SAMOA CONSERVATION SOCIETY
SOSAIETE FAASAO O SAMOA

Samoa Green Livelihoods Programme

A Training Guide for Facilitators

Prepared with support from:

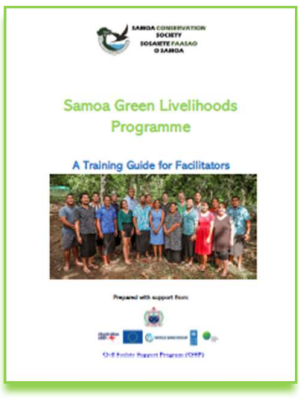
Australian AID

WORLD BANK GROUP

UNDP

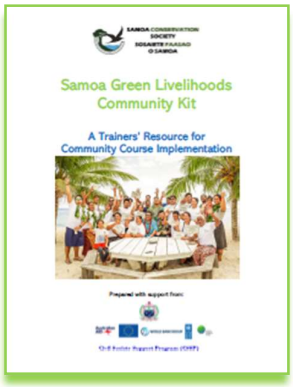
GREEN CLIMATE FUND

Civil Society Support Program (CSSP)



Samoa Green Livelihoods Programme: A Training Guide for Facilitators. Prepared by the Green Livelihoods Training Team. Published by the Samoa Conservation Society, Apia, December 2020 (65 pages)

Companion document to:



Samoa Green Livelihoods Community Kit: A Trainers' Resource for Community Course Implementation. Prepared by the Green Livelihoods Training Team. Published by the Samoa Conservation Society, Apia, December 2020 (70 pages)

Both documents are available from the SCS Google drive:
https://drive.google.com/drive/folders/1ggrEhGAXUdGzUlophuZJuZcqOSUw7eSS?usp=sharing

For further information and feedback, contact:

Samoa Conservation Society

E: conservesamoa@gmail.com

T: +685 7575300

FB: conservesamoa

Cover photo: Green Livelihoods staff, partners, and trainers at the Workshop of Trainers held in Vailima, Apia, 2020.

Contents

Acknowledgements

The Samoa Green Livelihoods team would first and foremost like to thank all of the communities that participated in the pilot year of the course: Faleaseela-tai, Faleaseela-uta, Matafaa, Vaovai and Falealupo.

The lifeblood of this project is the community and all of the wonderful men and women who attend our course. This is, after all, a course created and led largely by the community and for the community.

We specifically thank the local counterparts we partnered with during the pilot year 2020: Olsen Va'afusuaga (Faleaseela), Si'a Alec Latu (Vaovai), and Sililaei Tuaia (Falealupo). These individuals helped the project in its pilot year with their continued support, passion for the environment, and by fully committing to the future of the environment and natural resources in their communities.

We also thank all of our project partners: Conservation International, Samoa Voyaging Society, Faleaseela Environmental Protection Society, Matuaileoo Environmental Trust Incorporated (METI), Ministry of Education, Science and Culture (MESC), Samoa Business Hub, Sinalei Reef Resort, International Labour Organization, Samoa Green Products, Poutasi Development Trust, the UNDP Small Grants Programme; Samoa Waste and Recycling Management Association, the National University of Samoa and Maria Sapatu of Eco Current Consultancy.

A very special thank you to Seema Deo, who authored the Green Livelihoods Training Guide and facilitated the pilot Workshop of Trainers course in Vailima. We could not have implemented any of our courses without the partnership with the Ministry of Natural Resources and Environment (MNRE); and thank in particular Moeumu Uili and Laulu Fialelei Enoka from MNRE's Division of Environment and Conservation (DEC).

We would not have been able to deliver this course without the incredible effort and commitment of our five community trainers: Evangel Esera, Grace Ah Young, Mao Onesemo, Roman Waterhouse and Josh Papalii. Thank you for your dedication, team! We sincerely hope that you learnt useful things from the experience and will want to apply your new knowledge further in your careers and charity work and perhaps join us for more GL community courses in future.

This project would not have been possible without the funding, technical support and patience of Civil Society Support Programme (CSSP). We especially thank Christina Taua, Sefulu Salesulu, Taeaone Tamaseu, Elu Motootua, Aliitasi Sinclair and others in the diligent team. We also greatly appreciate the editorial skills of J.A. ("iapi") Jasperse in editing and formatting the Training Guide and Community Kit, and Mesepa Ituefa for translating the documents into Samoan.

Finally, as stated, this course is for the entire community in Samoa and especially for the youth in rural communities. The future of Samoa's environment and the health of our natural resources and people are in the hands of our youth! We encourage the young people in Samoa to find their voice and role in this large conversation of environmental conservation in Samoa. *You* are the difference!

Samoa Green Livelihoods is founded on the belief that the environment belongs to all of us and we all have an important role to play. And no one quite knows our natural environment better than those that rely on it for their livelihoods, day after day, and have done so for generations. This project is about learning from one another, improving, and being better for each other and the environment around us — we are all connected after all!

[page intentionally left blank]

SECTION I: ABOUT THIS FACILITATORS' GUIDE

Welcome to the Samoa Green Livelihoods Facilitators' Training Guide!

The Guide is a work in progress. The first working draft was trialled and refined at a Train the Trainers' workshop for community facilitators[1], held from 24 to 27 February 2020. Input from workshop participants helped refine the draft and it can now be used for training of environmental facilitators when working in the community. We expect there will be further revisions as we learn together.*

This guide is for you, the facilitator. There is a lot more information in this guide than you will need or even want to share in the community. But to be a good facilitator for change, you need to have a good background in the subject. Armed with this background, you can then work with your communities to inspire and motivate change in whatever way is appropriate for the group you are working with.

This guide also contains material to help you facilitate discussions and activities in the community.

Your feedback on the content of this Guide and the Training Programme will help us develop a useful process for guiding other community champion trainers in the future.

The Green Livelihoods Project

The Green Livelihoods Project is being led by the Samoa Conservation Society (SCS) with funding from the Civil Society Support Programme (CSSP). It has two objectives that are closely related in Samoa:

- to raise awareness amongst youth of Samoa's environment, of the range of threats facing it and how to manage these environmental threats; and
- to promote and demonstrate *Green Livelihood options*[2] amongst youth.

Samoan culture has developed based on an intimate relationship with the environment; and Samoan society and its economy still depend on a healthy, robust and resilient natural environment.

The primary target of the Green Livelihoods project are youth aged between 18 and 35 because of:

a) the general marginalisation of youth in Samoa;
b) the poverty experienced in this age bracket; and
c) their poor knowledge of environmental threats and impacts, and what to do about them. There is high unemployment amongst youth, who also have very limited authority in decision making in traditional Samoan culture.

* Numbers in superscript link to items in the Glossary at the end of this Guide.

The Train The Trainers' Programme

Objectives

This training programme will prepare designated Community Facilitators to become effective in sharing information regards understanding the value of the natural environment. The participatory approaches will enable people to build on their own knowledge and to develop solutions for making a living through improved management of their natural environment and resources.

Sustainability[3] means using resources that can renew themselves, without depleting any.

Sustainable livelihood choices can also be termed Green Livelihoods: the main purpose of this project is to increase the understanding and importance of Green Livelihood options.

The Train the Trainers' programme has the following objectives:

(I) Developing an understanding of Samoa's environment and threats to it, as a Pathway to Green Livelihoods

(a) Develop an appreciation of how Samoa's natural environment contributes to people's health and economic, social and cultural well-being
(b) Raise awareness on how human activities and climate change weaken and negatively affect the health and sustainability of different *ecosystems*[4]
(c) Discuss opportunities for implementing Green Livelihood programmes in Samoa that promote a sustainable and *resilient*[5] environment, culture and economy.

(II) Developing Facilitation/Community Engagement Skills

(d) Develop skills in sharing knowledge and information using participatory approaches, including experimental / discovery learning methods, through active discussion and participation
(e) Find approaches to working with community participants to develop innovative ideas, set goals and design / plan entrepreneurial Green Livelihood activities.
(f) Provide feedback on the training manual, including recommended activities and reference information.

The 4-day Train the Trainer workshop is just the first part of the training programme! We hope participants will take a *life-long learning*[6] commitment to this programme. The workshop can only cover the basics – it will be up to you to continue to learn new ideas, seek out those with more knowledge and expertise, and work with your communities to together develop new ways of approaching environmental protection and livelihood development.

The authors also hope participants will become active in further developing this training manual so that it will serve as a useful reference for others who will be working with communities and community groups in Samoa.

Using the Guide

This Training Guide aims to support learning during the 4-day workshop and later, when you are in the community on your own, to help you plan your engagement programme with your own participants.

This guide is divided into four sections:

SECTION I: Introduction

SECTION II: Engaging the Community

SECTION III: Learning about our Natural Environment

SECTION IV: Building Green Livelihoods.

Sections II and IV can be considered the more practical aspects of Green Livelihoods thinking. They focus on working with people: individuals and the community as a whole. They identify practical ways in which we may use our environment and natural resources sustainably so that benefits everyone. These sections aim to inspire, encourage and empower people to get creative, as they look for new and meaningful ways to make a living and at the same time keep their communities thriving into the future.

It is useful to remember that Green Livelihoods can have other names – sustainable living, low carbon lifestyles, sustainable communities, to name but a few.

Section III deals with the content or knowledge element of the programme. Not all of this information provided needs to be transferred to your community participants. Yet a certain level of knowledge and understanding is needed if they are to appreciate the inter-connectedness of the different parts of our natural environment; and understand how humans interact with, and affect the natural environment. The application of scientific information may be implicit in the community, by being applied without people realising it. Wherever possible, it is important to build on what exists in the community already. We will aim to incorporate livelihoods thinking as we progress through these sections.

Reviewing and evaluating learning

Throughout the training workshop (and after), we will make it a practice to evaluate our learning and review each proposed training activity for the community workshops. Review and evaluation make sure the learner / trainee is as responsible as the trainer for the learning that occurs!

There are different ways to conduct reviews. Some people find it useful to keep a journal – a daily record of their learning journey. Others prefer small group discussions. We will explore some of these methods during the workshop. Whatever method you prefer, it is important to be willing to openly and constructively critique the programme with the aim of improving it.

You will be asked to reflect on different concepts and your own learning. In some cases the trainer may ask you to share your reflections with the group or you may wish to simply keep a notebook for your own thoughts. The more you reflect, the more valuable this programme will be for you!

Reflection

Why am I here?

- Why am I participating in this programme?
- What do I already know?
- What would I would like to learn from this workshop (be specific)
- What makes a good trainer?
- Am I a good trainer?
- How do I most enjoy learning?

Write your own thoughts here:

SECTION II: ENGAGING THE COMMUNITY

Who are we working with?

We are not teaching children! We are working with young adults over a wide age group.

Understanding who we are working with, will help us shape our programmes better. Here are some important points to consider when working with adults.

- **Need for Knowledge:** Adults need to know **why** they should learn.
- **Motivation:** Adults are driven by internal motives. They will learn if they want to learn. For instance, they will want to participate in the Green Livelihoods programme if they are convinced it can help make their lives better, or help meet a specific need (e.g. increase their income). The What's-in-it-for-me question is a powerful internal motivator. Environment educators and conservationists often make the mistake of assuming that, because they care about the environment, others will have the same sentiment. This is not always the case. It is our role to instil that caring, which can be very challenging. At the very least, we want to encourage improved environmental practices by identifying and addressing participants' relevant drivers and motivators.
- **Willingness:** For adults, the willingness or readiness to learn comes from perceiving the relevance of the knowledge. They want to know how learning will help them better their lives; they learn best when they know that the knowledge has immediate value for them.
- **Foundation or Experience:** Adults bring with them rich reserves of experiences that form the foundation of their learning. They analyse, rationalise, synthesise and develop new ideas or tweak old ones through the filter of their experiences. Young adults will have less of this life experience, but they will bring their own knowledge of the ocean, the forest, and the community rules. These life experiences and such knowledge can enrich discussion, help make connections, and inspire others. But prior knowledge and experience can also serve as barriers: facilitators should take time to make themselves aware of this.
- **Self-Direction:** Adults are self-directed individuals who want to take charge of the learning journey. They are independent beings who want to feel in control.
- **Orientation to Learning:** Adults learn best from activities, when they "do". They find relevance in task-oriented learning, which they can align with their workplace realities. Task-oriented learning develops problem-solving abilities that, in turn, give them the confidence that they can conquer their challenges with their newly acquired knowledge.

What is our aim?

Being really clear on what we are aiming to achieve will also shape our approaches. It is worth having some discussion on this to ensure that you as the trainer, and your participants, are all on the same page.

What is the end goal of the activity?

What do people need to know?

What do people care most about?

Have a look at the two illustrations describing photosynthesis. Which one would you use in a community setting? Why?

Figure 1A: Photosynthesis chemistry

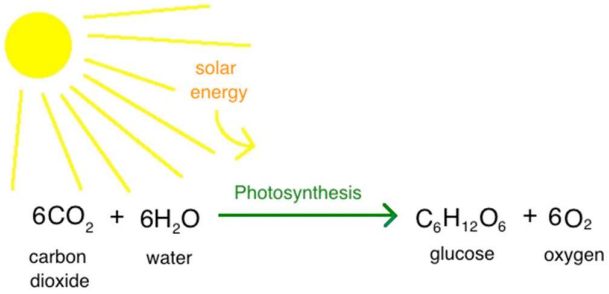
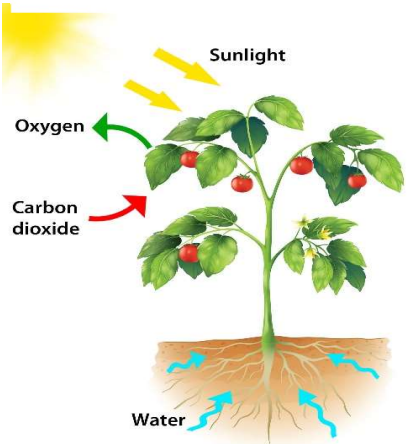


Figure 1B: Plant photosynthesis



Our approach

Working with any group of people, to change mindsets and motivate action, requires engaging them in a meaningful manner. People need to feel ownership of an issue before they will meaningfully engage in action for long-term change.

