in temperature contribute to losses of 25-50% of yield in any year, and the problem is intensifying	Increase ability of soil to hold water Provide run-off and storage of water, especially on slopes Increase shade on crops
Soil infertility, resulting from loss of organic matter and affecting crop yield	Farmers identified that soil infertility contributes to losses of 25-50% of yield in any year	Increase soil organic matter Minimise practices that affect soil structure
Pest and disease	Farmers identified that pests and diseases contribute to losses of 25-50% of yield in any year, and the problem is intensifying!	Increase habitat for pest predators Reduce opportunities for pests and disease to enter soils

TRAINING 1

Understanding agriculture problems and opportunities

ACTIVITY 1

Objective of Training

Engages communities in thinking about the natural resources available to them, the benefits they provide and the strengths they already have in managing their resources.

It's an active process, so leaders can see issues first hand, and it's a great way to gain the community's trust and build rapport between leaders and community members.

Activity

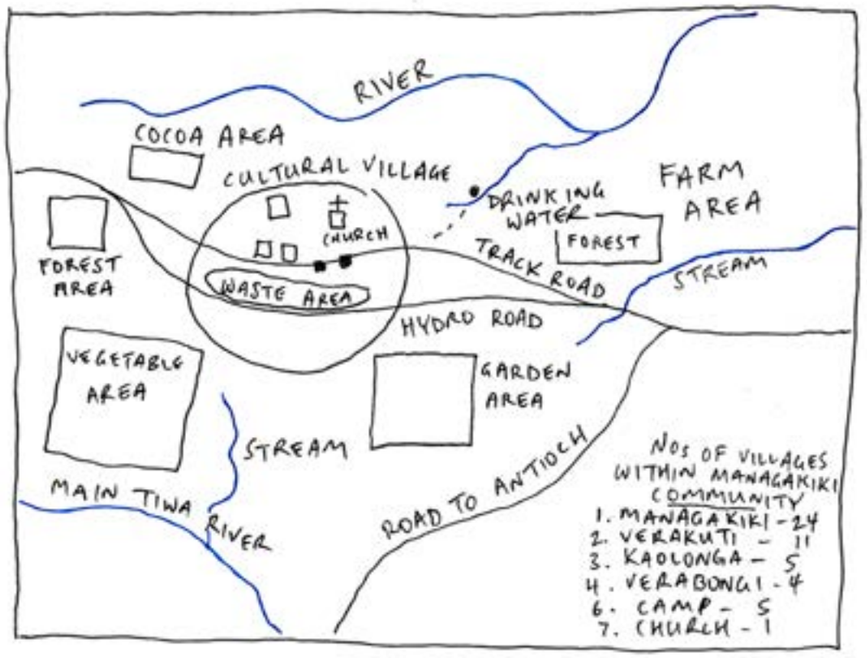
Create a map of resources and highlight priority problems or issues.

Materials

Papers, pens, green yellow and red dots (could be replaced by seeds or other objects)

Procedure

1. Take a short walk around the village area with a small group of interested / innovative farmers and ask them to identify their resources and the problems they have in maintaining benefits from them.
2. Ask them to draw a map that highlights key resources they use (forests, gardens, plantations, rivers, springs, places to shelter from disaster, culturally important resources, unused areas).
3. Ask them to place a green dot on resources that have improved in the past 10 years, a yellow dot on resources that have not changed much, and a red dot on resources that have declined.
4. For resources that have improved, ask them what has enabled this improvement. It could be management activities, limiting who can access the resources, new knowledge, resources, training or other factors. These are strengths you could potentially work with to promote SLM.
5. For resources that have declined, ask them why this is the case. These are threats. Discuss why current approaches have not been successful in addressing threats.
6. Focus on discussing how they could potentially resolve threats to important resources. Focus on using the strengths they have already identified.
7. Decide what activities are a priority for the community to focus on for SLM. This should address issues or opportunities and build on existing community strengths.



Example of a village map

ACTIVITY 2

Objective of Training

Engages communities in thinking about the natural resources available to them, the benefits they provide and the scale that challenges to managing their resources occur at.

It's an active process so leaders can see issues first hand, and it's a great way to gain the community's trust and build rapport between leaders and community members.

It's a little simpler than the first training activity to facilitate, but it does involve walking.

Activity

Identify resources within the catchment and challenges to their management

Materials

Papers, pens, cameras (optional)

Procedure

1. Take a walk through the community and into the surrounding forest area (you could follow a straight line or a water way or path). Ask a small group of interested / innovative farmers to join. If participants have access to phones with cameras, ask them to take pictures of important resources (e.g., spiritual trees, non-timber resources) or challenges (e.g., landslides).
2. Stop first at the upper part of the catchment or the area the farthest distance from the village. Ask participants to identify the important resources and challenges to their management in that part of the catchment. Take notes to prompt discussion later.
3. Return to the mid part of the catchment or an area half-way back towards the village. Ask participants to identify the important resources and challenges to their management in that part of the catchment. Take notes to prompt discussion later.
4. Return to the proximate part of the catchment or an area close to the village. Ask participants to identify the important resources and challenges to their management in that part of the catchment. Take notes to prompt discussion later.
5. As a group in the village, ask participants to recall the key resources and challenges they identified in the upper, mid and proximate parts of the catchment. Then use photos taken to remind themselves and others of important resources and challenges. Take a note on paper as appropriate.
6. Ask the group about the differences in resources and challenges in different parts of the catchment. Discuss what this means for management of the areas.
7. Focus on discussing how they could potentially resolve threats to important resources.
8. Decide what activities are a priority for the community to focus on for SLM in different parts of the catchment. This should address issues or opportunities and build on existing community strengths.

CHAPTER 3

The SLM toolbox

The importance of problem-centred approaches for facilitating SLM

SLM leaders want to ensure land is managed more sustainably. They recognise that many practices are new and will require them, and others they work with, to change their current practices to achieve their vision. Facilitating changes in practices requires:

- **recognition that problems exist.** If people don't see a problem with current practices, it's hard to convince them to invest in learning an alternative practice or to allocate materials to it.

- **understanding the reasons why alternatives to resolving a problem haven't been tried or haven't worked.** It's important to recognise that there might be reasons why a particular solution is not being applied in a community. It could be a lack of materials, time, tools, resources or a lack of interest in resolving a problem.

- **acknowledging and mobilising the assets a community has to resolve its problems.** Communities already have many resources, skills and knowledge available to them to resolve problems. When we engage them in the process of developing solutions, they are more likely to take ownership of solutions and adapt them to their own contexts. If experts tell a community exactly what their problems are, and provide a solution, they could be solving the wrong problem, be unaware of constraints to solutions and the community could become less likely to learn for themselves how they could resolve this or related problems.

- **using strengths-based approaches.** Strengths-based approaches value the capacity, skills, knowledge, connections and potential in individuals and communities. Strength-based approaches ask, "What is strong?" rather than just "What is wrong?" Focusing on strengths does not mean ignoring challenges, or talking about struggles, but it does mean helping people to acknowledge the skills, knowledge and physical things they already have that they can build on. In this way, people can become co-producers of support, not passive consumers of support. There is also evidence that use of a strengths-based approach can improve social networks and enhance well-being.

Sustainable land management as a toolbox of solutions

Agriculture problems and solutions offered by SLM techniques and practices

Sustainable land management offers a range of tools and techniques to achieve its goals – increased land productivity, improved food security and the provision of environmental goods and services. A short description of each is provided here – more detail can be found in the technical manual **Woakem Land Kum Up Gud Fala**

FORESTS

Technique	Purpose	Benefits	Approach / skills / inputs
Forest protection (protecting existing forests)	Retain biodiversity (fruit, medicinal plants)	Enhances environmental services Land stabilisation and flood impact reduction Improves water quality Potential for payment for ecosystem services	Tribes can declare community protected areas, and establish rules about access to and use of the area. These rules need to be enforceable.
Reforestation (enhancing existing forest or extending the area they cover)	Rehabilitates forest and land Enhances biodiversity	Potential for new livelihood from nursery Enhances environmental services Land stabilisation and flood impact reduction Improves water quality Potential for payment for ecosystem services	Materials and skills needed for nursery-based production Seed or seedling source needed Labour for nursery and replanting Knowledge and skills needed in plant propagation Tree examples – Fluggea Flexuosa, Vitex cofassus and Pomatia pinnata
Agroforestry (growing a range of shrubs and trees with crops)	Improve the sustainability of the farm system	Improves soil structure, composition and fertility Improves crop yield Reduces erosion and stabilises land Reduces impact of drought and heatwaves on plants Improves biodiversity Diversifies agriculture and livelihoods	Access to seedlings for harvestable and non-harvestable species for planting (these can be grown in a nursery) • Nitrogen fixing trees, e.g., Albizia falcataria, Gliricidia sepium, Leucaena leucocephala • Shade trees, e.g., Flueggea • Fruit and nut trees, e.g., breadfruit, coconut, betel nut, pawpaw, pomello, canarium, citrus fruit, sago palm Labour and materials for nursery and planting Knowledge of appropriate tree species Knowledge about propagating, planting and caring for trees
Smallholder forests (trees planted specifically for timber, sometimes as agroforestry)	Stabilises land and provides an alternative livelihood to removal of old-growth forests	Provides an alternative livelihood Examples include Teak and Flueggea flexuosa, Teak and coffee, Mahogany	Land tenure and tree ownership issues must first be addressed Sources of seedlings and labour for planting Knowledge of planting, maintenance (thinning), and harvesting

Technique	Purpose	Benefits	Approach / skills / inputs
Cover crops (cover crops can be cut to provide mulch when blocks are ready to plant)	Soil management	Reduces loss of topsoil and erosion Reduces soil water loss Prevents soil crusting Improves soil fertility and yield Reduces weeds Examples include tropical kudzu (Pueraria phaseoloides), centro (Centrosema pubescens), and desmodium (Desmodium adscendens), and hyacinth bean (Dolichos lablab or lablab purpureus)	Access is needed to seed
Mulching (includes residues from cover, alley and contour crops, as well as pruned branches and vines, husks, leaves etc.)	Soil, soil moisture, and weed management	Improves soil fertility and yield Reduces weeds Improves soil structure and water holding capacity Re-use of waste	Time needed to cut larger materials (branches etc) to smaller size for mulch Time is needed to collect residues
Composting (includes household scraps)	Soil management - soil fertility, soil moisture and soil structure	Improves soil fertility and yield Improves soil structure and water holding capacity Re-use of waste	Time is needed to make compost, and an appropriate contained area for making it
Contour farming (growing of food crops on slopes with vetiver grass used for controlling soil erosion)	Land stability and land productivity	Reduces loss of topsoil and erosion Increases water holding capacity of soil Can improve soil fertility Examples of plants include vetiver grass Chrysopogon zizanioides, taro and banana	Need to build contours to enhance natural drainage features if necessary May need to source materials (plants) for contour edges May need propagation skills for some species (e.g., vetiver)
Alley cropping (growing of crops between rows of legume trees to increase yield and maintain soil fertility)	Land stability and land productivity per land unit	Reduces loss of topsoil and erosion Increases water holding capacity of soil Can improve soil fertility Habitat for natural pests Livelihood diversification Provides residue for mulch Examples include nitrogen fixing trees, e.g., Albizia falcataria, Gliricidia sepium, Flemingia macrophylla, and Erythina	Need adequate space between alley crop species and garden species, especially for larger trees Need seedling source for alley crops May need to prune alley crops

Technique	Purpose	Benefits	Approach / skills / inputs
Crop rotation	Soil management and sustainable crop production	Improves soil fertility and yield	Knowledge of plant types and planting order
Intercropping	Soil and pest management	Improves soil fertility and yield Improves pest management	Knowledge of which combinations of crops work best together
Companion planting	Pest management	Provides habitat for predator species and deterrents for plant pests (smell, taste)	Knowledge of which species of crops work best together
Locally adapted/ new varieties	Disease management	Provide improved yield Better disease management e.g., taro, sweet potato, yam	Can be shared between farmers (seed from plants with high yield), or sourced from MAL
Low/no till seeding	Soil management	Reduces opportunity for pest and weed invasion Retains soil moisture and structure	Need hand tools for planting with low/no tillage
Raised garden bed	Pest and disease management Maximise limited land Keep pigs and chickens out of garden	Improves yield Improves water management Good for small spaces	Requires materials for making raised bed (stones, timber etc.)