An *active learning approach*[7] can enable participants to explore environmental issues together and in their communities. That means considering root causes in order to identify the change needed, while at the same time learning new information. Our focus is using the natural environment to make a living, so that participants actively engage in learning about their environment; and engage with their communities to enable conservation or environmental protection. This is what we call Green Livelihoods.

Making learning relevant and meaningful

Almost every young person in Samoa today has access to some form of communication technology: printed text and pictures, radio, TV, or the internet. Such communication media tend to offer immediate information in short, abbreviated bursts. It is no secret that people's attention spans are decreasing; sitting through presentations and lectures is rarely enjoyable (if it ever was!).

Our job as facilitators is to work out different ways to engage participants: to get participants actively involved in change for their own lives. Importantly, we want to encourage them to start thinking and develop innovating business ideas for themselves. This is not easy to do: it takes a lot of commitment and patience. You may find you have to step out of your own comfort zone quite often.

Pre-evaluation

Conducting a well-considered pre-evaluation survey can help ensure you understand the needs and interests of your participants; then you can tailor your programme well before the training starts.

Reflection

Who am I targeting?

- Why is it helpful to understand my participants?
- What sorts of things would I like to know about my participants?
- How can I find out more about the participants?
- What would I need to change about myself to become a good facilitator?

Additional resources

Green Livelihoods Process of Engagement – a proposed approach for engaging people in the Green Livelihoods initiative. By David Chung 2020, Samoa Conservation Society (3 p.).

Write your own thoughts here:

SECTION III: LEARNING ABOUT OUR NATURAL ENVIRONMENT

This section contains seven topics.

Topic 1: Championing Green Livelihoods

Topic 2: Exploring our environment

Topic 3: Focus on plants and forests

Topic 4: Diving into the ocean – the marine environment

Topic 5: Living with climate change

Topic 6: Waste and pollution

Topic 7: Tools and approaches for protecting the environment

Each topic contains:

(a) background information for the facilitator;
(b) activities and discussion questions for facilitating learning with your community group;
(c) reflection questions for the trainer; and
(d) information on additional resources, experts and organisations.

Background information is to provide you, the facilitator, with the environmental and livelihood development concepts that you will need, for conducting the Green Livelihoods programme in your community. You don't need to share all this information with your community participants.

Facilitating this topic sections provides suggested approaches and activities for each topic. These are designed to help you get your community participants engaged and actively participating in the discussions towards Green Livelihoods. This section also contains activities which are integrated into the process.

Reflection questions are for you! They are intended to support your learning during the workshop. They help you assess how well things are progressing when you run your community programme. Your reflections will be used to review and revise this training manual, so this it can become a standard training resource for use by facilitators in other communities.

More information/additional resources will help you find more information and support as you progress in your journey with your community groups.

Topic	Learning Outcomes	Facilitation Skills
Championing Green Livelihoods	a. Discuss why people need regular (cash) income b. Discuss the different ways in which people use and value their natural environment c. Appreciate that there are also non-cash uses of the natural environment d. Describe what Green Livelihoods means to you and discuss some examples	(i) Become comfortable with your role as a champion for change in your community
Exploring our environment	a. Describe and appreciate the unique and special features of your natural environment b. Describe different parts of Samoa's natural environment and some key ecosystems of importance c. Discuss why plants, birds, fish and other living things are important d. Describe the non-living parts of the environment e. Discuss how humans depend on the living and non-living parts of their physical surroundings f. Identify some of Samoa's special birds, plants and other species	(ii) Become familiar with using experiential learning techniques as a facilitator
Focus on plants and forests	a. Describe the importance of forests in nature and in keeping the Earth's natural systems in balance b. Discuss how humans use and benefit from the forest c. Identify some of Samoa's special birds, plants and other species d. Describe key threats to the health of Samoa's forests and forest biodiversity e. Contribute to developing solutions towards addressing these threats using participatory and holistic approaches	(iii) Use brainstorming as a simple technique for eliciting participant engagement (iv) Apply solution-oriented approaches in community engagement
Diving into the ocean	a. Describe the importance and value of the ocean and marine ecosystems to humans b. Appreciate the complex systems of the ocean and marine ecosystems and their link to the land c. Appreciate the role of freshwater ecosystems, including rivers in linking land and sea d. Describe some of the key marine ecosystems and how we interact with them e. Describe some marine species of importance for Samoa f. Describe key threats to the health of Samoa's marine ecosystems and what this means for people's livelihoods	(v) Model participatory facilitation techniques that engage others in finding solutions towards addressing these threats in a holistic manner

Living with climate change	a. Explain in general terms what is climate change and its implications at the local/village level b. Describe what is meant by the term resilience c. Explain how biodiversity conservation, resource management and forest restoration can help build community resilience d. Discuss why this needs to be incorporated into planning (at all levels)	(vi) Convey complex subject matter
Waste and pollution	a. Discuss how waste and pollution endanger people's lives b. Describe how different types of waste and pollution harm the environment and natural ecosystems c. Explain why there is a strong focus on addressing plastic pollution d. Categorise different types of waste by how they can be managed e. Debate the different solutions available for waste management; discuss short term and long term solutions at local/village level and at national level	(vii) steer the participants' discussion if needed, to include all key aspects
Tools and approaches for better managing our environment	a. Describe the laws and regulations relating to environmental management b. Discuss the different resource management applications being used in Samoa	(viii) clarify what is desirable and what is enforceable by law

Topic 1: Championing Green Livelihoods

Learning Outcomes

At the end of this session, you will be able to:

(a) Explain why people need regular (cash) income
(b) Discuss the different ways in which people use and value their natural environment
(c) Appreciate that there are also non-cash uses of the natural environment
(d) Describe what Green Livelihoods means to you and discuss some examples
(e) Become comfortable of your role as a champion for change in your community

Background Information

What do we mean by Green Livelihoods? Very simply, it is about earning a living in a way that uses the natural environment without degrading or harming it in the long term. It means respecting nature and reducing our footprint or impact on nature, so that nature can continue to provide for us forever.

Many communities in Samoa rely on their natural resources and the natural environment for their livelihoods. For example, through fisheries, the sale of fruit and vegetables, mat making, wood carving, use of local medicinal plants, and so on.

As our population increases and our need for money increases (e.g. to pay for things like school books, transport, electrical goods and phones), we are using up our natural resources faster than they can be replaced. There are many examples where we have already degraded the environment so much that we can't make a decent living from it any longer. In some places, we have overfished the lagoon so the fish aren't large enough to sell on the market. Or we don't have the right type of trees left in the forest so our wood carvings are of poorer quality and therefore bring in less cash.

A Green Livelihoods approach involves thinking about such things and planning better, so that we can continue to benefit from our natural resources in the long term. Better management of our resources will also help us in times of shortage – for example, after a cyclone or during a very dry season.

Building Green Livelihoods also involves adding value to what you might already be selling/providing so that you can earn more. For example, you might decide to make jams or chutneys with some of your fruit to stop them going bad before they can be sold.

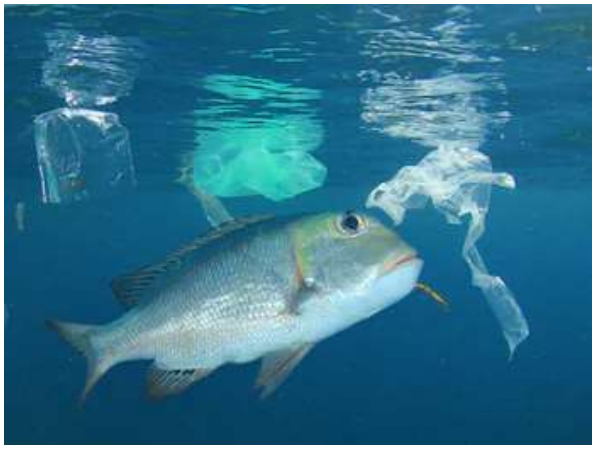
Another important aspect of Green Livelihoods involves managing your money effectively! This training programme will introduce you to, and give you the chance to meet, others who are running businesses based on Green Livelihood ideas.

Introducing Green Livelihoods into the community

Before we can start championing Green Livelihoods to others, it helps to understand our environment and how natural systems work. It is also useful to understand how our own actions might cause problems that will affect us a few years from now. This could help us better plan how we use and change the natural environment.

Where does all that plastic go? Across the world, scientific studies are showing us the seriousness of the plastic problem – all that rubbish we have been throwing into the ocean is now coming back to us – inside the fish and seafood we eat!

Figure 2: How plastic can affect marine fish and seabirds (credit: Shutterstock)



A word of caution

Unfortunately, humans don't always DO what they know to be right! They prefer to do what makes them feel happy and comfortable. It is therefore important to try and understand what the community (and individuals in the community) want before trying to educate them. If you understand people's wants and needs, you will find the right ways to get them involved in your job of helping to protect and better manage our environment.

Here are some things to think about when trying to bring about changes in behaviour and practice:

- What do people want for themselves, their children, their village?
- What are their aspirations?
- What are they most concerned about?
- Does everyone want the same thing?
- How do people currently earn a living? Does everyone have a cash income?
- What natural resources do they rely on?
- Are there problems with current approaches?
- Are there cooperative approaches that are working in the community?
- Why will people want to change the way they are currently doing things?

Answers to these questions will help you plan your approach better and pave the way towards bringing people together and thinking about changes and solutions that work for everyone.

Reflections

How do I make decisions?

Have you ever wondered why even people who **know** that something is right, may still not always **act accordingly**? (Think about how often you have said I know I should…, but…!)

Our challenge as Green Livelihood Champions is to help people tap into the things that will motivate and inspire them. Then they will want, and can develop new and long-term solutions that meet their needs and aspirations. As we go through this training process, we will investigate some possible approaches to try in our communities.

- Think of a situation when you had to make a choice about an action (Don't overthink this – it could simply be about whether to cross the road before the light turns green!)
- What choice did you make?
- What drove you to make that decision? What stopped you making the other decision?
- Can you think of any circumstance in which you might choose the other option? What might drive you to do that?

Write your own thoughts here:

Facilitating this topic

1.1 Making a living

This introductory activity helps set the scene for the overall Green Livelihoods programme. It also gives you an idea of what drives and motivates the group you are working with.

Through this activity, we begin to explore our ideas about what it means to make a living; understand why people need regular income; and take a look at what is needed to run a business or generate income from our activities. With your community participants, you may choose to simplify the questions and remove some of them.

Materials: taped sheets of paper/flipchart, marker pens.

Discuss
Use flipchart paper to record discussions

a. Why do people need money?
b. How does it feel to have money?
c. If you had a regular income, what are some of the things you would do?
d. How do people in your community/village make a living? (List the different activities)
e. What do they need to be able to make their living? Make a list. (e.g. a shop will need regular stock, money to buy the stock, electricity if selling frozen foods; if you sell fish, you need healthy fish from the sea, etc.)
f. Who does the work/provides the labour? (e.g. Who picks the fruit? Who catches the fish?)
g. Is there a time when the business might not be able to run any longer? Why would this happen? (We call these risks.) List all the risks that your business might encounter (e.g. pandanus used for making mats – when it rains too much and we can't dry the leaves, or the trees have been destroyed in strong winds or a cyclone; or we caught all the big fish and now there's no fish left to sell)

Sample table for recording your discussions (for questions d–g)

Type of business (d)	What is needed to run the business (e)	Labour (f)	What could go wrong: risks (g)

ASSESS

h. Are any of these businesses causing harm to the environment?
i. Are there any groups of people currently not doing anything?
j. Are there other ways for people to make a living that aren't being done at the moment? If yes, why do you think these have not been taken up?

Later, we will explore ways in which we can develop some viable income-generating businesses in our communities. To do this we will start by assessing what is available to us (our *resources*[8]).

1.2 Mapping the community

This activity is largely an experiential, self-discovery activity where participants start to take stock of the environment they live in.

Materials: large sheets of paper taped together if needed, colour felt pens, pencils or crayons

Facilitator tip: Use a large sheet of paper: try joining up sheets of paper to get a large floor map. You could get creative and use materials from the environment to make your map!

Guiding points

1. You are going to draw a map of your community. Your drawing needs to be as large as possible so that you can add to it later!
2. Start by putting in things like the road, the sea, the mountains.
3. Add in the public buildings – church, medical centre, main fale, pastor's home, school, shop, and so on; then put in the homes and other features. Try and focus in on all the different aspects of your village or community.
4. Add in the places where different activities happen: volleyball, young children playing, swimming, and so on. Encourage everyone to get creative, discuss!
5. Consider: What other features are there? (E.g. reef flats, coral reef, forest, river, mangroves, taro patch, vegetable gardens, food/fruit trees, pig pens, cows, rocky area, cliffs, community taps, water pipes, bathing area, toilets, sea wall.)

DISCUSSION

1. What are the main natural features you have identified? (List these on a separate sheet or whiteboard.)
2. Are there any parts of the environment that we have missed?
3. Now go back to your flipchart notes from Activity 1.1.
4. Choose one of the environment features (e.g. the forest or beach area).
    a. How is the forest or beach used?
    b. Who else uses the forest or beach?
    c. Are there other people who are not from the village but also use it? How?
    d. Do you think these areas are in a good condition? (Why? Why not?)
    e. What do you think has led to the status of the resource?

Repeat this for a few other features. You can draw up a table as shown overleaf to record your discussions, or use pieces of paper you can stick on to the sheet.

Type of Environment	Uses	Who uses it?	Status?	Cause of Status?
1. E.g. River: this may be divided into river bank, freshwater, ...				
2. E.g. Forest				
3.				

Facilitator tip: The aim is to start the thinking that our livelihoods are dependent on the health of our natural surroundings. Remember to think beyond cash income! If the river is used for washing clothes, or the forest for collecting medicinal plants or fruit or bark for dyes, make sure these are recorded.

Suggested additional questions:
- Are all the uses about making money/cash income?
- Are there other ways in which the environment can be useful, or were there other uses for some areas before (e.g. copra, nonu, tourism, diving, whale watching, picnics)
- What other ways do you think the natural environment is useful to us?

Here are some non-cash uses of the natural environment:
- clean air and water
- shade
- protection from storms, storm surge
- building materials, fence posts
- fuel/firewood, medicines, dyes
- enjoyment, relaxation, culture/traditional wear/dances
- materials for weaving/carving
- fish/fruit/vegetables/meat for subsistence.

Reflections

What have I learnt?

- Did you learn anything new during this topic? If yes, list them
- Were the learning outcomes met? (Explain)
- What would you change if you were running this session?

Write your own thoughts here:

Topic 2: Exploring our environment

Learning Outcomes

At the end of this session, you will be able to:

(a) Describe and appreciate the unique and special features of your natural environment
(b) Describe different parts of Samoa's natural environment and some key ecosystems
(c) Discuss why plants, birds, fish and other living things are important
(d) Describe the non-living parts of the environment
(e) Discuss how humans depend on the living and non-living parts of their physical surroundings
(f) Identify some of Samoa's special birds, plants and other species.

Background Information

Under Topic 1, we started to look at how we depend on our natural environment for our livelihoods. We probably started to realise that our whole lives depend on the health of our natural environment.

But what do we know about our natural environment? In this topic, we will spend some time learning about Samoa. Below are some facts and figures, which everyone can add to.

Samoa facts and figures

- Samoa has a total land area of 2,826 square kilometres ($km^{2)}$.
- Samoa has nine islands. They are Apolima, Manono, Fanuatapu, Namu'a, Nu'utele, Nu'ulua, Nu'usafe'e, Savai'i and Upolu. Including the small islands next to them, Savai'i is the largest island at 1,708 km^2 and Upolu the second at 1,118 km^2.
- The nation of Samoa has control over and responsibility for 98,500 km^2 of Pacific Ocean. This includes having the international exclusive rights to fish, drill and carry out other economic activities.
- The population of Samoa is nowover 200,000 people for the first time ever!.
- Samoa is composed of volcanic islands. Scientists have proof that it was formed about 5 million years ago from volcanoes erupting under the sea. The volcanic soil is rich and great for agriculture. The Samoan islands are moving northwest (towards China) at around 0.5 to 0.10 metres per year.
- Mountains, forests, rivers, lakes and streams, volcanic cliffs, mangroves and swampy wetlands, and the coastal environment and lagoon are the main physical features of the Samoan environment.
- Birds, flying foxes (bats), one species of snake, a variety of lizards, skinks, insects and snails and, in the lagoon, corals and fish are the main wildlife. There are hundreds of species of plants on the coast and all the way up into the mountains.
- Because Samoa is an island separated far from other land, it has plants and animals that are found nowhere else in the world.
- The smallest spider in the world is in Samoa (around 0.5 millimetres fully grown): it lives in the forests at Afiamalu.
- Samoa has more native fern species than New Zealand, a country 85 times bigger than Samoa!

Facilitating this topic

2.1 How much do I know?

In this activity we will test our knowledge and learn a bit more about Samoa. This can be a fun activity to get everyone in the learning mode.

Materials: Blank map (with the Pacific islands on it)
Some images of Samoa: crater lake, lava flows, forests, aerial shot of the islands

How much do you know about your island nation? Test yourself!

Where is Samoa on this map? [blank map needed]
Which is the closest country to Samoa?
How many islands does Samoa have?
Can you name them?
How much land does Samoa have?
How were the islands of Samoa formed?
How many people live in Samoa?
What is the name of a bird in Samoa that is not found anywhere else in the world?
…and so on: see Annex III for more ideas

2.2 Living and non-living parts of the environment

Prepare a large box with a hole in the top to allow a hand to fit through. Place in the box a selection of items: leaves, fruit/berries, leaf litter, stones, soil, bird feathers, plants, pieces of cloth, a cotton T-shirt, canned food, and so on.

Ask volunteers or teams to select an item from the box without looking, like a lucky dip. The participants then talks about their object.

Prompt them if you need:
- What is it?
- Where does it come from?
- How was it formed/produced?

Ask them to group these objects into two categories.
They should be able to group them into living and non-living categories. If not, guide them.

Discuss living and non living things.
Why are the non-living parts of the environment important?

2.3 The natural environment in my community

This activity is a taster for the next few topics. Before we focus in-depth on different aspects of the environment, we want to familiarise ourselves with what is around us.

DISCUSSION

Look at your maps from Activity 1.2 again. Ask yourselves:

1. How many different parts of the natural environment did you identify?
2. Is the taro planted everywhere? Why or why not? Where is the taro planted? Where is the pandanus found?
3. How is the area where the taro is planted different from the area where the pandanus grows?
4. Are there other areas that are different from each other as well? Consider conditions: sand, loose soil, swampy mud, mangroves, gras, corals, rocky, temperature, wind, moisture, birds and insects (including mosquitoes!), fish, shellfish, and so on. Encourage participants to think of as many things as they can.

Explain:

5. Each of these different areas has its own special environment – different soil, plants, different insects and birds will be found in each area. Scientists use the word *ecosystem*[9] to describe different parts of the natural environment and to help describe the connections between the living and non living things in the area. So you can have coral reef ecosystem, a forest ecosystem, etc.
6. We can also talk about *habitats*[10]. A habitat is where something lives. For example, the habitat of certain types of fish is the coral reef. The habitat for some birds is deep inside the forest. What is the natural habitat of the *manumea*[11]*?*

Facilitator tip: Most of us probably won't use these terms in our group conversation and that's OK. We just need to know that different creatures live in different parts of the natural environment and understand how they rely on that area for their food, shelter and protection.

By understanding these connections, we can make better decisions about how we should look after the environment. However, understanding the terms can help us navigate additional resources and seek more information quickly.

Topic 3: Focus on plants and forests

Learning Outcomes
At the end of this session, you will be able to:

(a) Describe the importance of forests in nature and in keeping the Earth's natural systems in balance
(b) Discuss how humans use and benefit from the forest
(c) Identify some of Samoa's special birds, plants and other species
(d) Describe key threats to the health of Samoa's forests and forest biodiversity
(e) Contribute to developing solutions towards addressing these threats, using participatory and holistic approaches.

Background Information

In this topic, we begin to delve a bit deeper into understanding the plants and forest ecosystems of Samoa. We will also learn about the importance of plants in maintaining life on Earth. We will learn some important connections between plants, animals and people.

Over half of Samoa (around 60 per cent) is covered with rainforest. In fact, rainforest is the natural or normal vegetation of Samoa: the islands would have been completely clothed in it when first humans arrived (except on recent lava flows before soil was formed and forest had time to grow). We will therefore start our learning by looking at a forest environment.

What is a forest?

A *forest*[12] is a living, constantly changing community dominated by trees, with other plants (shrubs, ferns, grasses) and animals. The forest floor is covered with leaves (sometimes called dry litter) which slowly decompose: such rotting adds nutrients to the soil. Many insects and small animals such as reptiles, spiders, snails, etc are found in Samoa's forests. Many species of birds and bats live and nest in the forest. They feed on the fruit of the trees or on some of the insects and lizards.

The types of plants found in the forest will depend on where the forest is located and on what kind of rocks it grows on (e.g. old weathered rocks, or young lava flows). Altitude (height) plays a big role in determining the characteristics of a forest: compare forests on the coast, on the lower part of the mountain, high up in the clouds of a mountain. Each of these types of forest will have different species of plants that are adapted to the climate, slope, rock type and soil.

How do people use forests?

We humans rely on the forest for many of our needs. Certain trees and plants are used as materials for construction, food, medicines, to make dyes, or for fuel. Recreation and relaxation are major uses too: for many people the forest provides a place to exercise away from the noise and traffic of the town or simply to sit back and enjoy.

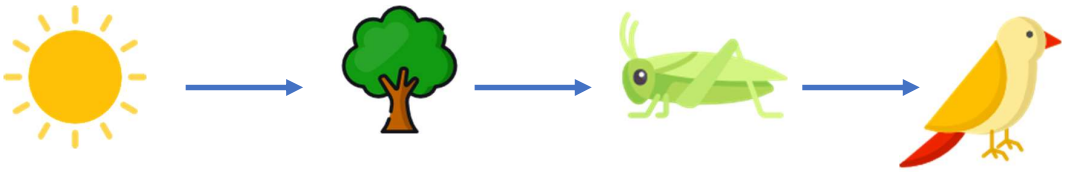
What is the role of forests in nature?

The most obvious part of the forest is the trees. Trees (and all plants) carry out some important functions in nature. Here are just some of the things they do:

1. **Plants make food for animals and insects**

Green plants and trees are known as *producers*[13], because they convert the sun's energy into food through a process known as *photosynthesis*[14]. All other life on Earth depends on plants. Animals known as *herbivores*[15] eat these plants or their fruit, roots or leaves to survive. Some animals are *carnivores*[16], which means they eat (parts of) other animals for food. Organisms that eat rather than make food are known as *consumers*[17]: they could be herbivores, carnivores or *omnivores*[18]. The latter eat both plants and (parts of) other animals.

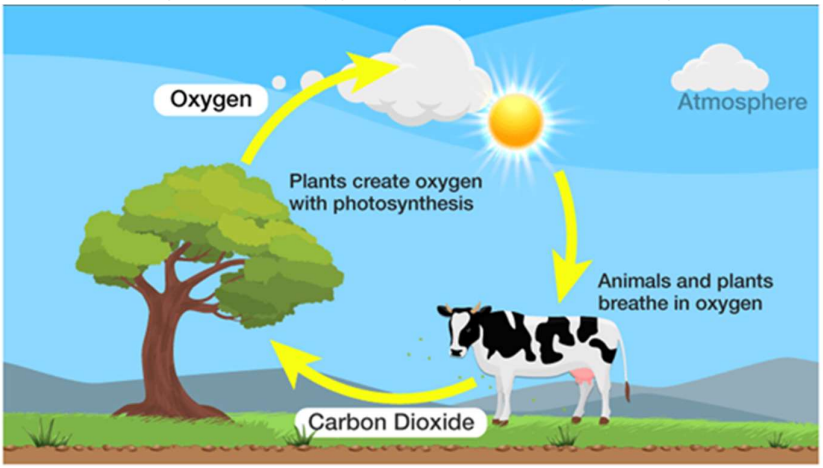
Figure 3: The sun provides energy for trees to grow through photosynthesis. Herbivores live from eating plants, carnivores eat other animals, omnivores survive on a mixture of foods



2. **Plants provide oxygen and remove carbon dioxide from the atmosphere**

The Earth's atmosphere contains a mixture of oxygen, carbon dioxide and other gases (mainly nitrogen, that doesn't affect us). All animals and plants need oxygen to stay alive. Our bodies take in the oxygen and give out carbon dioxide, in a process known as *respiration*[19]. Plant use some of the oxygen they produce and make some carbon dioxide.

Figure 3:The Oxygen Cycle (Source: byjus.com)



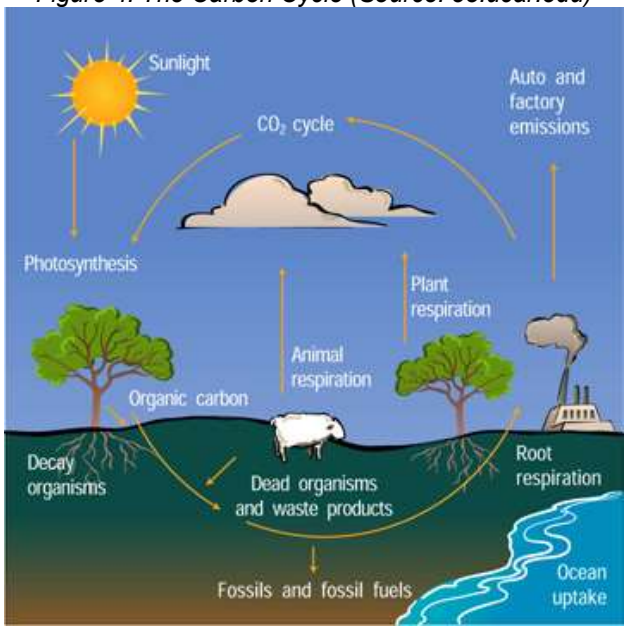
But plants are very special because they also remove much more carbon dioxide from the atmosphere than they produce. During the photosynthesis process described earlier, plants use carbon dioxide to make food. Better yet, when they do this, the by-product is oxygen!