LIVELIHOOD DIVERSIFICATION

LIVELIHOOD DIVERSIFICATION

Technique	Purpose	Benefits	Approach / skills / inputs
Niche markets	Alternative livelihood	Diversifies livelihoods Examples include kava, cocoa, nuts such as nagli, and fruits such as noni	Works best when innovative farmers exist Extension support needed
Organics certification	Alternative livelihood	Diversifies livelihoods Improves economic return Improves soil health	Extension support needed to meet requirements for certification Market connections required
Agro-processing (value adding from processing produce)	Alternative livelihoods	Diversifies livelihoods Improves economic return to farmers Examples include processed dried nuts, cocoa, kava	Extension support needed Technology needed (e.g. driers, processing equipment) Market connections required Group collaboration required

These approaches can be matched to problems identified by the community, and the strengths it has to address them. The following table provides a match between problems and potential SLM solutions. We developed the table below with problems identified by Solomon Island communities.

It shows the **best options** (green) and **helpful options** (orange). It demonstrates the multiple benefits that can come from each approach.

best options **helpful options**

Problem	**SLM toolbox**						
	Cover crops	Mulching	Composting	Contour farming	Alley cropping	Crop rotation	Inter-cropping
Soil fertility	helpful	best	best	best	helpful	best	best
Loss of topsoil	best	best		best	best		
Erosion	best			best	helpful		
Soil crusting		best		best			
Landslide	helpful			best	best		
Heat stress in plant (wilting)		best		best			
Forest too far away							
Not enough timber for houses							
Insufficient land or shorter fallow		best	best			best	best
Pests & disease		helpful					

SLM toolbox										
Com-panion planting	Locally adapted/ new varieties	Low/ no till	Raised garden bed	Niche markets	Organics	Agro-processing	Agro-forestry	Small-holder forests	Refores-tation	Forest protection
		best			best		helpful			
		helpful								
							best			
							best	best	best	best
							best	best	best	best
	best	best	best	best		best				
best	best	helpful					best			

Babatana and ecosystem services

The Nakau Programme and the Natural Resources Development Foundation have been working with the Babatana group towards developing options for payment of ecosystem services on tribal forests. Payment for ecosystem services is a way where communities earn income for protecting forests, rather than allowing them to be logged.

The Sirebe tribe in Choiseul province has protected 836 hectares of their forests. Almost all of this forest area is eligible for ecosystem services payments. The area is protected under government regulations as a conservation area and cannot be logged. To receive funds, the tribe has committed to protect these forests for at least 30 years. The funds a tribe can receive are equal to those they would earn for logging.

There are some conditions that must be met to receive these payments. Rangers must inspect the forest boundary, and must take actions to stop illegal logging. If illegal logging occurs, the tribe can lose some of the funds for protection, and must repay the funds they have received for protecting the logged area. They must try to prosecute through the courts any people who practise illegal logging in the protected area.

Many communities log their traditional forests because they need income. To address this need help is given to establish alternative livelihood activities. These include SLM practices, and alternative livelihoods such as bee keeping.

TRAINING 2

Matching solutions to problems

Objective of Training

Improve familiarity with SLM techniques.

Activity

Create a table of priority problems and techniques that could address them.

Materials

Papers, pens, priority problems identified during training 2 (table of).

Procedure

1. Leaders develop a table with the template below, prefilling priority problems identified during training 1.
2. Use the table to identify potential options from the SLM toolbox.
3. Discuss what resources are needed to implement solutions:
    a. Are there farmers already doing the technique who could provide a demonstration?
    b. Are there farmers in neighbouring villages who are using the approach to visit and learn from?
    c. Could the approach be adapted so local resources could be used?
    d. Does the way families farm need to be adjusted to implement the solution? If so, how?
    e. What other networks exist for getting necessary resources?

Priority problem	Potential solutions	Resources

Mulch cover on young plants

TRAINING 3

Understanding community strengths

Objective of Training

This activity documents the community understanding of the natural and physical resources that are important to their livelihoods, life and well-being. (The activity is adapted from the Oxfam Participatory Capacity and Vulnerability Analysis Guide.)

Materials

- Flip chart paper, chalk and blackboard, or pointed stick to draw in the sand (with labels written on cards or paper if needed)
- Markers or sticky notes and pens

Participants

Form two groups of 6-8 people (one group of men and one group of women) who together have good knowledge of the range of livelihoods done in the community.

Timing

This process requires walking, talking, and drawing, so allocate enough time for all needed activities when women and men can participate (so avoid food preparation times). Be guided by your participants in what works best for them and their schedule.

Procedure

Begin by explaining that the purpose of this activity is to walk around the community and then make a map that shows all the natural and physical things that are important to livelihoods, life and well-being.

Simple definitions to help the discussion are:

Livelihoods - Things that help people earn income or meet family needs - both natural things (like forest plants and vegetable gardens), and human things (like an outboard boat and motor)

Life - Things that people need to live – like a clean water supply, trees that provide clean air, shelter

Well-being - Things that make people feel happy and safe – maybe social groups, church activities, connection to special natural places

Ask the participants to walk through the different physical areas within the community in pairs, making notes of all the resources that are important to livelihoods, life and well-being for both individuals and community. If it is not possible to walk, then the group can talk about the community from memory.

When the participants return, ask them to combine everything they saw and noted, and draw this on a large map of the community. The map documents the physical, social and ecological assets of the community.

Once the final map is completed, have a combined discussion about how these assets can contribute to SLM practices, and how SLM can contribute to strengthening or protecting the assets that are most important to the community. An example of a completed livelihoods, life and well-being asset map is given below.

Example of a community map

CHAPTER 4

Sustainable land management in a changing climate

Why climate change is such a significant threat

Climate change has resulted from a change in the gasses released into the atmosphere. The atmosphere covers the earth like a blanket and makes the temperature just right for people, plants and animals to grow. Increased amounts of gasses make the blanket thicker. The main source of this increase is carbon dioxide which comes from burning fuel in fires, cars, planes and industry. These gasses trap heat. This trapped heat causes many changes which we refer to as climate change. This can cause:

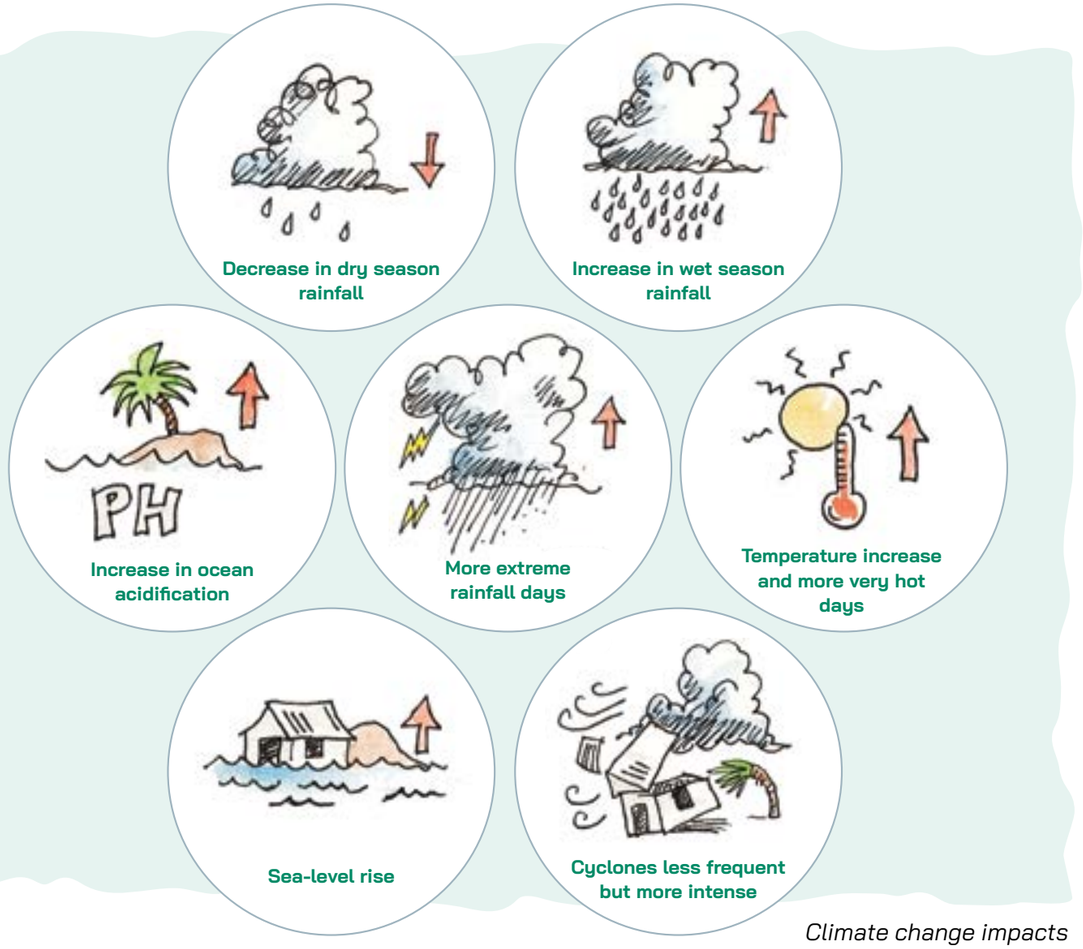
- rising sea levels
- changes in ocean currents and wind patterns
- change in weather patterns
- changes in the acidity of oceans

Rising sea levels

Large areas of ice at the north and south poles are melting, and the ocean is expanding when it warms. This results in increased height of the ocean. Rising sea levels are a big threat for the Pacific, especially for communities who live on atoll islands. They affect the area of land that will become ocean (coastal inundation), erosion of coastal areas because of waves, the amount of salt in the soils, and the saltiness of groundwater. This influences where people can live, what crops they can grow, and whether they will have water to drink. By 2100, the ocean is predicted to be up to 0.8m higher in the Pacific. Many coastal communities in the Solomon Islands will be affected.

Changes in ocean currents and wind patterns

The weather in the Solomon Islands is affected by changes in ocean currents and weather patterns. Normally, cool water rises along the coast of North and South America and warms up as it travels west across the Pacific. This causes a temperature difference that causes winds to blow in summer (trade winds). Sometimes more water moves (La Niña), causing harder winds, more rain and storms. Sometimes the opposite happens (El Niño) and there are less trade winds and it is cooler than normal. El Niño can increase the risk of drought to the Solomon islands, and cause erratic rain patterns. With climate change, El Niño is becoming more common and more intense. These trade winds and ocean patterns influence the bands of rain cloud that result in the monsoon (called the Southern Pacific Convergence Zone and Intertropical Convergence Zone). Weather in the Solomon Islands is also affected by Australia's weather, which is influenced by Indian Ocean and Antarctic Ocean weather patterns. It's a complex system. In addition to changes in weather patterns, these currents affect the fish populations beyond the reef, which affects fishing livelihoods.



Climate change impacts

Changes in weather patterns

The complex ocean current and wind patterns mean scientists are not very certain about some of their predictions for weather changes for the Solomon Islands. But they are confident that:

- the temperature will increase
- drought will be more frequent and more intense (because of more frequent El Niño)
- rainfall will be more variable in intensity, timing and duration (but not necessarily more rain overall)
- the frequency of severe storms (but not cyclones) will increase. (Cyclones may become stronger.)

The temperature is expected to change 0.4-1.0°c by 2030 and 3-4°c by 2100. This will cause heat stress in humans and in plants, and influence the ocean. Heat stress in plants can change the size of fruits and nuts, and affect yield.

Drought has impacts on soils and agriculture production. Long hot droughts affect the surface of the soil, and the ability to hold water in it. When rains do arrive, this can cause erosion. Drought also causes changes similar to temperature increase.