Too much carbon dioxide in the air will kill us, and heats up the atmosphere. By removing carbon dioxide from the air, plants help keep the air safe for us to breathe. The carbon is stored in the plant and not released again until the plant dies, is burned or eaten.

Carbon dioxide is produced not only when we respire, but also when we burn oil and gas and wood. Carbon dioxide is also produced when things decompose or rot. All this carbon dioxide would kill us if it were left in the atmosphere. Each year one tree can capture as much as about 12 kilogrammes of carbon dioxide from the atmosphere to grow and live: as a result, about half the weight of the tree is carbon (the other half is mainly water).

Unfortunately humans are producing more and more carbon dioxide through our factories, the cars we drive and the electricity we consume. Our forests are not able to keep up with these huge amounts of carbon dioxide. We discuss this further in the topic climate change.

Figure 4: The Carbon Cycle (Source: eo.ucar.edu)



3. Plants hold the soil together, prevent erosion and keep the soil moist

The roots of trees and shrubs, particularly those on hills and slopes, tend to spread out and grasp the soil to support the rest of the plant. This has the helpful effect of holding the soil in place as well! Landslides tend to occur in places where the native trees and shrubs have been removed.

4. Forests are masters of recycling

Nothing is wasted in the forest. Plants use the non-living materials (nutrients and minerals, water, sunlight) to make food, the plants are eaten by animals. When the plants and animals die, their waste is decomposed (by small organisms such as fungi and bacteria), and the decomposed materials are returned to the environment where it can be used again.

5. **Trees remove some types of pollutants from rivers and the air**

Trees can help remove some pollutants from the air by binding them to leaf surfaces. Their roots also can act as filters for polluted water.

6. **Forests help regulate temperatures and moisture in the air**

The roots of trees help to hold water in the soil and so keep the area moist. Forests actually regulate climate: areas in forest promote cloud formation and rainfall. Many areas that have been deforested, tend to dry out, heat up and become degraded. The Brazilian Amazon is a good example where huge areas of once-forested land are now semi-arid drylands.

Facilitating this topic

3.1 Introduction to the forest

Brainstorm Activity

Use a large board or flip chart paper to help record this session.

Write the word FOREST in large letters in the middle of your sheet.

Ask participants what words they associate with FOREST.

Write down in random order everything people say. You can space the words out all over the page. Don't ask questions – the trick of the brainstorm activity is that everyone gets heard, there are no wrong suggestions.

Now ask people to look at the information and to help you put these into groups.

The categories will depend on what input you have. The purpose of the brainstorm is to energise people and get their minds thinking about the topic. It is also a good way to find out what your participants already know.

Use the ideas on the board to facilitate a discussion on how humans use forests.

Ask, What are some of the ways people make use of the forest?

Explain that we will be looking further into forests and their importance and value to us.

3.2 The importance of plants

This is a suggested activity to show what plants can do. There are many such examples. Always test your demonstration activity well before you try to carry it out in the training session!

Materials needed:

- A tealight or other short candle
- A wide-mouthed glass jar or dish – a cut up large soft drink bottle should work (use some plasticine to seal the edges)
- A healthy leafy plant in a small yoghurt container (needs to be able to fit under the jar or dish)

Instructions:

First:

1. Ask: what does fire need to burn?
2. Light the candle.
3. Cover the candle with the glass jar.
4. Observe and write down what you see.
5. Ask: what happened? Why?

Then:

1. Place the potted plant next to the candle.
2. Light the candle.
3. Cover the plant and candle with the jar.
4. Discuss what you see.

Discuss what happened. Ask participants to explain their observations.

Ask:

What would happen if there were no plants or trees? (Participants can discuss in groups or call out their thoughts depending on the dynamics of your group.)

What gas do humans need to stay alive? (answer = air or oxygen)

Where does this air or oxygen come from? (explain using the oxygen cycle Figure 3)

Use the background information to explain other important services that plants and the forest provide to us.

3.3 What's inside the forest?

In this exploratory activity we will learn about the different living things in the forest and how they depend on one another. This is best done outdoors. Make sure to plan your trip and have the necessary resources at hand, well before you decide to run this activity. Alternatively, you could use pictures for a guided discussion.

a. Native and introduced plants and trees

Use the provided pictures of the plants and trees, or go outside and explore the plants and trees in the area]

Discuss

- Do you know the names of each of the plants and trees? What helps you tell them apart?
- Which ones are used by people. How are they used? Who uses them? (A rough rule of thumb in Samoa is that if a plant has no name it has no use by people...)
- Are there any plants you don't recognise? Find out their names.
- Some plants are only found in some parts of Samoa. Find out which ones. Different plants and trees need different conditions to survive. Discuss this further with examples.
- Some plants are only found in Samoa and nowhere else in world. Find out which ones!

b. Native and introduced birds

Use the provided pictures of birds (or observe the birds at a suitable time).

- Discuss the names of the birds you know.
- Which birds are used by people? How are they used? Who uses them?
- What other values do birds have?
- Are there any birds you don't recognise? Find out their names.

- Some birds are only found in Samoa and nowhere else in world. Find out which ones!
- What is the national bird of Samoa?
- Some birds of Samoa are *endangered*[20]. This means that there aren't a lot of them left and they are in danger of dying out altogether. Which birds of Samoa are endangered?
- Discuss why some of our birds are endangered.

c. Other species of the forest

- What other animals are found in the forest? Can you describe them? Do you know their names?

d. Invasive species

Some plants and animals are not originally from Samoa. They were either brought here deliberately by humans or they arrived accidentally. Many of these species thrive in Samoa and provide food, medicines, even cultural connections. Some species were introduced hundreds of years ago; some are new arrivals.

Discuss:

- Do you know of any introduced plants or animals?
- Are all introduced species bad? What makes them bad? (Consider: the pig, the mynah bird, the giant African snail)
- What is an invasive species?
- What impacts do invasive species have on our environment?

3.4 How humans affect the forest and forest ecosystems

Return to the earlier brainstorm chart and also the results from your discussions in Activity 2.2. Look at the different uses of the forest that people have identified. Ask if there are any other uses they hadn't noted.

Show a few pictures of a denuded/logged/burned forest.

Ask, What has happened here?

Discuss what sort of consequences this might have. Use a problem tree type analysis as a way of encouraging thinking and links.

Ask:

- Why do you think people are burning and logging forests?
- Are there other ways to use the forest without completely destroying? How?
- Why might people not want to use these other methods?
- What can we do to help encourage them to change their behaviours?

Topic 4: Diving into the ocean: the sea and marine ecosystems

Learning Outcomes

At the end of this session, you will be able to:

a. Describe the importance and value of the Ocean and Marine ecosystems to humans
b. Appreciate the complex systems of the Ocean and Marine ecosystems and their link to the land
c. Appreciate the role of freshwater ecosystems including rivers in linking land and sea
d. Describe some of the key marine ecosystems and how we interact with them
e. Describe some marine species of importance for Samoa
f. Describe key threats to the health of Samoa's marine ecosystems and what this means for people's livelihoods
g. Be able to model participatory facilitation techniques that engage others in finding solutions towards addressing these threats in a holistic manner.

Background Information

In this topic, we will study our ocean. We will find that it is difficult to talk about the ocean without looking at our islands and how they are linked to the sea. We will therefore also talk about freshwater rivers and streams in this topic.

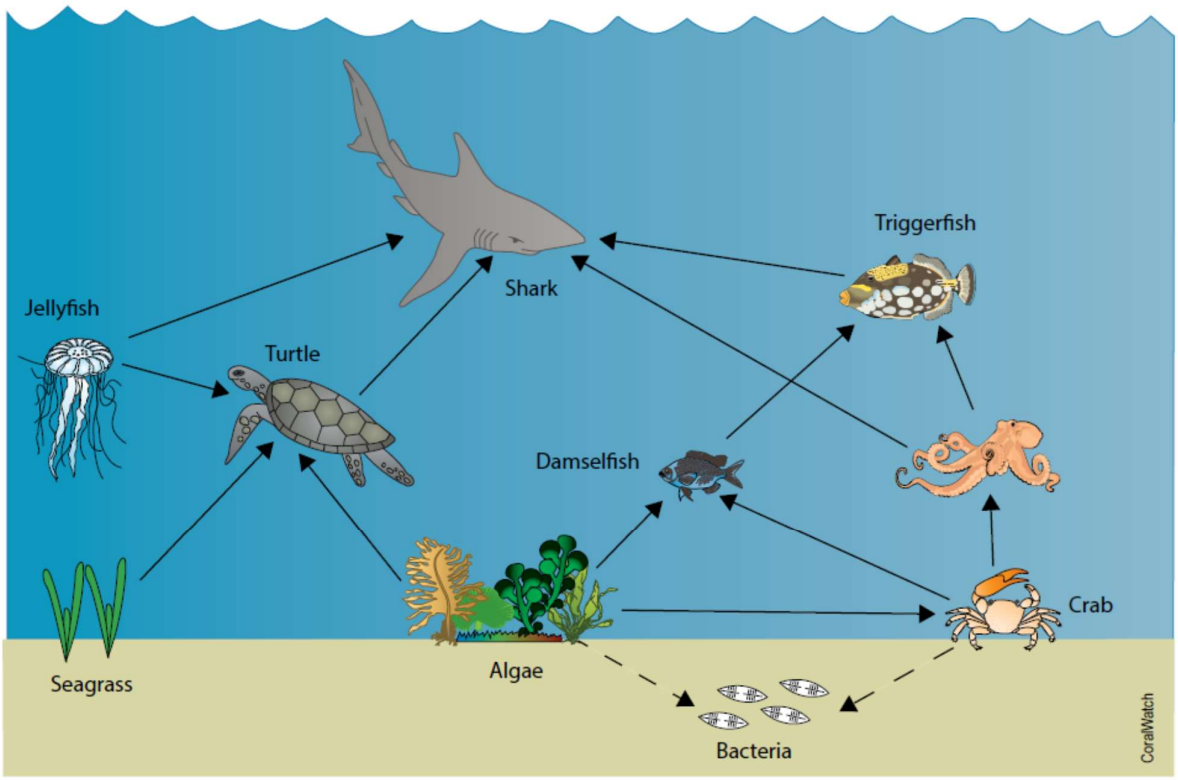
The Earth is sometimes called the Blue Planet. This is because 71 per cent of the entire planet is covered with water. Almost all of the water (96.5 per cent) on Earth is in the seas and ocean. Of all the water on the Planet, less than one percent (only 0.65%) is available as freshwater (in rivers, lakes, aquifers, streams, and a little in clouds). The remaining freshwater is frozen (in the polar ice caps and glaciers).

Here are some other interesting and important facts about the ocean:

1. Scientists (oceanographers) have identified five major *ocean basins*[21]: the Pacific, Atlantic, Indian, Southern (Antarctic) and Arctic Oceans. These ocean basins are all interconnected as one global ocean. The connections among the ocean basins allow seawater, matter and organisms to move from one basin to another.
2. The Pacific Ocean is the biggest of the ocean basins – it contains half of the total volume of the planet's oceans. The Pacific ocean covers an area of 161.8 million square kilometres: this is more than 30 per cent of the Earth's surface. The Pacific ocean basin is so big, it could cover all of the Earth's continents!
3. *Seas*[22] are much smaller than the ocean basins and are generally enclosed and separated from the ocean. Seas border the continents, as do the Mediterranean Sea, the South China Sea and the Caribbean Sea.
4. We are still learning about the ocean: scientists have only explored about 5 per cent of it.

5. Just as on land, the food chains in the ocean are based on the ability of some organisms to convert the sun's energy into food. Marine organisms such as seagrasses, sea weed and *phytoplankton*[23] are the plants of the ocean. All other life in the ocean depends on these primary producers of food. Phytoplankton in the sea is responsible for producing most of the oxygen in the atmosphere.

Figure 6: Example of a food web in the ocean



6. The ocean is the foundation of food security and livelihoods: For many Pacific island people, fish is their main source of protein. As populations grow, this demand is increasing.

7. The ocean is crucial to our climate. Over half of the oxygen that we breathe comes from hydroplankton. The ocean also absorbs about a quarter of our carbon dioxide emissions. Coastal mangroves store five times more carbon than forests do!

8. In the Pacific, other than fisheries and some tourism, we have not used the ocean for significant economic benefit at the national level. There is a lot of focus now on the blue economy globally, which is all about how we can use the ocean and its many resources sustainably.
   This can be a good thing for Pacific and other small islands as we try to find ways to bring income into our countries and grow our economies. At the same time, we need to think about HOW we will manage this use, so that we don't overuse and destroy the ocean. Scientists and economists are trying to put a financial value on the ocean and its resources. This is important especially when investors show an interest in Samoa's ocean territory. If we do not understand the value of our ocean assets, we are in danger of underselling it!

9. Some important ocean resources are:

Marine fisheries
Coral reefs
Mangroves
Seagrass

10. These resources provide products and services that can be valued in dollar terms. For example:

Commercial fisheries
Subsistence fisheries
Tourism
Cruise ship industry
Aquaculture

11. Mangroves , coral reefs and seagrasses provide other benefits such as coastal protection and carbon absorption. These benefits can also be costed in dollar terms.

12. Coral reefs have a special type of algae (called ***zooxanthellae***[24]) living in ***symbiosis***[25] within the corals. Like other algae, the zooxanthellae produce their own food through photosynthesis, which helps corals grow. (See also box on page 38.)

13. The quality of our ocean resources is declining fast. Some of the threats include:

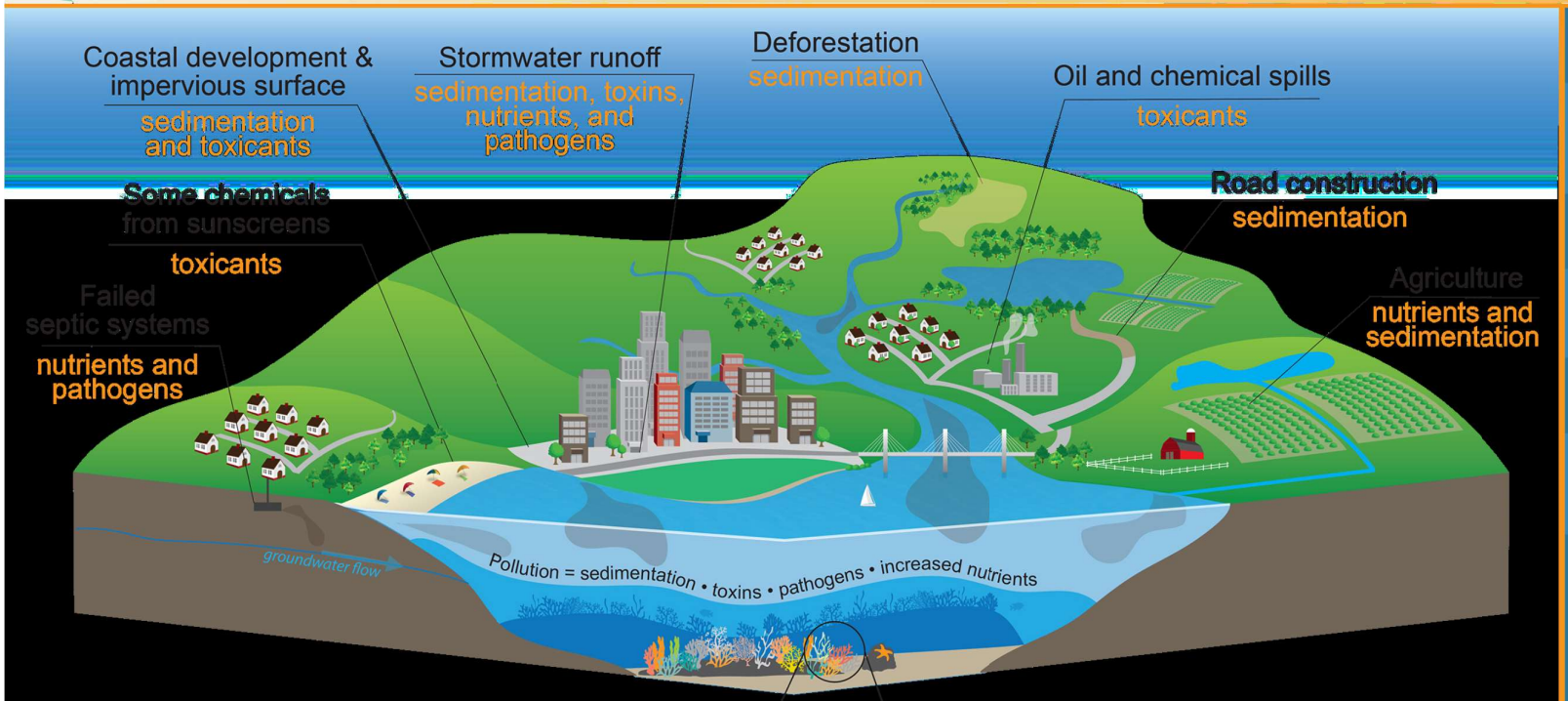
Overharvesting
Destructive fishing methods
Sea level rise
Extreme weather
Waste and pollution
Population increase

14. Each country that borders the ocean, has sovereign rights to use and safeguard a designated area of the ocean. This area is known as an Exclusive Economic Zone (EEZ). An international law known as the United Nations Convention on the Law of the Sea (UNCLOS) helps to determine national jurisdictions (borders).

15. We can take action at different levels (individually, locally at village level, nationally and even globally) to help protect the ocean – while benefiting from what it provides.

Figure 7 (overleaf): Threats to coral reefs / land-based sources of pollution (Source: NOAA)

THREATS TO CORAL REEFS LAND-BASED SOURCES OF POLLUTION



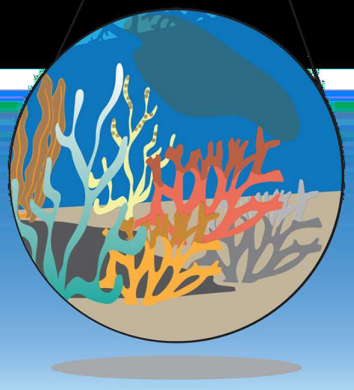
POLLUTION
sedimentation
toxicants
pathogens
increased nutrients

causes disease and mortality

disrupts ecological **functions**

changes dynamics and feeding behaviors

prevents coral growth and reproduction



As human population & development expands in coastal areas, the landscape is altered, increasing land-based sources of pollution & **THREATENING CORAL REEF HEALTH.**

HOW YOU CAN HELP

Apply fertilizers and pesticides sparingly.

Pick up after your pets.

Wash your car on your lawn.

Dispose of lawn clippings in a compost pile.

Harvest rooftop rain water through rain barrels or rain gardens.

DO NOT dump paint, oil, antifreeze, debris, or other household chemicals into street gutters or storm drains.

Clean up spilled brake fluid, oil, grease, and antifreeze.

Maintain proper septic system function with inspections and pumpouts every 3-5 years.

Seek shade between 10 a.m. and 2 p.m., use Ultraviolet Protection Factor (UPF) sunwear, and choose sunscreens with chemicals that don't harm marine life.

For more information, visit *oceanservice.noaa.gov/sunscreen*.

Facilitating this topic

4.1 Ocean facts

Ask everyone to think about their favourite marine creature. While they are thinking about it, tell them to take two deep breaths.

Say what your own favourite marine creature is and why. Then say that the first of two breath they took in, came from the sea. More than half of the oxygen you breathe comes from marine plants (phytoplankton, algae, seaweed) in the ocean!

Use a PowerPoint slide show or a map or globe of the world, and the background notes to introduce this topic. You do not have to cover everything in the notes: this part is mostly to get everyone engaged. Alternatively, you could ask participants to tell you what they know about the ocean.

Consider some points of interest:

- How much of the planet is covered by water? How much of this is ocean?
- What is size of the Pacific Ocean?
- Where is Samoa in the Pacific Ocean?
- What area of ocean belongs to Samoa? (120,000 km^2)
- Compare this to Samoa's total land mass (2,937 km^2)
- The Law of the Sea and Exclusive Economic Zones (EEZ) .

Explain that our activities on land are inextricably linked to the ocean (through the rivers and streams that flow into the sea as well as our transport systems). This is especially so for small islands such as Samoa where our land is only a small drop in the ocean! We will explore some of the different marine ecosystems and how they impact on our lives.

4.2 The water cycle, ocean currents and the weather

Introduce the water cycle and explain that the ocean plays a big role in the water cycle. Insert the words evaporation, condensation, precipitation into the diagram below and explain each term as you take everyone through the process.

Water from the ocean, rivers and lakes *evaporates*[26] (turns from liquid into gas) into the cooler layers of the atmosphere where *condenses*[27] to form clouds (gas turns into liquid) and finally, when the clouds get too heavy, it *precipitates*[28] (falls as rain) back onto the earth. Water that falls on land, leaches back into the soil and makes its way back down through rivers and streams into the ocean.

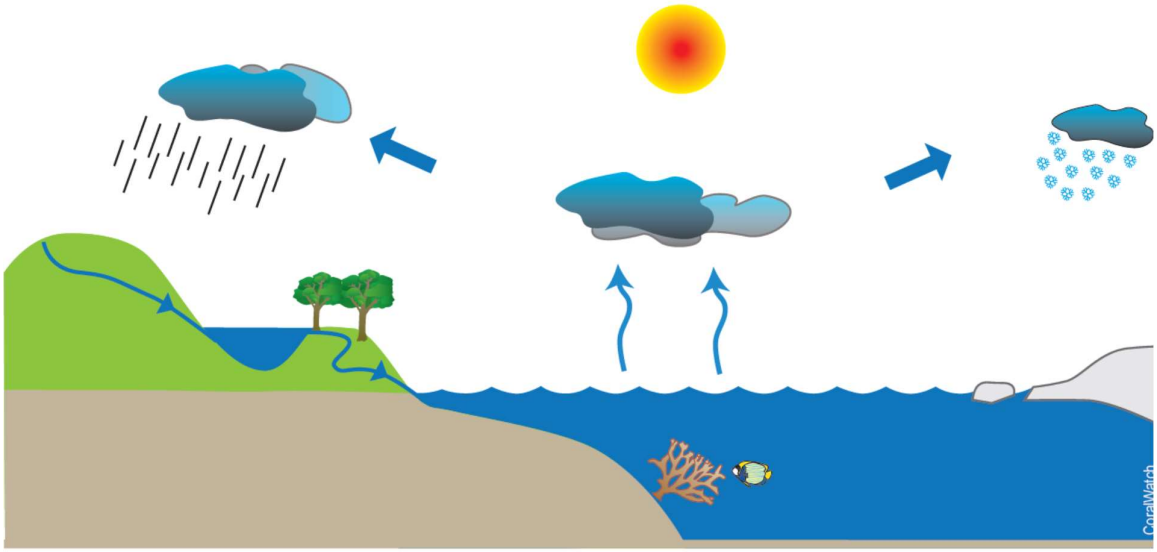


Figure 8: The water cycle

Ask:

- What makes water evaporate? (Heat, the sun)
- What would happen if the water gets very hot? (more rain, storms, cyclones)

Ocean water is constantly evaporating. This increases the temperature and humidity of the surrounding air to form rain and storms that are then carried by trade winds. Almost all rain that falls on land starts off in the ocean. The tropics are particularly rainy because heat absorption, and thus ocean evaporation, is highest in this area.

The ocean currents move water across the planet in particular directions. These currents can be warm or cold, depending on where they are coming from. They carry warm water from the equator to the North and South Poles and bring back cold water to the Tropics.

4.3 Marine biodiversity and food webs

Discuss the food web illustration (Figure 6), highlighting that plants and algae in the ocean help convert the sun's energy to food. These organisms are essential to marine life. Just like plants on land, marine plants and algae use up carbon dioxide to make food in the form of carbohydrates such as sugar and starch.

4.4 The coastal environment

The **coastal environment** is the area where the land meets the sea. Coastal environments include tidal wetlands, estuaries, bays, shallow near-shore waters, mangrove swamps, and in-shore reef systems. These areas are important feeding, breeding, nursery and resting areas for many marine species. Each of these ecosystems has its own special features and conditions and plays its own important role in nature.

For each of the ecosystems below, and depending on the situation/location of your community, discuss in more detail their uses and become familiar with the plant and animal species found there.

a. Wetlands
b. Estuaries
c. Mangroves

Some questions for consideration:

How would you describe the ecosystem?
What are some of the ways in which people use the area (refer to Topic 2).
Think about the different types of uses: subsistence, economic, traditional-cultural-spiritual, medicinal-health
Do different groups of people use this area more than others?

Facilitator tip: An important facilitator skill is listening. Remember that the participants have a lot of knowledge to share. Your task is to help bring this information out and process it.

4.5 Rivers and streams

Rivers and streams are not considered part of the marine or coastal environment. Yet they affect the marine and coastal environment because they link the land with the sea. They are like arteries taking nutrients and minerals from the land, depositing them in the sea and thereby providing nutrition for marine life. If we put waste and garbage such as plastics in the rivers, that too will flow to the sea. There it will be eaten by marine life, some of which we may eat ourselves.

Discuss this idea further and introduce the concept of ridge-to-reef thinking.

4.6 The coral reef and lagoon

If possible, take everyone out to a coral reef to explore what is there. If this is not possible, discuss using pictures and pieces of dead coral obtained from the beach. Do not encourage removal or live coral at any stage.

Discuss:

- What are coral reefs? Are they alive?
- Why are coral reefs useful to us? To marine life?

Additional information on corals (Source: CoralWatch)

Corals build hard structures that can be seen from the air and even from space. Corals are animals. They build reefs by secreting a skeleton which the animal uses to hold itself in place. When viewed close up, **tentacles** and a **mouth** are visible. Corals use these structures at night to capture **plankton** and feed on it. However, during the day something very different occurs. Corals often have a relationship with a special type of alga called **zooxanthellae** (pronounced 'zoo-zan-thel-ay'). The algae actually live inside cells in the inner cell layer of the coral. When exposed to sunlight, just like other algae, the zooxanthellae are able to produce their own food through photosynthesis. In fact, they are so good at producing their food that they have enough left over for the coral to share. In turn, the coral shares nutrients with the algae. This type of relationship is called a **symbiosis**. In a symbiotic relationship, the organisms live together with one another to the benefit of both. This relationship has happened over such a long period that many corals now cannot survive very long without their algal partners. When coral becomes stressed, it can kick out the algae living inside it. This process is known as **coral bleaching**. Bleaching is the term used, because the algae are often what give the coral their brown or green appearance and when gone the white skeleton is visible underneath. If corals cannot recover and get the algae back into their cells in time, they can die.

4.7 Beyond the reef

Show pictures of the deep sea, fishing boats, merchant ships, and so on. Ask what comes to mind when people think about the deep sea. What lives in it? How is the deep sea different to inshore and lagoon areas? How is the deep sea important to Samoa?