Variable rainfall is really annoying for farmers. If the monsoon arrives late, crops might need to be replanted. Heavy rains can cause some root crops to rot (e.g., rice), and damage some fruits and vegetables. They can also cause flash flooding, and lead to landslides.

Storms cause strong winds, high waves, and flooding from heavy rains. These can damage gardens, plantations, forests and infrastructure. They also cause harm to people, coral reefs and fish.

Scientists are less confident about other changes, such as increased cyclone frequency, but people should prepare for these because of the risk of damage they cause. The average impact of a cyclone in the Pacific islands is USD$75.7 million in 2004 value terms.

Changes in ocean acidification

As global warming causes the sea to become warmer, there will be negative effects on fish and corals. Coral reefs are important to coastal Solomon Islands communities. If the seas become too hot, corals will not survive. If the heat continues for too long, the corals can turn white and die (coral bleaching) This then reduces fish populations in coastal areas.

Impacts of flood

Impacts of drought

Predicting change

While we are certain that the climate is changing, we can't predict these changes accurately. Some predicted changes on agriculture include:

- reduced tuber size and yield of taro in Solomon islands
- increase in disease, e.g. coffee rust, taro blight
- decrease in yield of sweet potato
- changes in altitude suitability of plants, such as pandanus and coffee
- impacts on yield of 30-40% for one in every three years
- sea water intrusion causing soil salinity

SLM opportunities for adapting to climate change

Climate change affects the way we conduct agriculture. A significant way to adjust to climate change is to improve soil health. This can counter-balance the expected impacts of climate change on yield.

Healthy and fertile soil is the foundation for agricultural productivity. Soil organic matter, nutrients and structure all influence soil fertility. SLM includes soil management techniques that are part of 'climate-smart agriculture'.

They include the following:

1. **Enhancing soil organic matter** by returning plant and animal material to the soil to decompose: this includes returning unused green material to the land (branches from trees and plantation crops, unused vegetable stems and leaves, etc). Compost can increase soil organic matter, as can animal manure.

2. **Maintaining topsoil** means protecting the top layer where many nutrients exist and are transferred to lower levels of the soil. Covering the surface of the soil to prevent it from drying can reduce topsoil loss. We can use mulch and cover crops to protect topsoil, and other mechanisms to prevent soil washing away during heavy rain events and floods (e.g., contours, alley cropping).

3. **Avoiding soil compaction** means avoiding things that make soils feel hard. If we drive vehicles or small machinery on soil, the soil is squashed and it becomes more difficult for the roots of plants to grow and find the water and nutrients they need to survive.

4. **Improving nutrients** means we recognise that some crops use more nutrients than others. We can replace these nutrients by (i) letting soils rest (fallow), (ii) enhancing soil organic matter, (iii) planting species that are specialised at processing nutrients to a form that other plants can use, e.g. legumes, and (iv) mixing tree crops to provide a nutrient pump from lower levels to upper levels of soil so they are available for annual crops.

5. **Reducing tillage:** turning soil before planting (tilling) disturbs the structure, provides an opportunity for pest and disease to establish in soils, reduces organic matter decomposition, and increases the impact of rain on the soil (e.g., the risk of flooding and landslide, and loss of nutrients from soils).

Other opportunities for adaptation to climate change include:

- use of nitrogen efficient, short duration, drought resistant and/or saline resistant cultivars and crop varieties
- adoption of crop varieties that are more tolerant of heat and drought
- collection of livestock manure for combination with compost
- drip irrigation and increased agro-forestry for shade
- crop diversification
- adjustment of planting dates.

Climate-smart agriculture in Malaita

Climate-smart agriculture results in high yields through sustainable methods that build resilience to the impacts of changing climate. Farmers in rugged areas of Malaita in the Solomon Islands are using climate-smart techniques to cultivate sloping areas of the mountainside to grow food. Land shortages are common in this area.

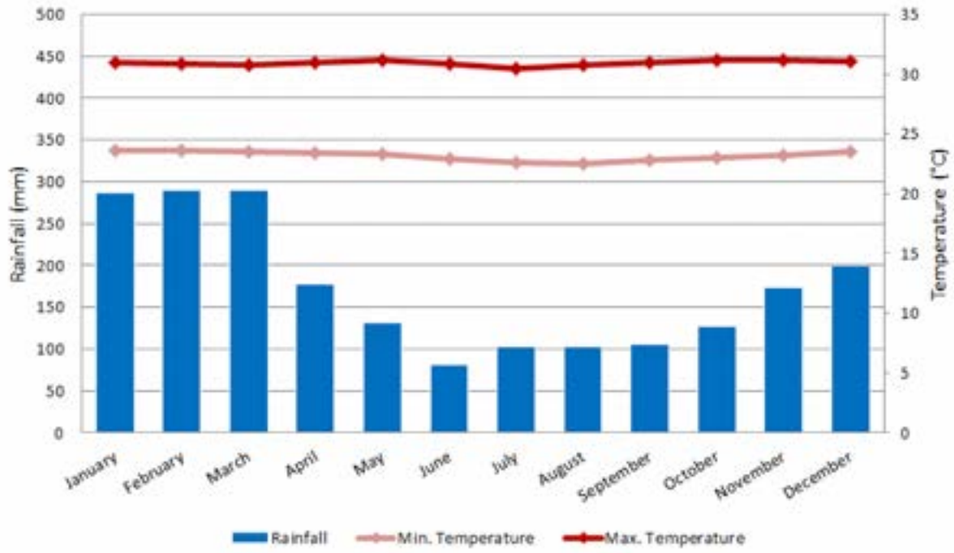
Contour farming and cover crops combined

Contour farming was adopted five years ago, to address the shortage of arable land. This is a practice that was used in the past and has been handed down through great grand-parents. The contours mean that the soil on the hillside is stable, and crops can be planted along the terraces. Vetiver grass stabilises the land. Pueraria is planted to cover the soil and provide nutrients to crops. It limits the erosion of the soil, and increases the soil fertility. This enables a diversity of crops to be planted.

Challenges: Building the contours requires hard labour.

Adapting cropping practices to climate change

The graph below gives a summary of the current temperatures and rainfall across the year in Honiara.



Source: Honiara urban resilience and climate action plan 2016: P13. UN-Habitat

Climate change predications for the Solomon Islands include:

- increased temperatures of up to 1degree Celsius by 2055, with more hotter days in December to April during the wet season
- increased annual rainfall of 4% by 2055, but with more variability
- increased rainfall expected with potential delayed and/or prolonged wet season.

These changes will have agricultural impacts that include:

- increases in soil drying, soil erosion and sedimentation
- more pest, disease and weed impacts
- potential delay of flowering and fruiting, affecting when to plant
- potential rotting of tuber crops due to increased rain.

Without adaptation, root crop yields could decline by up to 15% for sweet potato, and 28% for cassava.

It is difficult to develop a planting calendar for the Solomon Islands, given that planting times depend on elevation (e.g., coast or mountains), aspect (e.g., in the sun or in the shade) and whether a location is drier or wetter. A very general crop calendar for some common crops is provided in the table below.

	J	F	M	A	M	J	J	A	S	O	N	D
Banana *Musa sapientum*	P	P				H	H	H	H		P	P
Slippery cabbage *Abelmoschus manihot* 2 months Cassava *Manihot esculenta* 8-12 months Taro *Xanthosoma saggitifolium* 12 months	Year around											
Plant during cool season Capsicum *Capsicum grossum* 2-3 months Carrots *Daucus carota* 3-4 months Lettuce *Lactuca staiva* 2 months Long Bean *Vigna sesquipedalis* 2 months				P	P	P/H	P/H	P/H	P/H	H	H	
Planting during cool season but can be year-round Chinese Cabbage *Brassica chinensis* 2 months Cucumber *Cucumis sativus* 2 months Tomato *Lycopersicon esculentum* 2 months Watermelon *Cirtullus lanatus* 3 months				P	P	P/H	P/H	P/H	P/H	H	H	
Sweet Potato *Ipomoea batatas* 4-5 months				P	P	P	P/H	H	H	H	H	
Eggplant *Solanum melongena* 2+ months Pawpaw *Carica papaya* 8 months												
Maize *Zea mays. L.* 3-4 months												
Pana *Discorea alata*							P	P				
Taro *Colocasia esculenta* 10-12 months				H			P	P	P	P	P	P

Because it is hard to predict climate change impacts, it is difficult to know exactly how to prepare. Lead farmers and extension staff need to consider the following questions:

- **When is the rain forecast?** Find out about the predictions for each season from extension staff and the Bureau of Meteorology. Consider planting crops that need wet season rain a little later.
- **How can we manage if heavy rains are forecast?** Think about contour farming and cover crops, to avoid loss of topsoil during rain.
- **How can we manage if drought is forecast?** Consider cover crops and water storage options.
- **How can we manage hotter days?** Ensure you leave some shade trees in gardens and consider where you plant different crops (for example, beans capsicum, tomato, cabbage and tomatoes grow better away from full shade). Livestock will also appreciate the shade.
- **Are there new varieties of seed or root stock that are better suited to the conditions?** Seed and root stock that are better adapted to wet, disease and pests are likely to be give better yield. You can also consider collecting you own seed from individual plants that are stronger and more productive during drought, heat or heavy rain.
- **Can crops be diversified?** Consider mixed planting practices (e.g., intercropping) to avoid impacts of particular pests or diseases.

Examples of climate threats and responses in Solomon Islands

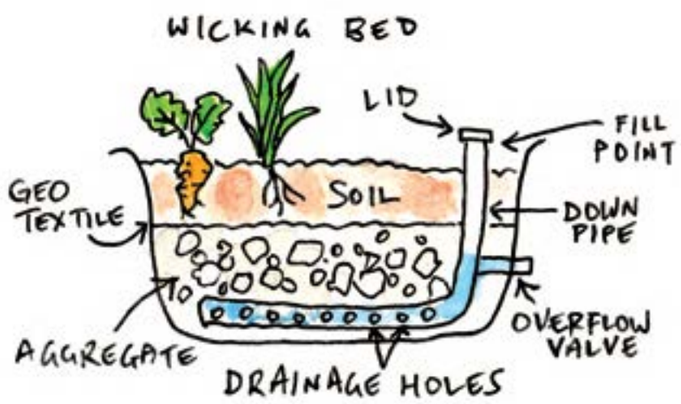
Threat and risk	Impacts	SLM related solutions
Increased temperatures and more frequent hot areas	Heat stress (humans)	Planting of food trees in village areas for shade and food security
	Heat stress and reduced productivity (plants)	Encourage planting of gardens in shaded areas (i.e., south facing locations) or with shade
		Encourage agroforestry
		Encourage planting of climate adapted varieties
	Heat stress (animals)	Planting trees for shade in areas used by animals
		Integrate animals as part of agroforestry
Increased total rainfall	Increased risk of landslide	Contour farming
	Loss of topsoil and erosion	Contour farming, cover crops
Increased humidity	Increased pest and disease spread	New varieties
		Seed saving
		Seedling checks for disease, soil management
	Biodiversity fungal disease, e.g., frogs	Forest retention
More frequent extreme rainfall events	Loss and damage to crops and livestock	Relocate community to less flood-prone areas
		Contour farming
		Livelihood diversification
Increased ocean acidification	Decline in coral reef quality and reduction in coastal fisheries	Livelihood diversification
Coastal inundation	Loss of area for agriculture	Sea walls
		Raised garden beds, home gardens
		Value chain development (using less area for more economic return, processing)
		Protect and regenerate forests
Storm water intrusion	Salty soils	Sea wall
		Raised garden beds
		Salt-tolerant varieties
	Salty ground water	Rainwater harvesting
		Relocation
More severe cyclones	Rotting tubers on plants	Develop stockpile of planting materials as a reserve
	Shortage of planting materials	Encourage growing and storing emergency foods (e.g., tubers)
	Damage to crops and livestock	Diversify livelihoods, agroforestry more likely to withstand cyclone impacts
	Damage / loss of infrastructure	Encourage local emergency markets to provide a buyer for produce
		Subsidise transport to markets to avoid the added cost of transporting produce to markets during disaster recovery

Water management

Although the predicted impacts of climate change are for more rain, more hotter days can also impact farming. Water management is particularly important in atolls where soil and water can be salty and limited in availability. Some potential solutions are outlined below.