4.8 Putting a value on natural resources

Earlier in Topic 3 we looked at different ways in which the forest and plants help keep natural growth and nutrient cycles moving on the Planet. These natural services are sometimes referred to as ecosystem services.

Similarly, the ocean provides a huge range of ecosystem services, some of which we are only just beginning to understand.

What are these services and how do we put a value on them? For example, if a developer offered you money to develop your land for a hotel, how would you decide on the right price? It is important to understand that the natural environment provides many services that we may not have yet have placed a dollar value on. For example, how do we assess how much the mangroves are worth when deciding whether to cut them down? What is the future cost to the future of cutting down mangroves? How else do we depend on having healthy mangroves?

Discussing these types of questions can lead to a better understanding of what our natural resources are really worth. Even then, we might only be scratching the surface as we don't yet really understand the many services that the environment provides.

We can start from our own immediate understanding of the uses of the ocean to us. Then we can consider what would happen if some of the ecosystems were no longer functional For example, what is the economic damage done by storm surges where there are no mangroves? Use any data available from Samoa, or simply have a general discussion.

4.9 How humans affect the marine environment

Explain that human activity is changing the marine environment and in doing so may harm it in many ways.

Ask:

- What are some of the things we are doing that harm the marine environment? (Make a list.)
- Do any of these changes impact on our lives? How?
  What can we do about these changes?

Facilitator tips:

i. Some issues to consider: overfishing, sand mining, rubbish dumping, waste from toilets, use of pesticides and fertiliser, coastal development, tree felling and bush clearing close to the river, and so on
ii. Think human health, livelihoods, other species, national economy
iii. Possible solutions: organic farming, composting, tree planting, selective logging, planned development, applying modern and traditional scientific knowledge, setting up marine or forest reserves.

Topic 5: Living with climate change

Learning Outcomes

At the end of this session, you will be able to:

a. Explain in general terms what climate change is, and its implications at the local or village level
b. Describe what is meant by the term resilience
c. Explain how biodiversity conservation, resource management and forest restoration can help build community resilience
d. Discuss why this needs to be incorporated into planning (at all levels).

Background Information

The Earth's atmosphere contains a mixtures of gases, mainly nitrogen and oxygen. Additional minor gases such as carbon dioxide, methane and nitrous oxide play a major role in trapping the sun's energy as heat. This is important for keeping the planet warm: otherwise the sun's energy would just reflect off the Earth, leaving it very cold. Normally, the concentration or amount of these gases in the air would stay the same, as production and use are balanced by plants and other natural systems.

Humans are releasing far more carbon than nature can remove. Burning fossil fuels like coal, oil, and natural gas is releasing more and more carbon dioxide into the atmosphere. At the same time, all over the planet, we have removed large areas of forests and grassland, converting them for agriculture, homes, roads and factories.

The carbon (in the form of gases) has nowhere to go and so it stays in the atmosphere. As the concentration of carbon in the atmosphere increases, more and more of the sun's energy is trapped. This blanket of carbon is changing our climate and warming our planet.

The more carbon pollution in the air, the more the sun's energy gets trapped as heat.

So the Earth keeps getting hotter. In fact, the world has already gotten nearly 1°C warmer since 1880. That may not seem much, but already has major implications.

What does warmer temperatures mean for us?

The warming temperatures are melting the polar ice caps and the glaciers. This increase of melt water is causing sea levels around the world to rise. Since 1901, sea levels have risen nearly 0.20 metres; many Pacific islands and other low lying coastal areas are being affected. As the planet warms, the intensity of extreme weather events like hurricanes, floods and droughts increases. For example, in the Pacific islands region, we are getting cyclones that tend to be of higher categories (Categories 4 and 5) than before.

Forests and the ocean are important carbon sinks

Plants are able to use carbon dioxide from the atmosphere to make food, in the form of carbohydrates such as starch and sugars. Plants also use the carbon to make their own skeletal structures such as tree trunks, roots, branches, and so on. Therefore they store the carbon, extracting it and keeping it out of the atmosphere until the plant dies or is burnt.

Carbon dioxide from the atmosphere dissolves in the surface water of the ocean. Some of the carbon dioxide stays as dissolved gas, but much of it gets turned into other chemicals. Photosynthesis by phytoplankton in the sunlit surface waters the carbon dioxide into oxygen, similar way to plants on land. Many organisms use carbon dioxide to make calcium carbonate, a building material of shells and skeletons. Other chemical processes create calcium carbonate in the water. If carbon is used by biological and chemical processes, more carbon dioxide can enter the water from the atmosphere.

Facilitating this topic

5.1 The reality of climate change

Use a mixture of a PowerPoint slide show and discussion to explain the basics of climate and its implications for communities.

Key points should include:

- Increasing levels of carbon dioxide in the air are warming the Earth.
- Carbon dioxide is increasing because of burning of fossil fuels (gas, oil, petrol, diesel, coal) to drive cars and run factories and other industry.
- Intensive agriculture, mass destruction of forests and of bushland directly contribute to more carbon dioxide in the atmosphere.
- Mass destruction of forests and bushland also removes the trees that are responsible for removing carbon dioxide from the atmosphere
- Sea levels are rising as the glaciers on the polar ice caps melt and the warming of oceans causes expansion of water.
- Weather patterns are changing, with more intense extreme events.
- Traditional calendars and agriculture are changing.
- There are impacts on plants and animals, tuna and other important economic species, invasive species, health and disease
- Uncertainty: we cannot predict exactly what will happen in different locations.

5.2 Building community resilience

Ask, If someone says they are resilient, what would this mean to you? (Write down the words.) How does someone become resilient?

We can think about community resilience in a similar way.
Say that Samoa has experienced many natural disasters (which ones do people remember?) but each time our communities and our nation has recovered and built back.

Ask: :

- What do you think makes Samoa resilient as a nation?
- What makes a community resilient?
- What makes individuals resilient?

Facilitator tip: This is a good way to see if people have been able to link previous learning to the big picture!

Topic 6: Waste and pollution

Learning Outcomes

At the end of this session, you will be able to:

a. Discuss how waste and pollution endangers people's lives
b. Describe how different types of waste and pollution harm the environment and natural ecosystems
c. Explain why there is a strong focus on addressing plastic pollution
d. Categorise different types of waste by how they can be managed
e. Debate the different solutions available for waste management and discuss short term and long term solutions at local/village level and at national level.

Background Information

Humans create waste in everything we do. We are *consumption-driven,* meaning that we like to buy things. We want nice new clothing, bags, shoes, cars, washing machines, phones and TVs. Because many things are now cheaply available, when they break or stop working, we often throw them away instead of trying to repair them.

We also want *convenience:* we want everything instantly. So we have instant noodles in plastic packets and tinned foods. We go to a restaurant and don't make time to sit and eat, but get our food-to-go in throw-away plastic or Styrofoam containers. Or we find it too much trouble to boil our water to make it safe to drink so instead we buy water in plastic bottles made in a factory.

As a result of these choices, humans, no matter where we live, have filled the land and the ocean with our rubbish. All sorts of rubbish is thrown away every day: tyres, cars, electronic equipment, batteries, plastic bags, glass and plastic bottles, broken toys, paper and magazines. In towns and cities people even throw away their food waste and vegetable scraps, because they don't have pigs or chickens to feed.

We have been doing this for so long that we almost stopped seeing rubbish as a problem. We simply build bigger landfills or dump it further out into the ocean. We might think about getting rid of our rubbish by burning it. This leads to air pollution and cause respiratory problems, so this is not a good solution for most of us.

Why should we care about waste?

Here are a few reasons why waste is a growing problem.

- Our world has reached a level where it is no longer possible to sustain the amount of rubbish humans are producing. We simply do not have enough land to keep dumping rubbish on it.
- A lot of rubbish makes its way to the sea either through direct dumping in coastal areas or via rivers. Fish and birds often mistake the rubbish for food and eat it.

- On land, batteries and electronic devices leach out their chemicals which pollute our soil and water systems.
- Rubbish left unattended is a hazard: children and animals can get caught and injured in metal, fishing lines, nets and other rubbish both on land and in the rivers and sea.
- Rubbish is unhygienic: organic rubbish (food, etc.) and things like baby diapers breed rats, flies, cockroaches that can carry diseases harmful to humans.
- Rubbish is ugly. It does not look nice. If we are trying to promote Samoa as a beautiful paradise that tourists want to visit, then we need to get rid of rubbish.

It is tempting to blame others for our rubbish problems – especially the manufacturers and importers. These businesses are of course, key to waste reduction. Governments can help by making policies and legislation that discourage the import and sale of certain items in the country. But it is the consumers – the individual people – who decides what they will buy and how they will use their purchases.

Figure 9: How long does litter last? (Source: SCS)

When trying to address waste management, it is useful to understand two terms: *biodegradable* and *non-biodegradable*.

Something that is *biodegradable*[29] will be easily broken down by natural systems. For example, if you throw a banana peel into the garden, the worms, insects and bacteria in the soil will eat it; they break it down to release the minerals and nutrients from the banana peel back into the soil. All food and plant matter and some types of paper and cardboards are biodegradable.

Non-biodegradable[30] waste either never breaks down or will take so long, it makes no difference. Almost all our manufactured items (tin cans, glass bottles, plastic buckets, plastic bags, milk boxes, diapers) are non-biodegradable. They take up space in landfills or on the river edge or beachfront and can stay there for a very long time. Figure 9 (previous page) shows how long it takes for some common items to break down.

Our aim in waste management should be to try and reduce the amount of non-biodegradable waste that we create. We can do this in several ways:

> **Refuse** – say no to buying unnecessary products in the first place! Say no to plastic bags by using cardboard boxes, cloth bags and woven baskets. Say no to drinking fizzy drinks: your health will improve and you won't have plastic bottles to worry about.
>
> **Reduce** – buy fewer throw-away items, buy in bulk if you have large enough families (it's often cheaper too), buy things that will last longer or have warranties that allow them to be fixed without cost to you.
>
> **Reuse** – or **Repurpose** – you could keep empty milk cartons and use them to grow seedlings or for mixing paint in the primary school. Empty jam jars and coffee bottles can be used AGAIN for jams and chutneys. Some smart people are collecting glass wine and liquor bottles and turning them into elegant vases and glassware for sale.
>
> **Return** – some items can be returned to the manufacturer for a small reward. For example, Vailima and Taula beer bottles are returnable.
>
> **Recycle** –bigger countries with large factories and industry, use plastic, aluminium, tin, electronic items, to make new products. Countries like Samoa would need to send the material elsewhere to be recycled.
>
> **Rot** – fruit and vegetable waste can be separated from all other waste and fed to pigs and chickens; or allowed to rot so that the nutrients are released back into the soil in the form of compost.

Before we can start to talk about managing our waste, it helps to get an idea of what sort of waste we are actually creating. This is known as a *waste audit*[31]. Once you have the information from your audit, you can better plan with your community what to do about it.

A recent JICA study found that Samoans create 7,000 kilograms of plastic waste every year!

Facilitating this topic

6.1 What types of waste are we creating?

In this activity, we take a look at the waste we make ,what we do with it, and what makes waste harmful.

(i) Introduce the topic.
- What makes something rubbish or waste?
- Is rubbish a problem? Why, or why not?
- Who creates rubbish?

(ii) Place people in teams and use your community maps to give them different zones to work in. Their job is to identify the types and amounts of waste or rubbish they see. There will be some guess work, but this is OK. You may need to give people rubbish bags and gloves if you intend to go through the rubbish Consider health and safety issues before starting this activity.

Note: if the audit was the focus of a Green Livelihood project, a more in-depth study would be needed over a week or two, to get a better idea of quantities and waste types over time.

(iii) Back in the meeting room, write down each item on a different piece of paper: Post-it notes are ideal. Stick these up on a large sheet.

(iv) Ask everyone to put the items into groups according to how similar they are. Try not to guide them in this activity.

(v) Discuss the groups they have made. Are the groupings by use or by origin: where the rubbish has come from; by how harmful the waste is, or whether it is natural or manufactured? There is no correct answer – the activity aims to give the facilitator an idea of the participants' understanding of waste.

6.2 Dealing with our waste

Using the same collection of rubbish from section 6.1, discuss how different types of waste can be safely disposed of.

For each item or group of items, discuss options for disposal and why or why not the options are viable:

- throw it into the sea?
- burn it? (Why should we not burn plastic, cardboard and Styrofoam?)
- throw on the rubbish heap?
- rubbish collection? (By whom? What should be put in the bins?)

Depending on your group and various sensitivities, you may want to consider a special discussion on disposing baby diapers and sanitary items.

6.3 How can we create less waste?

No matter how well we manage our rubbish, we still create more every day. The only real solution is to reduce the amount of rubbish we are creating and throwing away. Use the background information to discuss different options for reducing waste.

What choices can we make as individuals towards reducing waste? Why do our individual choices matter?

Additional resources

What a Waste: an environmental comic book, SPREP 2001.

Where has all the rubbish gone? Talavai Leaoa and Sonny M. Sofe, SPREP 2002.

Rubbish is a Resource: A Waste Resource Kit for the Pacific Islands, SPREP 2006.

The Samoa Voyaging Society also has a good waste management song and dance.

Topic 7: Tools and approaches for protecting the environment

Learning Outcomes

At the end of this session, you will be able to:

a. Describe the laws and regulations relating to environmental management
b. Discuss the different resource management applications being used in Samoa

7.1 Samoa's environmental laws

Samoa has a large range of laws and regulations designed to help protect and sustain our environment, including:

- Laws on harvesting, size limits and seasons for threatened biodiversity such as turtles, shellfish, marine mammals, sharks, birds and bats
- Laws regulating the use of natural resources including the use of watersheds, forests, rivers, soil and aggregates
- Laws controlling developments such as roads, buildings and all forms of construction to ensure that environmental impacts are considered and minimised
- Laws regulating waste disposal, logging, water extraction and the introduction of species that may spread and become invasive

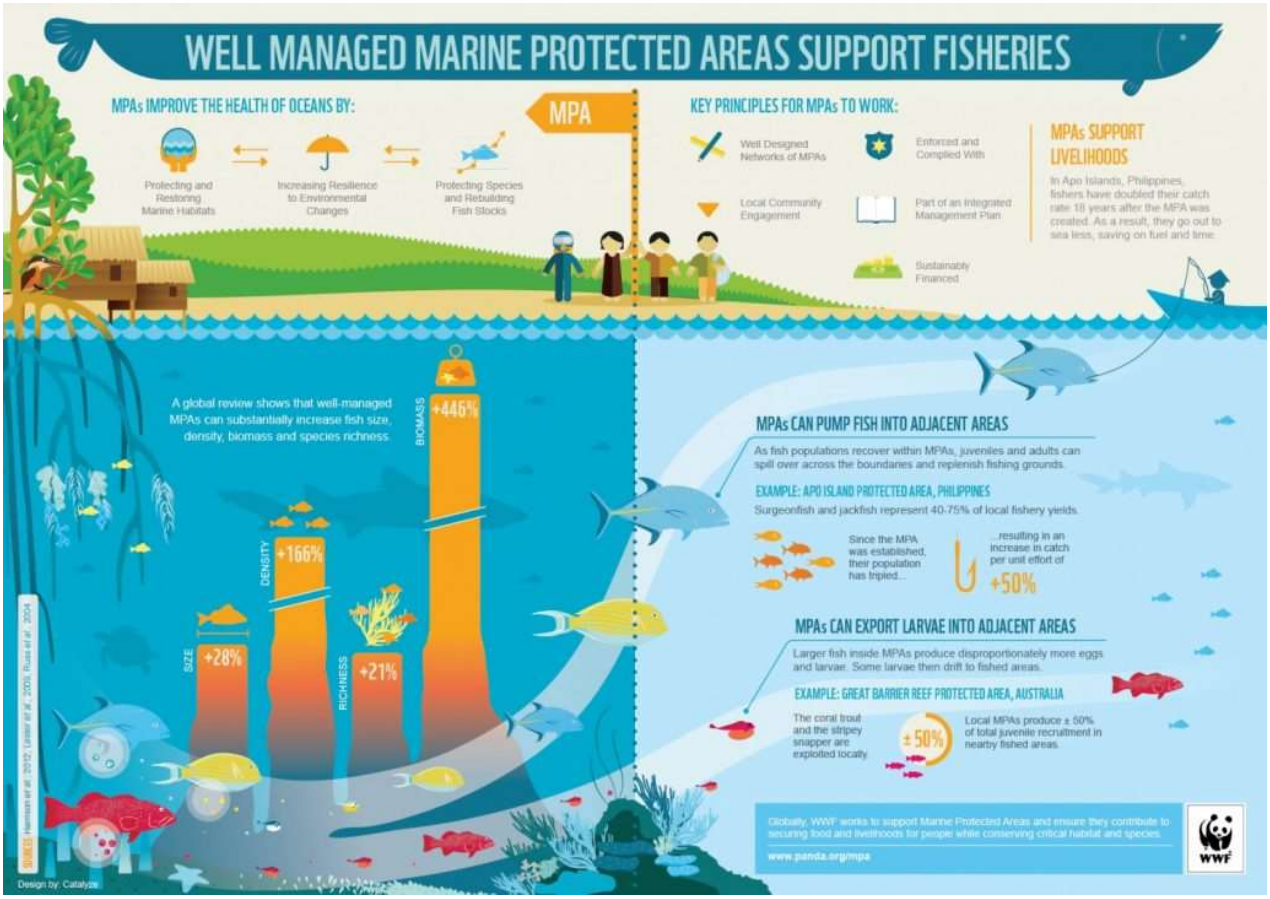
While there is much environmental law there is limited awareness of many of these laws and even less enforcement…You, as environmental champions, have an important role to play in informing others of the need for improved resource management

Some examples of the key laws, their requirements and who they are administered by is shown in the table below (See: Conservation laws in Samoa: Guidebook. By Jason Annandale and James Atherton 2013: MNRE/SPREP.)

Name of Law	**You Must Not**	**Adminis-tered by**
Protection of Wildlife Regulations 2004	• Harm any flying species endemic to Samoa (e.g. pigeons – including Manumea, fruit doves and flying foxes)	MNRE
Marine Wildlife Protection Regulations 2009	• Kill, injure or harm any marine mammal (e.g. dolphins and whales) in Samoan waters • Harass any marine mammal that is stranded or found in distress • Undertake any commercial harvest of turtles or sharks	MAF
Fisheries Act 1988 and Local Fisheries Regulations 1995	• Fish for any turtle, laumei (*Eretmochelys imbricata, Chelonia mydas*) whose shell is less than 700 mm along the longest part of the shell • Disturb the nest of any turtle • Take, use, sell or destroy the egg of any turtle • Fish for, possess, or sell giant clams known as faisua, which are less than 160 mm for *Tridacna maxima* and 200 mm for	MAF

	Tridacna squamosa: measured across the shell at its widest part – unless they are cultured clams • Fish for, possess or sell any lobster known as ulasami (*Panulirus* species) with a carapace (or shell) length of less than 80 mm • Fish for, possess or sell any slipper lobster known as papata (*Parribacus* species) with a length of less than 150 mm	
Lands, Surveys and Environment Act 1989 and Planning and Urban Management Act 2004	• Apply for development consent from PUMA for all proposed developments unless a sustainable management plan or regulations provide otherwise Developments needing consent include: ➢ manufacturing and storage: abattoir, food processing plants, storage facilities ➢ tourism and recreation: tourism operations, resorts, gyms, tennis courts ➢ health clinics, health centres ➢ transport, communications, energy and water utilities: plantation roads, water extraction plants, telecommunication towers, bus depots, power plants, petrol stations ➢ residential, commercial and retail operations or activities: land subdivisions, residential dwellings, markets, factories, shops, lumber mills, reclamations ➢ aggregate extraction: sand mining, concrete block making enterprises	MNRE and PUMA
Water Resources Management Act 2008	• Take water from the water resource of Samoa without a licence or permit except if you are entitled to a right of access • Discharge or allow any pollutant to be discharged into the water resource of Samoa	MNRE
Waste Management Act 2010	• Dispose of wastes from residential or commercial premises into a public waste receptacle that is not designated as being for the disposal of such wastes • Throw, deposit or discharge any waste in the vicinity of a roadway, vacant land or foreshore, or into any river, stream, creek, pool, well, lake, mangrove or the sea • Deposit or dump wastes at a place other than an approved landfill or waste dump so as to cause pollution to a public area or to land belonging to the Government or to another person • Burn waste that contains plastics or any hazardous waste or substance or which creates an unintentional Persistent Organic Pollutant	MNRE

Figure 10: How Marine Protected Areas can support fisheries (Source: WWF)



7.2 Carbon offset programmes

Putting a price on carbon pollution: We know what carbon pollution is costing us. More extreme weather disasters, higher healthcare bills, and an uncertain future for our children, to name but a few. All this while fossil fuel companies rake in billions of dollars.

So how do we turn this around? How do we make energy fair?

We start by pricing carbon pollution. Pricing pollution means putting a fair market price on greenhouse gas emissions so the companies or individuals responsible pay for the damage they do.

Pricing pollution isn't just about making polluters pay. It's also about encouraging everyone to make better energy choices and choose cleaner alternatives like wind and solar. Because when they do, they pollute less and they pay less.

Less pollution means less climate change. Which means we all win.

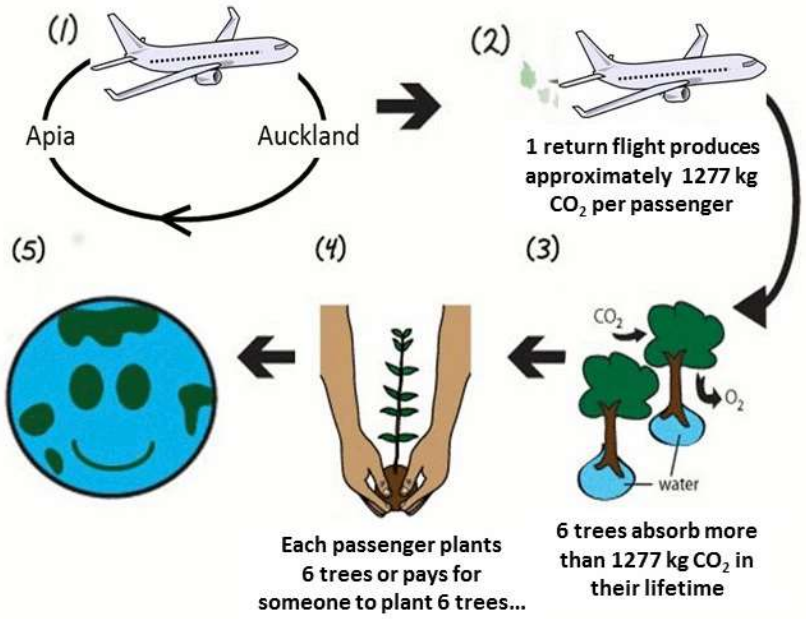
The Samoa Conservation Society (SCS) wants everyone to consider their carbon pollution and to try and offset it.

Every time we travel by car or plane, or even turn on the lights at home, we are contributing to the greenhouse gas emissions that cause climate change. The main greenhouse gas is carbon dioxide. Carbon dioxide emissions from airplanes have been increasing fast and can be calculated relatively easily via online carbon calculators. For example, a return trip Samoa-New Zealand produces around 1200 kilogram (kg) of carbon dioxide per passenger.

It is estimated that an average tree will absorb around 230kg of carbon in its lifetime. We can use that to calculate how many trees need to be planted to absorb the carbon produced by return flights. For Samoa-NZ it is around 6 trees, or around 8 trees for a return trip to Australia, and 50 trees for a return trip to Europe.

When you plant the trees or pay for someone to plant the trees for you, this is called a carbon offset. Such offsets are now a major tool used globally in the fight against climate change. SCS has helped many people offset their emissions and by 2020 had planted over 15,000 trees at Mt Vaea and at the O le Pupu Pue National Park already.

Figure 11: How the Samoa Conservation Society carbon offset project works (Source: SCS)



SECTION IV: BUILDING GREEN LIVELIHOODS

What do we mean by Green Livelihoods?

The goal for Green Livelihoods is to promote and ensure the uptake of Green Living skills and green knowledge amongst the youth of Samoa. So now one may ask, What does that *mean?*

Green Livelihoods is a simple concept: to live in a way that considers the livelihood of both our lives and the environment around us. It is as much a change to our *mindsets* as it is a change in our *behaviours* as well.

What is important to realize is that Green Livelihoods is not a new or novel concept in our rural communities. Conservation, mindfulness, and respectfulness of the environment has been inherent in the *fa'asamoa* (Samoan way) for generations. However, what needs to be addressed is: helping ourselves and our communities identify where we can improve this concept of Green Livelihoods, however small or large that change may be. And together, recognizing if these changes can also help benefit our communities with income/revenue. Below are some of the Green Livelihoods and green business opportunities that are prevalent around Samoa. They illustrate how we can help communities generate income for their families and villages by simply living Green Livelihoods.

The goal is always to put the people first by showing that our very own livelihoods and Green Livelihoods are one and the same.

Note that the list of options provided below is ever-growing: we are always looking to expand it. We also want to recognize those in Samoa who are models of Green Livelihoods and how they can be an asset for those looking to explore green business options.

Figure 12: Key concepts of the Green Livelihoods approach

What are our options?

1) **Organic Farming** – *Organic farming*[32] is a holistic method of farming that focuses on sustainable farming in harmony with the environment. This includes farming without pesticides, genetically modified organisms (GMOs), antibiotics, and growth hormones. Organic farming is common practice around Samoa and there is a large market for selling and buying local organic fruits and vegetables.

    a) **Matuaileoo Environmental Trust Inc. (METI)**
    METI is a registered Samoan organisation implementing permaculture projects while educating Samoans about the importance of nutrition. The Matuaileoo Environment Trust is a registered Samoan organisation currently implementing permaculture projects across Savaii and Upolu. METI has a long history in providing training and support through their Taiala (Life Skills Coaches), Assistant Trainers and their Central Training Team. METI is also passionate about promoting the Whole-Food Plant-Based diet and reversing the trend of obesity, diabetes and heart disease which has become extremely prevalent in Samoa. By holding weekly Healthy Living Seminars at its head office, METI is reaching out to the community and sharing the knowledge of nutrition. (*Source: METI Facebook Page*)
    METI is also a resource for communities to help establishing village farming co-ops; they can provide the Pasefika Label Organic Farming certification.

    b) **Mika Maiava** – Mika Maiava is a local organic farmer, keyhole gardener, and champion for the environment. He has a long history of speaking out and working against climate change. Mika specialises in organic farming and keyhole gardening as a sustainable means of living and income in Samoa. He frequently mentors young farmers, villages, and communities around Samoa and shows them how to properly set up their land or farm, and harvest their crops.