Wicking beds

Wicking bed technology provides a reservoir under the soil so that plants can suck up water through their roots. (See illustration below.) You can refill the reservoir from the top through a spout. The reservoir provides a water store which enables crops to survive without rain for a week or even several weeks. A wicking bed is usually partly below ground, and partly above, within walls (e.g., made from wood). The area within the walls can be filled with compost if the soil is too salty for growing crops.



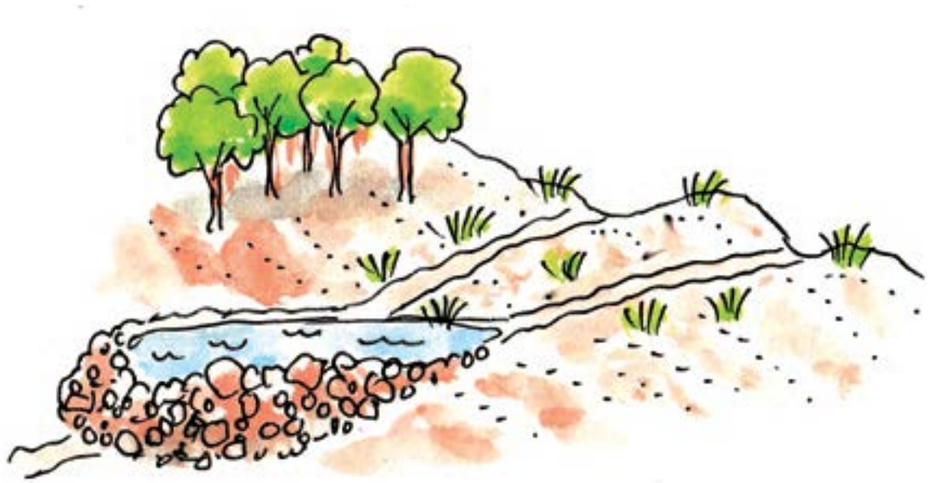
Wicking bed structure

Household water collection

Water collection by households is most commonly done through water tanks. Water tanks ensure more water is available through extended dry times. But this can be expensive for many households. The quality of water needed for gardens is lower than the quality needed for household drinking. Families with water tanks need to think about their own personal needs, as well as their garden needs, and what amount of water they should keep for each purpose. They also need to consider the equipment and time needed for transferring water from wells or tanks to the garden.

Contour dams

If contour farming is used on hilly areas, small dams can be made in parts of the landscape that naturally attract water. Channels can then be dug that move water across the contour. These will need to be planted to avoid the build-up of sediment in the channels. Channels will also need to be stabilised. Care needs to be taken to ensure dams are not big, otherwise there is a risk of landslides occurring.



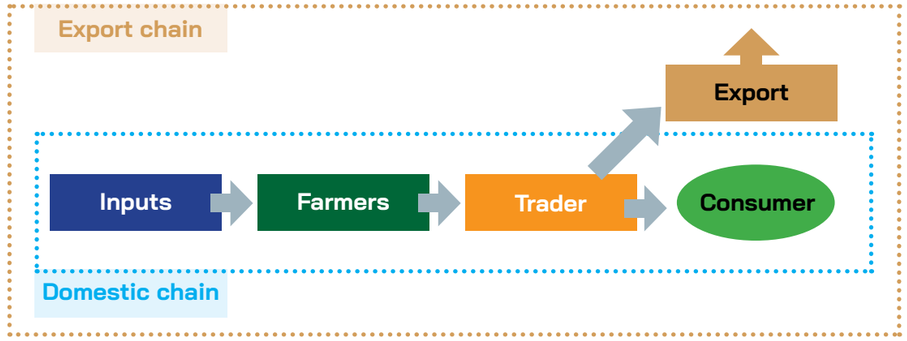
Contour dam using rock and soil

Drip irrigation

Drip irrigation involves the slow release of water through small holes in a pipe or tube to crops. This can be pumped, or fed by gravity (e.g., from a contour dam). Drip irrigation is likely to be expensive for smallholder farmers. Extension staff and farm machinery stores can provide the best advice on irrigation systems.

Supply and value chains and produce handling

Supporting farmers to think beyond production is an important part of leadership for sustainable land management and for dealing with pressures from a changing climate. A supply chain is simply the different processes that interact so we can provide products, services and information to a customer or consumer. We use the term 'product' because it could be a crop, fruit, nuts, juice, honey or handicraft. The image below shows a simple supply chain for a market.



Domestic chain

Food loss

When we think about supply chains, we often think about how much farmers earn for their efforts. Not all the food we produce reaches consumers or exporters. Some of it becomes 'food loss', which becomes a loss of income for farmers. Food loss can occur when we harvest produce, when we transport it, and when we have it at the market for sale. Examples include wilting of vegetables and damage from harvesting (e.g., broken sweet potato).

Studies on food loss in the Solomon Islands conducted in 2017 by the FAO and University of the Sunshine Coast found that at Honiara markets 7-9.5% of all food was lost, and up to 8% at roadside markets. For food transported from outer islands such as Malaita, food loss could be up to 16.7%. Food loss is higher for vegetables than for fruit.

What causes food loss and how can it be addressed?

Reducing food loss at harvest is important. The following issues were identified from research studies in Vanuatu, Tonga, Fiji, Samoa and Solomon Islands conducted by the University of the Sunshine Coast with funding from the Australian Centre for International Agriculture Research.

The way we harvest produce can influence what consumers are willing to pay for it. Careful harvesting can affect how long produce will remain in higher quality. Leaving produce in bags in the sun before loading it to trucks is a sure way to increase loss, as is storing produce on trucks and in containers with pesticide sprays. Vegetables are often wrapped to prevent wilting. However, if the vegetables are warm when wrapped, they will wilt more, not less.

Time in transport can often create wilting of vegetables and damage to fruit. Shorter transport time, or cool storage (e.g., in a lined polystyrene box) can reduce food loss. Keeping produce under shade can also reduce food loss in roadside markets.

The time it takes to store produce can affect the amount of food loss. For example, pineapples in Vanuatu that were stored for less than 4 days resulted in a 10% food loss, but if stored for more than 7 days the loss was 27% and more. Simple changes to practices, such as using packing crates and covering produce with tarpaulins, can reduce food loss.

In larger markets such as Honiara, there are more likely to be vendors selling the same thing. This can mean it takes longer to sell produce, which can increase food loss. Price discounting often occurs to reduce food loss.

Value-added production

Value-added production normally relates to increasing the market share a farmer can receive, usually by including some processing – for example, drying cocoa beans at the village before selling them to traders. When farmers take over another link in the supply chain, they can grow their income.

Farmers can also make additional income by working together. A value chain involves different people in the supply chain working together to improve the total value of their product**.** This means that everyone's slice of the pie can grow without affecting the other (see figure).

Value chain thinking (adapted from Collins et al. 2016)

Niche markets

Value chains work really well in niche markets. Niche markets are markets where there are fewer customers – for example, in producing kava or ginger. Niche markets allow smaller farmers to better compete because economies of scale aren't as important.

Organic agriculture is an example of a niche market. Certification can provider higher return to farmers because people are willing to pay more for organic produce. Certification requires:

- testing on metals and chemicals that remain in the soil – these need to be below certain levels to be considered organic
- limitations on the fertilisers, pesticide and other inputs
- distancing between organic production areas and non-organic production areas
- requirements for value-added processing.

Certification requirements for organic produce and value-adding depends on where a farmer wants to sell their produce. Within the Pacific, the Organic Pasifika trademark lets a consumer know that a buyer has met the standard developed by the Pacific Organic and Ethical Trade Community. This involves other farmers working together to determine whether practices meet the requirements. Other markets require record keeping and specialised inspectors to visit farms.

Extension staff should refer farmers to Kastom Gardens for more information about how they could have their produce and products certified.

TRAINING 4

Opportunity for Climate-smart Agriculture

Objective of Training

Improve familiarity with how SLM could address climate change

Activity

Understand patterns of climate hazards as relates to agriculture and discuss options for addressing them

Materials

Papers, pens

Procedure

1. Leaders develop a table with the template below (20 years should be sufficient).
2. Ask a group of farmers to discuss the impacts on agriculture and the flow on effects – an example has been provided.
3. Discuss options community members currently use for managing each type of event, and their effectiveness.
4. Discuss if there are any effective approaches that could be shared by local farmers with others in the community.
5. Discuss which SLM solutions or other practices could be applied to avoid the impacts of each type of event.
6. Discuss which SLM solutions or other practices could be applied to prevent the problem getting worse.
7. Discuss which SLM solutions could be applied to reduce the impacts of each type of event.
8. Decide within the group if there are solutions that you should try and how this could be done.

Year	Event / duration	Agriculture impacts and associated social, economic and ecological impacts that follow
2012	*Flood – lasted 2 weeks*	*Destroyed and rotten garden crops – had to buy food at high cost, and it was bad quality, soil was not healthy afterwards*
2020		
2019		
2018		
2017		
2016		
2015		
2014		
2013		
2012		
2011		
2010		
2009		
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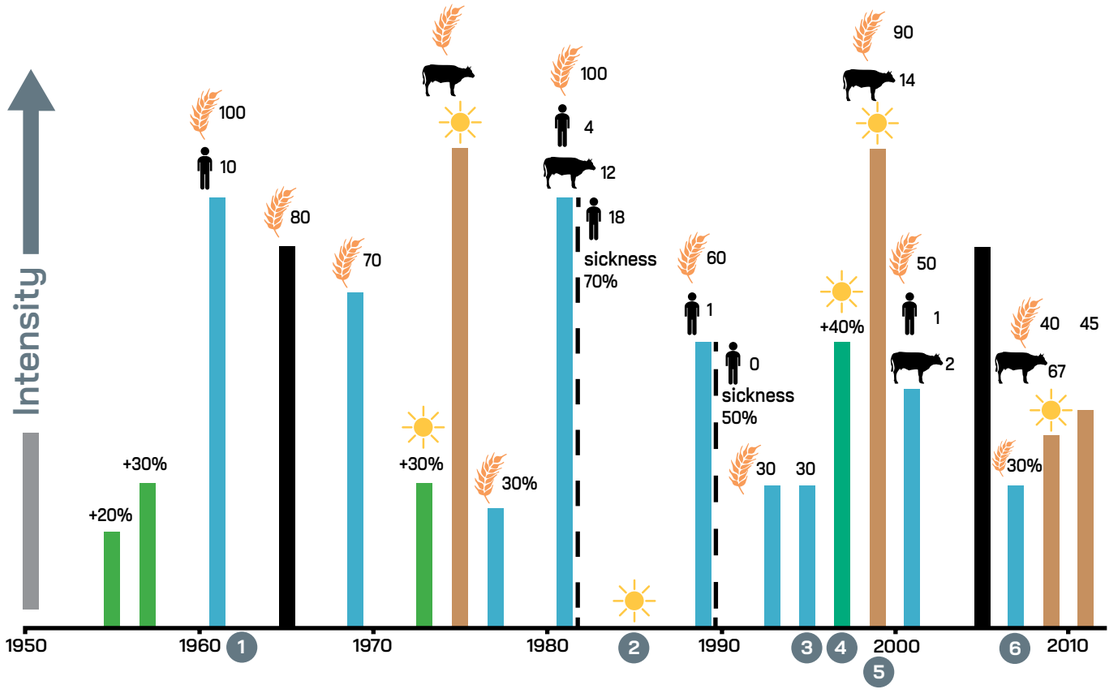
2000		

Example Timeline

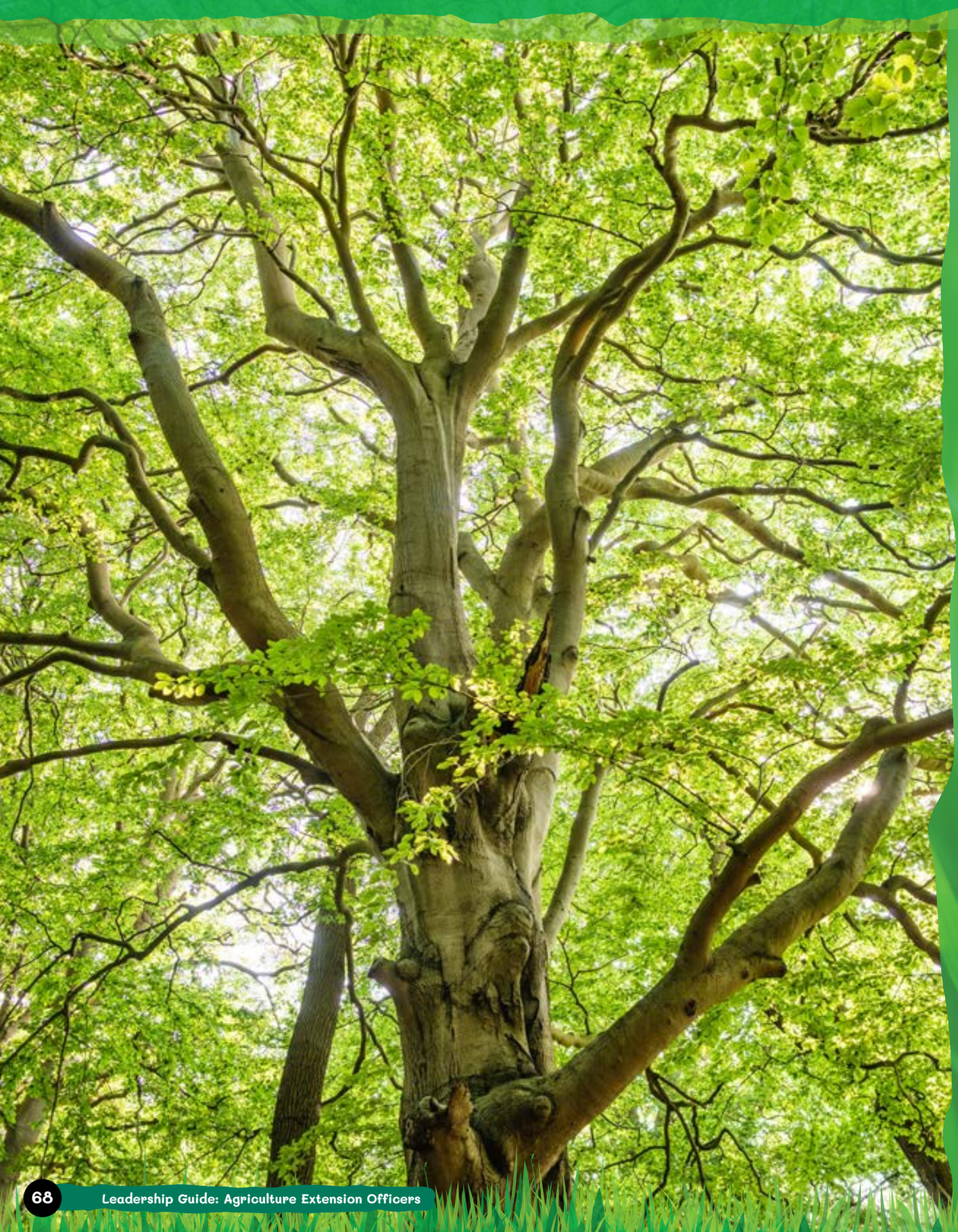


LABELLED EVENTS

1. Conflict (elections)
2. Clinic built
3. Farming project (training, nursery, replanting, crop trial)
4. Borehole redug
5. Tree planting
6. Piper water (to 40% of residences)

KEY

- Crop disease
- Drought
- Flood
- Above average harvest
- Human disease
- Very hot summer
- Crops lost (%)
- Lives lost
- Livestock lost



CHAPTER 5

Building momentum for SLM

Land degradation, loss of forests and climate change are not new problems for communities. However, they are accelerating and the impacts are growing. This means some agricultural practices just don't work - for example, when there is increasing population and pressure on resources, and land cannot be left to fallow for as long as it was in the past. Both new approaches and sharing of traditional practices are needed. We need to find ways to build momentum for sustainable land management.

While the scope of problems has been accelerating, government investment in agriculture information sharing (extension services) has remained stable or even declined. At the same time, the types of information farmers find useful has expanded. Information sharing also now involves an expectation that extension agents and leaders have knowledge about:

- environmental protection
- soil management and ways to address land degradation
- new diseases, pests and fungicide and how to manage them
- new crops and plantation trees, including varieties that are adapted to manage climate change and pests/diseases
- managing trials and experiments with new varieties and cultivars, including partnering in research projects
- growing emerging niche market crops (e.g. Kava, organics) and finding markets for them
- agricultural input use
- agricultural processing and markets for processed products (value chains for niche products)
- agricultural entrepreneurship and business management
- gender and youth issues in agriculture development
- climate change adaptation.

Extension is the process of reaching out to farmers or groups of farmers to help them grow and sell. It involves listening to them and bringing new science, practices and business skills to share with them. The good news is that government is not alone in this task. Many other groups are actively involved in providing extension services. This includes NGOs, farmer organisation groups, women's groups, church groups, development partners and even regional organisations like Secretariat of the Pacific Community, Pacific Island Farmer Organisation Network (PIFON), and the Pacific Organic and Ethical Trade Community (POETCom).

The SLM leader as a new extensionist

Changes are occurring in the role of extension providers. These providers are at the leading edge of agriculture innovation. While the tradition of extension has been for providers to be experts who share technical information, the size of the challenges (knowledge needs, pace of environmental change) means extension providers must have a range of technical knowledge and soft skills. We must also recognise an untapped resource for promoting improved agriculture: the experience, knowledge and wisdom of farmers themselves.

Many people refer to the change in role of extension providers as 'the new extensionist'. Given that SLM is only now gaining momentum in the Solomon Islands, SLM leaders should also recognise themselves as new extensionists.

The new extensionist role requires:

- a focus on the interactions among the wide range of people involved in agriculture to build momentum for new approaches and technologies to encourage innovation
- both technical knowledge and soft skills to build and strengthen networks between those with knowledge and those with passion to improve their crop, plantation, forestry and livestock systems
- engaging people from public, private, and civil society sectors who support rural communities in extension.

The 'new extensionist' implies changes in extension organisations such as government extension services, plus reskilling all types of individuals for increased productivity of agricultural systems and improved livelihoods of smallholder farmers.

The role of government in extension

International recognition of the changes in roles of extension providers is accompanied by advice about strengthening the policies and institutions that support organisations involved in extension.

This includes:

- analysis of existing approaches to extension provision, those people providing extension, and the capacities of different providers
- creating 'innovation platforms' to connect extension providers with other parts of supply and marketing chains (e.g., input suppliers, transport, product buyers, marketers, and researchers)
- encouraging collaboration and partnerships between farmers, farmer groups and supply chains
- support of national networks of extension providers to share information (e.g. the Pacific Islands Regional Advisory Services network - PIRAS)
- providing technical 'backstopping' to extension providers by linking them with researchers
- promoting evidence-based practice, to support extension providers to refine their advice
- establishing training centres for addressing capacity gaps identified by extension providers (technical knowledge and soft skills)
- developing curriculum for training extension providers and farmers
- developing regional and national policy to support extension provision.

The Pacific Islands Extension Strategy (2017-2027) provides a regional strategy for building capacity in extension. Multiple Pacific Island countries and territories have since incorporated and adapted strategies as part of their own extension development. But we need to remember that government is not alone in providing extension.

Many SLM leaders will be part of more than one group. They might be an innovative farmer who is applying SLM practices and techniques, who is also involved in farmer organisations, national networks and groups, and NGOs. It's a good idea for emerging SLM leaders to get to know these people and work with them to build on a vision.

Potential roles of different actors in SLM extension

Group	Role
Innovative and lead farmers	• Become champions of SLM and SLM leaders within communities, sharing knowledge, skills and practices with others through demonstration sites, farm trials and engagement in local training
Farmer organisations	• Identify and communicate farmer needs and support best practice in SLM through lesson sharing • Build an evidence base about which SLM techniques and practices work and don't work in different communities, and provide feedback to extension providers and research organisations
Extension providers	• Contribute to networking with other providers to share knowledge, skills, experiences and challenges • Listen to communities' experience and build awareness of Indigenous knowledge and practices that address SLM issues
NGOS, and development partners (e.g., ACIAR, FAO, IFAD, Kastom Gardens)	• Ensure the needs of all, including women and the most vulnerable, are incorporated in SLM • Provide scientific and technical knowledge of mutual interest and benefit
Education providers (e.g., USP, SINU)	• Provide vocational training that increases SLM technical knowledge and extension soft skills, and amplifies the passion for SLM in communities • Develop information materials for SLM extension
Private sector enterprises	• Work with extension providers to provide skills and mentoring that helps farmers bridge the gap between subsistence agriculture and market-based livelihoods
National networks and groups	• Drive networking, learning, communication and coordination
Research organisations (e.g. University, private and government research providers)	• Address SLM questions and challenges identified by farmers, avoiding duplication of efforts • Engage extension providers to share new information and ensure best practice and technological developments are shared across provinces and islands • Develop information materials for SLM extension
National government	• Policy for agriculture development and the promotion of SLM • National extension strategy that includes a focus on SLM • Connect and co-ordinate SLM extension providers • Strengthen the capacity of extension providers in SLM and extension soft skills that enhance the uptake of SLM
Regional organisations and intergovernmental bodies, e.g. SPC, PIFON	• Mobilise resources to support regional initiatives that enhance SLM

Working in partnership with other SLM leaders

To successfully build momentum for SLM, we need to engage a large range of different groups. These groups might compete for funding, or do similar work in another location. Working in partnership means recognising the different skills, knowledge and strengths and focus each group has in SLM. To respond to the challenges SLM addresses, we need to work together.

One way to work together is to consider a formal partnership. This could include partnerships between government and non-government extension providers, and groups of non-government extension providers. These are sometimes called 'public-private-partnerships' (PPPs). The main role of non-government providers is to provide additional or specialised extension that builds on the relationship with communities and supply chains, research providers, and their technical knowledge. It is important to consider the incentives they have for providing extension if we want their efforts to be sustained. Global experience indicates a range of ways to support the non-government sector in partnerships. SLM leaders could consider making a case for working in partnership.

Examples are included in the table.

	Description	Service Provider	Clients
Free services	Free services	Donor, government	Farmers, small enterprises, other service providers
	Paid by companies, delivered to farmers	Companies	Farmers, small enterprises
	Voucher	Donor, government	Farmers, cooperatives
Subsidised services	Part-payment by farmers	Government, donor, fees, in-kind contributions	Farmers (group)
	Subsidised cooperative services for members	Government, donor, membership fees	Cooperative members
Fully paid services	Embedded services	Client (part of price paid for something)	Farmers

Services and providers

TRAINING 5

Networks and partnerships for SLM

Objective of Training

Improve familiarity with networks within a community

Activity

Network matrix

Materials

Papers, pens

Procedure

1. Ask each participant to spend a couple minutes thinking about the different networks they have been part of and development programs they have been linked to over the past 10 years.

   Facilitators might need to prompt participants.
   - Community groups
   - Farmer organisations and innovative farmers
   - INGOs, e.g. FAO
   - Development projects, e.g. PHARMA+
   - NGOs, e.g. Kastom Gadens
   - Universities
   - Government groups

2. Participants share their list, and each new network gets a row on the chart.

3. Ask the group if they know of other networks in the community that have been missed.

4. Using one colour pen, ask each participant who they work with in the community (e.g. women, men, youth, individuals) – compile the list as columns. Place a tick for each group.

5. Ask the group to circle interactions that relate to SLM – remember that agriculture involves forestry, plantations, crops, livestock, crops, fish and food security. (This is also a good opportunity to review what SLM is.)

6. Review the matrix:

   a. Have the people who work with agriculture changed over time? What are the implications?
   b. Which of these networks support or could support SLM?
   c. Is there a reason why some projects only work with some people in the community? What are the implications for SLM? (e.g., we need someone who works with that network to be involved.)
   d. Are there any key networks missing? What are the implications for SLM? How can we develop linkages with that kind of network?

7. Summarise the activity findings and develop action steps.

NETWORKS	Community members						
	Chiefs	Older men	Men	Women	Youth	Specific individuals	Kids
Community protected area	✓						
Women's business group				✓			
Chief's council	✓	✓					
Kastom gadens			✓	✓			
DFAT – Pharma+							
FAO	✓						
POETCom						✓	
University bee project						✓	
School feeding program							✓
Commercial logging	✓						

CHAPTER 6

Sharing knowledge for SLM

How do adults learn? (trust, active engagement)

For SLM leaders to be successful in achieving their vision, they need to share information and facilitate learning. We therefore need some understanding about how adults learn. Adults learn a little differently to children.

Six adult learning principles:

1. Adults learn by doing, through direct experience – training needs to be active and practical.
2. Adults learn best when the relevance of information is clear – they need to understand how new information relates to them in their context.
3. Adults use their life experience when they learn – they compare new information against what they already know and have experienced, especially what has worked or not worked to address any issues they face.
4. Adults learn through practice – they need to practice new techniques and skills while being mentored.
5. Adults enjoy learning with others – learning in a group setting provides an opportunity to discuss how new information relates to their context, from others who have similar life experience to their own.
6. Adults are self-directed and self-motivated learners – they focus on learning about problems, focused on the immediate application of new information, and will often have their own ideas about what they want and need to learn, and their own reasons for learning.

How adults learn differently from children:

- Adults need to be involved in the planning and evaluation of their instruction
- Experience (including mistakes) provides the basis for the learning activities
- Adults are most interested in learning subjects that have immediate relevance and impact to their job or personal life
- Adult learning is problem-centered rather than content-centered

Different components of the learning process that are important for facilitating adult learning:

The individual

- A farmer's knowledge, skills and interests can affect preferences for how information is presented (e.g. a written manual is not much good for someone who struggles to read; face-to-face training can be a challenge for mothers of small children).
- A farmer's openness to risk will influence whether they apply new information – for example, what is the likelihood they will seek alternative approaches if existing ones do not lead to good outcomes? Some people might simply give up if they find the problem too challenging.

Their context

- A farmer's perception of problems will influence whether they seek new information.
- A farmer's confidence in information will affect whether they are likely to consider it.
- A farmer's family and farming situation will pose constraints, e.g. labour availability, food needs, cash income.

The exchange

- Trust in an information provider can influence whether farmers want to learn from that person – adults want to learn from someone they can relate to, who listens to and respects them.
- Communicating in a way that helps farmers to see how ideas relate to their context is more likely to result in learning.
- Engaging farmers in exploring new information for themselves (e.g. in a farm trial or through visits to a demonstration farm) can enhance learning outcomes.

Two-way information exchanges

When we think of learning, we often think of a teacher and a student(s). There is a power dynamic in this situation. The teacher is seen as powerful (they can pass or fail a student), knowledgeable (they know what is fact and not), and skilled at understanding the best way to learn (e.g., memorising definitions of key terms is critical to being able to apply them). Can you see any problems with this?

The power dynamic in this situation assumes that the 'teacher' has nothing to learn from the 'student', and the 'student' has no insights to offer the 'teacher'. In adult learning, we recognise that this is often not the case. We need to create opportunities to learn from each other, and to learn together.

Power dynamics

SLM leaders need to recognise that communities have techniques and approaches for addressing land and forest degradation challenges. Many are already applying some of these techniques as part of indigenous knowledge. This provides an opportunity for leaders and extension providers to learn from community experience, and to share these ideas with other communities. They could also ask these innovative lead farmers to conduct demonstrations or provide field days at their farm – this shows the community that leaders recognise the importance of indigenous knowledge.

There will be cases where communities have not experienced the types of challenges they are now experiencing (e.g. land degradation under climate change). SLM leaders and extension providers can help them to think about how they could adopt practices within the SLM toolbox. In other cases, SLM leaders might lack knowledge but could learn from communities and extend the toolbox and shared understanding about how practices ought to be applied in the Solomon Islands.

It is not surprising that there will be times when neither SLM leaders nor communities will have experience about how to address a problem. This provides an opportunity to learn together. Approaches such as farm trials and experiments and field days are a good way for SLM leaders to promote two-way information exchanges.

Opportunities for SI provincial extension officers and communities to learn from one another

Our research with Solomon Islands communities identified key SLM practice gaps, and extension officer knowledge gaps. The table below identifies learning opportunities we identified from the analysis.

Indigenous knowledge and SLM

Indigenous knowledge systems refer to the understanding, skill and philosophies developed by societies with long histories of interaction with their natural surroundings.

This includes the following:

1. Know-how (have understanding about pruning a cocoa tree), practices of farming systems e.g. (heavy mulching of sweet potatoes), skills (pruning a cocoa tree) and innovations (innovations are new farming practices which will support food production)
2. Principles for managing different resources (organised use of model farms, organised learning through hired labour, organised learning through shared gardening, verbal sharing at home, private conversations, Individual farm visits, conversations at the market, sharing during betel nut (Areca catechu) chewing, church working bees, village meetings and social events)
3. Principles for how decisions about resource management are made
4. Ways of interpreting and making sense of change
5. Ways of sharing knowledge e.g., between only one gender (women's knowledge) or through specialist storytellers or experts (e.g. orator chiefs in Samoa, Tohunga in New Zealand)

Solomon Island farmers have significant indigenous knowledge about SLM techniques and practices. Live and Learn's farm technology manual for climate adaptation incorporates many examples identified from working with communities across Melanesia.

Some examples are below:

- Brush and hoe method as an alternative to the shifting cultivation land management system
- Planting Gliricidia for improving soil quality in fallows
- The use of seaweed as fertiliser
- Home-made pesticides
- Emergency gardens
- Hohoti gardening (gardening in forest gaps)
- Heavy mulching
- Growing watercress on fishing nets

It is important to recognise that indigenous knowledge is not static but continually evolving as people continue to learn. Many younger people move to cities in search of cash work rather than wanting to farm the land. This risks a loss of this knowledge despite the fact that it is often still relevant. It's important to engage young people in learning indigenous practices. Sometimes, communities will express concern that their knowledge is not sufficient for new problems such as changes in weather patterns. However, they might still have valuable ideas for solutions that can be used to mitigate these problems.

Respect for indigenous knowledge is a key starting point for extension providers. Ideas about allowable and taboo practices might sometimes be expressed as cultural or spiritual taboos/ramifications. This can sometimes seem unscientific, but there are often good reasons for them. A second aspect of respect is recognising that indigenous knowledge has developed over years of trial and error and is an asset. A common complaint from indigenous people is that they are asked to share knowledge without recognition that it is their knowledge. The separation of knowledge from systems of sharing and interpreting it can also lead to circumstances in which indigenous peoples feel their knowledge is shared and applied inappropriately, e.g. when women's knowledge is shared with men.

A good way to address these challenges is to ask communities what they think is appropriate, and encourage them as authors when developing extension information materials. Most importantly, reciprocity is needed about indigenous peoples' visions and needs associated with their knowledge. For example, providing novel opportunities for youth to engage in learning from elders when running extension activities can address concerns about loss of indigenous knowledge.

TRAINING 6

Identifying opportunities for learning

Objective of training

Improve familiarity with knowledge gaps in communities

Activity

Understand knowledge and practice strengths and opportunities for improvement

Materials

Paper (draw lines dividing the paper into four quarters), pens

Procedure

1. Invite participants (extension providers and community members), be sure to include both men and women.
2. Explain the benefits of understanding knowledge and generating opportunities for sharing and comparing practices, for learning from one another and for learning together.
3. Ask the community to discuss what practices they use to address land degradation and forest loss (extension provider facilitates discussion).
4. Allocate common practices to the upper left quadrant, and knowledge gaps to the bottom left.
5. Ask extension providers to discuss what practices they promote to address land degradation and forest loss (a community member facilitates).
6. Allocate common practices to the upper right quadrant, and knowledge gaps to the bottom left.
7. Look across the first row – these are opportunities for sharing and comparing knowledge. Discuss the best ways to achieve this.
8. Look across the bottom row – these are opportunities for learning together. Discuss the best ways to achieve this.
9. Look at the diagonals – top left to bottom right are opportunities for extension providers to learn from communities. Discuss the best ways to achieve this.
10. Look at the diagonals – top right to bottom left are opportunities for communities to learn from extension providers. Discuss the best ways to achieve this.
11. Summarise the activity findings and develop action steps.

CHAPTER 7

Gender sensitive SLM

Why is gender important in agriculture?

A gender gap exists in agriculture. In the rural Solomon Islands:

- Women have less regular paid work, and therefore higher responsibilities for subsistence agriculture (63% of all women, compared to 48% of men).
- Women's domestic responsibilities, their roles in raising children and caring for the sick add pressure to their time.
- The wantok system relies on subsistence agriculture, adding to women's work burden.
- Women's engagement in cash cropping further stretches their workload, and might mean there is insufficient time for subsistence agriculture.
- Women contribute to the cash economy, but have no control over cash from it.
- Fewer girls are enrolled in school, contributing to lower levels of literacy and ability to learn from written agriculture information products.
- Fewer women have access to agriculture extension providers, and there are fewer women involved in providing extension services.
- Women have lower financial literacy and access to loans to start microenterprise activities or improve farming practices.
- Women have different roles in agriculture, and therefore different information needs to men.
- Land and forest degradation and climate change impact women's and men's roles differently.
- Although men are more likely to experience food insecurity than women, there is little difference in the poorest households, and older women are more likely than older men to experience food insecurity.

Gender sensitive approaches mean that the needs, priorities and realities of men and women are recognised and adequately addressed in the design and application so that both men and women can benefit. While we often talk about equal opportunity for men and women (equality), gender responsive techniques focus on equal ability for everyone to access opportunity.

Equality and Equity

Gender and impacts of land and forest degradation and climate change

Some challenges associated with land and forest degradation and climate change affect women and men in the Solomon Islands differently.

- When the climate is drier, women have to spend more of their time managing crops. This is an important consideration with predictions of a drier climate.
- Women have knowledge of foods to use in a disaster, especially when crops have been destroyed. This knowledge needs to be preserved and shared. These resources also need to be protected.
- A loss of forests results in a loss of resources for handicraft, and women are responsible for 80% of handicraft production.
- In some parts of the Solomon Islands, the knowledge about preparing traditional foods is being lost. Sales of traditional foods and handicrafts can be a quarter of all income in rural areas.
- When forests are cleared and water becomes polluted, women have to walk further to collect firewood, forest resources (e.g. traditional medicines) and water, increasing their workload.

Gender role division in SLM techniques

Some agricultural roles in the Solomon Islands are conducted by men, and some are conducted by women. Other roles can be shared.

Common wisdom is that men are usually responsible for:

- clearing land
- timber trees and production
- off-shore fishing

Common wisdom is that women are usually responsible for:

- planting land
- processing produce
- selling produce at markets
- inshore fishing (e.g., lagoons, mangroves)

Our research found that the division of agricultural roles varies from province to province. In matrilineal communities, more of the roles are shared between men and women. In Kolombangara, there is no apparent separation of roles based on gender – even selling produce was a mixed role. The chart below indicates some differences in roles.

Men's role	Women's role	Mixed role

	Choiseul	Guadalcanal	Makira	Malaita	Western (Kolombangara)
Selling produce					
Farmer organisations					
Collecting forest resources					
Aquatic agriculture					
Caring for livestock					
Caring for trees / plantations					
Applying agriculture inputs					
Clearing land					
Preparing land for planting					
Planting land					

Gendered roles in agriculture

How is this relevant?

This is important because SLM leaders need to consider who might need what type of information to improve land management. It is also important to remember that while a role is often undertaken by men, some women might be involved, and the reverse as well.

SLM extension needs to be tailored to gender roles in the communities that leaders are working in. Once leaders understand local gender roles, they can decide if extension activities are focused on men, women, or both genders.

Gender and agriculture problems in the Solomon Islands

Women and men have different perceptions of problems they face in agriculture. This is not surprising given the different roles of men and women, and differences in their education, access to extension and resources for agriculture. In our research, men thought agricultural issues were less of a problem than women did. They also thought their ability to manage them was better.

Why is this important?

These differences are important, given that problem solving is a key motivation for adult learning. Men might be less motivated to attend training or try new techniques and practices if they don't see the need to.

So how do we tackle this?

There are a few ways SLM leaders can help address differences between men and women and how they perceive agriculture problems.

1. When discussing agriculture (e.g. Training 1), focus on 'issues' rather than 'problems'. Ask both men and women to explain why something is an issue for them. This builds greater awareness of gender and differences in perceptions about issues.
2. When discussing solutions to issues, keep the focus on what impacts of them need to be managed for the solution to be considered a success.
3. When discussing weather events (e.g. Training 4), be aware that it impacts on men and women differently. Ask both men and women to explain the impacts of events on them.
4. Building networks is an important way of learning about effective solutions to problems (Training 5). Men and women will have different networks because of their roles. It's a good idea to discuss how useful these networks are in helping resolve issues.
5. Differences in men's and women's roles mean that men are more likely to have a better appreciation of some issues, and women about others. It is important that a discussion of roles is part of a discussion about issues, so we can understand whose voice we need to hear more of when discussing opportunities for learning (Training 6).

Gender and learning

Part of our research focussed on the sources of information farmers liked, and the ways they liked to learn. For both men and women, extension providers should consider:

- increasing access to innovative farmers, farmer groups, and government extension providers
- increasing use of demonstration farms, farmer trials in shared gardens, farmer field schools and formal education.

While men and women both have good quality interactions with family and friends, women also valued interactions with farmer groups, innovative farmers and NGOs – these are sometimes more important sources of information than friends. Another difference is that women didn't find one-on-one interactions as useful as men did, preferring more active learning.

Why is this important?

These differences are really important for SLM leaders and extension providers to understand. Women's lower literacy means they need to be engaged in learning differently.

So how do we tackle this?

1. For agriculture roles that are typically the role of women, try to use farmer groups, and build networks between women, innovative farmers and NGOs that they can learn from. Also try to use approaches that engage them in learning from experience, e.g. farm trials, farmer field schools, and demonstration farms. Avoid approaches that emphasise their interactions with friends and at the markets – they are already excellent at using these sorts of learning opportunities.
2. For men, focussing on opportunities for one-on-one learning is a great approach, along with trials, demonstration farms, and farmer field schools where they can learn from local friends.
3. When designing extension where roles are mixed, try to ensure both men and women are engaged so they can build understanding of how issues affect each gender. The approaches at the start of this section are very relevant.

What could gender sensitive SLM look like?

SLM leaders clearly need to understand how gender affects agriculture. But what does gender sensitive agriculture look like?

Remember: the aim of gender sensitive agriculture is to pay attention to the different needs, priorities and realities of men and women, so they both have opportunity to benefit from SLM.

Here are some tips for gender sensitive SLM.

- **Build an understanding of gender differences in agriculture.**

Roles, knowledge, experiences and ways of learning differ between men and women, and from community to community. SLM leaders need to build awareness of these differences in each of the communities they work in.

- **We need both men and women to be SLM leaders.**

It is important that both men and women take on leadership roles to avoid SLM being seen as a men's issue, or a women's issue. Both the issues and their solutions belong to men and women.

- **Recognise that men and women experience different impacts from forest and land degradation and climate change.**

The better we can understand the impacts, the more likely it is that we can develop approaches to limit negative change and improve food security and livelihoods.

- **Consider how SLM tool box solutions might impact women's workloads.**

Women have many roles in rural communities. We need to be aware that some of our solutions could burden them further. We need to be really mindful of this when we introduce new livelihood opportunities – if women don't have enough time, they might focus on new cash crop rather than subsistence agriculture, and they could experience food insecurity as a result.

- **Recognise the importance of men's roles in managing soils to adapt to climate change.**

Men play a key role in adapting to climate change, because they are usually the ones who clear land for planting. Their understanding about soil quality is critical for reducing slash-and-burn practices that damage soil health.

- **Ensure that both men and women have access to networks for SLM.**

Information sharing across networks is critical for building momentum for SLM, but women often lack access to innovative farmers and extension providers. SLM leaders should promote women's opportunity to be involved in networking positions, and advocate for extension services for women in rural communities.

- **Consider both men's and women's knowledge when designing mutual learning opportunities.**

Opportunities exist for creating mutual learning opportunities between extension providers and communities. They also exist between men and women. It is important to recognise that both add to the basket of knowledge we have for addressing forest and land degradation.

TRAINING 7

Gender roles and perceptions

Objective of training

Improve familiarity with gender roles

Activity

Gender and soil management

Materials

Paper, pens

Procedure

1. Invite participants - be sure to include both men and women (3-4 of each) – this could be done in conjunction with a shared garden group, farmer group or something similar.
2. Explain the benefits of understanding gender roles (i.e., for developing SLM options).
3. Ask the group to list all of the roles involved in agriculture (consider fisheries, livestock, crops, plantation, collecting and using forest resources). One woman and one man need to keep a record of the key roles.
4. Ask the group to separate – one group of men, and one group women. Each group should discuss the roles and decide if they are mostly a responsibility of men, mostly a responsibility of women, or mixed.
5. Bring the group together. Ask them to compare their responses. Are there differences? Why?
6. Introduce an example of soil management, explaining its importance for SLM (see Chapter 4).
7. Ask the group to separate again. Men's and women's groups should discuss (i) how their agriculture roles affect soils, (ii) the practices that each use to improve soil management, (iii) the biggest challenges they face.
8. Bring the group together. Ask men and women to compare responses.
9. Summarise the activity findings and develop action steps.

CHAPTER 8

Sustaining practice

Sustaining practice

For SLM to be effective, practices need to be continued after a training or development program ends or resources for experimental and demonstration projects are spent.

Our team's experiences indicate that some farmers will jump on to any projects that come to a community and take advantage of any available resources, but will stop implementing practices when the projects end. In these cases, projects sometimes help them re-organise household resources; resources they might have spent on agriculture are freed up for other needs.

Other farmers will seek opportunities, but for whatever reason, they are unable to implement new practices with any success. Sometimes these farmers simply lack the resources (time and money) to invest in practices that they might otherwise have implemented successfully.

SLM leaders need to aim for lasting and meaningful changes in land management, agriculture practices and livelihood diversification. Changes can take time, and it can take a few attempts to sow new seed before it generates. It's important that leaders don't become despondent.

Introducing new livelihoods

Introducing new livelihoods to communities, especially cash livelihoods involves:

- learning how to growing produce (including sourcing seed or propagation materials, knowing when and how to plant)
- knowing how to care for resources (crop and plantation inputs and or care of livestock)
- learning when and how to harvest or collect resources
- understanding what opportunities exist for value added processing and finding resources for it (e.g. ngali nut crackers, copra dryers, storage area)
- learning about markets for produce and how to find buyers
- knowing what sort of return to expect
- organising transport to markets
- understanding how to minimise post-harvest losses.

SLM leaders need to be knowledgeable about new opportunities and well networked so they can direct communities to information sources.

One-off training is unlikely to be successful when introducing new livelihoods. New livelihood ventures are also unlikely to be successful if returns on time and cash invested are high compared to alternative uses of these resources. Sustaining practice can also be a challenge for new livelihoods when farmers are not as efficient in producing them to begin with.

For new livelihoods, it is really beneficial to have innovative/lead farmers that others can learn from. It's not enough just to have these farmers in a community; they also need to be willing to share their experiences.

Offering incentives (e.g. materials) to these farmers compensates them for their time spent mentoring, but it can also create jealousy in a community. If new materials are needed, co-investment can often generate more commitment to new livelihoods.

However, co-investment also needs to be carefully considered, because it means that the opportunity will be inaccessible to the poorest. This can generate negative perceptions of extension providers. Promoting a range of SLM opportunities is therefore important.

Active learning

Adults learn through new experience. They think about how new ideas, techniques, technologies and practices fit with their own experience and understanding, and within their own mental image of their farming system and the time, materials and resources they have to invest in it. Being told something will work is not the same thing as experiencing it.

Adult learning typically moves through steps of taking an action, observing and reflecting on it, thinking about what it means, and making adjustments. This is called 'experiential learning' or 'action learning'. For example, farmers might plant a new crop variety, observe how well it grows and its yield, think about whether it was similar or different to the previous variety and why, and then make a decision to continue to use the new variety, adjust the way they grow it, or return to using the old variety.

Action learning

Experiential learning can generate lasting and meaningful change because farmers own the outcomes of their learning. Below are some tips for SLM leaders and extension providers for facilitating experiential learning.

- **Support farmers to experiment on their own.** This approach engages farmers' interests and vision for learning. The focus of the SLM leader/extension provider is not about a specific technique/technology/practice, but on farmers' vision, helping them to reflect on why they think a particular technique or practice will work, how they will know if they have been successful, and what they could try next. Specific technical information can then be provided when requested.

- **Provide opportunities for practical observations and demonstrations.** This could include visits with innovative farmers, demonstration farms, farmer trials, etc. These provide opportunities for farmers to consider how practices are similar or different to what they are currently doing.

- **Explain how new techniques are different to existing practices.** Focussing on difference rather than whether something is better or worse helps farmers to consider the resources they would need to spend (materials, time, money etc.) to implement a technique or practice. A particular technique or practice might not be feasible, or it might be too risky, but you might sow the idea to experiment with existing practices.

- **Support farmers to adapt techniques, technologies and practices.** Including plenty of practical tips enables farmers to adapt new techniques, technologies and practices to the resources they have. For example, provide advice on how to propagate different types of plants for alley crops, cover crops, contour plants, and agroforestry species and examples of the size of cultivated plants at cultivation, and when ready for planting, and options on species types and why they are appropriate.

- **Visit farmers to check on their learning.** Mentoring provides an opportunity for farmers to check on techniques or practices, and address any subsequent issues that might have arisen as a result of adjusted or adapted practices.

Working with groups, norms and beliefs

We recognise that it is not always possible for extension providers, NGOs or others to visit communities as often as farmers might like. One way to address this is to create opportunities for groups to learn together. This way, they can seek solutions to any issues that arise from one another, pool their networks and knowledge and build on the strengths that each has to offer.

Creating effective groups takes time. Teams need:

- clear goals that team members share, believe are important and are realistic to accomplish
- willing members with a range of skills, networks and knowledge to help achieve their goals
- short-term goals so that teams can celebrate success as they move towards their goals
- trust and a sense of belonging – so individuals feel a culture exists where they can ask questions, share knowledge and tips.

For SLM, groups could include farmer learning networks / groups for establishing new livelihoods (preferably including lead or innovative farmers), soil management groups, reforestation groups, women's marketing groups or agroforestry groups. They could also include 'innovation platforms', where farmers are linked to other producer groups, input suppliers, traders and commercial buyers, scientists and extension providers.

As groups develop, networks between members will tighten, they will establish shared vision and goals, and build trust. As the group matures, they become self-reliant but engagement might drop and need support. Eventually, teams can disband because their purpose is no longer relevant to members, or because group dynamics become challenging.

Stages of a Team

Forming:

Unclear or messy purpose with broad membership of committed and uncommitted but eager members. SLM leaders and extension providers' focus is on sharing interests and identifying a common vision.

Storming:

Sense of purpose is clarified, and membership is refined, but frustration can build because of interpersonal agendas and disagreement and because of a lack of progress. Power struggles can develop. SLM leaders and extension providers should focus on helping members to identify small achievable tasks and successes and encourage local leaders to take more active roles.

Norming:

Agreement, consensus and vision emerge, roles and responsibilities are clarified, and rules about membership and group processes emerge. SLM leaders and extension providers can provide checks on the implications of excluding ideas and members. They can also help members to identify and find networks, knowledge, materials and other resources they need to achieve their vision.

Performing:

Group is self-dependent and has a clear vision and purpose, a focus on goals, and delegates roles and responsibilities. SLM leaders and extension providers can provide encouragement without active involvement, share opportunities, and build linkages with other teams. They can also facilitate experiential group learning on what they think a particular activity will achieve and why and how they will know if they have been successful.

Adjourning and reforming:

Accomplishment of tasks, recognition of achievements and subsequent formation of groups for associated interests. SLM leaders and extension providers can help teams to recognise that change is normal, provide acknowledgement of success, and promote reformation based on emerging interests.

(Based on the Bruce Tuckman model of team dynamics)

Digital opportunities

Improvements in digital access in the South Pacific has enabled different online ways to share information. Social network groups on platforms such as Facebook and WhatsApp allow members with a range of technical expertise and experience to share knowledge. There are also many online resources such as Youtube, forums and websites that provide access to information such as tropical forestry, soil management and extension techniques. They also provide opportunities for virtual forums, links to videos on practical techniques and links to web-based resources.

While digital materials are cheaper and easier to produce than hard copy materials, internet connectivity is still challenging in rural communities in Solomon Islands, and where it is available the cost of data can be prohibitive. Older generations within the community might also need help with using devices, or finding groups and materials. Despite these challenges, there are opportunities for appropriate digital methods of sharing information that utilise lower data requirements via smart phones - such as Facebook Messenger groups, or WhatsApp information groups.

Some useful websites include:

Kastom Gaden - *http://kastomgaden.org*
(also includes information about the Solomon Islands Planting Material Network)

Pacific Farmer Organisations Network - *https://pacificfarmers.com*

Seed Savers Network - *https://seedsavers.net*

The lack of digital system for extension materials in the Solomon Islands was recognised in a 2021 review by the World Bank that recommended the Ministry of Agriculture and Livestock promote digital services and improve digital literacy.

Engaging youth post-COVID 19

Finding ways for engagement of youth and young adults in Pacific Islands agriculture has long been a concern raised by communities and agriculture leaders. Young people appear to have become less interested in agriculture, and sometimes don't want jobs or opportunities in agriculture.

The post-COVID 19 setting has resulted in dire situations and challenges to livelihoods and food security of communities in many countries, including in Solomon Islands. But while COVID 19 has produced challenges, there are also opportunities for supporting and sustaining SLM knowledge with young people due to the return of many young people to their rural communities.

Many young people will take opportunities to migrate to urban areas or internationally for work. Migration results in a loss of labour in rural communities, and can lead to increased food insecurity irrespective of remittances that flow back to families. Migration is often transient or seasonal, rather than permanent. The loss of young people from communities also affects the transmission of indigenous knowledge across generations.

The global COVID 19 pandemic has resulted in many migrants returning from urban areas and from overseas to their rural homes. This creates opportunities for re-engaging young people in agriculture and for sustaining SLM:

- **Young people are digital savvy.** Young people can help connect older generations to social networks and direct them to resources that facilitate learning about SLM.
- **New connections, networks and opportunities for learning.** Young people will have new connections and networks across villages and islands. This creates opportunities for sharing ideas and experiences between locations.
- **Young people bring new knowledge and ideas.** Concepts like sustainability are less likely to be foreign to young people. Young people are also more likely to be willing to try new practices, techniques and approaches. Engaging young people to share knowledge and ideas is a great way to help them see opportunities in agriculture.
- **Young people bring resources.** Young people sometimes bring resources to rural communities when they return. This can help with improved technology, equipment, and resources for new livelihoods. At the same time, they might lack the basic knowledge and skills, for example to ensure their crops are planted at the right time and are nurtured with the right care. This provides an opportunity for older generations to mentor young people and share indigenous knowledge across the generations.

SLM leaders should consider how young people could be engaged in SLM activities. They might need encouragement and mentoring, but they also need a space for their ideas to be heard, and to see the possibilities that exist.

TRAINING 8

Group work

Objective of training

Improved understanding about how your group is operating

Activity

Team performance checklist

Materials

Paper (with teams checklist prepared), pens

Procedure

1. Invite participants who are part of an existing group or team (extension officer group, women's group, community protected area committee, etc.).
2. Explain the purpose of the task: the checklist has been developed to guide the group/team to think about what makes it work. It will help them to reflect on what has been successful and what they could do differently in the future.
3. Ask the group/team to describe their vision – include the things their group was set up to achieve and the reasons why individual members are part of the team.
4. Guide the group/team through checklist questions. Ask them to reach agreement on how they should score each question:

   - *Green or three ticks – this aspect is well covered*
   - *Yellow or two ticks – we need to think about this as it might be affecting our ability to achieve our goals*
   - *Red or one tick – this factor is really affecting our ability to achieve our goals*

5. Prompt the group/team to think about why things are going well for them.
6. Prompt the group/team to discuss why things are not going so well, and how they could improve.
7. Summarise the activity findings and develop action steps.

1. Team achievements		**Rate**
1.1	Does the team have steps to achieve its vision?	
1.2	Does the team regularly check its progress towards its vision?	
1.3	Does the team regularly check how well they are working together?	
1.4	Are the team's successes, big and small, acknowledged?	
1.5	Does the team learn from its failures?	
2. Team structure		
2.1	Is the team the right size with the right mix of skills?	
2.2	Can the team's membership be changed if it needs to be?	
2.3	Does the team have the resources it needs? (materials, time, money)	
2.4	Does the team meet regularly?	
3. Team operations		
3.1	Does the team have effective leadership?	
3.2	Do team members understand their roles and can they carry them out?	
3.3	Does the team have the networks it needs to achieve its vision?	
3.4	Does the team have effective ways of managing differences in opinion?	
3.5	Does the team stay motivated?	
4. Team skills		
4.1	Does your team have skills in managing meetings? (setting agendas, managing time, etc.)	
4.2	Does your team have skills in keeping track of progress? (e.g. someone who can remind people of the vision and provide an update on what happened at the last meeting)	
4.3	Does your team have facilitation skills? (ensuring that members feel listened to, keeping on track, managing differences in opinion)	
4.4	Does your team have skills in building networks?	
4.5	Does your team have skills in accessing resources? (information, materials, extension providers)	
4.6	Does your team have ways of supporting opportunity and contributions from all of its members?	

Adapted from Supporting Effective Teamwork (learningforsustainability.net)

Conclusion

There are many challenges facing Solomon Islands agriculture. Population growth, pressure on forests and climate change are creating problems that require innovative thinking combined with a renewal of traditional practices. This guide provides ideas and practices that help conserve forests and agricultural soils, and that help us to grow more produce from the same amount of land, more sustainably and more equitably.

It is also clear from this guide that practising sustainable agriculture requires leaders working with other leaders, with government, and with agriculture workers and communities. While we have provided a number of different approaches and activities to encourage knowledge-sharing and communities working together, there are more helpful resources on the internet, and from other leaders and communities practising sustainable agriculture.

We list a number of websites over the page where you can find further information on both good agricultural practices and ways of spreading the word about good agriculture.

Helpful Websites

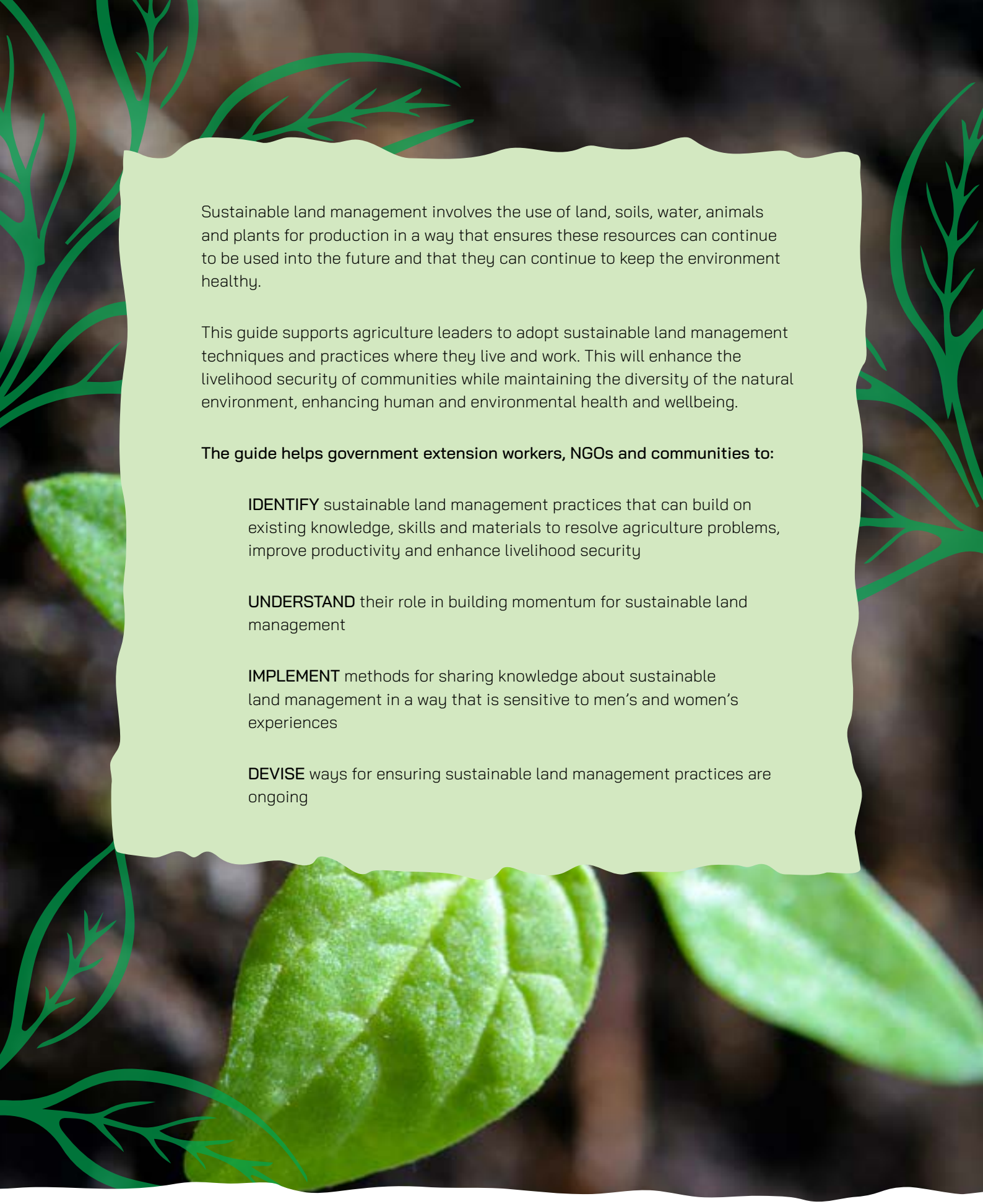
A list of publications (bibliography) used in the preparation of this volume can be found on our website *https://livelearn.org/*

The Food and Agriculture Organization of the United Nations (FAO) has resources available at *http://www.fao.org/land-water/resources/en/*

Kastom Gaden Association Solomon Islands has news and help for farmers and farmer groups at *http://kastomgaden.org/*

The POETCom (Pacific Organic and Ethical Trade Community) website has information about organic farming and the certification process *http://www.organicpasifika.com/poetcom/*

The Ministry of Agriculture & Livestock (MAL) offers resources and links on their website: *https://solomons.gov.sb/ministry-of-agriculture-and-livestock/*



Sustainable land management involves the use of land, soils, water, animals and plants for production in a way that ensures these resources can continue to be used into the future and that they can continue to keep the environment healthy.

This guide supports agriculture leaders to adopt sustainable land management techniques and practices where they live and work. This will enhance the livelihood security of communities while maintaining the diversity of the natural environment, enhancing human and environmental health and wellbeing.

The guide helps government extension workers, NGOs and communities to:

IDENTIFY sustainable land management practices that can build on existing knowledge, skills and materials to resolve agriculture problems, improve productivity and enhance livelihood security

UNDERSTAND their role in building momentum for sustainable land management

IMPLEMENT methods for sharing knowledge about sustainable land management in a way that is sensitive to men's and women's experiences

DEVISE ways for ensuring sustainable land management practices are ongoing

Food and Agriculture Organization of the United Nations

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