2) **Coconut Oil Production:** Coconut Oil production has a vast and growing market. Many villages and families around the country supply coconuts and coconut oil to organisations that source their materials locally, such as :
    a. **Women in Business Development (WIBD)**
    b. **Mailelani Bodycare**

    Both organizations also employ local men and women and WIBD promotes green skills-building and businesses relating to coconut oil production.

3) **Honey Production:** Groups such as the Samoa Women's Association of Growers (SWAG) and Beekeepers Association of Samoa Inc. (BASI) are working in the field of beekeeping and honey production. They also raise awareness of why and how conserving and growing the bee population in Samoa is important to our ecosystem; and how it can simultaneously provide green business opportunities.

a. **In Upolu: Samoa Women's Association of Growers (SWAG) Beekeepers Association of Samoa Inc.**
b. **In Savaii: Bee Mai Honey, Aopo Organics**

4) **Jams and chutneys:** Much like coconut oil production, companies and individuals alike are using the abundance of fruit and vegetables in their farms to create jams and chutneys as means of revenue. Learning to create jams and chutneys is a useful green skill. Individuals such as Beverly Arp help teach this skill to community members; organisations such as Fruit Pacifique employ community members to create these jams and chutneys for distribution.
    a. **Tuki**
    b. **Beverly Arp**

5) **Nature-Based Tourism:** Nature-based tourism or Eco-tourism is a growing niche market of tourism in Samoa. This is a means of using tourism as an awareness and preservation tool for our natural environment in Samoa. It is also a means of rewarding villages and communities for taking care and watching over their own natural resources that are tourism attractions (rivers, lakes, waterfalls, bird watching, kayaking tours, mangroves, etc.). Organisations such as Faleaseela Environmental Protection Society and Samoa Conservation Society are providing nature-based tourism training and guides, as well as further career opportunities for experienced tour guides.
    a. **Faleaseela Environmental Protection Society**
    b. **Lalotalie**
    c. **Steve Brown**
    d. **Samoa Conservation Society**
    e. **Samoa Rangers Association - Olsen Vaafusuaga & Kelly Knights**

6) **Biodegradable (Green) Plates, Bags, etc:** All around the markets and roadsides, more and more families are selling their bags, brooms, and even wood plates for a more eco-friendly alternative to containers, dishes, etc. Conservationist James Atherton is also the founder-owner of Samoa Green Products, a green-business that creates plates, bowls, and assorted cutlery out of palm leaves.
    a. **Samoa Green Products - James Atherton**

7) **Biogas production:** Biogas is a means to create natural gas from organic material such as animal waste, plants, and food waste. Livestock farmers are using waste from pigs and convert this into natural gas to power their stoves and ovens; the left-over waste is a potent natural fertilizer. Samoa Farmers Association, in partnership with MNRE, train farmers on how to attain, use and maintain biogas digesters. Other groups such as Youth with a Mission (YWAM) use biogas to fully operate all stoves and ovens on their campus.
    a. **Samoa Farmers Association**
    b. **Ministry of Natural Resources and Environment (MNRE)**
    c. **Youth with a Mission (YWAM) - Fono Fepulia'i**

8) **Marine Reserves, fisheries:** Villages and communities are establishing tilapia farms and marine reserves or marine protected areas. This can mitigate (counter-act) and alleviate (reduce) the pressure of inshore over-fishing in our waters. The Fishery Division at the Ministry of Agriculture and Fisheries (MAF), the United Nations Development Programme (UNDP), and other organisations are helping villages and communities establish these fisheries; they also help spread an awareness of catch limits and restrictions on inshore fishing.

   MAF and MNRE may also assist villages in establishing marine protected areas and marine reserves (e.g. Savaia Giant Clams, Palolo Deep, Moataa Mangrove Board walk).

9) **Waste Management & Recycling:** Proper waste disposal and waste management is a large major prevalent issue in Samoa: in Apia as well as in village communities. The Samoa Waste Recycling Management Association (SWRMA), led by Marina Keil, is working towards providing more awareness on how to properly dispose of waste in Samoa. This is done through information sessions, providing rubbish and recycling bins, upcycling, and even setting up a means to dispose of all electronic waste (e-waste) in Samoa. SWRMA can be contacted by villages, communities and businesses that are seeking more information and practical ways to alleviate their waste impact.
   a. **Samoa Waste Management & Recycling Association (Marina Keil)**

The above list of options is constantly growing and under revision, because there are countless initiatives and individuals. We welcome additions and invite our partners and trainers to expand this list as it develops. The main goal of compiling this list is to distribute it to the youth in our communities, so that it may be used for practical purposes.

Write your own additions here:

Green Minds = Green Behaviours

Samoa has always held a position of respect towards the environment. Whether it was fishing, farming, voyaging, or simply keeping their land tidy, our ancestors have humbly used our environment to bring us to where we are now. There was no need for conservation societies and government sectors because conservation, preservation, and respect for the environment was already inherent in Samoans. Using their own passion, ingenuity, and creativity, they carved out a *green lifestyle*: living in harmony with the environment was a natural by-product of the fa'asamoa. There was no need to call it a *Green Livelihood* then, because it simply was their *livelihood*!

Fast forward to today.

Take one look at some of the rivers and coastlines near Apia: there is a lot to be said about our current stance and state on how we treat and view our environment. On the flipside, it is also easy to see the advertisements and billboards on climate change and what part we can play as individuals to help mitigate our impact and reduce our footprint on the environment.

The solution is clear and the problem may well be clearer. But in order for a message to come across effectively, we cannot simply give a list of solutions and do's and don'ts. Real change comes from within—when we make an active effort to realise the current state our environment and natural resources are in. As trainers, you are the catalysts for change; you must approach our environment the way we approach our communities and villages as trainers: with *lotomaualalo*, with humility. The mindset starts from you!

As trainers who are preparing to package a message and mindset to our community, we must recognize that meaningful and lasting change comes from authenticity. Our *green* message may need to be repackaged to suit our audience. But in the end, our delivery should show that the key component of our message is not creating green businesses left, right and centre. It is acknowledging that we can actually build (or rebuild) our livelihoods around the concept of being *green citizens* — approaching our behaviours with mindfulness and intentionality: just like the way the ancestors of today's Samoans once lived.

If you have a *green* mindset, then your behaviours will naturally be *green* as well. Perhaps the concept of *Green Livelihoods* is just reminding ourselves that we are going back to the best of traditions in the fa'asamoa.

Annex I: Pledge Sheet

My Pledge to the Environment and Biodiversity

I promise that I will try to reduce my impacts

on_____

by trying to:

1. ----------

---

2. ----------

---

3. ----------

Signature_____

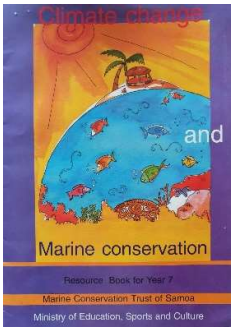
Printed name_____

Village_____

Phone Number(s)_____

Date_____

Annex II: Available resources



Climate Change and Marine Conservation: *resource book for Year 7.* Marine Conservation Trust of Samoa and Ministry of Education Sports and Culture. 2003.
Using clear and simple language, this little guide provides an overview of climate change and leads into practical actions for Samoa. The information on global action will need to be updated.

Annex III: Field trip/observational activity

[This is an optional activity and would replace some of the previous activities or could be adapted into a field trip activity]

We will do some research of our land environment through this activity. This activity involves being outside.

When it's your turn!

This activity is adaptable in the community. The important thing to remember is that you won't have all the answers. Your job is to inspire learning and ultimately, action. The best way to do this is to get out into your surroundings and start learning together in a guided manner.

Everyone has knowledge that they bring from their own experience. You will have access to parents, grandparents and other elders, who will also have knowledge and explanations about why things are done in certain ways. By enlisting scientific approaches that engage everyone, you will find that you are better placed to make well-informed decisions.

A. Exploring our land-based environment

Divide the maps that you have made into areas and assign each area to a team of 4−5 people.

Each team will visit your assigned area and conduct a study of the area. After that we will all get together and see what we have discovered.

Create a log sheet of your findings.

1. Start by taking a big picture look at your designated area. You might see things you had not previously noted on your maps! If you see anything of interest, put it on your map or note it for later.
2. Identify (or describe) the different plants (shrubs, trees) growing there.
3. Are there special uses for any of the plants? (write this on the record sheet. If you are not sure, keep notes so you can find out later.
4. If you see any birds or insects, snails in the area, note this down (or take a photo on your phone).
5. Is there a river, creek or other source of freshwater nearby? Note it on the map.
6. If there is a freshwater feature, check in and around it for signs of any living things and for vegetation (trees/shrubs) growing around it.

7. Are there any signs of areas that have been cleared or are lacking in trees and plants. Highlight these areas on your map.
8. Once you have completed your observations return to the group and share your findings by transferring your information onto the main floor map.

Questions

a. Were there any plants or other living things you could not identify? (Can you ask someone?)
b. Which plants do you know are useful? How are they useful? Should we plant more of them?
c. Are any of the plants causing problems in the village?
d. [if there was a freshwater system] is the water in the river/stream/creek clean? How do you know?

B. Why look after the birds? [field trip?]

Spend some time observing the birds around your area. A good time to do this is early in the morning or later in the evening.

a. Describe all the birds you see.
b. Note where there like to hang out (e.g. on the beach, in the taller trees, on the reef flat, etc
c. What are the birds eating? Are they each eating the same food?
d. What role do you think birds play in the forest?
e. Do you know of any birds that are eaten for food or used in any other way?

Annex IV: Facilitator reflections in the community

Since we know that every community will present a different setting, what can we observe and learn from the natural environment of the community pre and post training? The following questions could be useful for trainers to keep in mind for the community training:

- What natural resources are present in the environment and what is their current state?
- Are there any village or community efforts that are being done currently or have ceased?
- What do current community members or participants know about their environment?
- Are there currently any commonplace activities in the community that are damaging to the environment?
- Who can help partner and implement initiatives in the village or community post-training?

Write your own thoughts here:

Annex V: Glossary

This glossary puts together in one section the main concepts from the Training Guide and how they are discussed in it. The order follows that in which they are introduced in the main text: clicking on the endnote number in the electronic text should take you to the section where the terms is introduced. Note that many other definitions may be possible, but we feel these ones suit our target audience.

---

[1] *Facilitators*: People trained to guide others through an education process, using a participatory approach

[2] *Green livelihood options*: ways of making a living that is sustainable. Also known as sustainable living, low carbon lifestyles, sustainable communities

[3] *Sustainable***:** using only resources that can renew themselves, without depleting any; using the natural environment without degrading or harming it in the long term

[4] *Ecosystem*: the complex interactions of organisms and their environment, showing relationships and flows of nutrients and energy

[5] *Resilient*: able to bounce back to its original state after setbacks

[6] *Life-long learning*: the realisation that learning never stops after school or completing a course, but that these only point you in the way of further mental growth and development

[7] A*ctive learning approach*: "Active learning is an approach to instruction that involves actively engaging students with the course material through discussions, problem solving, case studies, role plays, and other methods." (Source: https://www.queensu.ca/teachingandlearning/modules/active/04_what_is_active_learning.html)

[8] *Resources*: Whatever is available for use in order to achieve an objective

[9] *Ecosystem*: the combination of different parts of the natural environment and the connections between the living and non-living things in the area

[10] *Habitat:* the environment where a living organism lives

[11] *Manumea*: the tooth-billed pigeon: a rare bird species that only occurs in Samoa

[12] *Forest*: a living, constantly changing community dominated by trees, with other plants (shrubs, ferns, grasses) and animals

[13] *Producers*: living organisms that convert the sun's energy into food through a process known as photosynthesis

[14] *Photosynthesis*: A chemical reaction process taking place in plants that converts the sun's energy into food for growth

[15] *Herbivores*: Animals that only eat plants to live and grow

[16] *Carnivores*: Animals that eat other animals for food

[17] *Consumers:* Organisms that eat rather than make food: they could be herbivores, carnivores or omnivores

[18] *Omnivores*: organisms that eat both plants and (parts of) other animals

[19] *Respiration*: The process in which bodies of living organisms take in oxygen and give out carbon dioxide

[20] *Endangered*: animal or plant species of which there aren't a lot left and which are in danger of dying out altogether

[21] *Ocean basins*: the Pacific, Atlantic, Indian, Southern (Antarctic) and Arctic Oceans; these basins are all interconnected as one global ocean

[22] *Seas*: Water bodies that are smaller than the ocean basins and are generally enclosed and separated from the ocean

[23] *Phytoplankton*: Microscopic plants, mostly consisting of a single cell, living in water. Phytoplankton in the sea is responsible for producing most of the oxygen in the atmosphere

[24] *Zooxanthellae*: a special type of alga living inside coral cells. Like other algae, the zooxanthellae produce their own food through photosynthesis, which helps corals grow

[25] *Symbiosis*: organisms living together with one another to the benefit of both

[26] *Evaporate*: turn from fluid into vapour

[27] *Condensate*: turn from vapour into fluid

[28] *Precipitate*: turn from water vapour into rain

[29] *Biodegradable*: items that are easily broken down by natural systems. All food and plant matter and some types of paper and cardboards are biodegradable

[30] *Non-biodegradable*: items that either never break down or will take so long that it makes no difference. Almost all manufactured items (tin cans, glass bottles, plastic buckets, plastic bags, milk boxes, diapers) are non-biodegradable

[31] *Waste audit*: investigate what sort of waste is being created in a certain spot or community. Use this information to plan for waste reduction

[32] *Organic farming*: a holistic method of farming that focuses on sustainable farming in harmony with the environment

[ENDS]

Write your own definitions here: