CLIMATE CHANGE & FOREST CARBON EDUCATION TOOLKIT

NAKAU

live & learn
ENVIRONMENTAL EDUCATION

Developed by:

Nakau and Live & Learn Environmental Education

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Level 2, Donkey Wheel House
673 Bourke St, Melbourne 3000
Australia
www.nakau.org

www.livelearn.org

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Written by: Robbie Henderson, Anjali Nelson and Sasha Kiessling
Contributors: Tamara Logan, Emily Findlay, Kate McFarlane, Hayley Michener, Alex McClean and Marian Reid.

Illustrations: Nicholas Pike and Nick Mattiske
Design: Designosaur Brand Studio

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CLIMATE CHANGE & FOREST CARBON EDUCATION TOOLKIT

CONTENTS

Introduction

This *Climate change and forest carbon education toolkit* was developed to support the full and effective participation of Western Pacific Indigenous communities in forest carbon projects. Information and activities in this toolkit are written for Pacific-based organisations who partner with Nakau and who are using the Nakau Methodology, but the toolkit is also valuable for any organisations who support Indigenous community participation in high-integrity carbon projects.

Forest carbon approaches offer Indigenous communities the opportunity to move away from logging and land-clearing towards community-owned projects that protect and restore forests and other ecosystems.

The Nakau Methodology supports people to generate income from their forests, while maintaining the social, environmental, cultural and other economic benefits forests provide. However, Nakau also acknowledges the obstacles to making community-owned forest carbon projects a reality and the risks some projects have when it comes to upholding Indigenous Peoples' rights.

Equitable outcomes for forest carbon projects can only be genuine when the people who own and depend on forests are effectively involved, and this toolkit is designed to give Indigenous customary landowners — and the wider community — the knowledge to participate in dialogue and decision-making about forest carbon projects, and to realise their land and carbon rights.

Concepts of climate change and forest carbon projects are complex, rapidly changing and often intangible. Modern science and market economics underpin how forest carbon projects are developed and framed and do not always account for different knowledge systems and less formal education. Inequitable access to this information can disrupt traditional governance and lead to an unfair share of benefits.

This toolkit equips local partners and community facilitators with step-by-step activities to present scientific and economic concepts of climate change and forest carbon. And it includes important guidelines on respecting Indigenous Peoples' rights to provide or withhold free, prior and informed consent (FPIC) — emphasising how true consultation must be measured by understanding and participation.

Education that enables and empowers Indigenous Peoples — and society generally — to participate in dialogue and decision-making about forest carbon projects is often absent, and this has caused a critical gap in readiness for participation in carbon markets. The carbon market policy agenda has been largely driven from the 'top down'; however, an effective and equitable outcome for forest carbon projects can only be a reality when the peoples who own and rely upon forests are effectively involved.

After participating in the activities in this toolkit, we hope many more Indigenous Peoples — customary landowners, women, community members, youth, chiefs and people with differing education levels and abilities — gain sufficient knowledge to truly participate in forest carbon projects. This could include local land-use planning, negotiating with a project developer or advocating on national carbon market policy.

Who is this toolkit for?

The toolkit is written for local Pacific partners, community facilitators and forest carbon project developers implementing community-owned forest carbon project methodologies. Activities can be led by one or more facilitators and are aimed at engaging Indigenous customary landowners and communities. With modification, this toolkit is also useful for project or policy developers seeking genuine community participation on other forest carbon models.

How is this toolkit organised?

Facilitator's guide

A brief review of the principles and skills for effective facilitation. These can be applied to almost every activity within the toolkit. It includes how to begin a workshop session, including making introductions, expectation-setting and making workshop agreements.

Section 1: Assessment of knowledge and learning outcomes

A self-assessment tool for measuring knowledge before and after the community has participated in learning activities in this toolkit. Prior assessment will help identify knowledge gaps and prior learning and understanding, allowing the facilitator to adapt the activities to participants' needs. Post-program assessment can assess the effectiveness of the program against the prior assessment baseline data. The post-program assessment may also provide a quantifiable record of participants' knowledge of climate change and forest carbon projects, and their capacity to undertake informed decision-making — valuable in demonstrating FPIC.

Section 2: Climate change

Provides participants with a basic understanding of what climate change is, the impacts, and some solutions to reduce and manage these impacts. It is an essential step in enabling people to engage in discussion about this critical issue and to understand concepts such as greenhouse gases and the carbon cycle, which are prerequisites for understanding forest carbon projects.

Section 3: An introduction to forest carbon projects

Provides community members with sufficient knowledge about forest carbon projects to participate in dialogue or consultations about forest carbon projects. Participants will build a new understanding using relevant existing local knowledge as a starting point, for example, knowledge of local markets. This section covers the key concepts of carbon markets, carbon credits, additionality, permanence, opportunity costs, rights and FPIC.

Section 4: Our land, our future, our decision

Engages participants in thinking about forest carbon projects in a more holistic way. Rather than starting with forest carbon projects and then looking for how they may lead to benefits for communities, this section encourages communities to investigate their core values, needs, wants and development aspirations. Economic and non-economic values of land receive equal attention. Participants will be better placed to consider if forest carbon projects are a good fit, and how these projects measure up to alternative economic opportunities.

Topics

Sections 2, 3 and 4 in the toolkit are divided into topics. With each topic you will find:

- Topic summary – a brief explanation of what the topic covers
- Learning outcomes – the main learning outcomes to be achieved by implementing activities in the topic
- Background reading – a short text written for the facilitator that introduces the concepts covered in the activities. The reading will prepare the facilitator for presenting activities and contains information that will be useful when answering questions. It is not designed to be written up for participants to copy or to be provided as a handout.

Activities

Activities provide step-by-step guidance to the facilitator on presenting information about the topic. They promote an engaging and participatory approach to teaching and learning.

Learning outcomes

Topics and activities are designed to achieve predetermined learning outcomes written from a learner's perspective. The effectiveness of the teaching and learning experiences can be measured by assessing whether participants can carry out the task identified in the learning outcome statements. Each learning outcome should be prefixed with the statement *'Participants can …'*.

Topics and activities are designed to achieve the following learning outcomes.

Climate change

Participants can …

2.1 Draw the greenhouse effect and explain how it warms the Earth's surface
2.2 Explain human-induced climate change — the enhanced greenhouse effect
2.3 Recognise the impacts of climate change at local and global levels
2.4 Identify the main global sources of greenhouse gas emissions
2.5 Describe the carbon cycle, including the role of forests in storing carbon
2.6 Identify actions that reduce greenhouse gas emissions — in particular, land management and the role of forests as carbon sinks

Introduction to forest carbon projects

Participants can …

3.1 Explain why someone would want to pay landowners to look after a forest
3.2 Describe what is being sold and what is being bought in forest carbon projects
3.3 Identify what factors affect the price of commodities sold in the marketplace
3.4 Explain what carbon credits are and how they are produced
3.5 Explain why an existing forest must have been under threat of deforestation or degradation before the project to make it eligible for a forest carbon project
3.6 Identify forests that cannot be used to generate carbon credits (for example, forests that are already protected, inaccessible or uneconomic for other uses)
3.7 Describe the opportunity costs (lost opportunities) from managing a forest for carbon credits
3.8 Explain how long a forest needs to be protected (for example, 50 years) to allow carbon credits to be produced and sold
3.9 Explain what would happen if forest used for a forest carbon projects continued to be deforested or degraded
3.10 Explain what activities may still occur in a forest managed for a carbon project (for example, tourism, gathering non-timber forest products and local building materials, forest management)
3.11 Describe the roles and responsibilities of various 'actors' and the process for development of a forest carbon project
3.12 Explain their right to give or withhold their free, prior and informed consent (FPIC) for developments on their land, including for forest carbon projects
3.13 Identify where to find more information, independent advice and support

Our land, our future, our decision

Participants can …

4.1 Identify existing values, attitudes and future aspirations for themselves, their families and their community

4.2 Recognise the positive and unintended effects of having increased access to money

4.3 Identify financial and non-financial benefits women and men want to receive from forests and broader community development

4.4 Identify the 'ecosystem services' provided by forests and understand the financial and non-financial benefits provided by these services

4.5 Recognise the effects of forest destruction or degradation (personally, locally and globally) and the different ways this impacts community members (men, women, youth, elderly, people with disabilities or non-landowners)

4.6 Identify land-use change in their community or region over a period of time

4.7 Recognise the drivers (root causes) of deforestation or degradation of forests in their community or region

4.8 Identify key land-use management options and recognise pros and cons, including opportunity costs, of each option

How to use this toolkit

Activities are designed for flexible delivery. They could be presented at a meeting, in a workshop or to just a small number of people. The sections, topics and activities can be delivered in the order they appear, or they can stand alone and be presented separately if this is more appropriate for the group's needs.

Facilitators are encouraged to consider participants' prior knowledge when deciding what order to present activities. The toolkit assumes participants have little knowledge before commencing the activities, but many later activities build on knowledge developed in earlier sessions. However, presenting a session in response to the needs and interest of participants — for example, to answer a specific community question — is an empowering and effective tool for learning.

Who makes up a community?

When using the term **community**, it is important to include everyone who makes up a community. Women, men, young people, people with disabilities, the elderly and any marginalised groups such as community members who are not customary landowners but who use the land.

Clarify what community means for your context and name all the groups to ensure everyone has a voice. Be clear about which groups you will seek to invite to your workshop, and what barriers they may face to participating.

For projects collaborating with the Nakau Programme, refer to your project level gender, disability and social inclusion (GEDSI) plan to clarify which social groups you need to engage and how you will do this.

Explore who specifically is participating within each group. For example, you may have women participating. But are they young, married, elderly, community leaders, women with disabilities or women from outside the landowning community? Look at how they participate during the workshop. Is their involvement token or are they or actively participating and listened to? How can you include them more? It will take time, but inclusion is important.

Activity guide

The activity guide below provides a snapshot of activities in the toolkit to help facilitators plan their workshops.

TIP: You do not need to follow every activity in this guide. Decide what activities your groups need based on existing knowledge and where your project is at in development.

	Name of activity	Summary	Suggested timing
Section 1: Assessment of knowledge and learning outcomes			
1.1	Group self-assessment	A participatory activity that measures people's understanding of the expected learning outcomes	20-40 minutes
Section 2: Climate change			
2.1	Explaining climate change and the greenhouse effect	A factual presentation explaining global warming and climate change, and the process of the greenhouse effect	30 minutes
2.2	The impacts of climate change: Case studies and personal stories	Participants will look at real-life stories about the consequences of the greenhouse effect and climate change	40 minutes
2.3a	Greenhouse gases and the carbon cycle: Presentation of the facts	Examines how greenhouse gases are contributing to the greenhouse effect and creating global warming. Covers the human sources of the most abundant greenhouse gas — carbon dioxide	30 minutes
2.3b	Factories and forests	A fun game demonstrating the carbon cycle and the imbalance of greenhouse gases being released compared with the amount of greenhouse gases being stored with a focus on forests	30 minutes
2.4	Responding to climate change	Strategies for mitigating and adapting to climate change, followed by a discussion on local opportunities for mitigation and adaptation	40 minutes
2.5	Film – *'Climate change: everyone's business'*	An animated film that summarises all content covered in the climate change training	20 minutes
Section 3: An introduction to forest carbon projects			
3.1a	Forest carbon project role-play — 'A new proposal'	A role-playing performance that provides an explanation of how a forest carbon project works	20 minutes
3.1b	Carbon for sale	Facilitator-led discussion using volunteers from the group designed to get participants thinking about what happens in the marketplace	30 minutes
3.2a	Hands-on carbon	Participants learn how carbon credits are produced under forest carbon projects. The use of a visual representation of baseline and project scenarios provides a tangible reference for a carbon credit. The concept of additionality is introduced	60 minutes
3.2b	Visualising forest change and additionality	Participants review how carbon credits are produced under forest carbon projects using a visual representation of baseline emissions and project scenarios	45 minutes
3.2c	Additionality	Reinforces the concept that a forest carbon project must be additional and introduces the opportunity costs of doing forest carbon projects	30 minutes
3.2d	Permanence	Participants examine what they can and cannot do within their forest if it is used for generating carbon credits	30 minutes
3.3	Process for establishing a forest carbon project	Participants consider the 'actors' and steps involved in developing a forest carbon project	30 minutes

3.4	Know your rights	Highlights Indigenous Peoples' rights to provide or withhold their free, prior and informed consent (FPIC) for forest carbon projects, and identifies sources for independent financial and legal advice	15 minutes
3.5a	Role-play finale	This role-play performance repeats Activity 3.1 and adds a final scene. It is presented as a summary of concepts already covered	20 minutes
3.5b	Film – *'Forest carbon for communities'*	An animated film that summarises all content covered in the introduction to forest carbon projects training[1]	20 minutes
Section 4: Our land, our future, our decision			
4.1a	What do we value?	Participants identify and compare personal, family and community values	40 minutes
4.1b	Aspirations and 'the money life'	Participants identify their aspirations for the future and reflect on the pros and cons of having increased access to money. Participants start to address the questions: 'How can money help us achieve our goals? How much money do we need? What are some unintended outcomes of money?'	40 minutes
4.2	Our 'free' forest goods and services	Participants calculate the financial value of what the forest provides for free	60 minutes
4.3a	Forest change and its drivers	Participants draw on local knowledge to examine land-use change in their community and identify common reasons for change, leading to a discussion about the impacts (positive and negative)	40 minutes
4.3b	Pros and cons of alternative land uses	Participants examine locally relevant land-use alternatives to identify pros and cons of forest carbon. This activity enables participants to draw on their past experiences and local knowledge about development alternatives	40 minutes

[1]Note: in this toolkit REDD+ is referred to as 'forest carbon projects'

Facilitator's GUIDE

This guide offers a brief review of the principles and skills for effective facilitation. These can be applied to almost every activity within the toolkit. It includes how to begin a workshop session, including making introductions, expectation-setting and making workshop agreements.

The tip of the arrow — why community facilitators are so important

The success of any community development project — including forest carbon projects — relies on the important work of community facilitators.

Think of the community facilitator role as the 'tip of the arrow' — the pointy end of the work. This is where the project developers connect with the community, and the success of a project is primarily dependent on good connections based on strong relationships and solid trust. Facilitators are responsible for building this connection.

It is at this connection point (the tip of the arrow) that information is shared — both ways. The sharper the tip of the arrow, the stronger the connection and better the flow of information. Think of key contacts in the community as being at the tip of an arrow that mirrors yours. They work back to their own hierarchies and village social and power structures.

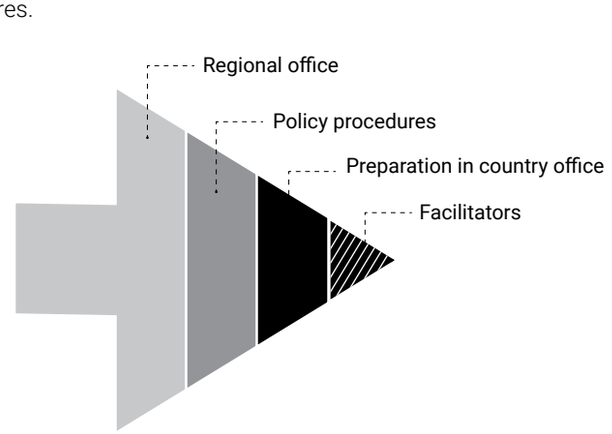


*Figure A: The 'tip of the arrow'. *This 'the tip of the arrow' concept is provided with permission from Little Fish*

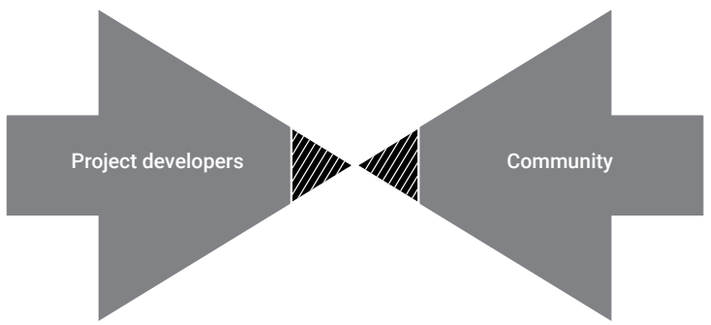


Figure B: Facilitators work at the interface between project developers and the community

Facilitators have central importance

- Information from project developers and partners is channelled through facilitators and communicated by them to community partners in a way that is meaningful and constructive.
- Most of the feedback from community goes through facilitators. This feedback is an essential part of being able to improve performance and achieve sustainable outcomes.
- Good facilitators are highly effective at interfacing global ideas with the equivalent local ideas. Certain skills are needed to achieve this successfully — for example, flexibly adapting and applying one set of processes effectively in a different cultural context. This flexibility and adaptability requires a deep level of understanding of those processes and good knowledge of local conditions.

Before you begin a workshop

- Have a complete understanding of the topic you will be facilitating. Read through the toolkit and research or ask for further clarification on anything you do not understand.
- Enter the workshop with the idea that facilitation is a two-way process — you are there to learn from the community as much as they are there to learn from you. It helps to let the community know what you are learning from them. It also balances power better when the community knows it has a teaching role to play.
- Think of fun and engaging ways to deliver the information. You have a better relationship with and understanding of the community and know what will work. If you come up with a creative addition to the toolkit, try it out and share your ideas with other facilitators.
- The role of the facilitator is to make things easy. This means providing enough guidance in the group to engage the participants in the discussion without creating certain responses through leading questions. A leading question is a question that subtly prompts the respondent to answer in a particular way. Ask open-ended questions that allow participants to respond honestly, not how they think the facilitator wants them to. Ask questions that require open and personalised responses.
- Localise the training. As much as possible, tie the discussion points to what is happening in the local community. This is a simple and effective way to keep participants engaged.
- Record what you learn and incorporate it into the topics and the way you deliver them — for example, the community may relate to examples based on their values. The role of a scribe (somebody to record all the stories of the workshop) is important. You can either select one person for the workshop or ask for several volunteers to help.
- Let the community know what you have learned from them too. By turning each section into a learning exercise for you as the facilitator, it helps addresses the power imbalance. Establishing workshop agreements can help with this too. Learning from the community about what agreements are important for a successful workshop builds agency from the start.

Training introduction

The point at which you commence this climate change and community-owned forest carbon training depends on the knowledge and experience of participants. As discussed in How to use this toolkit, as the facilitator, you will be best placed to determine which section or topic is best suited to your group. Before starting, spend a few moments getting to know your participants and introducing the training workshop outline.

Below is a rough guide on how to do this. Adapt it to suit your own style and approach.

Welcome

Welcome everybody to the training. You may need to do introductions if people do not know you (the facilitator) or each other.

Explain why you are running this training

For example, explain that people have been invited so that they can learn about climate change, the role of forests and forest carbon projects. This training will help communities make informed decisions about their forests and participation in forest carbon projects.

Outline the training structure

Go through the structure of the training, including breaks and activities.

Discuss your expectations about attendance and participation

Explain it is not compulsory for people to attend the training, and highlight the importance that all participants want to be there and have freely chosen to attend. With this said, emphasise that once they have committed to attend, participants are encouraged to fully engage and attend all sessions. Each session will build on previous sessions and an accumulated knowledge of the subject will provide the best understanding of climate change, the role of forests and forest carbon projects for participants.

Establish the workshop agreements

Explain that a key starting point for the workshop is to establish some agreements that you hope all participants will be guided by during the training. This is a good way to start engaging your group. Ask the participants to provide some agreements that can be adhered to during the training. Some examples are:

- Respect — everybody is allowed to participate and express their views.
- Speak up, join in, have a go and actively participate.
- Listen to what people say, do not talk over anyone.
- Start on time and stay until the end.
- Have breaks for food and drinks.

Answer questions

Ask the participants if there are any questions, and clarify any queries raised.

Managing expectations

Participants may have prior expectations about forest carbon projects, particularly with respect to money. Unrealistic expectations may come from rumours often instigated by inaccurate media reporting that inflates the value of carbon projects. It is entirely reasonable that communities should ask how much money they will get from forest carbon projects and when it will come.

We recommend these topics be introduced sensitively at an appropriate time so participants understand the bigger picture when discussing income. If these questions are raised early in the discussions, provide information as soon as possible and provide people with an explanation of the steps needed to work out the costs and benefits of a forest carbon project.

The amount of money available depends on several factors, some of which are quite uncertain. For this reason it is hard to provide a simple answer in the early stages of project development. Variables include population, number of credits produced, their value in the market and how benefits are shared. But if the requirements for certification of a forest carbon project are met, landowners can expect to receive financial benefits from their carbon credits.

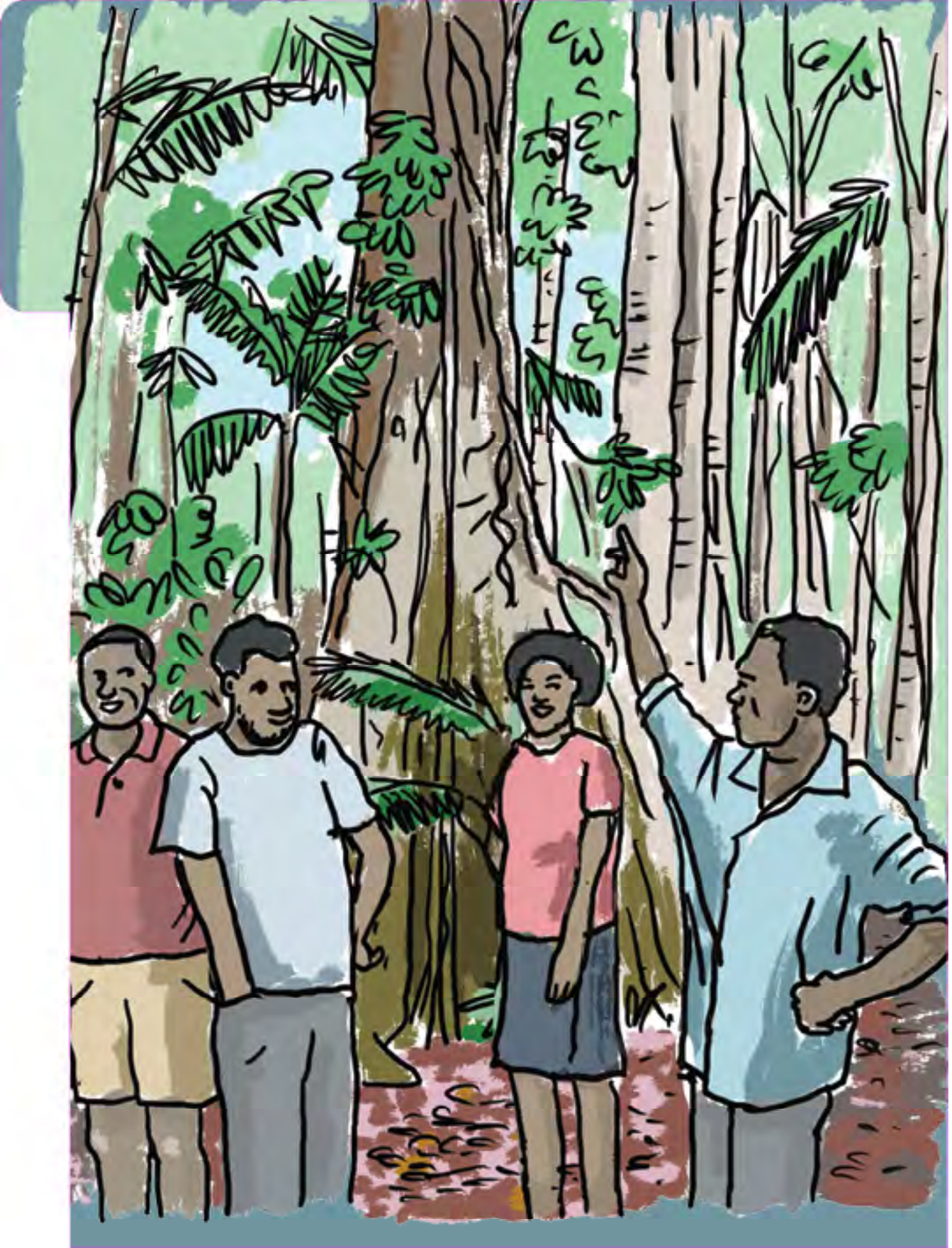
We recommend project owners (the landowner community) insist on a feasibility study, including a cost benefit analysis, to examine the possible financial benefits early in the process of project development. This should include various scenarios, such as the market price for carbon. This will provide a rough answer as to what is possible. We also recommend that before signing any project contract, the financial benefits and uncertainties are clearly documented and understood.

It is important to be open and honest with the community about money. For informed consent, the community need to know everything, including the negative aspects of forest carbon projects and the alternative options for making a living.

1

ASSESSMENT OF KNOWLEDGE AND LEARNING

SECTION **1**



SECTION

1

ASSESSMENT OF KNOWLEDGE AND LEARNING OUTCOMES

This section provides a self-assessment tool for measuring knowledge before and after participation in the learning activities presented in this toolkit.

Prior assessment will help identify knowledge gaps and prior learning and understanding, allowing the facilitator to adapt the activities to participants' needs. Post-program assessment can be used to assess the effectiveness of the program against the prior assessment baseline data. The post-program assessment may also provide a quantifiable record of participants' knowledge of climate change and forest carbon projects, and their capacity to undertake informed decision-making — valuable in demonstrating free, prior and informed consent (FPIC).

Activity 1.1
Group self-assessment

This is a participatory group activity that measures people's understanding of the key learning outcomes. It can be used to assess learning and knowledge across the whole toolkit or for individual sections. This activity is relevant for assessing FPIC. The findings may be recorded and then used to assess if the community members are sufficiently informed about the relevant topic; this would count as one aspect of their ability to make informed decisions about forest carbon project activities.

Suggested timing

20–40 minutes

Materials

- Self-assessment tool: Community readiness for forest carbon projects (p. 25–27), paper and/or electronic
- Chart (poster) paper
- Markers

Step-by-step guide

1. Before this session, prepare the templates for recording knowledge and learning outcomes (see Self-assessment tool: Community readiness for forest carbon projects, p. 25–27). Note: The assessment could also be conducted using a digital platform, such as Kobo.

2. Clearly explain the reason for conducting this activity:

   - If this activity is being presented before the workshop, tell participants the aim is to find out what sorts of things they need to learn about. If participants already know the topic well, there is no need to spend time learning more about it. But if participants don't know very much, this is where effort should be directed.
   - If this activity is presented at the end of the workshop, explain that the aim of the activity is to find out if the training was effective in building participants' understanding of the topics covered, and that the self-assessment will highlight if any concept or topic needs to be revised. It also allows the facilitators to learn about the effectiveness of the workshops.
   - If the data is to be collected and used for demonstrating FPIC, it is important this is clearly and transparently explained to participants. For example, the facilitator should explain how data will be recorded, how it will be presented, and who will look at it and for what purpose.
   - Explain that for the purpose of this activity, it is important to answer honestly. There is no shame in knowing or not knowing about a topic. Honesty is critical for the integrity of the findings.

3. Choose two points at opposite ends of the room or space in which the group is gathered. Ask participants to imagine a line between the two points. Explain that one side represents 'True, yes, definitely, 10-out-of-10, totally and 100%'. The other side represents 'False, no, absolutely not, no idea, zero, nothing', and the in-between area on the line represents 'Maybe, kind of, a bit, sometimes'.

4. Explain you will present some statements about key concepts that will be covered in the training. Each statement will begin with 'I can …'. If a participant feels as if the statement is true in their case, they should stand at the 'Yes' end of the room. If they feel like they don't know anything about the topic, then the statement is considered false and they should stand at the 'No' end. If they feel they know a little about the topic, they should stand somewhere in-between. If they don't feel they can answer, participants should be given the opportunity to opt out.

5. Before you introduce the first statement, ask participants to close their eyes until they have considered what has been said. Once they have listened to the statement, they should move to their answer position as quickly as possible and not look at anyone else. This helps participants to not follow others.

6. Example:
   Present the group with the statement: 'I can illustrate the greenhouse effect, and explain how it warms the Earth's surface.'

   Remind them: 'Before you move, think about your answer. If you are definitely familiar with the causes of climate change and could explain it to a friend, move to the right. If you definitely couldn't and have no idea move left, or position yourself in the right place somewhere in-between.' Reaffirm there is no shame in knowing or not knowing.

7. Using the recording template on p. 25–27 as a guide, record where people are standing in response to this statement. Rate their responses as 'good understanding' (green), 'low understanding' (red) or 'medium or some understanding' (amber).

8. If there are a few 'good understanding' participants, ask if they would briefly describe what causes climate change, and record their responses on chart (poster) paper. At this stage take care not to correct people. The purpose is to quantitatively assess what people already know or believe. This provides a quick check to ensure people who claim to understand really do understand the concept being assessed.

9. Repeat steps 6–8 for the remaining key learning statements (see p. 24), which are organised according to the topics in this toolkit. The statements are also listed on the recording template on p. 25–27, which has been provided as a guide. Facilitators may wish to modify these statements to suit their goals.

Facilitator's note: Alternative activities

1. Instead of asking participants to 'stand on a line', you could provide three buckets labelled 'good understanding', 'medium or some understanding' and 'not much understanding' (use local language if possible). Provide each participant with a stone and ask them to place their stone in the appropriate bucket. This method will assist you to quantify the results. If you use this technique you should also ensure nobody feels shame in answering truthfully and that people don't follow others.

2. Ask the questions as an individual survey to a representative sample of participants. This could be done using a digital application such as Kobo and can be an effective way of recording data to determine if participants can provide free, prior and informed consent.

Key learning statements to assess with participants

Prefix each statement with *'I can …'*.

TIP: Ask participants to explain the learning outcomes as though they were talking to a friend or a family member.

Climate change

- Draw the greenhouse effect and explain how it warms the Earth's surface
- Describe several possible impacts of climate change
- Explain the role forests play in climate change

Forest carbon projects

- Describe the main activity that could be undertaken on the land to create carbon credits*
- Explain what is meant by additionality*
- Explain who would buy carbon credits and why*
- Describe the opportunity costs (lost opportunities) from managing a forest for forest carbon*
- Explain activities that may still occur and those that probably could not occur in a forest managed for forest carbon*
- Explain what may happen if forest that is part of a forest carbon project was allowed to be deforested or degraded*
- Explain how long a forest carbon project may last*
- Explain where to find out more information and seek independent advice and support about forest carbon projects

Our land, our future, our decision

- Identify my values and future aspirations
- Explain the financial and non-financial benefits my community receives from the living forest
- Describe the positives and negatives of development alternatives*
- Describe activities that are likely to cause loss or degradation of forests
- Make informed decisions about if or how I would like my community to be involved in forest carbon projects*

*These questions are particularly relevant to assessing readiness to provide free, prior and informed consent (FPIC)

Self-assessment tool: Community readiness for forest carbon projects

Location/s: .....

Date: .....

Description of group (participants): .....

Facilitator/s: .....

Key learning statements 'I can …'	Self-assessment rating **Green:** Achieved **Amber:** Partially achieved **Red:** Not achieved							
	Green		Amber		Red		Total participation	
	Male	Female	Male	Female	Male	Female	Male	Female
Climate change								
Draw the greenhouse effect and explain how it warms the Earth's surface								
Describe several possible impacts of climate change								
Explain the role forests play in climate change								

Key learning statements 'I can ...'	Self-assessment rating **Green:** Achieved **Amber:** Partially achieved **Red:** Not achieved							
	Green		Amber		Red		Total participation	
	Male	Female	Male	Female	Male	Female	Male	Female
Forest carbon projects								
Describe the main activity that could be undertaken on the land to create carbon credits								
Describe the opportunity costs (lost opportunities) from managing a forest for forest carbon								
Explain activities that may still occur and those that probably could not occur in a forest managed for forest carbon								
Explain the consequences of allowing a forest carbon project area to be logged or cleared								
Explain how long a forest carbon project may last								
Explain where to find out more information and seek independent advice and support about forest carbon projects								

Key learning statements 'I can ...'	Self-assessment rating **Green:** Achieved **Amber:** Partially achieved **Red:** Not achieved							
	Green		Amber		Red		Total participation	
	Male	Female	Male	Female	Male	Female	Male	Female
Our land, our future, our decision								
Identify my values and future aspirations								
Explain the financial and non-financial benefits that my community receives from the living forest								
Describe activities that are likely to cause destruction or degradation of forests								
Describe the positives and negatives of development alternatives								
Make informed decisions about if or how I would like my community to be involved in forest carbon projects								

CLIMATE CHANGE

SECTION **2**

SECTION

2

CLIMATE CHANGE

Understanding climate change and the carbon cycle are prerequisites to being fully informed about forest carbon projects. Climate change is here, and the impacts felt daily, but many climate change concepts and causes remain intangible for people around the world. Greenhouse gases are invisible to our eyes, as is the heat they reflect. The analogy of a 'greenhouse' is not familiar to most people who live in tropical forests.

This section provides participants with a basic understanding of what climate change is, the impacts, and some solutions to reduce and manage these impacts. It is an essential step in enabling people to engage in discussion about this critical issue.

It is recommended the activities in this section be undertaken in workshop format. The section could be undertaken before or after *Section 4: Our land, our future, our decision.* However, this section is an essential prerequisite to *Section 3: An introduction to forest carbon projects*. If your training starts at this section, spend a few moments getting to know the participants.

Section 2 Learning outcomes

2.1 Draw the greenhouse effect and explain how it warms the Earth's surface

2.2 Explain human-induced climate change

2.3 Recognise the impacts of climate change at local and global levels

2.4 Identify the main global sources of greenhouse emissions

2.5 Describe the carbon cycle, including the role of forests in storing carbon

2.6 Identify actions that can reduce greenhouse gas emissions — in particular, land management and the role of forest as carbon sinks

Introduction to climate change

Background reading

Climate change is one of the biggest problems facing the world today. This section will look at the challenge of climate change — its cause, its effects, and some solutions to reduce the impacts.

What is climate change?

Climate change is any change in the climate that lasts for several decades or longer, including changes in temperature, rainfall or wind patterns. The climate change happening now is mainly caused by human activity. Humans are emitting excessive harmful pollution — greenhouse gases — into our atmosphere, trapping heat and warming the Earth's surface. This causes increasingly fast and significant changes to our weather and climate systems, which impact almost every aspect of our lives.

What are some impacts of climate change?

In coastal communities and mountainous regions, in big cities and remote villages — the impacts of climate change are felt by people and nature everywhere. In the Pacific Islands region, climate change might look like rising sea-levels, floods, droughts and increasing extreme weather like storms and cyclones. Climate change affects weather, plants, animals, oceans and rivers, changing the way these ecosystems interact with each other. It also changes the predictability of Earth's patterns, seasons and cycles.

What are the causes?

Population growth and industrialisation over the past 150 years has led to an increase in the use of fossil fuels and the logging of native forests. These activities are directly linked to a steady rise in carbon dioxide levels accumulating in the atmosphere and to a rise in global temperatures (global warming) and climate change.

The **digging up and burning of fossil fuels** — such as petrol, oil and gas — is the lead contributor to climate change. Fossil fuels are extracted from the ground and are primarily used in energy generation (electricity), industry and transport (fuel for cars, boats and planes).

The second biggest contributor to climate change is **deforestation and land-clearing**. Trees and plants absorb carbon from the air and store it in their roots and in the soil. When trees are cleared or burnt, much of the carbon they have stored is released back into the atmosphere as carbon dioxide.

More information is provided in 'Topic 2.3: What causes climate change?' (see p. 55).

What are some solutions to climate change?

Mitigation

Two significant approaches to mitigation are stopping the extraction and burning of fossil fuels and investing in nature-based solutions.

- **Stop using coal, oil or gas:** There are global efforts to stop the digging up and burning of fossil fuels, and to instead use renewable energy from the sun, wind and waves for the world's energy and transport.
- **Nature-based solutions:** Protecting and restoring ecosystems like forests is a nature-based solution to climate change. Trees naturally absorb carbon dioxide from the atmosphere. Protected forests mean carbon dioxide is safely stored in trees. Restoring forests means more carbon dioxide can be absorbed from the atmosphere.

Adaptation

Even if we were to stop all greenhouse gas emissions today, the impacts of climate change would continue to be felt for decades. We can prepare for the impacts of climate change by adapting to the changes in weather, seasons and environment.

- **Preparing for climate change impacts:** Growing alternative crops that can cope with a different climate, moving our houses away from flood zones or coastal areas, protecting infrastructure from rising sea-levels or securing reliable sources of drinking water are all adaptation.
- **Natured-based solutions:** Protecting forests and mangroves increase community climate resilience. They protect people and infrastructure from storms and floods and maintain a source of clean water, food and building materials for recovery.

More information on solutions is covered in 'Topic 2.4: Climate change: What can we do about it?' (see p. 68).

TOPIC

2.1

What is climate change?

Learning outcomes

'Participants can …'

2.1 Draw the greenhouse effect and explain how it warms the Earth's surface

2.2 Explain human-induced climate change — the enhanced greenhouse effect

Background reading

For more than 150 years, scientists have observed average temperatures around the world getting warmer. The United Nations Intergovernmental Panel on Climate Change (IPCC) — an international collaboration of more than 2,500 scientists and 270 lead authors reported in 2023 that:

- In the past 150 years the Earth has warmed by 1.1°C.
- From available data (in 2024), the years 2015–2022 were the hottest eight years since temperature records were first collected (in the 1850s).
- By the end of this century, temperatures could rise by between 1.5°C and 5.7°C.

The temperature increase of 1.1°C that has already occurred may not seem like a lot, but this seemingly small temperature rise has already transformed our weather system.

Scientists predict irreversible global effects will occur with a 2°C temperature increase, including melting ice sheets, rising sea-levels, extinction of coral reefs and widespread destruction of wildlife and habitat.

> *"Climate change is the change to our weather over a long, continued period of time."*

This warming of the Earth is known as **global warming** and this is the root cause of climate change. Global warming increases temperatures and has all sorts of effects on the rain and wind, the melting of ice and snow, the movement of ocean currents and the patterns of our seasons. Every country in the world is affected and humans, plants and animals all feel the impacts of a warming planet and a changing climate.

What is the difference between 'weather' and 'climate'?

Weather refers to whatever the conditions are over a short period of time (minutes, days, or weeks). It is the day-to-day changes of sunny, rainy or windy weather.

Climate describes the average weather over a longer period of time and the change in seasons for each place — for example, the Western Pacific Islands have a tropical climate with monsoon and dry seasons.

What is the difference between 'global warming' and 'climate change'?

global warming

FACT:
The world is getting warmer.

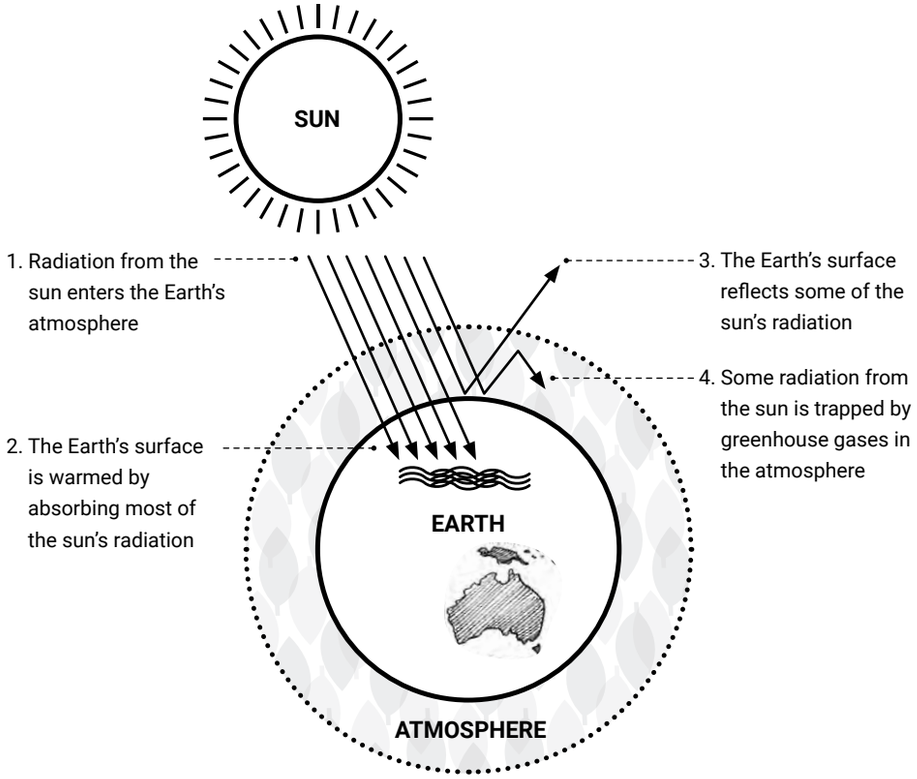
EFFECT:
The daily weather is hotter.

climate change

FACT:
Warmer weather causes changes to rain, ocean currents, wind, storms, snow.

EFFECT:
The climate is disrupted and the seasonal patterns are unpredictable.

2



Just as a glass greenhouse traps heat radiated by the sun, greenhouse gases in the Earth's atmosphere also trap the sun's heat.

Why is climate change happening? The enhanced greenhouse effect

While the weather can change in just a few hours, the climate usually takes hundreds, thousands or even millions of years to change. Yet the climate change we are experiencing now is happening very, very quickly — about 10 times faster than the Earth and its people, cities, towns, animals and nature can adapt to. This is because of the enhanced greenhouse effect.

The greenhouse effect

The greenhouse effect is a natural process that warms the Earth's surface and makes life on Earth possible. The sun's rays hit the Earth and are retained within our atmosphere by a layer of greenhouse gases, keeping the air warm — like the glass walls of a greenhouse that let the light through but trap the warmth inside.

The enhanced greenhouse effect

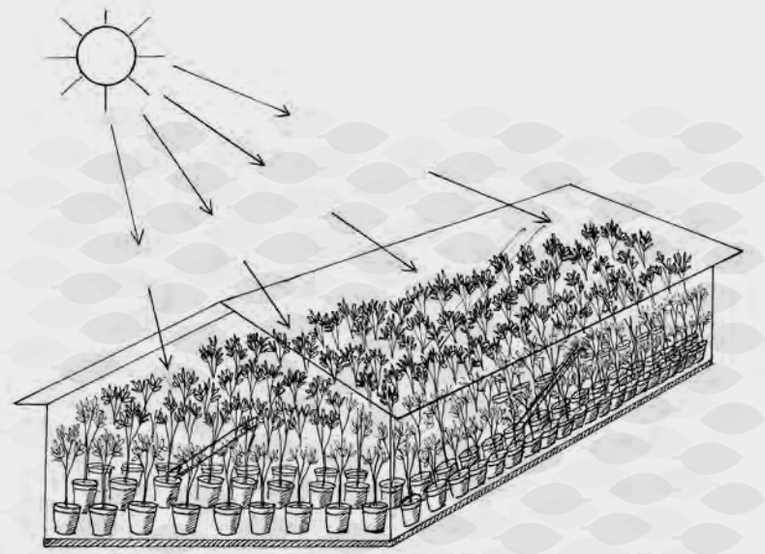
We need the naturally occurring greenhouse effect to sustain life. Without it, the Earth would be around 30°C colder than it is now.

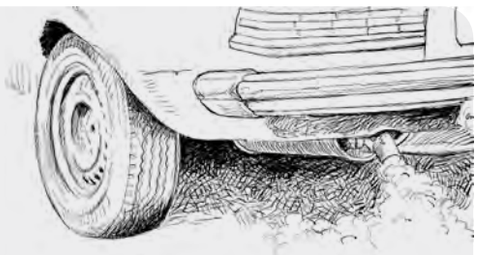
But human activities have added excess greenhouse gases that have accumulated in the atmosphere, blanketing the Earth. This is referred to as the enhanced greenhouse effect. With this excess of greenhouse gases in the atmosphere, too much heat gets trapped, causing the Earth to warm beyond its ideal, stable temperature.

The greenhouse effect

The greenhouse effect gets its name from the glass greenhouses that are used for growing plants. In the tropical Pacific region, greenhouses are not common; they are used more in colder places throughout the world.

In a greenhouse, sunlight enters through the glass walls and warms up the air trapped inside, so it stays warm inside even when it is cold outside. It is the same as when you park a car in the sun with all the windows up and no air-conditioner on — pretty soon it gets hot inside.





What are greenhouse gases?

A simple way of thinking of greenhouse gases is to think of the smoke, exhaust and fumes that come from things that burn coal, oil, petrol, gas, diesel or wood — for example, smoke from fires, exhaust fumes from cars, planes, motorbikes and boat engines, and fumes from factories, electricity generators and power stations.

More information on where greenhouses gases come from is covered in 'Topic 2.3: What causes climate change?' (see p. 55).

The atmosphere – Earth's blanket

The atmosphere is made up of gases and acts like a big blanket, keeping the air around the Earth warm. Without this layer of gases, the Earth would be too cold to live on. This is the **natural greenhouse effect**

Activity 2.1
Explaining climate change and the enhanced greenhouse effect

Activity summary

This activity is a factual presentation explaining global warming and climate change, and the process of the greenhouse effect.

Learning outcomes

'Participants can …'

2.1 Draw the greenhouse effect and explain how it warms the Earth's surface

2.2 Explain human-induced climate change — the enhanced greenhouse effect

Suggested timing

30 minutes

Materials

- Chart (poster) paper or blackboard
- 3 large paper arrows
- Markers or chalk
- Tape, pins or tack for sticking charts to the wall
- Dress material, calico, blankets, jumpers, etc.

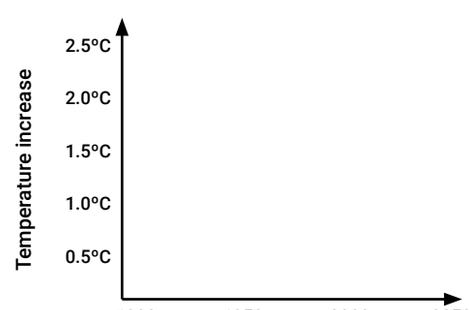
Step-by-step guide

Part 1: Climate change and the greenhouse effect — the facts

1. Explain to participants that this section will explore:

   - Global warming
   - Climate change
   - The greenhouse effect and the enhanced greenhouse effect

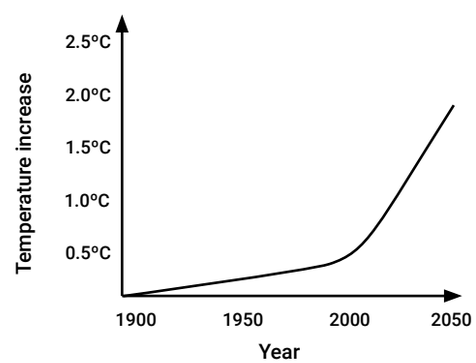
   Draw the following graph on a chart or blackboard.



2. Explain that the horizontal line along the bottom of the graph represents the passing of time, starting from the year 1900 up until the year 2050 in the future. It might be helpful to ask participants to mark their birth dates along the time axis. This will help people understand how to read the graph and will place the changes in the context of their lives.

3. Explain that the vertical line on the left-hand side of the graph represents increasing temperatures — with 'zero' at the bottom representing the 'average' or normal temperature. Anything above that is an increase in the average.

   Now draw the following:



4. Explain the sloping line shows that since 1900 the temperature slowly started increasing over time. This has been happening particularly fast since the end of World War II, when world population boomed and industrialisation increased.

5. Tell the group, 'Scientists who have been recording temperatures around the world have observed that 2010 to 2019 was the hottest decade ever recorded in world history' (note this was relevant in 2024, you might need to update this). Tell them, 'The facts are: the Earth is getting warmer. This warming of the Earth is global warming. The increased temperatures caused by global warming are more than just changes to our weather.'

6. Ask the group, 'What do you think will happen if the Earth's temperature keeps getting hotter and hotter?' (Some answers might include 'melting of ice and snow', 'sea-level rise' and 'extreme weather'.)

7. Tell the group, 'Global warming has all sorts of effects on the rain and winds, when monsoons (wet season) will come, the melting of ice and snow, the movement of ocean currents and the patterns of our seasons. The change to our weather over a long, continued period is called climate change.'

8. Now explain that we know the cause of these changes — it is something called the greenhouse effect. Ask the group, 'Does anyone know what a greenhouse is?' (If not, explain that in a greenhouse sunlight enters through the glass walls and warms up the air that is trapped inside, so it stays warm inside even when it is cold outside.)

9. Explain the greenhouse example is the same as what happens in a parked car on a hot day. Ask the group to imagine, 'You are sitting in a car. The car is parked in the full sun. It is a really hot day and all the car's windows are up and the air-conditioning is not on. You have been sitting there for a long time now. Tell me — how are you feeling? What is happening to the car? Is it hotter inside or outside of the car?

(Possible answers are: Feeling very hot! The sun is coming in through the windows and heating up the inside of the car. It is now hotter inside the car than out.) Explain that the same thing happens to the Earth in the 'greenhouse effect'.

If you park your car in the sun with all the windows up pretty soon it gets really hot inside. This is similar to the greenhouse effect.

10. Prepare a large piece of chart (poster) paper and three large cut-out paper arrows (to represent heat). First draw a picture of the Earth and the sun on the paper, with a dashed line around the Earth. Explain, 'This dashed line is like the glass windows on the car. It is called the atmosphere and it is made of greenhouse gases. We will learn more about these greenhouse gases later in the training.'

11. Explain what each arrow represents and ask volunteers to place them on the poster:

    Arrow 1: 'The sun's rays shine down onto the Earth.' Ask for a volunteer from the group to place the first arrow on the poster, showing the sun's rays (and heat) shining down onto the Earth.

    Arrow 2: 'The Earth absorbs some of that heat and the rest is reflected back out into the air.' Ask another volunteer to place the second arrow on the poster, showing the heat bouncing off the Earth into the atmosphere.

    Arrow 3: 'The atmosphere is a layer of gases that traps some of the heat, keeping a layer of warm air around the Earth, with the rest lost back out into space. The atmosphere acts like a big blanket, keeping the air around the Earth warm. Without this layer of gases, the Earth would be too cold to live on. This is the greenhouse effect. Ask a volunteer to place the third arrow on the poster, showing the heat bouncing back to the Earth, trapped under the layer of greenhouse gases. (See figure 2.1A.)

12. Explain that the layer of gases in the atmosphere has been growing thicker over the past 120 years because people have been creating lots of extra greenhouse gases. A simple way of thinking about greenhouse gases is smoke, exhaust or fumes created by people — especially from fires and the burning of coal, oil, petrol, gas and diesel. For example, smoke from forest fires, exhaust from cars, planes, motorbikes and boat engines, and the fumes from factories, electricity generators and power stations contain greenhouse gases. Show this by adding a thick blanket of smoke building up and thickening in the atmosphere. (See figure 2.1B.)

    Explain that because the gases in the atmosphere have been getting more concentrated due to the greenhouse gases created by humans, the 'blanket' around the Earth is getting thicker and the air around the Earth is getting hotter.

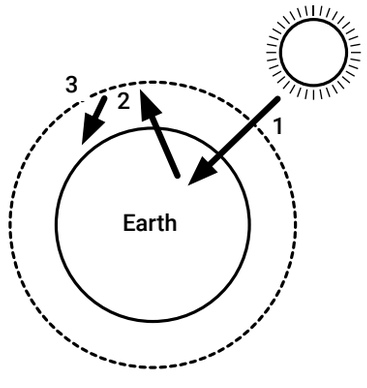


Figure 2.1A

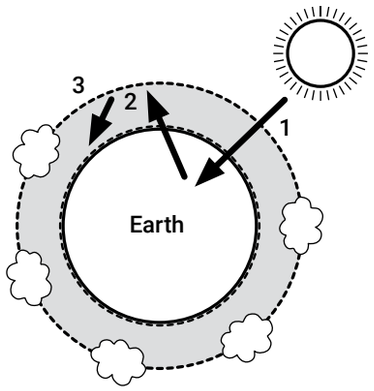


Figure 2.1B

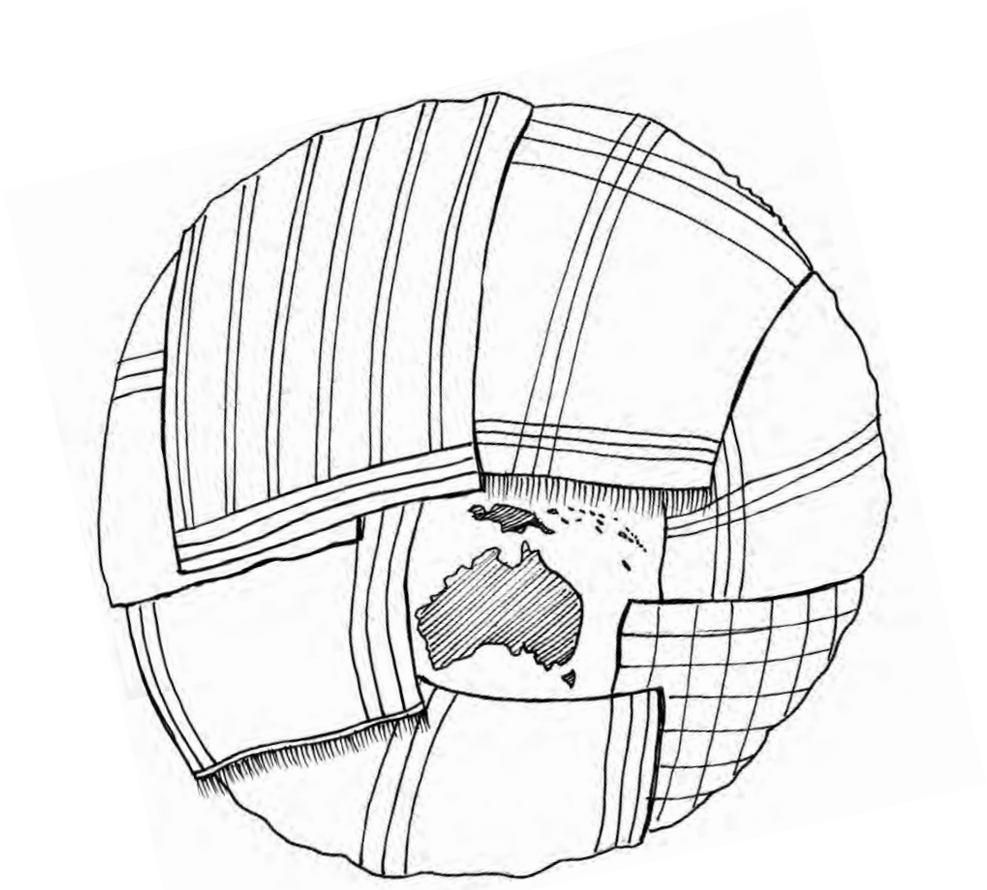
13. Explain that there is a direct connection between increases in greenhouse gases and increases in temperature. This is what is causing the enhanced greenhouse effect, which is warming our Earth above normal levels.

14. Ask the group if they have any questions about the greenhouse effect before moving on to the next part of the activity.

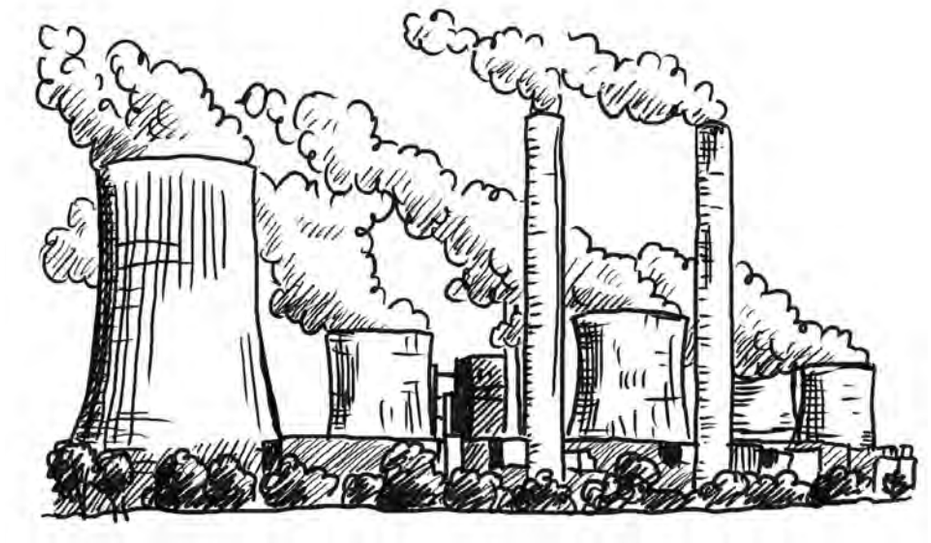
Part 2: The greenhouse effect — it's getting hot in here!

15. Explain to the group that in this activity we will see what happens to the Earth during the greenhouse effect.

16. Tell the group, 'You will see the Earth gets too hot by being smothered by a blanket of greenhouse gases. Remember, a simple way of thinking about greenhouse gases is to think of the smoke, exhaust or fumes created by people.



The atmosphere acts like a big blanket, keeping the air around the Earth warm.



Pollution from factories around the world contains dangerous greenhouse gases.

17. To begin the activity, you will need to hand out at least one blanket, sarong or jumper to each participant. Ask everyone to stand in a circle.

18. Ask for one volunteer to lie down on their back in the middle of the circle. They are the Earth.

19. The blankets/sarongs/jumpers represent a layer of greenhouse gas. Explain to the group that, for this game, they need to think up what kind of smoky exhaust or gas their blanket represents. Taking turns, each person should shout out 'car exhaust', 'forest fire smoke', 'cooking fire smoke', 'electricity generator fumes', etc. and then cover the Earth with their blanket.

20. After a few people have had a turn, ask the 'Earth' how they are feeling. Is it hot in there? Continue on until everyone has finished blanketing the Earth with their greenhouse gases.

21. Again, ask the 'Earth' how they are feeling? Is it hot under there?

Follow-up discussion questions and activity

Wrap up this section of the training by reviewing what has been covered. Tell the group:

While the natural greenhouse effect has kept our planet Earth warm enough to live on, human activities have produced an excess of greenhouse gases. The increased concentration of greenhouse gases in the atmosphere traps too much heat and creates a 'blanket of invisible smoke', which warms the Earth beyond its ideal temperature. As more people have been adding more greenhouse gases into the air, the Earth has become further smothered, trapping in more heat and making our planet heat up too much. This has led to problems with our climate and the environment. We will look more at the impacts of global warming in the following workshop topic.

A build-up of greenhouse gases in the atmosphere causes too much heat to get trapped, and the Earth warms beyond its ideal temperature. In a similar way, a build-up of blankets makes this person too hot.

TOPIC

2.2

Climate change:
How does it affect me?

Topic summary

In the previous workshop topic, we looked at the facts about global warming and how it is occurring through a process called the enhanced greenhouse effect. In this topic, we will look at the consequences of the enhanced greenhouse effect and climate change.

Learning outcomes

'Participants can …'

2.3 Recognise the impacts of climate change at local and global levels

Background reading

The world is getting warmer

The impacts of global warming and climate change are already felt around the world. Many of us have experienced the biggest cyclone, the driest dry season or the hottest month. Scientists predict global warming and extreme weather will continue and intensify because of climate change. This impacts where we live, our food supplies, livelihoods and lifestyles. Climate change impacts us now, and it will impact the lives of future generations.

Every country is affected by climate change, not just the countries that create the most emissions. When greenhouse gases are released into the air, they move about and spread themselves evenly throughout the atmosphere. Measurements of greenhouses gas concentrations are relatively even throughout the world — regardless of where the gases came from.

Impacts of climate change on the Pacific

The Western Pacific is one of the regions most impacted by climate change. It is the greatest threat to the security and wellbeing of Pacific people. Small islands and coastal communities heavily dependent on fishing, agriculture and natural resources for their livelihoods are vulnerable to severe weather conditions and are likely to be affected in the following ways.

Rising sea-levels

As global temperatures increase, ice and snow held in glaciers and polar ice sheets is melting, adding more water to the oceans. Ocean levels rose by 20cm globally between 1900 and 2018, and this has been accelerating each year, with a rate of 4mm each year over the past decade.

The increase in temperatures is not only melting ice sheets and glaciers, but also making the water in oceans expand — when the same amount of water takes up more space. And as waters rise, there is a greater risk of the edges of ice shelves and coastal glaciers collapsing into the sea, causing the sea to rise even further.

Rising sea-levels will inundate, waterlog and submerge coastal land — particularly during high tides — and completely swamp small, low-lying islands. Sea-level rise will also increase damage from large waves and storm surges.

Coastal areas are critical for the people, cultures and economies of the Pacific Islands. More than 80% of Pacific Islanders live in or around coastal areas. Sea-level rise has already impacted the region and there are concerns many island atolls will become unliveable, forcing communities off their land to higher, safer ground.

Sea-level rise will have a major impact on our lives in the Pacific with more than 80% of us living in or around coastal areas.

Extreme weather

Climate change increases and intensifies extreme weather such as severe storms, cyclones, floods, droughts and heatwaves. In some areas, this causes flash flooding, landslides, and damage to crops, buildings and roads. The Intergovernmental Panel on Climate Change (IPCC) predicts tropical cyclones (typhoons and hurricanes) will become less frequent but more intense, with larger wind speeds and heavier rain.

Many Pacific Island communities are low-lying and more vulnerable to the impacts of sea-level rise and storm surges. Cyclone Pam that struck Vanuatu was the second most intense tropical cyclone in the South Pacific Ocean. This Category 5 storm reached wind speeds of up to 300km, damaging up to 70% of houses and leaving 100,000 people homeless.

At the same time, the IPCC predicts it is very likely that extreme heat and heatwaves will become more frequent in the Pacific. Severe droughts will place forests at high risk from fires, dry up water sources and affect the production of food. This has already been observed in many areas since the 1970s.

IPCC observations and predictions of extreme weather

Change in climate	Likelihood that trend occurred in the late 20th century (typically post 1960)	Likelihood of a human contribution to change in climate	Likelihood of future change based on projections in 21st century
Warmer and fewer cold days and nights over most land areas	Very likely	Virtually certain	Virtually certain
Warmer and more frequent hot days and nights over most land areas	Very likely	Virtually certain (for hot nights)	Virtually certain
Warm spells/heat waves. Frequency increases over most land areas	Likely	Virtually certain	Virtually certain
Heavy rain. Frequency (or proportion of total rainfall from heavy falls) increases over most areas	Likely	Virtually certain	Virtually certain
Area affected by drought increases	Likely in many regions since 1970s	More likely than not	Likely
Intense tropical cyclone activity increases	Likely in many regions since 1970	More likely than not	Very likely
Increased incidence of extreme high sea-level (excludes tsunamis)	Likely	Very likely	Virtually certain

Source: IPCC, 2007

Water shortages

Fresh water will become less available in coming decades. Rising sea-levels, storm surges and increased drought all result in saltwater intrusion, which is when salt water enters underground freshwater supplies. This is a considerable risk in the Western Pacific Islands where people depend on shallow groundwater for drinking and to grow plants and food. Surface water will also be affected as climate change decreases the amount of water flowing through rivers and streams. Higher temperatures in the region will also increase the rate of evaporation of fresh water.

Erosion

Rising sea-levels, flooding and severe storms cause erosion of land — particularly on coastal and low-lying areas. Increased rainfall can wash away roads and buildings. When soil is eroded, land available for houses, crops and gardens is limited. When soil is washed away into the ocean, it can smother and kill coral reefs.

Biodiversity decline

It is predicted that about 20% of plant and animal species are at risk of extinction if global temperatures rise to 2°C. If temperatures rise by 4°C, 50% of tropical marine species could go extinct.

As species die out, other destructive, invasive species (such as weeds and pests) take their place in the ecosystem. In marine environments, seawater becomes warmer and more acidic, and more difficult for some species to live in. Ocean currents are also affected by climate change, disrupting the migration and food supplies for fish species. Warmer water temperature can kill coral, causing reefs to suffer and making it harder to catch fish. Silt from erosion and flooding rivers can smother marine life.

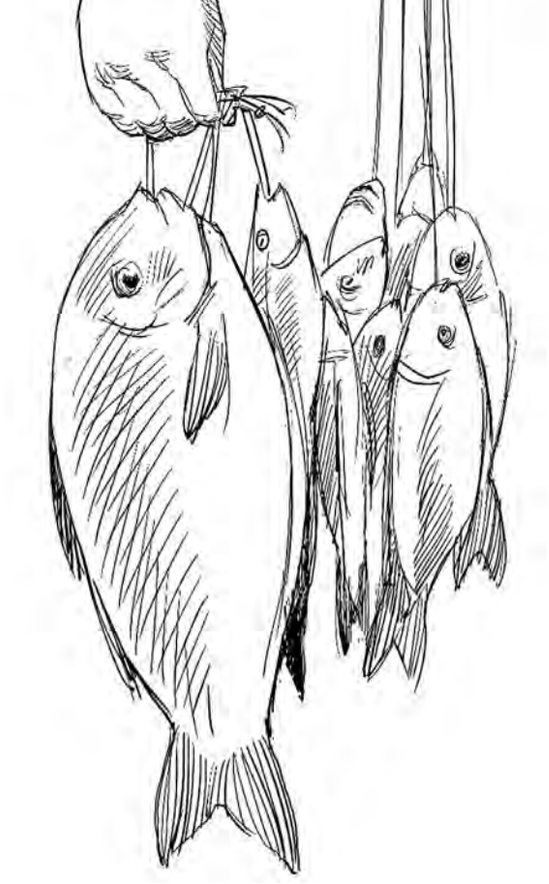
Thriving animals, birds and insects are critical for a healthy ecosystem.

Disrupted food production

Seasonal changes are now less predictable, impacting when crops are planted and harvested and disrupting the typical growing patterns. Tropical cyclones, flooding, saltwater intrusion, erosion and damage to coral reefs mean greater stresses on food production. Coral bleaching events are happening closer together, leaving less time for reefs to recover. Coral reefs are projected to decline by a further 70–90% at 1.5°C of global warming. Water stress from higher temperatures and evaporation also impacts food production.

Social and cultural effects

As coastal communities become inundated by rising sea-levels, they are forced to find new homes on higher ground. This may lead to overcrowding or even conflict. Diets and livelihoods also change due to diminishing freshwater supplies and negative effects on productive agricultural land and marine reef conditions. Social and cultural upheavals around identity, tradition and culture for affected communities are significant for many.



Climate change is affecting the distribution, abundance, breeding cycles and migrations of marine plants and animals that millions of people rely on for food and income.

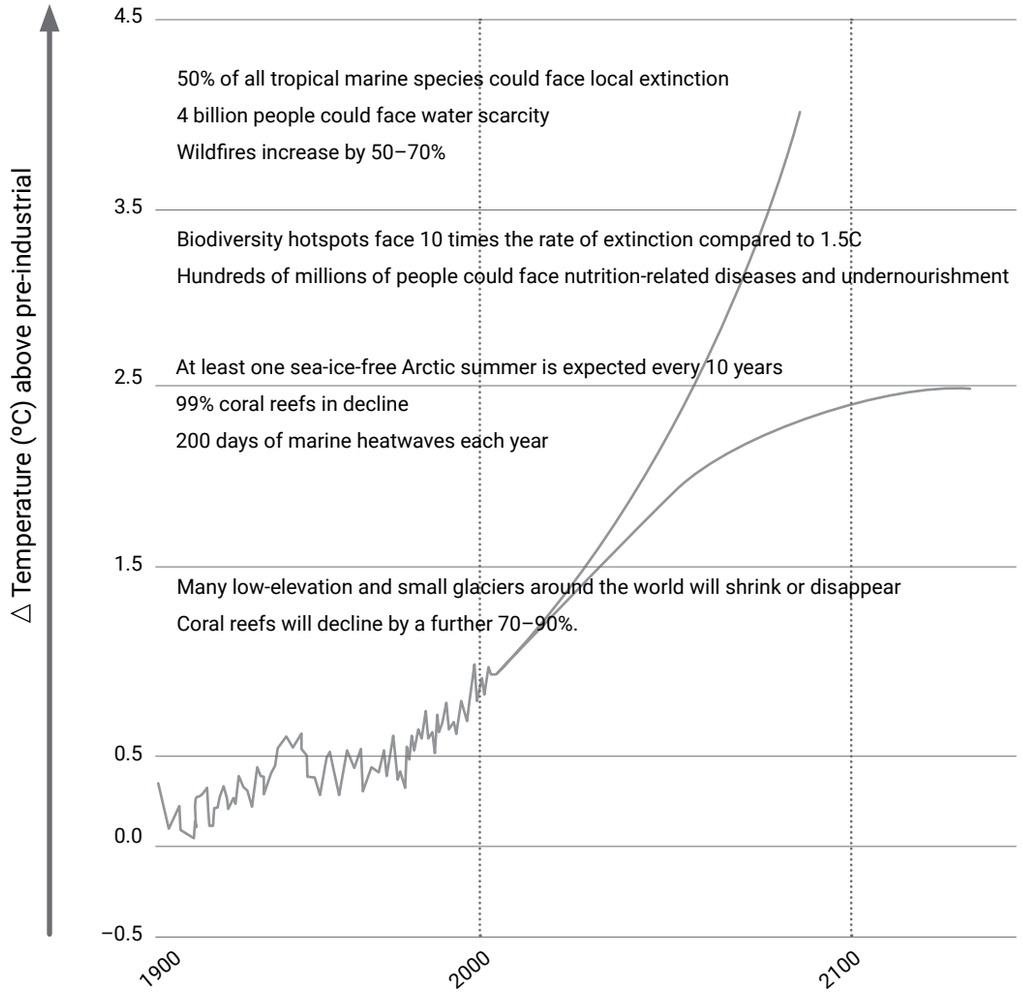
Climate change impacts have different effects on groups within communities too. Water and food shortages often increase the work of women and girls providing these essential needs, walking long distances to collect water or pulling out of school to help with gardening. People with disabilities and elderly people are often at greater risk during natural disasters and their aftermath. Economic hardship may cause men, women or whole families to leave a community and even move overseas looking for work, increasing the short-term hardship on those left at home.

Health issues

Rising temperatures and floods increase waterborne and vector-borne (rat, mosquito or fly) diseases such as cholera, typhoid, malaria and dengue. Climate change also presents mental health challenges from loss of livelihood and culture, and from upheaval and trauma from extreme weather events.

Future development of Pacific Islands

The impacts of climate change will affect the future development of Pacific Islands by affecting the growth of industries such as agriculture and tourism. The effects of climate change on tourism will probably include loss of beaches, degradation of the coastal ecosystems, saltwater intrusion and damage to infrastructure.



Source IPCC, 2007 (see IPCC 2023 for updated supporting information)

Impacts of climate change on ecosystems.

Activity 2.2
The impacts of climate change: Case studies and personal stories

Activity summary
Participants will look at real-life stories about the consequences of the enhanced greenhouse effect and climate change.

Learning outcomes
'Participants can …'

2.3 Recognise the impacts of climate change at local and global levels

Suggested timing
40 minutes

Materials
- Chart (poster) paper
- Markers
- Tape, pins or tack for sticking posters to the wall

Step-by-step guide
1. Explain to participants, 'Now that we have looked at what the enhanced greenhouse effect and climate change is, we will start to think about what this means for us'. Ask everyone to sit comfortably for the next few minutes as you read aloud to them the following true stories from people living in the Western Pacific Islands, as they describe how their lives have already been affected by climate change.

Case Study

1. Obed Mono, Kaonasugu Village, Makira, Solomon Islands

In the last 10 years, my village in Makira has experienced changes. We have started to realise our weather conditions seem unpredictable. Now we get abnormal rainfall throughout the year, and it gets unusually dry and hot during dry season. During the dry season our streams go dry and it is difficult to collect water for drinking and washing. The changes in weather conditions have impacted the normal seasons for planting and harvesting our yam and pana, and have produced low-yield crops. The sea tides are not normal. The high tide goes into the village and destroys our coconut plantations. My community does not know what has caused these changes and has no committee to plan and address it. The coastal people started to move inland to their registered block of land, which was allocated for each family by the chief in the past.

Case Study

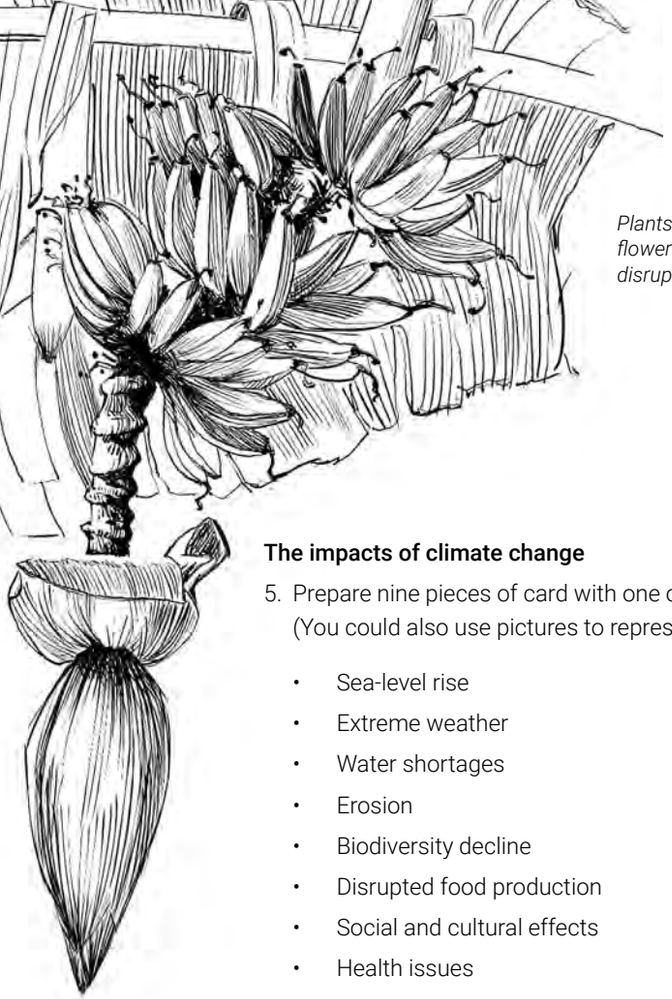
2. Susan Kile, Zuzuao Village, Isabel, Solomon Islands

I used to live in Baolo village, about a 20 minute-walk from Zuzuao. The sea-level started rising when I was 10 years old. When I was 15, I noticed that the coconut trees were being washed away. The sea-level rose up on three sides of the village, flooding everything. Because of the sea-level rising, we decided to move from Baolo. We started building a new house in Zuzuao village in 1997. It took time to build and we only moved into the new house in 2003. There was no support for us to move, we paid for everything ourselves. There is another tribe still living back at Baolo — they do not have any other land to build new houses. Women who are married to the other tribe had to stay in Baolo. My relatives find it hard to build a new house at Zuzuao. We tried to keep trees near the shore and close to rivers standing, and not cut down mangroves. In 2008 we built a stone wall in front of our new house in Zuzuao to stop the sea-level rise. We are worried we might need to move from our new home one day because of sea-level rise. We can help ourselves by carrying stones from the hills or the sea to build sea walls, but we need help to buy a wire net to hold more stones.

2. The case studies show us that some people have started to notice changes in the environment. In the next part of the activity, each participant will be asked to think about their own story and if they have noticed anything different in their environment since their childhood, or from their parents' and grandparents' time.

3. Ask participants to form small groups to discuss the following questions for 15 minutes: 'Is the environment any different now from what it used to be in your parents' and grandparents' times? If so — how?'. You can prompt participants to think about the weather, the seasons, the ocean, the water in rivers, groundwater, the rainfall, the temperatures, the winds — anything.

4. After 15 minutes, form the big group again and ask each small group to share their answers.



Plants have an annual cycle of growing flowers and bearing fruits. This can be disrupted by climate change.

The impacts of climate change

5. Prepare nine pieces of card with one of the following terms written on each. (You could also use pictures to represent the terms.)

    - Sea-level rise
    - Extreme weather
    - Water shortages
    - Erosion
    - Biodiversity decline
    - Disrupted food production
    - Social and cultural effects
    - Health issues
    - Future development of Pacific Islands

6. Hand out the cards among the group and explain each person is being given one predicted impact of climate change. Some of these impacts are felt already and scientists predict they will get worse.

7. Ask each person holding a card to stand up, and read what their card says.

8. Ask each person or the group, 'What do you think this means? Can you explain what this impact is? How will climate change cause this to happen? Have you heard about this happening anywhere? What impact do you imagine this would have on your life? Will this have a different impact for men, women, youth elderly, people with disabilities or other groups in your community?'

9. Explain to the group what the impact means and how climate change is causing it to happen.

TOPIC

2.3

What causes climate change?

Topic summary

This topic looks at where human-made greenhouse gases are coming from and how they are accumulating in our atmosphere. It will also cover the link between greenhouse gases and forests.

Learning outcomes

'Participants can …'

2.4 Identify the main global sources of greenhouse emissions

2.5 Describe the carbon cycle, including the role of forests in storing carbon

Background reading

In Topic 2.2, we learned that global warming occurs when greenhouse gases create a blanket above the Earth and trap heat in the atmosphere. Humans are contributing excessive amounts of greenhouse gas emissions, which smother the atmosphere, trapping too much heat and causing global warming and climate damage.

Greenhouses gases: What are they and where do they come from?

From the start of the industrial time (about 1750), people around the world started burning large amounts of coal, gas and oil (and its products, petrol and diesel) to create energy and to heat and power homes, factories, cities and vehicles. Coal, gas and oil are called 'fossil fuels'. Today, most of the world relies on fossil fuels for their energy needs. Fossil fuels are a part of almost every aspect of modern life.

What are 'fossil fuels'?

Fossil fuels such as coal, oil and gas are found deep under the Earth's surface. Fossil fuels are the fossilised carbon remains of ancient organic matter. They were created over millions of years from the dead remains of plants and animals, which were squeezed and cooked under pressure and heat, deep beneath the Earth's surface.

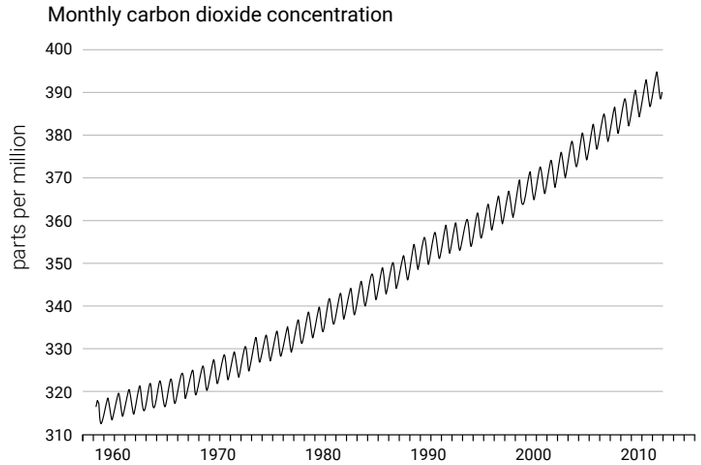
When fossil fuels are burned, carbon dioxide is released. Carbon dioxide is the main greenhouse gas that is added to the atmosphere and it is the biggest human contribution to global warming.

- Carbon dioxide comprises 74% of greenhouse gas emissions.
- Other greenhouse gases are methane (17%) and nitrous oxide (6%).

Greenhouse gas growth

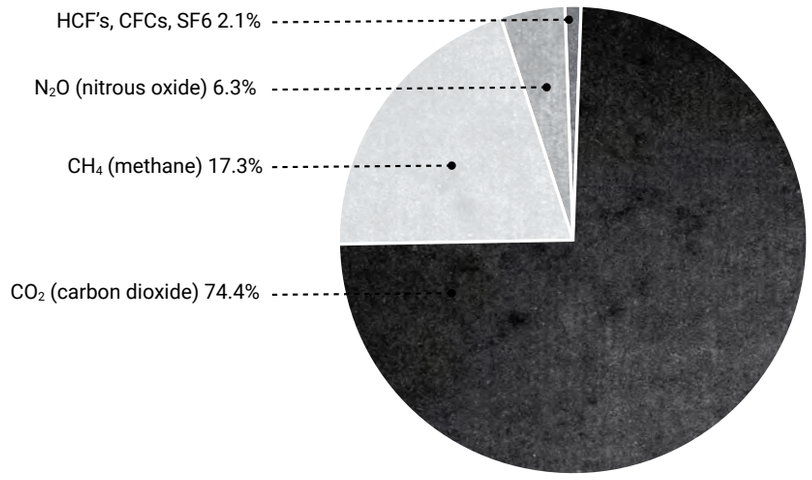
Greenhouse gases (carbon dioxide, methane and nitrous oxide) in the atmosphere increase in concentration over time. Measurements from the late 1700s (before fossil fuels were the main source of energy) show the concentration of carbon dioxide in the atmosphere was about 280 parts per million (ppm). In the mid-1900s, that number had risen to 300 ppm; in 2021, concentrations reached 415 ppm. This is likely to be the highest concentration of carbon dioxide in the last 2 million years.

The rate at which carbon dioxide concentrations have increased in the atmosphere has grown alarmingly quickly — faster than any time before in the Earth's history. These changes coincide with the rise in human populations and directly correlate to increased use of fossil fuels. For this reason, scientists from the United Nations Intergovernmental Panel on Climate Change (IPCC) confirm the rate of global warming is far beyond what can be explained by natural processes.



The Keeling Curve: This graph shows the rise in atmospheric carbon dioxide levels measured at Mauna Loa in Hawai'i since 1956. The repeating pattern of dips and spikes reflects the annual growth of vegetation due to the Earth's seasons.

Source: Dr. Ralph Keeling, Scripps Institution of Oceanography (scrippsco2.ucsd.edu/).



Composition of annual global greenhouse gas emissions

Source: Adapted from Our World In Data 2022.

> *The IPCC concludes that humans — and, in particular, their burning of fossil fuels — are the direct cause of climate change.*

Where do emissions come from?

Around the world, fossil fuels are the single largest source of emissions (although this varies from one country to another). But deforestation and land-clearing are also significant contributors to emissions.

- Fossil fuels — coal, oil and gas account for around 75% of global greenhouse gas emissions.
- Deforestation, agriculture and land-clearing accounts for around 22% of greenhouse gas emissions.
- Transport — using petrol, oil and diesel for cars, planes and boats — is also a significant source of global greenhouse gas emissions.

The Pacific region depends heavily on fossil fuels which comprise an estimated 80% of all energy consumption.

Destruction of forests contributes to climate change

In many tropical countries, most emissions come from deforestation or degradation of forests. For example, this accounts for more than 98% of annual greenhouse gas emissions from Solomon Islands and 64% in Papua New Guinea.

Annual global emissions from deforestation and forest degradation are greater than the annual global emissions from transport.

Big old trees absorb carbon dioxide and help keep our planet cool.

How trees and forests are a nature-based solution

The situation presented is gloomy. But more trees and healthy old-growth forests are a solution to the impacts of climate change.

While some greenhouse gases stay in the atmosphere and impact the climate for thousands of years, some greenhouse gases — including carbon dioxide — stay in the atmosphere for only a short time. One reason is because **trees remove carbon dioxide from the air.**

The carbon cycle: How carbon dioxide is removed from the atmosphere

Living trees absorb carbon dioxide — dead trees release it

Carbon dioxide is absorbed from the air by green plants as they breathe and grow through a process called photosynthesis. During photosynthesis, plants store carbon and are important carbon sinks.

Living trees breathe in carbon dioxide and dead trees release it back into the atmosphere. When trees die — or are destroyed through land-clearing, logging and fire — the remaining leaves, branches, roots and wood either rot or are burned and the carbon dioxide captured and stored during photosynthesis is no longer stored in the tree but released to the air.

Carbon sinks
Carbon sinks absorb carbon dioxide from the atmosphere. Trees and plants, oceans, sea grass, coral reefs, mangroves, and buried organic matter are all carbon sinks.

The process of the absorption and release of carbon dioxide is called the **carbon cycle**. And the amount of carbon dioxide in the atmosphere at any one time depends on the balance that exists between carbon sinks and carbon sources.

Today, carbon sources are out of balance with carbon sinks. Excessive burning of fossil fuels and unprecedented deforestation means more carbon dioxide is being produced than carbon sinks can remove, leading to an accumulation in the atmosphere and the enhanced greenhouse effect.

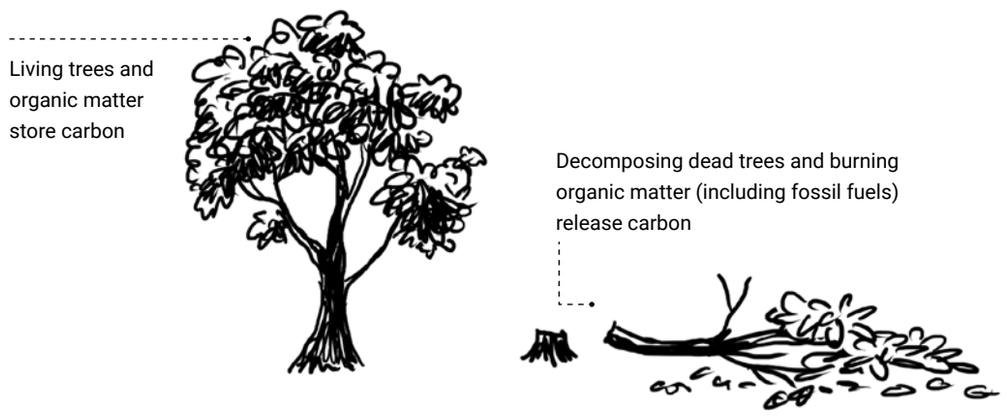
Cutting down trees contributes to global warming in two ways:

- Releasing carbon dioxide into the atmosphere
- Removing a potential sink for absorbing carbon dioxide out of the atmosphere.

The clearing of trees and forests for commercial timber, agriculture and urban development releases the carbon stored in the trees and forest into the atmosphere.

While planting new trees is a good way of removing excess greenhouse gases from the atmosphere (because trees breathe carbon dioxide and store it as they grow), preserving and protecting old trees and forests is better because over their lifetimes they have already stored large amounts of carbon and provide far greater ecological benefits.

The more trees we remove, the more carbon we release into the atmosphere. The more trees and forest we keep, and the more new trees we plant, the less carbon dioxide there will be in the air. This is why forests are so important.



Activity 2.3a
Greenhouse gases and the carbon cycle: The facts

Activity summary

This activity will examine how greenhouse gases are contributing to the greenhouse effect and creating global warming. It will cover the human sources of the most abundant greenhouse gas — carbon dioxide.

Learning outcomes

'Participants can…'

2.4 Identify the main global sources of greenhouse gas emissions

2.5 Describe the carbon cycle, including the role of forests in storing carbon

Suggested timing

30 minutes

Materials

- Chart (poster) paper
- Markers
- Tape, pins or tack for sticking posters to the wall

Step-by-step guide

1. Ask participants to think back to the earlier discussion on the greenhouse effect and Activity 2.1 (part 2) where the Earth was smothered with blankets. Ask the group, 'What did those blankets represent? What were they made of?' (*Possible answers are: smoke, greenhouse gases, exhaust*.) If you didn't do this activity previously, skip to step 2.

2. Explain to the group that the most common greenhouse gas humans are creating is called carbon dioxide. Carbon dioxide is created when coal, gas and oil (and its products, petrol and diesel) are burned. Coal, gas and oil are called fossil fuels. Carbon dioxide is also created when trees are cut down and burned or left to decompose. Today, most of the world relies on fossil fuels for their energy needs — to create electricity, and to heat and power homes, factories and vehicles.

Facilitators Note: Group participation

Consider making 'cut-out' arrows for this activity. You can then ask the group members to place the arrows on the diagram. Involving participants will help them learn and recognise existing knowledge in the group.

3. On a large piece of paper or blackboard, draw a diagram using the following steps. Explain as you go how each aspect of the carbon cycle works. Use the diagram provided on p. 63 as a guide.

    a. Start by drawing a patch of forest. Explain how trees take carbon dioxide in through their leaves, which is a gas we can't see, touch, taste or smell when it is in the air. Plants turn carbon dioxide into wood or leaves, which is solid carbon, as well as pumping it into their roots and even the soil. Draw arrows to show the carbon being stored.

    b. Next, draw a person. Explain that people breathe out carbon dioxide. Again, draw arrows to explain. 'We breathe out carbon dioxide and trees absorb it. This is part of the natural carbon cycle.'

    c. Now, draw cows eating grass. Explain that cows digest grass in their stomachs in a process that creates methane gas and causes the cattle to burp and fart. Enjoy a laugh and draw arrows accordingly. Explain that while methane is not the same as carbon dioxide, it is still one of the greenhouse gases that cause global warming.

    d. Draw a fire. Explain that when trees burn they release carbon dioxide into the air. The carbon dioxide is part of the smoke. Again, draw arrows to show carbon going into the sky.

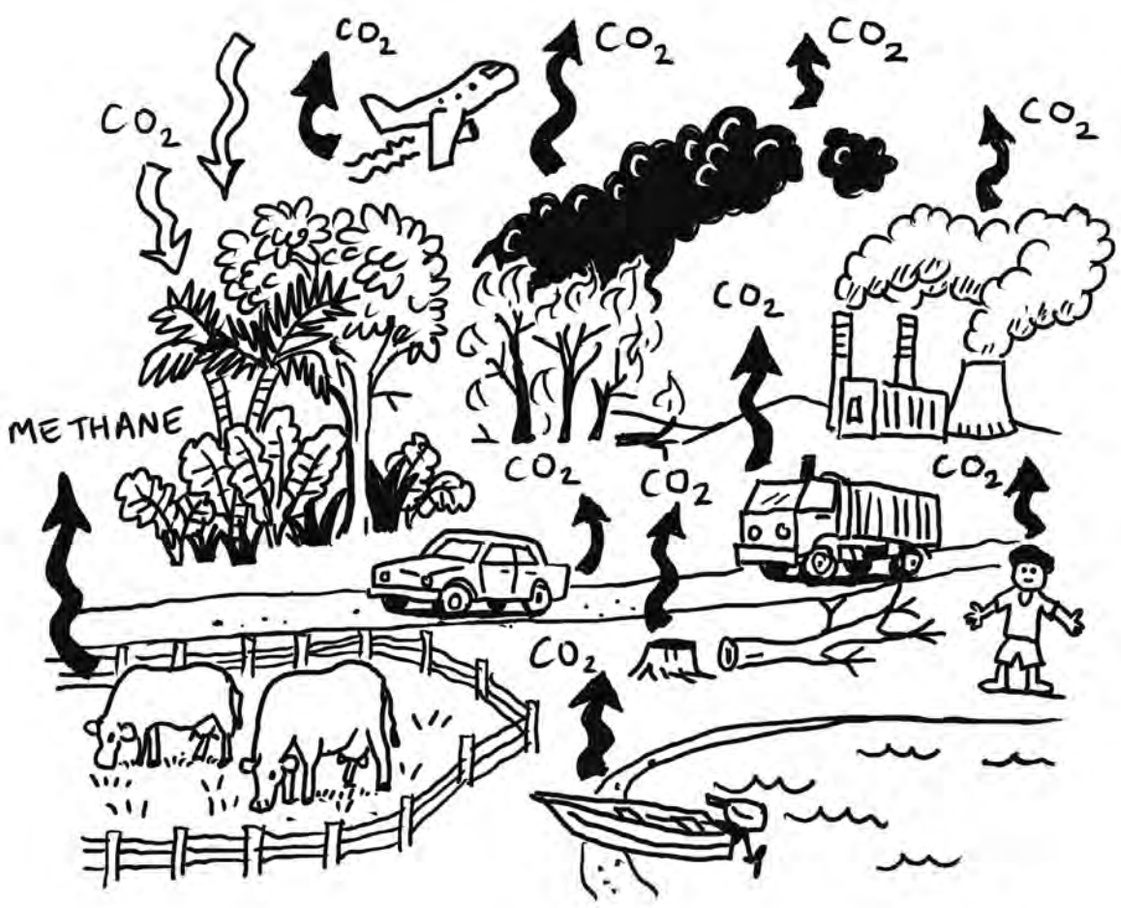
    e. Next, draw vehicles (cars, trucks, boats and planes). Explain how the exhaust from the engines releases more carbon dioxide into the air. Again, draw arrows.

    f. Draw a factory. Include a big chimney with pollution going to the sky. Explain how the factory is releasing carbon into the atmosphere. Again, draw arrows.

    g. Finally, draw carbon arrows being sucked down from the sky to be stored in the vegetation (trees). Explain that more carbon is being released than all the vegetation in the world can suck down. Also, explain that if we reduce the amount of vegetation, we release even more carbon and, critically, the world has less vegetation to absorb the carbon from the atmosphere and store it safely in plants. Explain that natural vegetation (such as forests) is like a bank. This bank safely stores carbon that was free in the sky. When the amount of vegetation is reduced, the air is robbing the carbon bank.

4. Explain that the process of absorption and release of carbon dioxide in the atmosphere is called the carbon cycle. Today, humans are releasing more carbon dioxide into the atmosphere than all the forest in the world can absorb. As more land and forests are cleared, fewer trees are available to absorb carbon dioxide from the atmosphere. And, as each tree is burned or cut down, it releases its own store of carbon dioxide. Forests are therefore very important in helping to reduce the greenhouse effect and slow climate change. While planting new trees is good, preserving old trees and forests is better because they store far more carbon than new, smaller trees.

    The more trees we remove, the more carbon we release into the atmosphere. The more trees we protect and plant, the less carbon dioxide there will be in the air. This is why healthy and old-growth forests are so important.



Drawing the greenhouse effect.

Activity 2.3b
Factories and forests

Activity summary

This is a fun game that demonstrates the carbon cycle and the imbalance of greenhouse gases being released (emissions) as compared with the amount of greenhouse gases being stored (sequestered), with a focus on forests.

Learning outcomes

'Participants can …'

2.5 Describe the carbon cycle, including the role of forests in storing carbon

Suggested timing

30 minutes

Materials

- Balloons, with ties if possible
- Conduct the activity indoors if possible

Step-by-step guide

1. In a large open space, divide your group into two. Ask one group to spread out and find a place to stand. The people in this group represent the 'trees'. The other group must stand together in a huddle to the side. They are the 'power station'.

2. Tell the trees, 'You are a tree, a healthy large and growing tree. Reach both your hands up high into the sky and feel how tall and ancient you are. Reach your roots down firm into the ground — feel how strong and steady you are. Look around us. The space we are in is the forest. We are surrounded by clean air in the atmosphere of our Earth — wide, open and clean.'

3. Explain to everyone, 'the healthy trees love to grow and breathe in carbon dioxide — which we now know is one of the greenhouse gases.'

4. Now explain to the power station group that is huddled together, 'You are the power station. You burn a lot of fossil fuels to create electricity and this releases lots of carbon dioxide into the air.' Give the power station group a large bag of balloons. Their job is to blow up and tie off the balloons and throw them into the air for the trees to catch.

In this activity the balloons represent carbon dioxide released into the atmosphere.

Facilitator's note:

It may be useful at this point to give a small demonstration in blowing up and tying the balloons. It can be a bit tricky sometimes. Give everyone two to three balloons to practice on. This way you also have some ready before the game begins.

5. Now explain, 'The job of the trees is to catch as many of the carbon dioxide balloons as you can. Remember, trees love carbon; you need it to grow. Once you catch the balloons of carbon dioxide you must hold on to them — store them up, don't let them go. Your aim is to catch and hold on to as many balloons as you can.'

6. Begin the demonstration by saying, 'OK, power station, now it's time for you to begin releasing your greenhouse gases. Start blowing up balloons and 'release' them into the atmosphere'.

7. After some time, pause the activity. Say, 'Good work, trees. You have been doing a great job catching and absorbing all the carbon that the power station has been producing from the atmosphere. We only have a small power station, producing a small amount of greenhouse gases, and the trees have been able to absorb it all. The environment is in balance. But now the forests are being destroyed. Trees are being chopped down.' Pretend to chop down most of your forest, leaving only one or two trees standing. 'All the carbon they have absorbed is released back into the atmosphere as carbon dioxide.' Each cut-down tree should drop the balloons they are holding.

8. Once each tree has been 'chopped down', direct them to join the power station group.

9. Explain, ‘Now there are fewer trees and more greenhouse gases back in the atmosphere. Notice the balloons of carbon from the chopped trees have been dropped and released back into our atmosphere. There are now fewer trees to hold and absorb them all. Also notice that at the same time, our power station is growing. There is an increase in demand for electricity. The power station will now be producing more greenhouse gases.’

10. Resume the activity, with the now-enlarged power station group blowing up and releasing balloons. Observe how the trees now struggle to catch and absorb all the balloons. Ideally, there will be ‘excess’ balloons floating around the ‘atmosphere’.

11. Pause the activity again. Ask the group, ‘What is going on here?’ (Possible answers: ‘Our environment is not in balance — we have too many carbon dioxide balloons and not enough trees to absorb them all.’ ‘The trees can’t catch and absorb all the carbon dioxide that is being produced.’)

12. Ask the group, ‘What will happen if we cut down the remaining trees?’. (Possible answer: ‘There will be no forests left to absorb the carbon dioxide from the atmosphere’.)

13. Now explain to the group, ‘This is what is happening in the world today. There is too much carbon dioxide and other greenhouse gases in the atmosphere and not enough trees to absorb it all. Also, if we cut down the trees we have left, they will release the carbon that they have stored back into the atmosphere.’

14. Continue explaining, ‘However, we want to help the Earth and stop global warming from happening — so we will plant a few trees.’ Take two or three people from the power station and ‘plant them’ back into the forest, asking them to kneel to represent they are young.

15. Explain to the group that young trees grow fast so they will greedily gobble up the carbon dioxide balloons to help them grow. However, they are still small and cannot store as much carbon as large, mature trees. This is because they do not have as much wood, leaves and branches to hold the carbon. Explain to the group that while newly planted trees are a good way of helping remove some of the excess carbon dioxide from the atmosphere, it takes a long time before young trees can hold and store as much carbon as old trees.

16. Now resume the activity for a final time, with the power station continuing to produce balloons of carbon dioxide and the mature trees and new young trees (people kneeling) catching the balloons.

17. After some time, end the activity and summarise by leading participants through the follow-up discussion.

Follow-up discussion questions

Sum up Activity 2.3b by telling participants that humans are causing the unnatural warming of the Earth by contributing greenhouse gases from three main sources:

1. Burning fossil fuels for energy and transport

2. The destruction and clearing of forests for commercial timber, agriculture and urban development, which causes the carbon stored within plants to be released into the atmosphere

3. Agriculture, including emissions from livestock, artificial fertilisers and soil.

While planting new trees is a good way of removing excess greenhouse gases from the atmosphere — because trees breathe carbon dioxide and store it as they grow — preserving and protecting old trees and forests is better because over their lifetimes they have already stored large amounts of carbon.

The more trees we remove, the more carbon we release into the atmosphere. The more trees and forest we keep, and the more new trees we plant, the less carbon dioxide there will be in the air. This is why forests are so important.

Deforestation or degradation of forest accounts for more than 90% of annual greenhouse gas emissions from Solomon Islands.

TOPIC

2.4

Climate change:
What can we do about it?

Topic summary

In the previous topics, we learned about climate change, global warming, the greenhouse effect, greenhouse gases and the carbon cycle. We have also learned that protecting and restoring forests is important for two reasons:

1. Forests absorb carbon dioxide from the atmosphere. Old trees and existing forests are greater sinks (or stores) of carbon than new trees and young forests.
2. Conserving existing forests will keep emissions from deforestation out of the atmosphere. Living trees absorb carbon dioxide, but dead, burnt and rotting trees release it.

In this topic, we will look at what we can do about climate change, including forest conservation and other measures to reduce the impacts. These actions are broadly described under two headings: mitigation and adaptation.

Learning outcomes

'Participants can …'

2.6 Identify actions that can reduce greenhouse gas emissions — in particular, land management and the role of forests as carbon sinks

Background reading

Mitigation

Mitigation refers to actions aimed at preventing or minimising the emission of greenhouse gases that cause climate change.

Although the Pacific Islands collectively emit less than 1% of the total global greenhouse gases responsible for climate change, the region and its island countries remain among the most vulnerable in the world to its negative impacts.

One simple way of mitigating climate change is by increasing energy efficiency and reducing dependence on fossil fuels by using renewable energy. However, in the Pacific region, the most significant changes can be made through protecting and restoring forests.

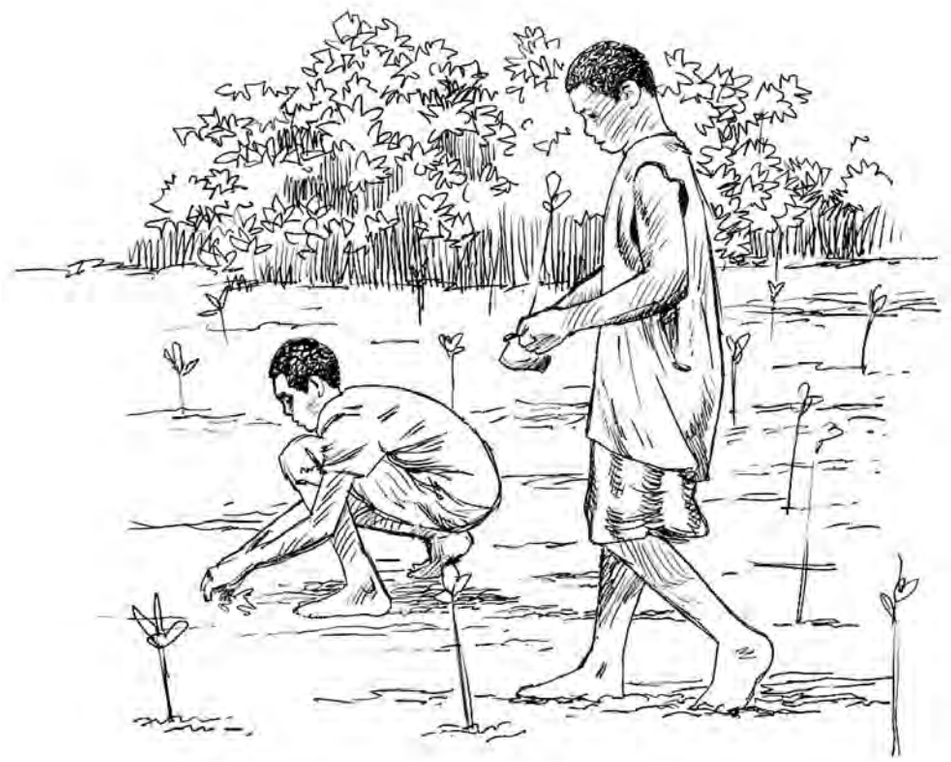
Adaptation

Adaptation refers to actions or activities people take to adjust to, cope with or benefit from the impacts of climate change.

Because the Earth's climate system is so complex and because greenhouse gases persist in the atmosphere for a long time, even if we were able to put a stop to all greenhouse gas emissions today, climate change impacts would still be felt for many years. We need to adapt to its consequences now.

Some examples of adaptation to climate change include:

- Protecting coastlines from sea-level rise and erosion by replanting mangroves or building sea walls.
- Strengthening secure access to food by diversifying food crops, improving soil fertility and planting food in different locations so there is better chance of food surviving extreme weather emergencies.
- Climate-proofing infrastructure. In the case of roads, this could include improved drainage and strengthening against floods. In the case of buildings, this could include stronger roofing to protect against storms.



Replanting mangroves helps to protect coastlines from sea-level rise and the eroding effects of storm surges.

- Adjusting how people earn an income, shifting from destructive practices (like logging) towards more sustainable income generation (like forest carbon).
- Changing where you work. For example, farming that currently happens on flood-prone or coastal land may need to be relocated.
- Protecting communities against the impacts of saltwater intrusion, including building raised garden beds and finding, installing or using alternative water sources such as rainwater tanks.

A renewable energy future

Replacing fossil fuels with renewable energy will reduce greenhouse gas emissions and slow climate change impacts. Renewable energy comes from the sun, wind and waves, and is converted to make electricity. It produces little to no greenhouse gas emissions and the sources of renewable energy will not run out so long as the sun shines, the waves crash and the wind blows.

Examples of renewable energy sources include solar panels, wind turbines, solar-powered generators, biofuels (for example, coconut oil), solar lanterns and wind-powered water pumps. It is possible to use renewable energy to power whole houses, villages and cities.

Around the world, fossil fuels are being replaced by renewable energy. In 2022, around 30% of the world's electricity was generated from renewable sources.

Wind turbines in a wind farm in Port Vila have the capacity to supply 40-70% of power to the capital.

Land-use change

A key cause of land-clearing and destruction of forests is the demand for resources, such as timber or minerals, and the demand for land for agriculture or development. But the need for new cleared land can be reduced if we look for ways to use land more effectively.

Mitigation potential lies in improvements in how we manage agricultural and grazing land, as well as through the restoration of cultivated organic soils and degraded lands. Traditional gardening practices (for example, organic agroforestry) in the Pacific region are far more sustainable than industrial agriculture, so Pacific Islanders should be encouraged to retain their knowledge and continue to farm this way.

Forest carbon projects as a nature-based solution

Climate change can also be mitigated through nature-based solutions such as protecting and restoring ecosystems — like forests — which also provide community wellbeing and environmental benefits. Forest carbon projects encourage people to move away from logging and land-clearing toward ecosystem conservation, giving people who might have received income from logging or land-clearing an opportunity to receive income to protect and restore their forests.

Taking action

With knowledge and an understanding of climate change we can all take action to mitigate and adapt to the problem. Individual and local actions, like keeping forests intact, will make a difference locally and globally. By acting against climate change, we will not only improve our lives and that of our communities, we will also improve the lives of future generations.

Raising public awareness of climate change and the different ways we can mitigate and adapt to it can greatly improve the future for Pacific communities.

Activity 2.4
Responding to climate change

Activity summary

This is a factual presentation on strategies for mitigating and adapting to climate change, followed by a discussion in which people explore local opportunities for mitigation and adaptation.

Learning outcomes

'Participants can …'

2.6 Identify actions that can reduce greenhouse gas emissions — in particular, land management and the role of forests as carbon sinks

Suggested timing

40 minutes

Materials

- Chart (poster) paper
- Markers
- Coloured markers
- Blank A4 paper
- Tape, pins or tack for sticking posters to the wall

Step-by-step guide

1. Explain to the group that in this section of the training we will look at what we can do about climate change, including forest conservation and other measures to reduce its impacts. Explain to the group there are two main responses to climate change: mitigation and adaptation.
    - Mitigation means doing things that prevent or minimise greenhouse gas emissions, including protecting forests and finding new, less-polluting alternatives to the use of fossil fuels.
    - Adaptation means doing things that help us to adjust to, cope with or benefit from the effects of climate change. Adaptation is a way of minimising the impacts of climate change on the natural environment and on our lives.
2. Create two posters, one for mitigation and one for adaptation. Write the definitions from Step 1 at the top of each.

3. Explain to the group that even if we were able to put a stop to all greenhouse gas emissions today, greenhouse gases persist in the atmosphere for a long time and climate change and its effects would still be felt for many years. There is a time lag between the causes and the effects of climate change and while we may be working to stop the greenhouse effect in the future, we need to adjust to its consequences now.
4. On the mitigation poster, list the following mitigation measures and give explanations and examples for each.
    - Protecting forests
    - Renewable energy
    - Planting trees
    - Helping forest to regenerate
5. On the adaptation poster, list the following actions and give explanations and examples for each.
    - Actions to adapt to sea-level rise
    - Actions to secure water supplies
    - Actions to adapt to extreme weather
    - Actions to adapt food gardens to a changing climate

Communities are now building sea walls to protect their homes from rising seas and storm surges.

6. Divide participants into two groups. Explain to each group their task is to spend 30 minutes thinking about locally relevant ways that they could:
   a. Mitigate against climate change (that is, prevent producing greenhouse gases) in their everyday lives
   b. Adapt to the effects of climate change.
7. Tell them to come up with as many ideas as they can. The ideas should be drawn (in pictures) on separate sheets of paper. **Hint**: the ideas can be same as those already on the poster, but the participants can be encouraged to identify local or specific opportunities. When the groups have completed the task, ask them to share their pictures and explain what is happening.

Follow-up discussion questions and activity

Recognise the value of local solutions during and after the presentations. Explain that mitigation and adaptation do not have to mean that we stop doing things we normally like to do in our lives. It can also be an opportunity to discover new and more efficient ways of doing things. For example, forest carbon projects may provide an alternative income to people who, in the past, might have got an income from logging or activities that require land-clearing. Instead, these people can receive income to keep their forests or replant trees.

Sum up by telling participants there is a lot we can do to prevent and prepare for worsening climate change impacts, including increasing energy efficiency and reducing dependence on fossil fuels. However, in the Pacific region, the most significant changes can be made by protecting forests through activities like forest carbon. Using both adaptation and mitigation measures together could greatly reduce the impacts of climate change on our region.

TOPIC

Climate change:
Conclusion and evaluation

Topic summary

This is a review of all concepts covered in *Section 2: Climate change*. The activity requires participants to reflect on their learnings from the training. In doing so, they will come to realise that climate change connects us — both in our communities and throughout the world. Climate change impacts everyone, and it is the joint responsibility of everyone to address it.

Activity 2.5a
Film – *'Climate change: everyone's business'*

Activity summary

This is a light animated film that summarises all content covered in Section 2.

Learning outcomes

Reviews learning outcomes 2.1–2.6.

Suggested timing

20 minutes

Materials

- Copy of the film *Climate change: everyone's business*
- Computer and projector or screen
- Power source

Step-by-step guide

1. Ask participants to think back over everything covered in the training so far.

- Remind them that global warming is occurring because of an increase in greenhouse gases building up in the atmosphere.

- Remind them that greenhouse gases come from burning fossil fuels (largely for energy and transport), as well as from deforestation and land-clearing.
- Remind them of the effects of climate change, including:
  - × Sea-level rise
  - × Extreme weather
  - × Water shortages
  - × Erosion
  - × Disrupted food production
  - × Health issues
  - × Social and cultural impacts
  - × Decline in biodiversity
  - × Future development of Pacific Islands

2. Introduce the film *Climate change: Everyone's business*. Tell the group, 'This is a fun, simple way of looking again at everything we have covered in our training'.
3. Watch the animated short film.
4. Run a question-and-answer activity to address any further questions. Encourage knowledgeable participants to contribute to answering the questions of others.

AN INTRODUCTION TO CARBON FOREST PROJECTS

SECTION **3**

SECTION

3

AN INTRODUCTION TO FOREST CARBON PROJECTS

This section provides community members and project participants with sufficient knowledge about forest carbon projects so they can participate in dialogue or consultations about projects, and provide or withhold informed consent to forest carbon project development on their land.

Section 3: An introduction to forest carbon projects covers the key concepts of carbon markets, carbon credits, additionality, permanence and opportunity costs. Participants will build an understanding of the less tangible concepts behind forest carbon credits, using relevant existing local knowledge as a starting point, (for example, knowledge of local markets). These understandings include electronic trade, and the buying and selling of a commodity without a physical exchange, and how credits are generated.

It should be delivered to participants who have already undertaken *Section 2: Climate change* (unless participants already have an understanding of climate change and the carbon cycle). We recommend it be delivered before *Section 4: Our land, our future, our decision*, as a basic knowledge of forest carbon projects is a prerequisite to being able to have an informed debate about development alternatives.

Section 3 Learning outcomes

3.1 Explain why someone would want to pay landowners to look after a forest

3.2 Describe what is being sold and what is being bought in carbon trading

3.3 Identify what factors affect the price of commodities sold in the marketplace

3.4 Explain what carbon credits are and how they are produced

3.5 Explain why an existing forest must have been under threat of deforestation or degradation before the project to make it eligible for forest carbon projects

3.6 Identify forests that cannot be used to generate carbon credits (for example, forests that are already protected, inaccessible or uneconomic for other uses)

3.7 Describe the opportunity costs (lost opportunities) from managing a forest for carbon credits

3.8 Explain how long a forest needs to be protected (for example, 50 years) to allow carbon credits to be produced and sold

3.9 Explain what would happen if forest used for a forest carbon project continued to be deforested or degraded

3.10 Explain what activities may still occur in a forest managed for a forest carbon project (for example, tourism, gathering non-timber forest products and local building materials, forest management)

3.11 Describe the roles and responsibilities of various 'actors' and the process for development of a forest carbon project

3.12 Explain their right to give or withhold their free, prior and informed consent (FPIC) for developments on their land

3.13 Identify where to find more information, independent advice and support

Pacific Islands communities may have the option to develop forest carbon projects.

TOPIC

3.1

Forest carbon projects and the carbon market

Topic summary

This topic explores the concept of forest carbon projects in relation to carbon markets. It explains why a company, business or individual would want to pay landowners to look after a forest. Basic terms used within the marketplace are explained and participants examine what is being sold and what is being bought in carbon trading. Factors that affect the price of goods sold in the marketplace are also examined. Participants will see that a carbon trade is like other more familiar kinds of market trade.

Learning outcomes

'Participants can…'

3.1 Explain why someone would want to pay landowners to look after a forest

3.2 Describe what is being sold and what is being bought in carbon trading

3.3 Identify what factors affect the price of commodities sold in the marketplace

Background reading

What is REDD+ and how does it relate to forest carbon projects?

Forest carbon projects are originally known as REDD+ projects. REDD stands for Reduced Emissions from Deforestation and Degradation. The '+' indicates other carbon-storing opportunities in forests such as restoration (for example, tree planting). Under REDD+, owners of forests that are under threat from deforestation or degradation can generate carbon credits for the carbon they store if that forest is not logged or cleared, or if the forest is restored. The term REDD+ is now usually replaced by the term 'forest carbon projects', which we use in this toolkit.

Behind burning fossil fuels, the next biggest contributors to the release of the greenhouse gas carbon dioxide are deforestation, agriculture and land-clearing.

Deforestation

Deforestation is when forested land is permanently turned into non-forested land. It happens when humans destroy forests by bulldozing, logging or burning. Deforestation usually happens because of changes in land use, such as commercial logging to sell timber, large-scale agriculture such as palm oil, and clearing for cattle grazing, residential development or mining.

Degradation

Forest degradation is the depletion of tree cover in a forest due to human activities. Activities such as selective logging, the harvesting of timber for local use and gardening methods are often causes of forest degradation. Forest degradation decreases the carbon stocks within a forest, which limit the opportunity for a forest carbon project.

Forest carbon projects and REDD+

While different carbon standards allow for various activities to be eligible under carbon projects, forest carbon projects (or REDD+) can be understood as activities[1] which:

- Avoid reducing the total area of forest (reducing deforestation) OR
- Avoid decreasing the density of the forest (degradation; for example, by stopping the removal of trees or plants within forest boundaries) OR
- Increase the carbon density of a forest (increasing the carbon store; for example, by tree planting or removing weeds that inhibit regrowth) OR
- Establish a new forest in a location where forest had been historically cleared (reforestation) or in a location that was previously not a forest (afforestation).

[1] Other activities such as sustainable forest management (for example, reduced impact logging) and forest conservation are described as eligible activities under the UNFCCC's definition of REDD+. For simplicity's sake, in this toolkit we have kept the definition of REDD+ to the four activities described above.

Understanding the carbon market

Carbon credits and the carbon market — a lot like any other market

The production, sale and purchase of carbon credits is one way to help reduce the levels of carbon dioxide in the atmosphere and address climate change.

Collectively, the sale and purchase of credits is called the 'carbon market'. This market is like other more familiar markets, such as an agricultural market. However, instead of fruit and vegetables, the products traded are carbon credits.

There are different places where carbon credits can be sold and purchased. This is also similar to agricultural markets, which may be local (such as in the village), larger town markets or an export market.

The carbon market is a bit like a produce market. However, instead of fruit and vegetables being bought and sold, the products traded are carbon credits.

What is a carbon credit, and how are carbon credits made?

A carbon credit is equal to one tonne of carbon dioxide (CO_2) that has either been removed from the atmosphere or prevented from being released into the atmosphere.

1 carbon credit = 1 tonne of CO_2

Credits are created by certified carbon projects that measure the number of tonnes of removals or reductions in CO_2 from the atmosphere. Only 'additional' removals or reductions in CO_2 that happen because of the project — and that would not have happened otherwise — can be counted and made into credits.

How credits are made

Plans to clear a native tropical forest to plant oil palm will release 10,000 tonnes of CO_2 into the atmosphere. A decision to change plans and protect the forest will allow the same amount of CO_2 to remain stored in the forest. This means 10,000 tonnes of CO_2 will be prevented from entering the atmosphere; and 10,000 carbon credits can be produced.

How do you move carbon credits to market?

The carbon credits issued to a project owner are a result of the work protecting the forest or planting trees. Project owners are being paid for storing carbon, not for removing any carbon to sell.

A carbon credit is moved electronically. It is like money when it is banked electronically — it exists and has an owner, but we cannot physically hold it. Carbon credits are recorded electronically in an account or registry. Just like a bank account might show that we have $5,000 in the bank, the registry account might have 5,000 credits in our account. This is the stock you own.

When the registry account receives credits, we say these credits have been 'issued'. The credits are issued in batches representing the year when they were produced. This is the vintage. For example, an account may have 2,500 of vintage 2023 credits and 2,500 of vintage 2024 credits.

Selling a carbon credit

If we sell a carbon credit, we electronically transfer the credit to the buyer, or alternatively we cancel or 'retire' the credit for the buyer. In the case of a transfer, the credits leave our account and move to the buyer's registry account, and then belong to the new owner.

If the buyer wants to use the credit to claim an impact or offset, they may ask us to retire or cancel credits for them. We need to give the buyer notification (evidence) that the credits were cancelled or retired for them. The reason for the cancellation is so credits can only be used or claimed once.

The sale transaction takes place according to an agreement with the buyer, often called an Emissions Reduction Purchase Agreement or ERPA. Under the Nakau Programme, for example, Nakau plays the role of sales and registry agent and administers sales on behalf of landowners. This means Nakau administers the registry account for landowners and invoices (receives the payment) from buyers for the landowners.

But why would someone create carbon credits and sell them?

The creation of carbon credits is a source of income, often in addition to other sources of income created by a project or activity.

In the example on the previous page, a decision to protect forest means a lost opportunity for income from palm oil. Without a carbon project, there is no financial motivation to protect the forest. This is important because we know the need to earn income is an underlying driver or reason why forest is destroyed. If protecting and restoring the forest can produce carbon credits and earn an income comparable to palm oil, there is a financial opportunity to protect the forest and an alternative option for earning money for the community.

A decision to protect and restore a forest may provide the opportunity for carbon credits to be produced and alternative income to be earned.

Who buys carbon credits?

Individuals and companies choose to buy carbon credits to help reduce their contribution to climate damage.

Profile 1. An individual

Mary lives in a small town. She drives her car a lot because her work and her children's school are in the next town. Mary can calculate how many tonnes of carbon dioxide her car produces every year. She can then buy the equivalent amount of carbon credits to offset the emissions produced by her car.

Profile 2. A business or company

Sue's business makes chocolate. Transporting the chocolate around the world creates CO_2 emissions. Sue's customers care about the environment and so does she. She doesn't want her chocolate business to contribute to climate change. Sue changes to more efficient transport — but her business still creates some emissions. Sue decides to offset the remaining emissions by purchasing carbon credits.

Profile 3. Resellers

Resellers help people like Mary and Sue (above) to purchase offsets. A reseller would work with a business, like Sue's, to help her reduce emissions, and then reduce the number of offsets (credits) that Sue needs to buy. The reseller may then combine the credit orders from several clients and buy them from a project.

Buying carbon credits

Voluntary carbon market

The voluntary carbon market is made up of individuals, businesses and companies who voluntarily purchase carbon credits to help offset their greenhouse gas emissions. Carbon credits in this market include Voluntary Emissions Reductions (VERs). VERs are often cheaper than CERs.

Some individuals, small businesses or companies choose to buy carbon credits on the voluntary carbon market to help reduce their carbon emissions. Ideally, they will be reducing their emissions in other ways too and the carbon credits they buy make up for the portion of emissions they cannot reduce, such as from transport or manufacturing.

For example, the carbon credit buyers Nakau work with are not under any obligation to offset their emissions. Most buyers of community-owned carbon credits care about addressing climate change, about the forests landowners are protecting and restoring, and about the communities who depend on them.

If enough credits are purchased to offset all their emissions, then a buyer can claim to be making a positive contribution towards addressing climate change.

Mandatory carbon market

Mandatory carbon markets require those involved (usually countries or large polluting companies) to reduce their emissions by setting targets for them to meet. Examples of mandatory markets are the Australian Safeguard Mechanism and European Union Emissions Trading System. In these mandatory markets, carbon credits can be sold to participants to help them meet their targets. Carbon credits in these markets are called Certified Emissions Reductions (CERs).

A mandatory (or compliance) carbon market is for companies who are required by the laws of their country to reduce their emissions, and who are allowed to purchase carbon credits as one means of achieving their target emissions reduction levels. This usually applies to big emitting companies such as mining, petroleum or heavy manufacturing (for example, steel). Community-owned carbon projects, such as the ones Nakau works with, do not operate in these markets.

How much will I get for selling one carbon credit?

The value of any item being sold in a market varies, depending on supply (how many are being sold) and demand (how many people or companies want to buy them).

The same applies for a carbon market. The price fluctuates according to how many carbon credits are on the market for sale (supply), how many people or companies want to purchase them (demand), and what kind of project has been developed. Ecosystem Marketplace is a good reference point to check in on current prices: www.ecosystemmarketplace.com

It is difficult to predict if prices will go up or down in the future, but a lot will depend on the international policies developed through UNFCCC meetings like the Paris Agreement. Currently demand is predicted to increase for high-quality forest carbon credits on the voluntary carbon market over the next 10 years. However, a number of factors could either increase supply ahead of this demand, or decrease demand itself in a way that makes future prices hard to predict.

Understanding carbon credit demand

We can compare a carbon credit to selling a common fruit like pineapples. When pineapples first come into season there are not many being sold at the market — but many people have been looking forward to them. The price is usually high as there are enough people willing to pay a high price for them; despite the higher price, the vendor will probably sell them all. Once there are large numbers of pineapples at the market the price usually drops because buyers have more choice and there is more competition. If someone tries to sell too high, the customer will just go to somebody else with a lower price.

High-integrity carbon credits

Some of the highest prices are paid for carbon credits that come with core benefits (also known as co-benefits). These benefits are the other good things that the project delivers aside from the benefits to our climate. These benefits could include conservation of biodiversity, clean water sources, protected Indigenous culture, social inclusion, the creation of sustainable livelihoods and increased climate resilience for communities.

A comparison could be made between credits with core benefits and the choice to buy a pineapple from a regular store or from a store that raises money to support a community enterprise. You might be happier to pay more for a pineapple from a community enterprise because your purchase is also supporting the community.

Some buyers want to reduce CO_2 emissions but also deliver biodiversity and community benefits — and carbon credits from community-owned forest projects have great potential to provide these benefits. However, these benefits must be proven and monitored. This is one reason why all Nakau projects include a biodiversity assessment and a social impact assessment, as well as measurement of carbon.

Core benefits vs co-benefits

Nakau approaches carbon projects with the belief that benefits for people and forests is of equal importance to climate benefits of a forest carbon project. Carbon credits are a way to pay for these benefits and ensure we address climate change at the same time. Many other carbon projects refer to these benefits as co-benefits but we consider benefits like improved livelihoods, protecting customary land and a rich biodiversity as the core benefits of a community-owned forest carbon project.

Activity 3.1a
Forest carbon project roleplay — *A new proposal*

Activity summary

This activity is a quick roleplaying performance, starring either the facilitators or volunteers from the group. A further scene will be added to this performance (and will build upon this introduction) later in this section, in *Activity 3.5a: Roleplay finale*.

Learning outcomes

'Participants can …'

3.1 Explain why someone would want to pay landowners to look after a forest

3.2 Describe what is being sold and what is being bought in carbon trading and forest carbon projects

Suggested timing

20 minutes

Materials

- The roleplay script *A new proposal* (see p. 92)
- Props for the performance:
  - × Backpack for travel company operator
  - × Tree branches for the landowner

Facilitator's note:

The aim of this activity is to introduce the concept of forest carbon projects in a fun way. A script has been provided. The roleplay activity could be performed by the facilitators or by members of the group. If choosing a member from the group, take care that the role is appropriate for them, and they are happy to be in the performance. The narrator has an important role in the flow of the performance and should be played by one of the facilitators. Consider translating the performance into the language spoken by participants

Step-by-step guide

1. Let the group know there will be a performance that explains how forest carbon projects work, using the example of the voluntary carbon market. Choose your performers from your group of facilitators or volunteers.

   The characters are:

   - Narrator
   - Diana or David (a tourism business-owner and buyer of carbon credits)
   - Landowner.

2. Carry out the performance using the script provided (see p. 92). Try to achieve as much audience participation as possible

In this role play a sustainable travel and tourism company decides to buy emission reductions from landowners, demonstrating in basic terms how forest carbon projects work.

Follow-up discussion questions

When the performance is over, reflect on what took place by asking questions and checking participants' understanding. Use the following questions as a guide.

- Why does the travel company want to pay the forest landowners? *(Possible answers: They want to reduce their company carbon dioxide emissions, but they can't reduce all of it on their own; They're concerned about climate change and the people and places impacted by climate change; They want to see more forests protected and restored.)*
- Should the landowners agree to his proposal? *(Discuss the need for landowners to gain further information and understanding of the costs and benefits before they decide.)*
- Is it just travel companies that may want to buy emissions reductions? *(Possible answer: No, it could be any individual or company that wants to buy emissions reductions.)*

Script: A new proposal

NARRATOR: Hi everyone. I'd like to introduce you to Diana/David. They run a sustainable travel and tourism company. Where are you based Diana?

DIANA: We are based in New Zealand but our customers travel all over the world, including a lot to the Pacific. People come here to experience the nature and culture of this beautiful part of the world.

NARRATOR: You must have a lot of customers? Does your company do well?

DIANA: Yes, I would say so. We have many people come to us who want to experience other places. But our work comes with some worries too. For us, a big worry is the environmental impact of our business.

NARRATOR: I've heard travelling can produce a lot of carbon dioxide when people fly, drive and use boats — is this true?

DIANA: Yes, it is true. Travelling produces a lot of emissions from all the vehicles that are used. And even when people use air conditioning in hotels.

NARRATOR: So, this contributes to the greenhouse effect? Don't you care that your company is contributing to climate change?

DIANA: Actually, yes, I do care. Very much. This is why we are always looking for ways to make our travel company more sustainable, including reducing emissions.

NARRATOR: So how can you reduce the carbon dioxide you produce?

DIANA: We have some offices in New Zealand that we have made more energy efficient — this has reduced some of our emissions. We also work with eco-hotels and small local businesses in the countries we visit and who don't have big emissions. But this doesn't do enough, and we need to reduce more of our carbon dioxide emissions.

NARRATOR: Here's an idea: why don't you pay someone else to stop putting carbon dioxide into the air? You will be supporting people to protect an important ecosystem — like a forest. This will help save emissions from your company. For example, if your customer's travel creates 20,000 tonnes of emissions, you could pay someone else to save 20,000 tonnes of emissions somewhere else. Your negative impact could be balanced by your positive impact.

DIANA: That's a great idea. I'm going to meet with our team and see if we can make it — thanks!

NARRATOR turns to LANDOWNER (community member).

NARRATOR: Good afternoon/morning. You must be the landowner here?

LANDOWNER: Yes, I'm responsible for this land.

NARRATOR: Why is your land important to you?

LANDOWNER: Our land is very important — it's part of our identity and culture. Land is life. It also allows us to make money and gives us food and materials for our homes.

DIANA or DAVID (from the travel company) speaks directly to the LANDOWNER.

DIANA: Good afternoon/morning. My name is Diana. I'm from a sustainable travel and tourism company based in New Zealand. I'd like to talk to you about a business opportunity involving your land.

LANDOWNER: I hope you don't want to build a big hotel on my land?

DIANA: No, not at all. In fact, I don't want to build anything or take away anything from your land.

LANDOWNER: I don't understand – what sort of business opportunity is this?

DIANA: I'm talking about a forest carbon project. Basically, I would like to pay you to protect your old-growth forest and plant trees to make a new forest area as well. This will mean more carbon is stored in your trees and not polluting the atmosphere.

LANDOWNER: Why do you want to do this? What's in it for you?

DIANA: My travel company has a lot of customers who care about the impacts of climate change. And we do too. As more people travel each year, the carbon dioxide footprint is growing, and this is contributing to climate change.

LANDOWNER: I understand, yes climate change is a big problem. As a matter of fact, we have been noticing changes in our seasonal patterns.

DIANA: Yes, my travel company and our customers don't want to contribute to this problem. I can't stop all my carbon dioxide emissions on my own, but I can reduce emissions on your land if I work with you.

LANDOWNER: On my land?

DIANA: Yes. I can pay you to protect your forest and to replant trees. The emissions your trees store will help make up for the emissions my company makes, and you will earn an income you can use for the community while your forest stays healthy. Will you accept my payment in exchange for you protecting your forest and replanting more trees?

End script

Note:

This performance is extended, through an extra scene, in ***Activity 3.5a: Roleplay finale***. The additional scene introduces the issues of additionality, permanence and opportunity costs.

Activity 3.1b
Carbon for sale

Activity summary

This simple facilitator-led discussion, using volunteers from the group, is designed to get participants thinking about what happens in trade and the marketplace. By showing the similarities between the local market and the international market, this exercise should make the concept of an international carbon market less daunting and intangible.

Learning outcomes

'Participants can …'

3.2 Describe what is being sold and what is being bought in carbon trading

3.3 Identify what factors affect the price of commodities sold in the marketplace

Suggested timing

30 minutes

Materials

- Coloured pens and paper

Step-by-step guide

Facilitator's note:

While it is important that you have read and understand the background reading regarding carbon markets, it is not advised to go into this level of complexity with your participants at this stage. Facilitators should use their discretion and present the information at an appropriate level with due consideration of participants' education levels and prior knowledge.

1. Broadly introduce the activity. Explain that you are going to discuss what happens in the marketplace.

   Ask if any participants sell anything at the local food market. Ask for a volunteer from those who say 'yes' (if there are no sellers, then just choose a volunteer). Ask your market seller what they sell, and ask them to draw a picture of what they sell on a piece of paper. At the same time, ask for a volunteer from the group who buys things from them. Ask them if they ever use money to buy from the market, and then ask them to draw some simple money or money symbols on a piece of paper.

2. When they have finished, ask the volunteers to hold up their pieces of paper. Ask the following questions:

   - Who is the seller?
   - Who is the buyer?

   Ask the seller:

   - How much are you going to sell X to the buyer for?
   - What affects the price of what you are selling?

   Ask the buyer:

   - Why do you want X from the seller?
   - How much are you willing to pay for it? Why are you willing to pay that amount (Is it good quality? Is it a good price? Are there others selling X? Are you desperately hungry?)

   Ask the seller:

   - If you weren't selling X, what would you do to make money?
   - Why have you chosen to sell X instead of what you would do otherwise?

3. Complete the sale, asking the buyer and seller to swap their pieces of paper to represent the trade.

4. Now ask participants to imagine the international market, not the local village market This time, present your seller with a drawing of an internationally traded good that may be relevant to the community (for example, timber or minerals). You can ask the participants if they know of anything their community or nearby communities sell internationally and use that as an example. Explain that your seller is now a representative of the community or village and they are selling this internationally sold product. Give your buyer a prop to indicate they are a foreign buyer.

5. Ask the same questions from Step 2, facilitating answers from the participants and leading where necessary. Keep this brief. You are simply demonstrating that many of the aspects of a marketplace remain the same even at the international scale.

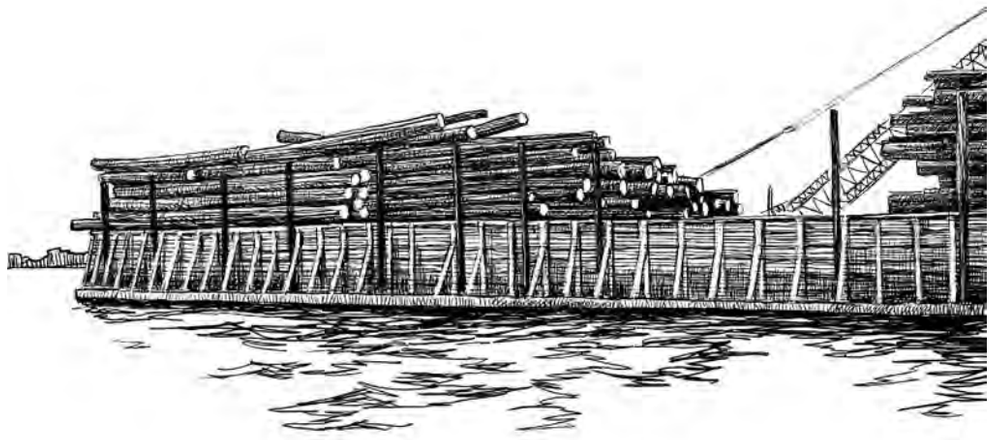
6. Reflect on the roleplay performance from *Activity 3.1a: Forest carbon project roleplay – A new proposal.* Recap to the group that there are buyers who are looking to buy carbon credits. When they pay for someone else to reduce emissions, they purchase carbon credits from those people.

7. Give your buyer a prop (for example, a backpack or clipboard). Explain to participants that tourism is an important economy for places like the Pacific, but that the more tourists that travel around the world in planes, cars and boats, the more greenhouse gas emissions are generated. The travel company owner cannot reduce the emissions any further at this time so they want to pay for other people somewhere in the world to reduce their emissions instead. They may be buying these 'carbon credits' because they want to be environmentally responsible, and so do their customers.

8. Explain to the group that the seller is part of a community that own a forest. Remind the participants that trees store carbon. The seller can therefore sell the carbon in their forest to the owner of the travel company. Intentionally leave the seller with no props and nothing in their hands. Ask the group how the seller is going to give the carbon to the buyer if the carbon is in the trees and the trees must stay where they are.

9. Explain the seller must produce carbon credits to sell to the buyer. A carbon credit is made when someone stores carbon on their land by protecting and restoring forest that would otherwise be destroyed or degraded. These activities reduce emissions by removing carbon dioxide from the air and storing it as trees and forests. Each tonne of emissions savings or 'removals' equals one carbon credit.

10. Explain that carbon projects are almost always developed in collaboration with a project developer, such as Nakau, because of their technical nature and the significant start-up funding required.



Timber is an example of a product that is commonly traded on the international market. Carbon can also be traded in this way.

TOPIC

3.2

Forest carbon project types and rules

Topic summary

This topic will make participants aware of different types of forest carbon projects. The activities will focus only on the project types that are locally relevant for communities, and these will be looked at in more detail. The activities in this section focus on a simplified version of a 'logged-to-protected-forest' project type. However, activities can easily be modified to cover other project scenarios. This topic also examines additionality and permanence, which are key criteria for any forest carbon project.

Learning outcomes

'Participants can …'

3.4 Explain what carbon credits are and how they are produced

3.5 Explain why an existing forest must be under threat of deforestation or degradation to make it eligible as a forest carbon project

3.6 Identify forests that cannot be used to generate carbon credits (for example, forests that are already protected, inaccessible or uneconomic for other uses)

3.7 Describe the opportunity costs (lost opportunities) from managing a forest for carbon credits

3.8 Explain how long a forest needs to be protected (for example, 50 years) to allow carbon credits to be produced and sold

3.9 Explain what would happen if forest used for a forest carbon project continued to be deforested or degraded

3.10 Explain what activities may still occur in a forest managed for forest carbon (for example, tourism, gathering non-timber forest products and local building materials, forest management)

Background reading

As explained in Topic 3.1, carbon credits are generated by protecting forests from logging or clearing, or by restoring forests and encouraging forests to grow — which stores carbon.

The focus of Topic 3.2 is on different types of carbon credits — also known as carbon units, certificates or offsets — that can be made by protecting or restoring forests.

One carbon credit is equivalent to one tonne of carbon dioxide that has either been removed from the atmosphere or prevented from being released into the atmosphere.

What types of forest carbon projects are eligible?

A project is eligible to create carbon credits only if it creates a future where more carbon is stored in the forest (removed from the atmosphere), or if less CO_2 is emitted from the forest as a direct result of the project. In other words, if the project did not go ahead, there would be more emissions released or less removed in the future.

In more technical language, the likely future without the forest carbon project is known as the 'baseline emissions', 'reference emissions level' or 'business as usual' (BAU) scenario. The amount of carbon credits that can be produced is the difference between the baseline emissions and the new future created because of the project. This is known as the project scenario.

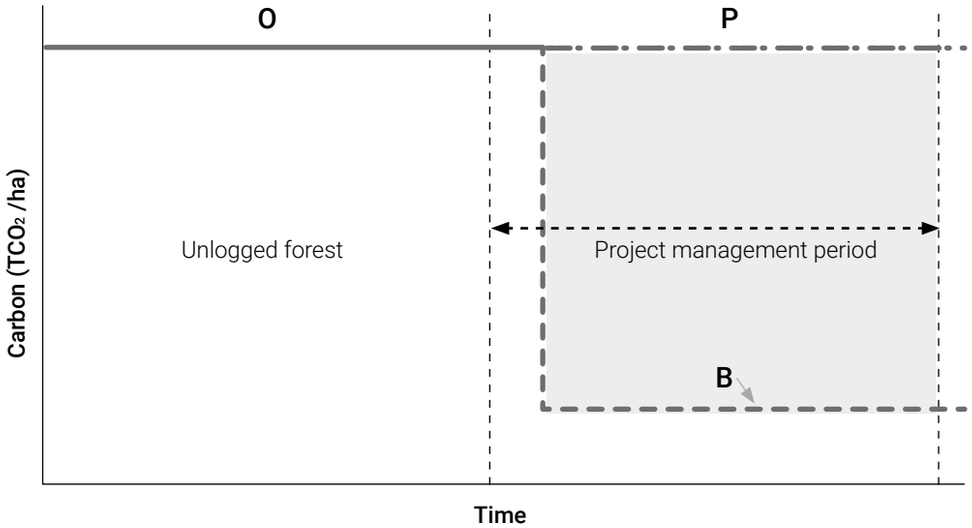
The term 'project type' is used to describe the various project scenarios. Carbon standards have developed a system of naming forest carbon activity types. The following pages illustrate examples of four forest carbon activity types. Pick the project that relates most to you and explore it further:

- Reduced Emissions from Deforestation and Forest Degradation (REDD)
- Improved Forest Management — Conversion of Logged to Protected Forest (IFM-LtPF)

- Afforestation Reforestation and Revegetation (ARR)
- Improved Forest Management — Conversion of Low Productive to High Productive Forest (IFM-LtHF)

Reduced Emissions from Deforestation and Forest Degradation (REDD)

Explanation: Figure 3.2A is concerned with an old-growth forest that is going to be cleared. The forest will not be replanted or allowed to recover but used for large-scale agriculture or cattle grazing. This would create a scenario where the carbon stocks stored in the forest decline rapidly (see line B) and remain low. But if the (REDD-APD) project establishes a protected conservation area, then the carbon stocks would remain at present levels (see line P). The grey shaded area represents the difference in emissions between the baseline emissions and the new future created by the project, the project scenario. This difference could be calculated and turned into carbon credits.



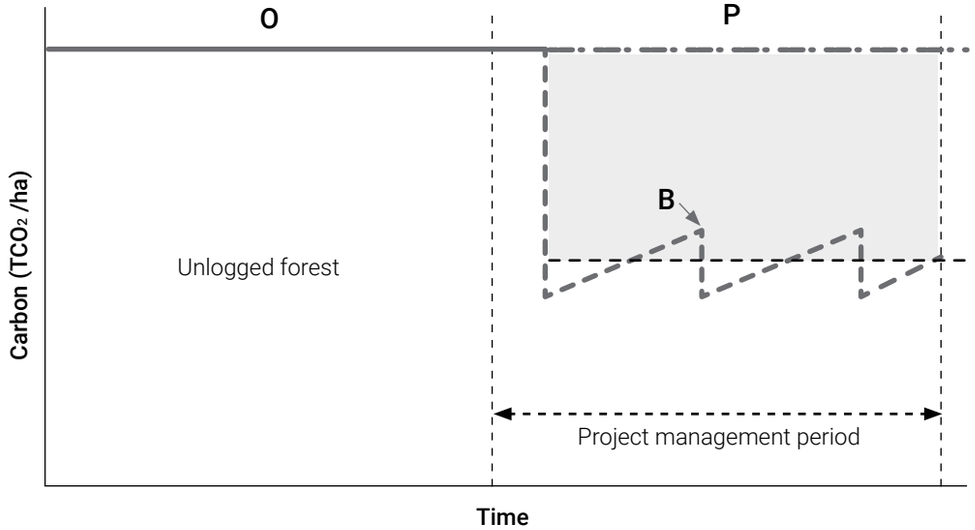
Key:

O = Original mean carbon stocks in old-growth undisturbed forest
B = Baseline scenario carbon stocks under deforestation
P = Project scenario carbon stocks under forest protection regime
Grey Tradable carbon

Figure 3.2A: Concept diagram: REDD-APD Variant 1 starting with an old-growth forest

Improved Forest Management – Conversion of Logged To Protected Forest (IFM-LtPF)

Explanation: Figure 3.2B is concerned with a mature, old-growth native forest where logging will take place. In this case, the forest will regrow after logging, but it will be re-harvested following a periodic regeneration-harvesting cycle. This logging practice creates a sharp decline in carbon storage, followed by a cycle of modest recovery and then decline when the re-harvesting occurs (see line B). If the (IFM-LtPF) project establishes a protected conservation area, then the carbon stocks would remain at present levels (see line P). The grey shaded area represents the difference in emissions between the mean (average) baseline emissions (see line MB) and the new conservation scenario created by the project scenario. This difference could be calculated and turned into carbon credits.



Key:

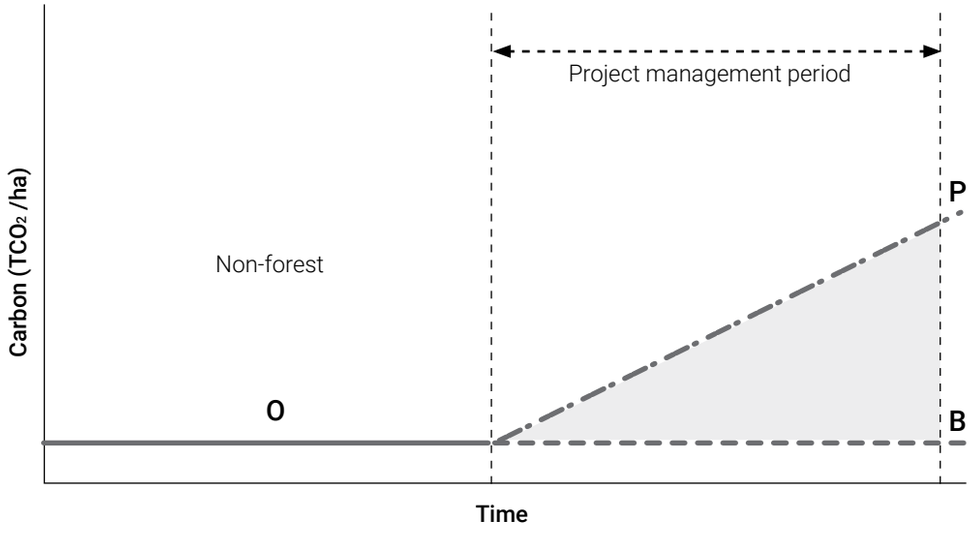
O = Original mean carbon stocks in old-growth undisturbed forest
B = Baseline scenario carbon stocks under deforestation
P = Project scenario carbon stocks under forest protection regime
MB = Mean baseline carbon stocks under harvest regime

Figure 3.2B: Concept diagram: IFM-LtPF Variant 1 starting with an old-growth forest.

Afforestation Reforestation and Revegetation (ARR)

Explanation: In this example there is no forest on the site before the project (figure 3.2D). The amount of carbon stored is very low and is expected to continue to be low in the future (see lines O and B). The (ARR) project type will involve replanting forests and regenerating a forest on the site. As the new forest grows, the carbon stocks gradually increase through time (see line P).

The grey shaded area represents the difference in carbon stored between the expected future (baseline emissions) and the new project scenario created by the project (a growing forest). The extra carbon stored can also be referred to as 'enhanced removals' as it represents extra carbon dioxide removed from the atmosphere. The extra carbon removed and stored could be calculated (see grey area) and turned into carbon credits.



Key:

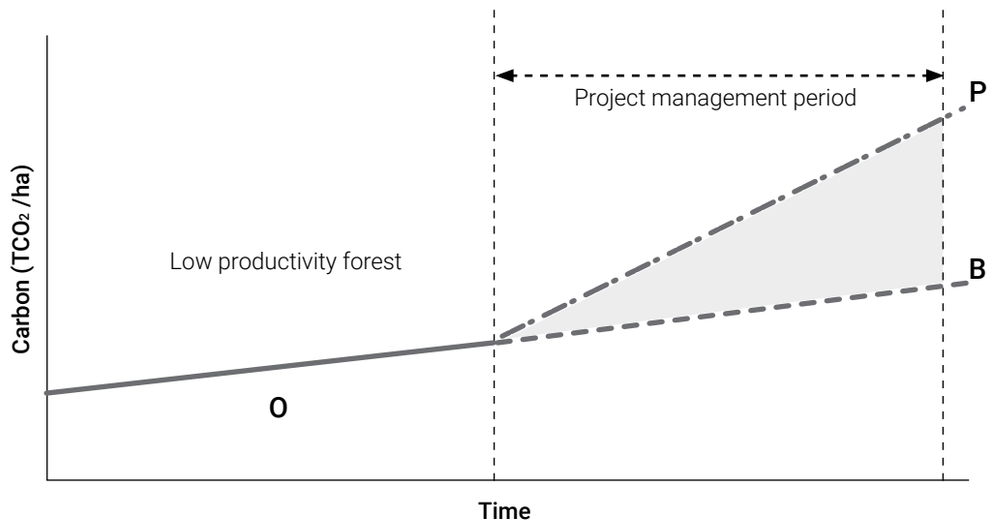
O = Original mean carbon stocks in old-growth undisturbed forest
B = Baseline scenario carbon stocks under deforestation
P = Project scenario carbon stocks under forest protection regime
Grey = Tradable carbon

Figure 3.2D. Concept diagram: ARR project type starting with non-forest land (including degraded and weedy coconut plantation)

Improved Forest Management – Conversion of Low Productive to High Productive Forest (IFM-LtHF)

Explanation: If the original condition is a degraded forest with very low carbon stocks, then the activity type is a forest-remaining-as-forest activity and falls under Improved Forest Management. In this example (see figure 3.2E), there is forest on the site prior to the commencement of the project, however it is degraded and recovery from a past disturbance has been poor. An example of this scenario could occur when weeds invade a forest after logging, and these weeds inhibit regrowth (for example, *Merremia peltata* in the Pacific Islands). The amount of carbon stored is relatively low and will only slowly increase in the future (see lines O and B). The (IFM-LtHF) project type will involve management actions (such as weed removal) that result in rapid regeneration and recovery. As the managed forest now grows faster than before, the carbon stocks also increase faster (see line P).

The grey shaded area represents the difference in carbon stored between the expected future (baseline emissions) for a slowly regenerating forest and the new future created by the project scenario (a fast-growing forest). The extra carbon stored can also be referred to as 'enhanced removals' as it represents extra carbon dioxide removed from the atmosphere. The extra carbon removed and stored could be calculated (see grey area) and turned into carbon credits.



Key:

O = Original mean carbon stocks in old-growth undisturbed forest
B = Baseline scenario carbon stocks under deforestation
P = Project scenario carbon stocks under forest protection regime
Grey = Tradable carbon

Figure 3.2E: Concept diagram: IFM-LtHP project type starting with non-forest land (including degraded and weedy coconut plantation)

Important rules for forest carbon projects

Additionality

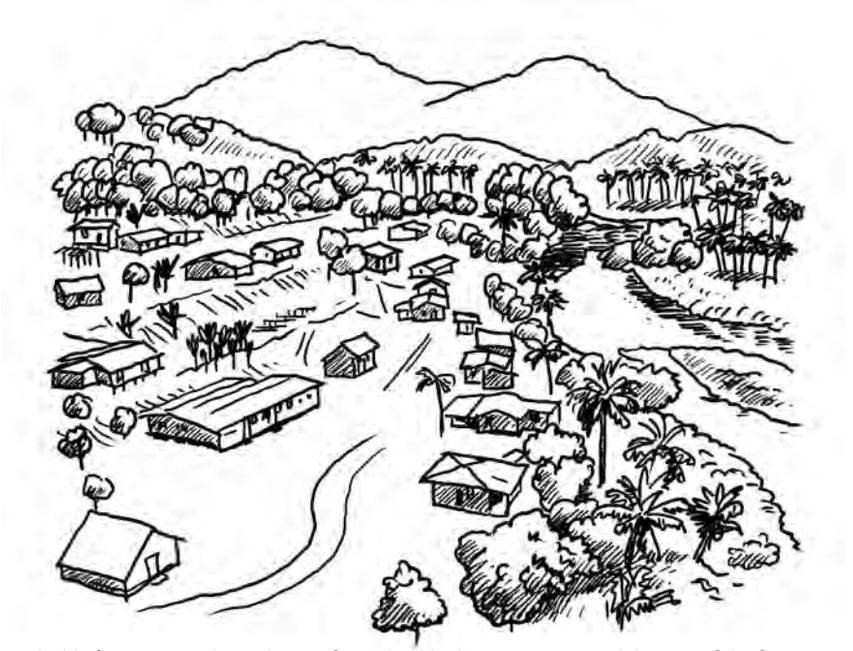
To be eligible to create carbon credits, a project developer must be able to demonstrate that the emissions reductions or emissions removed from the atmosphere happened because of the project and would not have occurred anyway without the project existing. The carbon dioxide emissions reduced or emissions removed from the atmosphere must be additional to what would have happened if the forest carbon project did not exist. This is called additionality.

To obtain certified carbon credits, the project developer must show additionality by proving the threat from logging or degradation, or the forest must already be degraded. The forest carbon project developer may also have to prove that the threatening activity — such as commercial logging — is economically viable and would have occurred.

To become a certified carbon project, the project must meet certain rules set by an international carbon standard. These rules are there to ensure the carbon stored is real and verifiable. They are also there to ensure sold carbon credits can be guaranteed to remain stored and will not be released into the atmosphere. Without these rules, forest carbon projects would not be considered by the carbon market (standards or buyers) to have integrity.

Without integrity, the market would be flooded with carbon credits that do not represent any carbon benefit above what was already being stored in forests. The credits would not be offsetting the greenhouse gas emissions or helping climate change.

Large-scale agriculture and plantations are one of the threats to Pacific rainforests.



Forest is eligible for a project depending on forest health, threats, access and the size of the forest.

Forests that are not eligible

People often ask if an area of forest that is not valued economically or useful for gardening can be used for forest carbon projects. The answer is usually no. An area of forest that is inaccessible or too steep for logging or gardening is not under threat from deforestation or degradation. A project to protect it will not result in 'additional' emissions reductions.

Protected forests and forest carbon projects

Can a protected forest be eligible as a forest carbon project? The answer to this question is most likely no. But there are exceptions. If a forest is already protected, then protecting it through a forest carbon project won't make any difference to emissions. However, it could be eligible as a forest carbon project if the form of 'protection' was under threat or not working, for example due to insufficient capacity for enforcement. This may be difficult to prove and would require evidence. Some carbon standards will not certify projects that occur in forest protected by national government legislation.

Some ways to check if a protected area may be eligible for a forest carbon project:

- Check if forest carbon projects was stated as an objective of the protected area when it was established (see the management plan or registration documents)
- Ensure the protected area was not established before the allowable period for back-dating projects (for some carbon standards this is up to five years)
- Research deforestation rates within the protected area during the protection period to assess the effectiveness of the protected area.

Protecting healthy rainforest trees that store carbon for the long-term is known as project permanence.

Permanence

A forest carbon project must demonstrate that its management and design will store carbon permanently. The project design must include strategies and activities that address the risks that stored carbon might not last. For example, how can a project prevent illegal logging? If the carbon dioxide emissions from a project are released, the carbon credits for that project lose their value. This is known as lack of permanence or 'reversals'.

Risks that can lead to a lack of permanence or reversals include:

- Illegal logging
- Fire
- Extreme weather (for example, a cyclone)
- Land disputes
- Continued deforestation or degradation
- Breaking forest carbon project contractual obligations
- Population-growth near the forest
- A lack of understanding of the need for permanence from landowner communities.

The length of time over which we can measure emissions reductions and create carbon credits from a project is called the crediting period. However carbon standards often require carbon to remain stored in the forest for much longer than the crediting period. For example a project may have a crediting period of 30 years, but a permanence period of 50–100 years.

While steps can be taken to reduce the risk of non-permanence in a forest carbon project, carbon standards go further to protect carbon projects from a lack of permanence or reversals. During the certification process, carbon standards allocate a certain amount of credits from the project as an insurance buffer; these credits are held in a buffer account. The size of this buffer is determined by the perceived size of the risk. If a release of carbon (a reversal) occurs, the standard will use (retire or cancel) the buffer credits to compensate for the credits that have been lost. Landowners do not receive any income from retirement of buffer credits.

Addressing permanence in a forest carbon project requires addressing the causes of deforestation. It is important that a landowner community involved in a forest carbon project understands the need for permanence. They must feel satisfied with the conditions on the contract outlining how they can continue to access and use the forest.

If the community has needs that require carbon to be released from the forest, these needs must be planned for in the project — so carbon losses are considered when calculating the credits — or addressed through alternative avenues. For example, a community may rely on slash-and-burn agriculture and this will threaten the area demarcated for forest carbon. Supporting the community to find alternative, sustainable methods of food production may be appropriate to reduce the need for slash-and-burn farming. Alternatively, the generation of income from forest carbon may reduce the pressure on agricultural production for income.

Slash and burn is a common farming technique in the Pacific.

Activity 3.2a
Hands-on carbon

Activity summary

Participants learn how carbon credits are produced under forest carbon projects. The use of a visual representation of baseline and project scenarios will provide participants with a tangible reference for a carbon credit. The concept of additionality is also introduced. This activity is initially demonstrated by the facilitator and then repeated by workshop participants.

Learning outcomes

'Participants can …'

3.4 Explain what a carbon credit is and how they are produced

3.5 Explain why an existing forest must be under threat of deforestation or degradation to make it eligible as a forest carbon project

Suggested timing

60 minutes

Materials

- 1 x 4-litre container of green-coloured playdough*
- 1 x 2-litre container of red-coloured playdough*
- 1 set of kitchen scales (choose scales that are most familiar to a person from the target audience)
- Knife

* See recipe for making playdough on p.112. Remember you need enough play dough so that everyone in your group can see this demonstration and so that the dough can represent all the carbon in the forest, so you may need to make a few batches.

Step-by-step guide

Facilitator's note:

This activity is a complex element in the explanation of forest carbon projects. Take time to prepare this activity so you can present it as simply as possible.

Keep in mind this activity will describe forest carbon activities in their most basic format. The 'story' told in the activity is most relevant for a community considering a 'logged-to-protected-forest' project type. The activity could be easily modified for another project type — such as reforestation.

Part 1: Weighing up the carbon

1. Ask the audience to close their eyes and imagine their forest:

   'Imagine you are walking on a path through the forest. Take a deep breath — what does the forest smell like? Listen carefully to the sounds of the forest — what can you hear? What animals can you see in the forest? Are there birds in the trees? Now reach out and touch the trees — what does the bark feel like? Rub your hands on it — is it hard or soft?'

2. Now tell the group to imagine they feel a strange sensation in their legs and arms and whole body — they are starting to grow. 'You are growing rapidly until you are as big as the surrounding mountains and can look down on the entire forest. Using your giant arms, you reach out and sweep up all the trees in the forest. You use your giant hands to pack them into one giant green ball.' Invite the participants to open their eyes. When everyone is re-engaged, hold up the large ball of green-coloured playdough. Explain that this represents the ball of trees. Check all participants understand this metaphor.

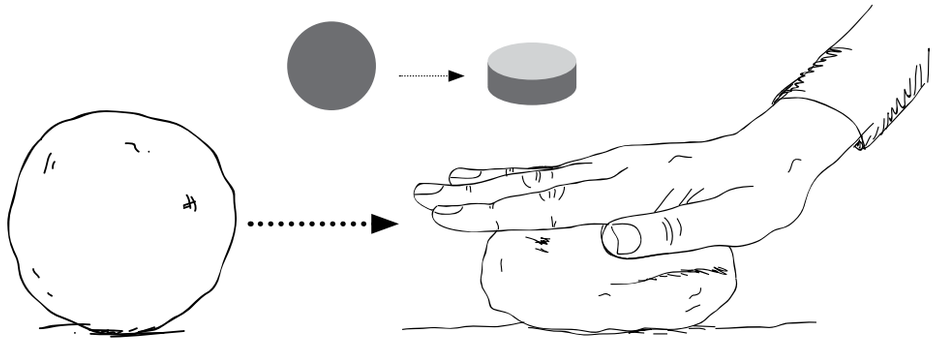
Facilitator's note:

'Unpack' the metaphor. Metaphors and diagrams can be useful tools for explaining something that cannot be readily seen or observed. Take care to ensure participants do not take the metaphor literally. This activity represents a simplification of the real situation, which is much more complex — it is important to get this message across, too.

3. Explain the trees in their forest are mainly made up of carbon. The carbon is a building block that creates the wood, roots and leaves. (This should be revision from earlier activities.) Explain that carbon is not the only substance in the trees. Other substances, such as water, are also in the trees. Take about one-third of the green playdough and put it back in its container. Explain you are now holding only the forest carbon, minus the other materials.

4. Ask a volunteer to weigh the ball of forest carbon using the kitchen scales and to record the weight in grams on a piece of paper (displayed where everyone can see it). Ask the participants to imagine the weight is actually tonnes rather than grams. You will end up with a number of tonnes of carbon stored in the green ball, which represents the amount of carbon stored in the forest.

5. Ensuring everyone still understands the metaphor (that is, this is a great ball of carbon, not just playdough), flatten the ball into the shape of a disc (that is, a pie shape).



6. Explain to the group that a logging company plans to log the forest and will harvest around 50% of the large trees. Ask the group if there will be more or less carbon in the forest after the logging is completed? Hopefully someone will respond there would be 'less carbon'.

7. Ask a volunteer to come up to the front. Give them a knife and ask them to cut and remove around one-third of the volume out of the green ball of forest carbon (they should cut it out in a wedge shape). Explain to the group the dough that has been removed represents the carbon lost due to the logging activities. Ask the group, 'Where did it go?'. Explain it ultimately ends up in the atmosphere as CO_2 gas.

8. Referring to the remaining pie-shaped mass of forest carbon, ask the group what would happen if a forest carbon project was established that stopped logging by creating a conservation area in the same place. Encourage the answers to come from the participants, but ensure the following message is communicated: 'The trees (and carbon) would remain in the forest, and the dough would remain in the pie.'

9. Ask the volunteer to replace the missing forest carbon (dough) in the pie, by filling the gap using red-coloured playdough. Explain if the deforestation was avoided because of a forest carbon project, the red dough represents how much carbon would remain stored in the forest instead of being released as CO_2 emissions.

10. Ensure everyone can see the 'pie', and everyone understands what the red dough represents. Now ask the volunteer to remove the red dough from the pie and put it on the kitchen scales. Again, measure the weight in grams and assume that each gram equals one tonne of carbon. Record this number where everyone can see it. Explain that each tonne of avoided CO_2 emissions equals one carbon credit, and if this was a real figure (referring to the final calculation) this amount of carbon credits could be produced by the project and sold to a buyer.

Follow-up discussion questions

Ask the group:

- What did the green dough represent?
- Why were the portions of green dough removed?
- What was the significance of the red dough?
- If a logging company were only going to harvest 30% of the large trees in your forest (instead of 50%), how much green dough would have been removed? What would this do to the total number of carbon credits that could be produced?

Facilitator's note:

This activity has caused some participants to become concerned about the value of their potential forest carbon project. People may say things like 'But this means we can't use all of the carbon in the whole forest to make credits'. Do not be worried if this happens; it is important people understand the reality of what forest carbon projects can and can't do and it is a way of clarifying expectations. If well managed, this is healthy dialogue and positive learning.

You may also be asked questions such as 'Why don't we just go invite a logging company to come to our land so we can show the threat and start a project?'. In this case, explain that proposing a development just to gain carbon credits would make a project ineligible. It is only eligible if the development was already going to take place.

Part 2: Reviewing with peers

11. Acknowledge the activity is complicated because it tries to represent something that happens in the real world that is difficult to see, and it replaces the real world with a more easily observed representation of what happens. Ask members of the group to put up their hand if they feel they understood the activity well.

12. Organise the group into smaller groups, with one of the people who raised their hand in each group. Provide each group with two balls of playdough (green and red) and ask the person who raised their hand to repeat the demonstration for their group. Be on hand to lend assistance and to answer questions. Continue until everyone has experienced the demonstration a second time.

13. Ask the group, 'How did repeating this demonstration help you to understand forest carbon projects?'. Ask those who were leading each demonstration, 'How did you feel having to demonstrate this activity? Do you think you explained it well?.

Recipes for making playdough

If you are unable to purchase playdough for this activity, it is easy to make. Here are two recipes, one using cream of tartar (a common baking ingredient) and one without. The other main difference between the recipes is that one needs to be cooked and the other does not.

You may need to make more than one batch to ensure you have enough for the demonstration.

Once the playdough is made it can last for many months if stored correctly. Wrap it in plastic in an airtight container and store it in a fridge.

Easy, no-cook playdough

- 2 cups plain flour
- 4 tablespoons cream of tartar (a baking product available from bigger supermarkets)
- 2 tablespoons cooking oil
- 1 cup salt
- 2 cups boiling water
- Food colouring, red or green

Method

Just pop it all in a mixing bowl and mix! It might not come together at first, but keep on mixing;
it will eventually take on a nice playdoughy texture.

Playdough recipe (no cream of tartar)

- 1 cup plain flour
- 1/4 cup salt
- 3 teaspoon vinegar or lemon juice
- 2 tablespoons oil
- 1/2 cup water
- Food colouring, red and green

Method

- Mix the dry ingredients in a saucepan
- Stir in the water over low heat
- Mix in the vinegar
- Pour in the oil
- Continue to mix over low heat until it forms a playdough texture
- Split up the dough into two batches, and knead in the food colour when it's cool enough to touch

Activity 3.2b
Visualising forest change and additionality

Activity summary

This activity repeats and extends on the concepts demonstrated in activity 3.2a. Participants review how carbon credits are produced using an alternative visual representation of baseline emissions and project scenarios in the form of graphs. The concept of additionality is also reviewed.

Learning outcomes

'Participants can …'

3.4 Explain what carbon credits are and how they are produced

3.5 Explain why an existing forest must be under threat of deforestation or degradation to make it eligible as a forest carbon project

Suggested timing

45 minutes

Materials

- Whiteboard or blackboard
- Different coloured markers or chalk

Step-by-step guide

Facilitator's note:

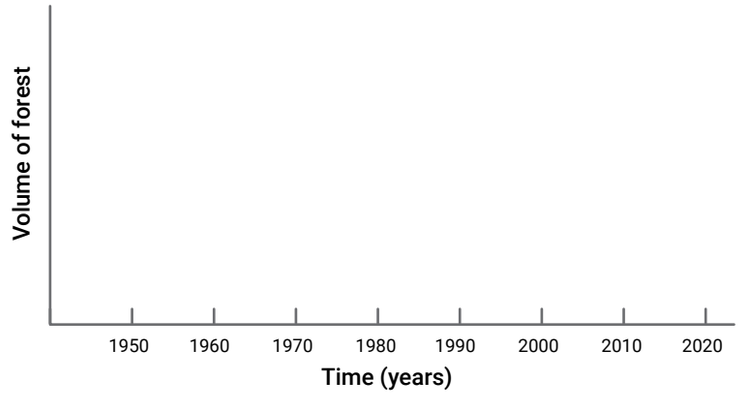
Allow participants to discuss and use their local knowledge when deciding how forest has changed each decade. This is an opportunity for older people to share their knowledge and experiences with younger community members. In addition to describing the history of change, this discussion can unveil the drivers of deforestation. The story of change will be recorded in the bars of the graph — but you can also label significant events so that it becomes a timeline.

Part 1: The past

1. Explain to the group that you are going to draw a graph that shows if the community's forests could create carbon credits. The graph will provide another way of visualising how carbon credits could be made.

2. Draw the two axes of a graph (as shown in figure 3.2bi) on a whiteboard or blackboard.

Figure 3.2bi



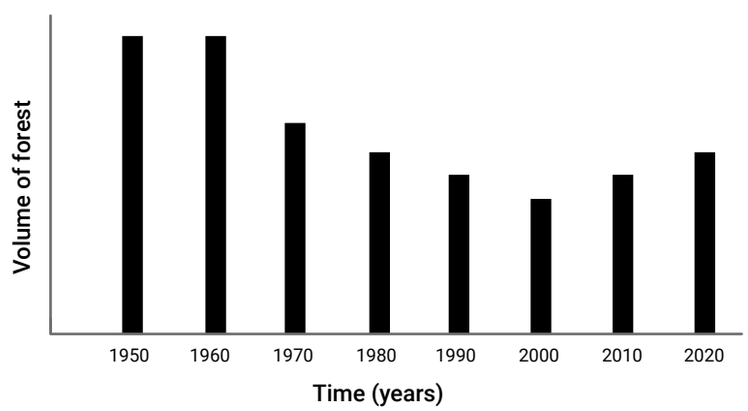
3. Start by asking participants to mark on the graph the year they were born. This ensures everyone understands how to read the X-axis as a timeline.

4. Next, draw a bar three-quarters up the Y-axis, starting above 1950 on the X-axis. Explain to the group this bar represents how much forest (by volume) there was in 1950. Explain that by 'how much forest' we mean the area of forest (how much ground it covers) as well as the density of forest (how thick it was).

5. Now ask the group to tell you how much forest there was in 1960 (relative to 1950). Was there more or less forest? Draw a corresponding bar on the graph (for example, see figure 3.2bii). Continue to discuss and — guided by participants — draw a bar for each decade until you have a graph showing the change in forest volume through time. Ensure group members understand how to read the graph. If forest volume has been decreasing (for example, due to logging, commercial crops or gardening) then the graph may look something like the figure 3.2bii, below.

Your graph will be a unique graph representing the real history of the community's forest. If possible, add some notes to the graph explaining what happened at key times (for example, '1960 — logging took place near the river').

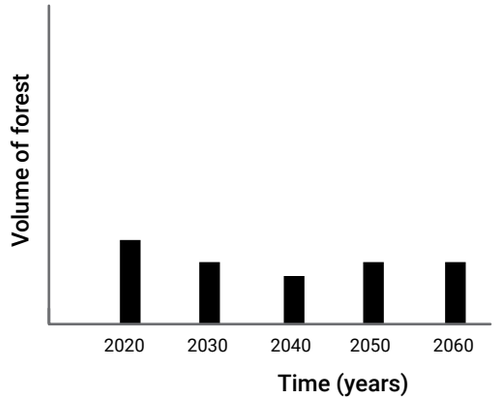
Figure 3.2bii



Part 2: The future

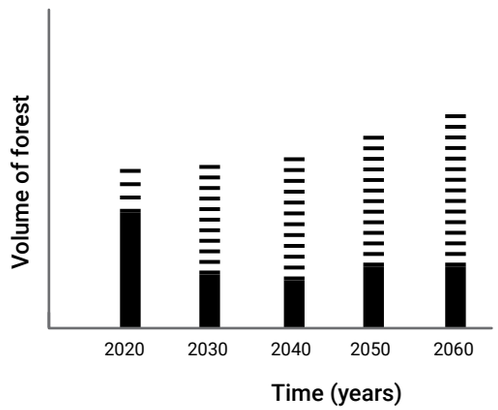
6. Draw a new graph or extend the current graph so that the X-axis 'timeline' goes through to 2060 or 2070. Ask the participants to imagine what is likely to happen to the volume of the forest in the future if there is no project to protect the forest. Ask them to carefully consider the types of activities that may take place. Is logging likely to occur? Will gardens take up more space? Are there plans for roads or other new developments? Starting at the 2020 marker, create bars on the graph showing the predicted change in forest volume into the future. The graph may look something like figure 3.2biii.

Figure 3.2biii



7. Ask the group to imagine what would happen if the forest was protected and managed through a forest carbon project. Using a different-coloured marker or chalk, and again starting at the 2020 marker, draw bars on the graph showing the predicted forest volume for each decade. If the remaining forest was protected and well managed, then the graph may look something like figure 3.2biv.

Figure 3.2biv



8. Explain the original part of the graph shows the 'business as usual' or 'reference case' for the future. A declining volume of forest corresponds with a decline in the amount of carbon stored in the forest. The new coloured bars show how much forest would be protected over time if the forest was protected. This is the 'project scenario'. The amount of forest saved (new colour) is linked to the amount of carbon saved. Explain it is possible to calculate how many tonnes of carbon are saved — and this figure is the number of carbon credits that could be created.

Activity 3.2c
Additionality

Activity summary

This activity is designed to reinforce the concept that a forest carbon project must be 'additional'. It also introduces the opportunity costs of forest carbon projects, which may trigger discussion over the benefits and costs of forest carbon projects versus alternatives.

Learning outcomes

'Participants can …'

3.5 Explain why an existing forest must be under threat of deforestation or degradation before the project to make it eligible for a forest carbon project

3.6 Identify forests that cannot be used to generate carbon credits (for example, forests that are already protected, inaccessible or uneconomic for other uses)

3.7 Describe the opportunity costs (lost opportunities) from managing a forest for carbon credits

Suggested timing

30 minutes

Materials

- Whiteboard or blackboard
- Markers or chalk

Step-by-step guide

1. Show participants a copy of the *Mapping land for potential forest carbon projects* picture (see p. 120). Make sure everyone can see it. You may use a poster-size printout, a digital projection or you could carefully re-draw a large version on a whiteboard, blackboard or poster paper.

2. Describe the picture to participants. Ask if they can identify any local places that are similar to those marked on the picture. Invite participants to elaborate on any local similarities to the picture.

3. Briefly explain the rule of additionality. Explain the below points to the group in your own words. (Refer to the background reading for support.)

   - For a forest carbon project to be certified, it must prove additionality.
   - Additionality means the emissions reductions or carbon removals have happened because of the project and wouldn't have taken place without the project.
   - The second point is important because an aim of a carbon credit is to help the world reduce greenhouse gas emissions. If the carbon credit does not represent extra emissions reductions or carbon removals, then it does not help reduce greenhouse gas emissions.

4. Address the sites on the picture one at a time and focus on those that are locally relevant. Ask the question, 'Could a forest carbon project happen at this site? Why or why not?'. The table on pages 118–120 may be useful in guiding the discussion and your explanations.

5. One of the main messages or learning outcomes from this activity is the realisation that forest carbon projects have opportunity costs and other economic opportunities become unavailable. Facilitate discussion about these. Also highlight how alternative land uses (for example, logging and agriculture) bring their own opportunity costs. Encourage participants to reflect on these costs too. If appropriate, you may wish to link this activity to Activity 4.3b to examine the pros and cons of forest carbon projects.

6. Mention the importance of land-use planning for considering if and where to undertake a forest carbon project. Sustainable land-use planning is a participatory process of planning future activities for the land that will cater for current and future needs.

Legally protected forest areas

It is advised to always legally protect a forest used for forest carbon projects. Legal protection is encouraged and may even be required by some carbon standards. If the forest is already legally protected (for example, by the national government) before forest carbon is considered, then it is probably not eligible. The situation is less clear for a forest under local or customary protection (community conservation area). In this case, the project would only be eligible if the protection is unlikely to be ongoing because of the drivers of deforestation — such as logging for much-needed income generation. Project developers and customary landowners should seek advice from the carbon standard before investing too much in project development in this instance.

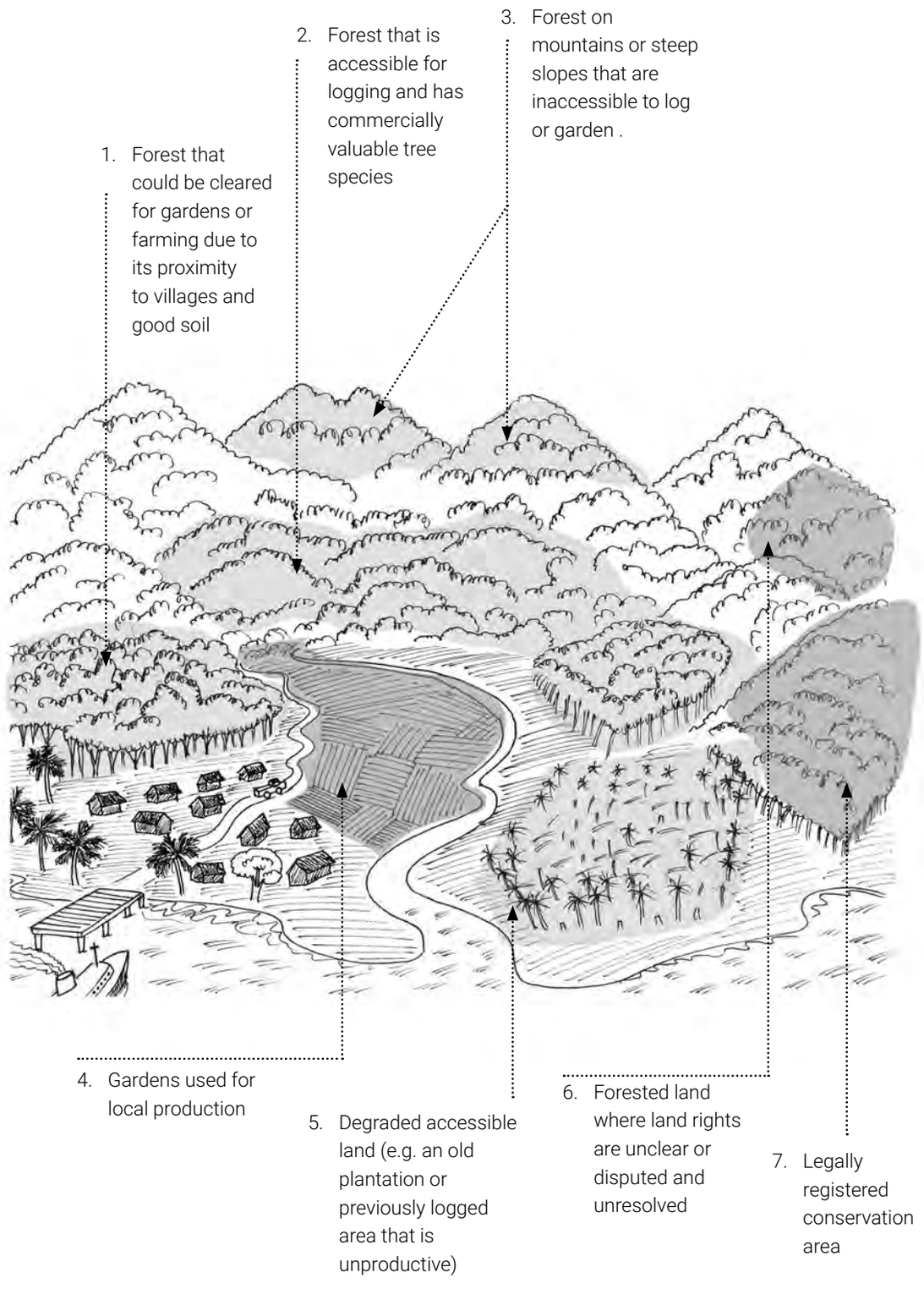
Exploring the pros and cons of forest carbon projects

The table below examines different land areas and asks the questions, is this location eligible for a carbon project? Is it a good idea to have a project in this area? In some cases an area is not eligible and a project is not an option. In other cases there are pros and cons. For example, a carbon project may replace another economic activity so that the activity can no longer happen. This is called an opportunity cost. This must be weighed against the positives for doing a carbon project.

Area description	Is this location eligible for a carbon project?	Is this a good location for a carbon project?
1. Forest that could be cleared for gardens or farming due to its proximity to villages and good soil.	Yes — if the forest is under threat from deforestation for agriculture there could be a carbon benefit from avoiding deforestation.	Maybe — landowners need to decide if this area is needed for farming and food security in the future. Once it becomes a carbon project it must remain as forest.
2. Forest that is accessible for logging and has commercially valuable tree species.	Yes — if the forest is under threat from logging there could be a carbon benefit from protecting the forest.	Yes — carbon projects are a viable economic alternative to logging and have many other benefits such as protecting cultural values and ecosystem services (clean water, food etc.).
3. Forest on mountains or steep slopes that are inaccessible to log or garden. This may include sites where logging is not allowed under laws or policy (e.g. logging code of practice).	No — if there is no direct risk of deforestation or degradation. There is no additional carbon benefit from 'protecting' a forest that would remain as a forest even if there was no carbon project.	No — this site is ineligible.
4. Gardens used for local production.	Yes — if the site was reforested through agroforestry or native forest regeneration, it may remove extra CO_2 from the atmosphere.	Maybe — landowners need to decide if this area is needed for farming and food security in the future and how a carbon project could impact this. An agroforestry project could increase food security, while growing a native forest could reduce food production.

Area description	Is this location eligible for a carbon project?	Is this a good location for a carbon project?
5. Degraded accessible land (e.g. an old plantation or previously logged area that is unproductive).	Yes — if the site is reforested it may remove extra CO_2 from the atmosphere.	Maybe — as above, landowners need to decide if this area is needed for farming and food security in the future. Growing native forest won't impact current food production but might reduce opportunity for future production.
6. Forested land where land rights are unclear or disputed and unresolved.	No — landowner identification and consent are essential for forest carbon projects. A project cannot proceed unless land ownership is clearly defined, and disputes resolved.	Maybe — the location is currently unsuitable for carbon project development, but preparatory activities might be worthwhile. If forest is threatened it may be worth investing in resolving disputes and clarifying rights for future eligibility.
7. Legally registered conservation area.	Yes or no. No — if sites were legally protected prior to a carbon project being considered this suggests a carbon project was not needed. There is no additional carbon benefit if the forest would have remained protected in the absence of a carbon project. Yes — if the site is protected as part of developing a carbon project, and if this protection would not have happened otherwise, then the site could be a carbon project.	Yes and no. No — if the site was already protected independently of the carbon project (it is ineligible) Yes — if the site is protected as part of the carbon project. In this case the legal protection is needed to ensure protection is long lasting.

Eligibility for forest carbon projects



Activity 3.2d
Permanence

Activity summary

Participants examine what they can and cannot do within their forest if it is used for generating carbon credits. This is related to the concept of 'permanence', which is ensuring the project and the benefits are long lasting. It also links to the concept of opportunity costs.

Learning outcomes

'Participants can …'

3.7 Describe the opportunity costs (lost opportunities) from managing a forest for carbon credits

3.8 Explain how long a forest needs to be protected (for example, 50 years) to allow carbon credits to be produced and sold

3.9 Explain what would happen if forest used for a forest carbon project continued to be deforested or degraded

3.10 Explain what activities may still occur in a forest managed for a carbon project (for example, tourism, gathering non-timber forest products and local building materials, forest management)

Suggested timing

30 minutes

Materials

- Balloons
- Paper
- Adhesive tape
- Scissors or a pin

Step-by-step guide

Facilitator's note:

If you do not have balloons, you can conduct this activity using anything to visualise large and small activities. You can also draw pictures on a large sheet of paper.

1. Explain to the group that once a forest carbon project has started in the forest area, there are certain changes to how the community use the forest. Explain that landowners still retain ownership, rights and access but some activities may change, especially those that significantly reduce carbon stocks. Ask the participants to call out things they do in their forest. As they call out an example, write or draw that example on a small piece of paper. Then ask for the volunteer to come forward and take the piece of paper with the activity presented on it.

2. Ask the group whether that activity would release a lot of carbon into the air or only a little (they may need to refresh their knowledge by looking at the greenhouse gas diagram; see page p. 36). Give your volunteer a balloon and ask them to blow up their balloon to a size that corresponds to how much carbon would be released by that activity. For example, logging would release lots of carbon so the balloon would be blown up all the way, but sustainable hunting of pigs would release virtually no carbon so they would not blow up the balloon at all.

3. Once the volunteer has blown up the balloon, stick the piece of paper to the balloon and ask the volunteer to hold up the balloon.

4. Continue steps 1 to 3 with the rest of the volunteers. Examples of activities that may be suggested are:

    - Slash and burn the forest to clear for agriculture
    - Harvesting trees for local building materials
    - Logging timber to sell
    - Collecting firewood (small amounts, only what is needed)
    - Collecting wild food (for example, fruit or yams)
    - Ceremonies
    - Collecting medicines
    - Collecting building materials
    - Removing pests or weeds
    - Grazing livestock
    - Taking visitors on tours through the forest.

5. Once you have a line of volunteers standing up the front holding their different-sized balloons, address each volunteer and activity in turn. Ask the group if it would be okay to do each activity if there was a forest carbon project? Does that activity release lots of carbon? If the activity does not release lots of carbon, move on to the next activity. If it does release a lot of carbon, then explain the activity would either be banned at the project site or taken into account, which means it would reduce the amount of carbon credits (and income) from the forest carbon project.

6. Once all the balloons are reviewed, explain that the length of a forest carbon project can be very long — sometimes 50 or 100 years. Explain that activities which release a lot of carbon need to be limited or stopped during the entire project period.

7. To finish the activity, explain to the group that if they have a forest carbon project, they should come to an agreement with the project developer about how they use the forest.

TOPIC

3.3

Implementing community-owned forest carbon projects

Topic summary

This topic provides a general overview of the process for developing and implementing a community-owned forest carbon project. Participants will learn about the main 'actors' in a forest carbon project and examine a realistic timeline for making a forest carbon project a reality.

Learning outcomes

'Participants can …'

3.11 Describe the roles and responsibilities of various 'actors' and the process for development of a forest carbon project

Background reading

Who is involved in a community-owned forest carbon project?

The information below describes the roles of key people or organisations (sometimes referred to as 'actors') that you might expect to be involved in a forest carbon project.

Project owners: customary landowner community

In the case of community-owned forest carbon projects, the landowners and rights holders are usually the Indigenous Peoples and local community who are dependent on the land and resources.

The land tenure systems and land rights held by Indigenous Peoples vary widely between countries. In some cases, the Indigenous customary landowners have full rights over land and resources and power to make decisions. In other countries Indigenous Peoples have less or little control and the majority of power is held by the state. The rights to land and decision-making also vary within communities, and some groups may enjoy more rights and access to benefits from land than others.

Indigenous landowners and communities have the highest stake in the outcome of development on their land. They must be fully informed about forest carbon projects and their implications. Free, prior and informed consent (FPIC) from landowners is required before a forest carbon project can go ahead. However, community forest carbon projects should set their sights much higher and aim to maximise the control and benefits from a forest carbon project for the community.

Project developers

International or local NGOs or companies are working to help set up forest carbon projects around the world. They are referred to as the project developer and take the lead role in planning and develop the technical side of a forest carbon project. They should be fully engaged and working in collaboration with the landowners and community, and undertake feasibility assessments of the forest to check it is viable for a project.

Ideally, project developers are working with and on behalf of landowners to enable financial, environmental and social benefits to flow to the community.

Government regulators

Governments of many countries are establishing regulatory frameworks and institutions to govern forest carbon activities. This process is often facilitated or supported by external actors, such as UN REDD, Global Green Growth Institute (GGGI), the World Bank or other international governments.

On the national level, the country's government will establish the 'rules' for carbon markets by creating legislation and policy. This includes determining the process to have a forest carbon project approved and deciding on standards or conditions. They can also determine how finances from a forest carbon project are distributed.

Most national governments seeking to tap into carbon finance want to align their national policy, laws and capacity for governance with the international rules for carbon markets, which relate to the agreements and decisions emerging through the UNFCCC COP process, such as the Paris Agreement. Project developers and project owners need to understand what is happening in this area, as they will need to comply with regulations and may need to advocate for protection of their rights, access to benefits and better policy.

On a national level, governments will establish 'rules' for carbon markets by creating legislation and policy.

Donors

Forest carbon projects, especially first generation or pilot projects, have expensive set-up costs and a donor or investor often finances these early costs. In community-owned forest carbon projects, this can mean the project is more viable for the community because they don't have to raise the funds for project start-up. However, communities should be aware of who is paying for what, and what financial liabilities and costs (as well as income) will arise from the project.

Carbon standards

A forest carbon project will need to meet the conditions of a standard to become certified (sometimes referred to as validation), which then allows the project to receive carbon credits that can be sold. This process is explained further on p. 131. The organisations that run the standards will review the project design and its implementation in the field — only then can credits be issued. Carbon standards typically require an independent third-party review of the project, however the project developer or project owner must pay for this.

Technical consultants

Forest carbon projects are a relatively new type of project and often require advice from technical consultants. Costs of consultants may be lowered through the design of projects that increase the capacity of the community or project developers to undertake this work themselves and reduce the need for outside support.

Forest rangers now use a mapping app to help monitor the forest.

Table 3.3A. Project roles and responsibilities for an example Plan Vivo certified project under the Nakau Programme. Plan Vivo is a carbon standard.

Project actor	Roles and responsibilities
Project owner (for example, cooperative, tribal association or community business) on behalf of the landowners	Owner of carbon rights
	Represents, reports to and accountable to landowner members
	Responsible for managing the income from credit sales
	Runs the project-owner enterprise (governance and business management) under the project-owner business plan
	Implements benefit sharing at community level under the benefit-sharing plan
	Undertakes monitoring (forest, biodiversity)
	Implements the conservation management plan (for example, ranger work in the forest)
	Regular communication and reporting to landowner members
Project coordinator (NGO or private sector)	Project design and development, including land-use and community development planning
	Support in setting up project governance structures
	Stakeholder engagement during project development and implementation
	Preparing annual reports and coordinating validation and verification events
	Supports project owners to monitor project indicators
	Undertakes social impact monitoring and reporting
	Provides technical assistance and capacity building for project owner to help them implement conservation management and forest monitoring
	Hands-on support to the project owner (landowners) to run their carbon enterprise
	Support to communities in entrepreneurship and alternative livelihood activities
Program developer (Nakau)	Owner of intellectual property associated with the Nakau Programme tools and methodologies. Develops and provides these for projects to use
	Leads on the Nakau Programme's integrity and reputation (brand)
	Oversight on project design and development, preparation of Project Design Documents (PDDs)
	Ensures carbon standard requirements are met and policies, laws and regulations complied with
	Secures and manages project data (for example, management plans, project agreements, monitoring results and sales agreements)
	Technical assistance and capacity building for project participants and the project coordinator (for example, remote sensing, land-use planning, social impact monitoring)
	Service provider for mapping, forest inventories and carbon accounting
	Design and training in project monitoring systems

A community forest carbon project cycle

Community forest carbon projects usually have two phases: the set-up phase (project development) and carbon trading phase (project implementation).

Project development

Setting up a project is a step-by-step process that can take two to three years. The steps in this process are required to gather the information needed for carbon standard approval. Community forest carbon projects should be fully integrated into the broader aspirations and plans for community development.

1

Developing a project idea

Includes consultation with the landowners and community to determine if the idea for the project is supported. If feasibility is not yet known, we recommend only consulting a small group of community leaders to avoid raising expectations.

2

Feasibility study

Determines if a project is technically and economically viable, and to establish if it can meet the eligibility requirements (such as additionality).

3

Community empowerment and education

A significant investment of time and effort throughout the project to ensure the community has the skills and knowledge to participate in decisions about whether a project should take place and how it should be designed. Includes signing an agreement to collaborate on project development.

4

Project Idea Note (PIN)

A brief document (or concept note) that describes the main attributes of the project, including location, standard selected, project type, etc. It allows stakeholders, such as the community and regulators, to understand and approve of the project concept before further investment in project design.

5

Baseline establishment

Collection of important data to understand the current situation (or baseline) for the forest (through a forest inventory), for the community (through household surveys) and for the plants and animals in the project area (through a biodiversity survey).

6

Activity planning

Where the landowners and broader community plan what activities they will do to create a carbon benefit. This usually involves land-use planning, establishment of a protected area, and development of a conservation and/or restoration plan.

7

Benefit sharing planning

An open and transparent process for sharing benefits is crucial to a good forest carbon project. This stage takes communities through a process for agreeing on how to use the income that will be earned from the sale of carbon credits.

8

Governance and business setup

Landowners set up their own organisation to represent themselves and engage in selling carbon credits. It must be representative, transparent and have a good business plan for running activities and distributing benefits. This organisation can be a cooperative or an association. It will be central to running the project in the future.

9

Project Design Document (PDD)

Design of a forest carbon project must be written up in the format required for the certification standard. This step requires a monitoring plan and the carbon baseline and project benefit to have been measured. It will also broadly define how the project owners (community) will share the benefits.

10

Project validation and registration

When a forest carbon project is validated (by the certification standard), then carbon credits are issued and registered. The project can then sell the carbon credits.

Project implementation

Once the project is approved, the process of implementing a community forest carbon project can be described as a cycle that repeats every three to five years until the project is finished (in 30–50 years).

The second lap around the cycle should include learning and improving implementation of forest carbon projects or new project ideas that aren't necessarily related to forest carbon, but that could complement and be supported by the carbon credit income.

1 Project implementation

Involves the project owners (the community) implementing the management actions that will achieve the project objectives. This could be to protect the forest, grow trees, and undertake the regular monitoring activities.

2 Internal reporting and governance (quarterly and annual)

Quarterly activity and financial reports, regular board meetings, Annual General Meetings (AGMs) and an annual report to the project developer and the carbon standard.

3 Verification reporting to the carbon standard (every 3–5 years)

A monitoring report is submitted to the carbon standard to prove the carbon benefits, social benefits and biodiversity benefits have been achieved for the period. Once approved, the carbon registry issues more credits to the project.

4 Baseline renewal (every 10 years)

Every 10 years, projects are required to check their baselines are correct and up-to-date. For example, forestry regulations may have changed, or forest may have been impacted by storms or fire. A change in the baseline situation could require a change in the way the project works, or how many credits can be issued.

Measuring (or monitoring), reporting and verification (MRV)

MRV is a central activity to any forest carbon project. The project developer will engage technical specialists to measure and monitor the carbon in the forest using remote-sensing tools and site visits. They collect data at the beginning to measure the baseline carbon stocks, and then monitor for change, or measure trees again each monitoring cycle, to determine changes to the carbon stocks. This monitoring work should be done in collaboration with forest ranges employed within the project.

Certification or validation

A forest carbon project will need to be certified or validated according to a carbon standard before carbon credits can be issued. Certification ensures the activities planned for the project are real and long lasting. Assessment of a project focuses on the information provided to the carbon standard and a site visit by an independent auditor approved by the certification standard but paid for by the project developer.

Measuring trees during a forest inventory calculates the amount of carbon stored in a forest area and contributes to MRV.

Several types of carbon standards exist in the voluntary market — some are focused on the social and environmental outcomes of a forest carbon project, while others focus on technical carbon accounting and MRV. Different standards require different information and data and suit different types of projects.

Third-party verification

Once certified, a forest carbon project can start selling carbon credits. But projects must undertake regular monitoring of the forest. The results of the monitoring provide the 'tonnes of emissions avoided' or removed from the atmosphere, and this leads to the issuing of credits. Most carbon standards also require an independent third-party audit to verify that the monitoring and reporting is true and accurate.

Once the measured carbon becomes verified, credits are issued and these can be sold on the voluntary carbon market where only certified and verified carbon credits can be sold.

Activity 3.3
Process for establishing a forest carbon project

Activity summary

Participants consider the 'actors' and steps involved in developing a forest carbon project.

Learning outcomes

'Participants can …'

3.11 Describe the roles and responsibilities of various 'actors' and the process for development of a forest carbon project

Suggested timing

30 minutes

Materials

- Footprints or circles containing steps in the forest carbon project cycle
- Forest carbon actor role statements
- Photos of people doing MRV work

Step-by-step guide

Facilitator's note:

This activity requires advance preparation. Background reading will provide helpful information but this should be tailored to the participants' needs and the local situation. For example, the project cycle may be modified and the project actors' information could be localised. This information could be heavy, so try to keep it light and concise.

Part 1: Community forest carbon project process

1. Before this activity prepare some paper footprints (or circles) that represent stages in a community-owned forest carbon project development process or implementation cycle, depending on your community's needs. You can use words and images. A generalised project process has been suggested in the background reading but this can be tailored to suit the specific circumstances.

2. Lay out the footprints in front of participants out of order. Tell them, 'These footprints represent the stages of a community forest carbon project. Your job is to arrange them in order according to which one you think should come first, then second, and so on'. Explain the meaning of each step before participants start selecting the order so everyone is clear. Be on hand to explain or clarify each step as the activity progresses.

3. When participants have arranged the steps in order, ask them to nominate a spokesperson to explain their decision. Ask questions and prompt discussion where appropriate. When the participants have concluded their discussion, rearrange the steps of the project (if necessary) into the correct order. Explain the rationale as you go. Note, there is an opportunity to be flexible here, and you may decide to record participants' expectations and consider changing the order of some activities in response to their feedback.

Part 2: Forest carbon project actors

4. Nominate individuals to sit in front of the other participants. These individuals will play the role of various 'actors' (individuals or organisations) who have a role in a forest carbon project.

5. The activity can then proceed in two ways. You can ask the volunteer actors to read out the statements about their roles and responsibilities. Or, if reading will create a barrier, you can read out the roles and attribute them to each person. The role statements can be located in the background reading for this topic (see p. 126–127).

6. Invite discussion and questions about the roles. Ask participants to identify key areas where the community would be involved or have responsibilities if a project was to take place. If forest monitoring is considered in the forest carbon activity, you may wish to explain how community members could be involved.

Optional

7. If appropriate, conclude the activity by constructing a rough timeline showing a realistic forest carbon project implementation schedule. Project activities (from the implementation project cycle) could be arranged simply along a rope or line on the ground. This could provide an understanding as to when community members would receive benefits if a project went ahead, and help emphasise how forest carbon is not quick money. Take care you are not developing unrealistic expectations. Unless FPIC requirements have been met, a timeline must be seen as hypothetical.

TOPIC

3.4

Rights, FPIC and opportunity costs

Topic summary

In this section, participants are made aware of their rights to provide or withhold their free, prior and informed consent (FPIC) to any development on their land, including for forest carbon projects. The activity provides participants with knowledge about where to find out more information about their rights and where to go for independent advice.

Learning outcomes

'Participants can …'

3.12 Explain their right to give or withhold their FPIC for developments on their land, including for forest carbon projects

Background reading

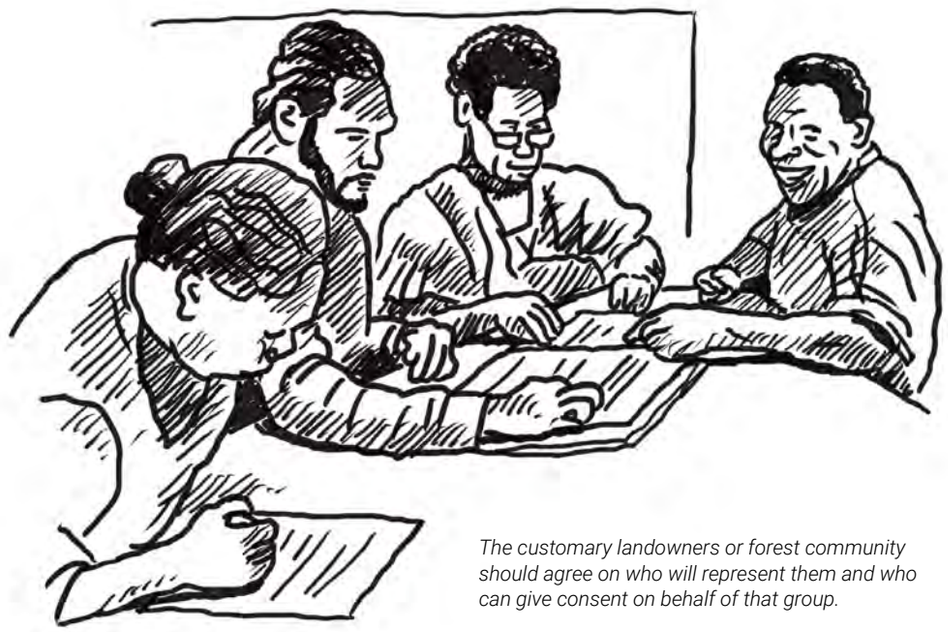
Free, prior and informed consent (FPIC)

It is broadly acknowledged that Indigenous Peoples and local communities should have a right to give or withhold their FPIC to developments that affect their land or access to resources. This right is expressed in the United Nations Declaration on the Rights of Indigenous Peoples (2008), signed by 147 UN member countries:

"*When making policies, laws or undertaking activities that affect our peoples, governments and others should negotiate with us with the aim of obtaining our consent. For government, this is much stronger than an obligation to just provide information or 'consult'. Governments and companies should not impose their position onto our peoples, without first taking our rights into consideration. The following outlines FPIC:*

- *Free means no force, bullying or pressure.*
- *Prior means that we have been consulted before the activity begins.*
- *Informed means we are given all of the available information and informed when that information changes or when there is new information. If our peoples don't understand this information then we have not been informed. An interpreter or other person might need to be provided to assist.*

- *Consent means we must be consulted and participate in an honest and open process of negotiation that ensures:*
  - × *all parties are equal, neither having more power or strength*
  - × *our group decision-making processes are allowed to operate*
  - × *our right to choose how we want to live is respected."*



The customary landowners or forest community should agree on who will represent them and who can give consent on behalf of that group.

FPIC and carbon market policy

In carbon market policy, FPIC is likely to be actioned through the social safeguards established by regulatory bodies which exist on several levels. The voluntary carbon market has a system of self-regulation where there is an incentive to certify a project according to one of several established carbon standards. These standards require various conditions to be met, including the provision of FPIC by Indigenous communities.

FPIC will also be reflected in national government policies, which are used to consider approval of projects within each country. Development of such polices are part of current forest carbon readiness activities happening around the world.

In community-owned forest carbon projects, FPIC is essential for a project to work. Success requires the support of the whole community.

Levels of community engagement in forest carbon projects

Like other forms of land or resource development, a forest carbon project could involve Indigenous landowners or communities to varying degrees.

- At one end of the spectrum, landowners may give away their 'carbon rights' to a project developer in exchange for royalty payments and have limited or no involvement in governance or implementation of the project. There is a risk in some countries that rights of Indigenous Peoples to land and carbon may not be recognised and the state may assume control over these resources and control the flow of benefits.
- On the other end of the spectrum, Indigenous communities and all their members (men, women, the elderly, people with disabilities, youth, leaders and marginalised groups) may be deeply involved in development and management of forest carbon projects and be the project owners. They would control the flow of benefits. In between these two divergent positions there is likely to emerge a variety of models for forest carbon projects, providing Indigenous Peoples with varying degrees of involvement.

The community-owned forest carbon approach considers that Indigenous customary landowner and inclusive community participation in forest carbon projects is central to long-term project success. This addresses project risks around additionality and permanence, and the causes of deforestation.

Opportunity costs

Opportunity costs are the benefits from other land uses that can no longer be realised because of a forest carbon project.

Before agreeing to a forest carbon project on their lands, communities or customary landowners must think carefully about their options. While a forest carbon project can provide many benefits, it comes at the cost of other benefits, such as income from commercial logging or large-scale agriculture. A forest carbon project is long-term, and landowners must be clear about what they are signing up to, why and for how long.

Although income and employment gained though logging or agriculture are opportunity costs (lost economic opportunities), the loss of clean water, food, nature and employment for the community that may be provided by healthy and intact forest could be opportunity costs of choosing logging or agriculture over forest carbon.

A further opportunity cost might be locking up fertile land that could have been used in the future to grow food. Food security is an issue around the world, particularly considering rapidly expanding human populations. It is important the opportunity costs of all development and land-use options are weighed up, and that forest carbon projects or any other development be considered in a holistic way. This is an integrated or 'systems' approach.

Core benefits (or co-benefits)

Protecting forest resources also comes with core benefits that should be considered when making decisions about land use — not all opportunity costs are economic. What makes forest carbon projects attractive to many project developers, funders and communities are all the benefits that a forest carbon project can provide aside from reducing emissions. These may include:

- Clean air and clean water, provided by intact or revegetated forest
- Opportunities for hunting, fishing and collection of medical plants
- Access to local building materials
- Maintaining cultural values and social inclusion
- Thriving biodiversity and a healthy ecosystem
- Ecotourism opportunities.

More information about the value of intact forests is contained in the description of 'ecosystem services' in Topic 4.2 and Activity 4.2.

Income and employment gained through logging may be opportunity costs if a forest carbon project is chosen.

Activity 3.4a
Know your rights

Activity summary

This is a simple facilitator-led discussion that raises the community's awareness of their rights to provide or withhold their free, prior and informed consent (FPIC) for forest carbon projects. The activity also identifies sources of further information and independent financial and legal advice.

Learning outcomes

'Participants can …'

3.12 Explain their right to give or withhold their FPIC for developments on their land, including for forest carbon projects

3.12 Identify where to find more information, independent advice and support

Suggested timing

15 minutes

Materials

- Handouts of list of questions to ask project developers (see p. 140–142) translated into the appropriate language
- List of potential organisations and/or legal firms where the community may go for independent legal advice (prepare in advance)

Step-by-step guide

1. Explain to participants that when considering a forest carbon project (or any other project) on their land they have the right to provide or withhold their FPIC. Break down FPIC into its parts and ask participants to comment on what they think each word means.

- What is meant by 'free'? In what circumstances would consent not be free?
- What does 'prior' mean? At what point/s should consent be given or withheld?
- What is 'informed'? Who should be informed? How do you know when you are informed enough? Is anyone within the community not being informed?
- What does 'consent' actually mean? How do you think it is given? According to your custom, how is it provided? Is anyone's voice being left out of this process? (men, women, youth, non-landowners, other social groups?)

2. Revise the concept of opportunity costs (also covered in Activity 3.2c). Explain how an understanding of the opportunity costs relating to all forms of development is extremely important. Introduce the concept of land-use planning as a useful tool for creating a holistic plan for the future.

3. Explain to participants that it is important they are aware of where they can go to get independent financial or legal advice about any type of development proposed for their land (including forest carbon projects). Tell them, 'We believe this is important and we take it very seriously, so we have prepared some information on where to find additional information or advice that is totally independent from our organisation'.

4. Provide participants with information that guides them toward independent advice and that will help them with questions they should ask. We recommend providing a copy of List of questions to ask project developers (see p. 140–142), a list of available and relevant legal contacts in the country and any other useful reports or information. Explain the content and value of each document you provide.

Landowners should get independent financial or legal advice about any type of development proposed for their land.

List of questions to ask project developers

The following questions are adapted from *Understanding community-based REDD+: A toolkit for Indigenous communities*, International Work Group for Indigenous Affairs (IWGIA) and Asia Indigenous Peoples' Pact (AIPP) 2011.

- Where is the project, how big an area does it cover, what are the names and number of affected people(s) or communities?
- What kind of land rights do your people or community hold over your lands and territories? Are your rights customary and untitled, customary and titled, individual and titled, individual and untitled, communal and titled or communal and untitled, or some other form of right?
- Are you being proposed as a party to the contract selling the carbon credits? If yes, who is the named seller? If no, what company, agency or other entity is the named seller?
- What is the length of time that the project covers? What are the different stages of the project and their respective durations?

The financing mechanism

- Is the project funded through the sale of carbon credits or through other funding or a mix of the two?
- If the project is funded by the sale of carbon credits, what kind of information has been provided to you proactively, and what information has been requested by the community during project and contract negotiations on:
  - Who is the buyer? Who pays for the carbon rights the community is considering selling and at what average price? What are the prices for comparable projects?
  - Possible legal implications of signing a carbon offset contract and the possible impact of such a (long-term) contract on ownership rights over the carbon in the forest, both for present and future generations?
  - Possible implications of both decreasing and increasing carbon prices for the specific project? For example, will the community benefit if carbon prices go up or do they receive a fixed sum payment irrespective of the price for which offset credits are traded?
  - With regard to falling prices, will payments to the community be linked to the price of carbon on an international carbon market?
  - Are contractual obligations linked to payments agreed on in the signed carbon contract?

- If the project is financed through a fund, has information been provided proactively or requested by the community during the presentation and negotiation of the project on:
  - The objectives of the fund
  - Where the fund is located
  - Who is providing the funding
  - Whether those providing the funds are getting carbon emission offset rights in return for their contribution?

Consultation and negotiation process

- Who was the negotiating partner, if there was one?
- Who has negotiated for you or is proposed to negotiate for you? Will you negotiate by yourself?
- Who will be signing the contract on behalf of your people or your community?
- How has this been decided?
- Have you had independent legal advice and/or an opportunity to discuss the contract and its implications on rights with a lawyer?
- Was there a lawyer representing or advising you present during the negotiations?
- Were the national laws of the country discussed? (They may affect the carbon contract.)
- Has the contract been written and presented in the language of your people or the language spoken in the community, or at least a language that community members can understand?
- Have women, the elderly, the next generation (youth), non-landowners, people with disabilities or other important marginalised groups been involved in the consultation and decision-making?
- Did the consultation process allow for feedback from community members?
- Was the consensus of the people in the community obtained in accordance with their custom and tradition? If not, why not?
- Has the community been given a copy of the contract and other documentation related to the carbon offset project?
- Assuming there are restrictions on the use of the forest, how have these been negotiated within your community?

- Do the restrictions affect all members of the community equally? Who is affected most?
- Who is affected the least?
- Is there a process to address unequal impact?
- Does the project create any new jobs? If yes, by what process are jobs allocated or provided, and what kind of jobs?

The content of the contract

- What is the time period of the contract? Is it the same as the length of the project?
- Does the contract limit or restrict your right of access and use or the right of use for other neighbouring communities? If yes, have these limitations been fairly negotiated and has fair compensation been provided under the contract?
- How are the payments being determined?
- If the selling of credits is part of the contract, how many credits is this?
- Is the payment received linked to the price of the carbon?
- Did you have your own financial analysis to assist in arriving at the agreed price?
- Is the payment made as one-off fixed sum or continuous payments for as long as the contract lasts?
- What rules or regulations have been put in place to make sure the carbon remains in the forest during the contract period? Who has put these rules and regulations in place?
- Who carries the risk if something happens to the forest or trees? What happens if the carbon is lost through an accidental event, such as a wildfire? Would you have to pay back money to the contract partner?
- Has sufficient information been provided for or sought by you to understand both the responsibilities and benefits as agreed upon in the contract?

Implementation and monitoring

- Who is responsible for the implementation of the rules and regulations agreed on in the contract? Who is monitoring the implementation?
- What enforcement mechanism is in place to ensure that the contractual obligations are met?

TOPIC 3.5

An introduction to forest carbon projects: Conclusion and evaluation

Topic summary

This is a review of the key concepts covered in *Section 3: An introduction to forest carbon projects*. Participants will see a repeat performance of *A new proposal*, however this version extends to cover new concepts of opportunity costs and permanence. The final activity involves watching the short film *Forest carbon for communities*, which provides another summary of the key information people need to understand to be able to have informed participation in discussions or decisions about forest carbon projects.

Activity 3.5a
Roleplay finale

Activity summary

This roleplay performance repeats *Activity 3.1a: Forest carbon project roleplay – A new proposal* and adds a final scene. It is a quick performance, starring either the facilitators or volunteers from the group. It is presented here as a summary and revision of concepts already covered.

Learning outcomes

Reviews learning outcomes 3.1–3.13.

Suggested timing

20 minutes

Materials

- The extended roleplay script for *A new proposal* (see p. 144)
- Props for the performance:
  - Backpack for travel company operator
  - Tree branches for the landowner

Step-by-step guide

1. Refer to instructions in Activity 3.1a (see p. 90) to prepare and commence the roleplay performance.
2. Find a volunteer or facilitator to play the new role of Max, the logging company representative.

Extended script (roleplay finale): *A new proposal*

NARRATOR: Hi everyone. I'd like to introduce you to Diana (or David). They run a sustainable travel and tourism company. Where are you based Diana?

DIANA: We are based in New Zealand but our customers travel all over the world, including a lot to the Pacific. People come here to experience the nature and culture of this beautiful part of the world.

NARRATOR: You must have a lot of customers? Does your company do well?

DIANA: Yes, I would say so. We have many people come to us who want to experience other places. But our work comes with some worries too. For us, a big worry is the environmental impact of our business.

NARRATOR: I've heard travelling can produce a lot of carbon dioxide when people fly, drive and use boats — is this true?

DIANA: Yes, it is true. Travelling produces a lot of emissions from all the vehicles that are used. And even when people use air conditioning in hotels.

NARRATOR: So, this contributes to the greenhouse effect? Don't you care that your company is contributing to climate change?

DIANA: Actually, yes, I do care. Very much. This is why we are always looking for ways to make our travel company more sustainable, including reducing emissions.

NARRATOR: So how can you reduce the carbon dioxide you produce?

DIANA: We have some offices in New Zealand that we have made more energy efficient — this has reduced some of our emissions. We also work with eco-hotels and small local businesses in the countries we visit and who don't have big emissions. But this doesn't do enough, and we need to reduce more of our carbon dioxide emissions.

NARRATOR: Here's an idea: why don't you pay someone else to stop putting carbon dioxide into the air? You will be supporting people to protect an important ecosystem — like a forest. This will help save emissions from your company. For example, if your customer's travel creates 20,000 tonnes of emissions, you could pay someone else to save 20,000 tonnes of emissions somewhere else. Your negative impact could be balanced by your positive impact.

DIANA: That's a great idea. I'm going to meet with our team and see if we can make it happen — thanks!

Narrator turns to the landowner

NARRATOR: Good afternoon / morning. You must be the landowner here?

LANDOWNER: Yes, I'm responsible for this land.

NARRATOR: Why is your land important to you?

LANDOWNER: Our land is very important — it's part of our identity and culture, land is life. It also allows us to make some money and gives us food and materials for building houses.

Ask for a new volunteer. *Explain that they are a representative from a logging company.* They introduce themselves to the landowner

Max: Hi I'm Max, I'm from Tall Timbers logging company. I'd like to talk to you about your forest. Are you the landowner here?

LANDOWNER: Yes, I'm the landowner, pleased to meet you.

Max: I've had a look at your forest, and you have some great timber here. We would like to offer you a deal for a logging licence. You'll receive a big royalty payment — enough money that you'll be able to buy a new house. We will also give the village five new trucks and we'll even build you a new bridge.

LANDOWNER: Wow — that sounds amazing. I would like a new truck, and a bridge could help us get our produce to market. But I will speak to the community, and we'll get back to you with our decision.

Diana (or David) speak directly to the landowner.

DIANA: Good afternoon. My name is Diana. I'm from a sustainable travel and tourism company based in New Zealand. I'd like to talk to you about a business opportunity involving your land.

LANDOWNER: I hope you don't want to build a big hotel on my land?

DIANA: No, not at all. In fact, I don't want to build anything or take away anything from your land.

LANDOWNER: I don't understand — what sort of business opportunity is this?

DIANA: I'm talking about a forest carbon project. Basically, I would like to pay you to protect your old-growth forest and plant trees to make a new forest area as well. This will mean more carbon is stored in your trees and not polluting the atmosphere.

LANDOWNER: Why do you want to do this? What's in it for you?

DIANA: My travel company has a lot of customers who care about the impacts of climate change. And we do too. As more people travel each year, the carbon dioxide footprint is growing, and this is contributing to climate change.

LANDOWNER: I understand, yes climate change is a big problem. As a matter of fact, we have been noticing changes in our seasonal patterns.

DIANA: Yes, my travel company and our customers don't want to contribute to this problem. I can't stop all my carbon dioxide emissions on my own, but I can reduce emissions on your land if I work with you.

LANDOWNER: On my land?

DIANA: Yes. I can pay you to protect your forest and to replant trees. The emissions your trees store will help make up for the emissions my company makes, and you will earn an income you can use for the community while your forest stays healthy. Will you accept my payment in exchange for you protecting your forest and replanting more trees?

NARRATOR: Diana/David offers the landowner a contract. The contract says that in exchange for payment the landowners must protect their forest. But it has conditions.

- They can only get paid for protecting forest that was under threat of being cut down. If a part of the forest is on land too distant or too steep to be threatened by logging or clearing, then the landowners cannot get money for protecting it.
- A protected area must be maintained for 30–50 years
- They cannot cut down the forest in the protected area to plant gardens or cash crops
- They can't allow logging of the protected forest
- They can access the protected forest whenever they like to hunt and collect foods and medicines
- They may be able to collect building materials from the protected area, but they can't take too much
- They must monitor the protected forest, and they will only receive benefits if they can prove the forest is really protected

Diana (or David) and the landowner look at the contract. They then leave the stage in opposite directions.

NARRATOR: The landowner has gone to discuss the options with the rest of the community. The village has some decisions ahead. Will they accept logging? Or will they accept the offer of the travel company and protect the forest? Will they do neither?

Diana (or David) and the landowner re-enter the stage.

LANDOWNER: We have decided to accept your offer, but we also have conditions. DIANA: That's fine, what are they?

LANDOWNER: We will protect most of this forest, but we need some forest for harvesting wood for cooking and building. We will grow a new forest on another part of our land, but not all of it. We need some land for new houses and new gardens because our population is growing. Also, we want to manage this project ourselves, we are not going to lease you our land, we want to maintain our ownership, access rights and control. Do we have a deal?

DIANA: There are more details to discuss, but yes, we have a deal. Thank you.

Diana (or David) and the landowner leave the stage.

Part 2 (take a break here to re-energise)

NARRATOR: The landowners and the travel company worked on the contract. They had to get the project approved by the government and make sure it met an international carbon standard. Consultants came to help measure the carbon in the forest. A community organisation was formed to manage the project and distribute the benefits when they came from carbon credit sales.

But the contract was signed and years have passed. The planted area is rapidly growing into a new forest, and the protected area has been well maintained. Money has been received. But the story is not finished. The sound of a truck can be heard in the distance. It's the representative from Tall Timbers logging company.

The landowner and Max (the logging company representative) re-enter the stage

Max: Hello, do you remember me? It's been a long time — it's nice to see you again. You still have some very valuable timber on your land.

LANDOWNER: Yes we do, we are very proud of our forest.

Max: I have come back to make another offer. We would still like to log your forest. The price of timber has gone up, so we can make you an even better offer than before. You will get more money and we will double the number of trucks we provide. We can also now offer to build two bridges, and a new schoolhouse and health clinic.

NARRATOR: The landowner considers the offer, but he remembers the contract for the carbon project. The contract has conditions, if the community allows the forest to be logged they will lose all further payments. In addition to this they may have to pay back the money they already received. This seems like a lost opportunity, but the landowners were informed and aware of this before they decided to protect their forest.

LANDOWNER: Thanks for the offer Max, but no thanks. We have protected the forest to receive money from a sustainable travel company. It gives us benefits, and we get to keep our forest which is also important to us. The forest protects our water supplies and provides us with materials we can use. Please don't make us another offer, as we are not able to accept it.

Max and the landowner shake hands and leave the stage in different directions.

NARRATOR: This was a brief and simplified story about the opportunity to protect forest called forest carbon. The story of forest carbon in the landowner's village will continue for 30 to 50 years

Activity 3.5b
Film – *Forest carbon for communities*

Activity summary

Participants will watch a light animated film that summarises all content covered in the introduction to forest carbon training.

Learning outcomes

Reviews learning outcomes 3.1–3.13.

Suggested timing

20 minutes

Materials

- Copy of the film *Forest carbon for communities*
- Computer and projector or screen
- Power source

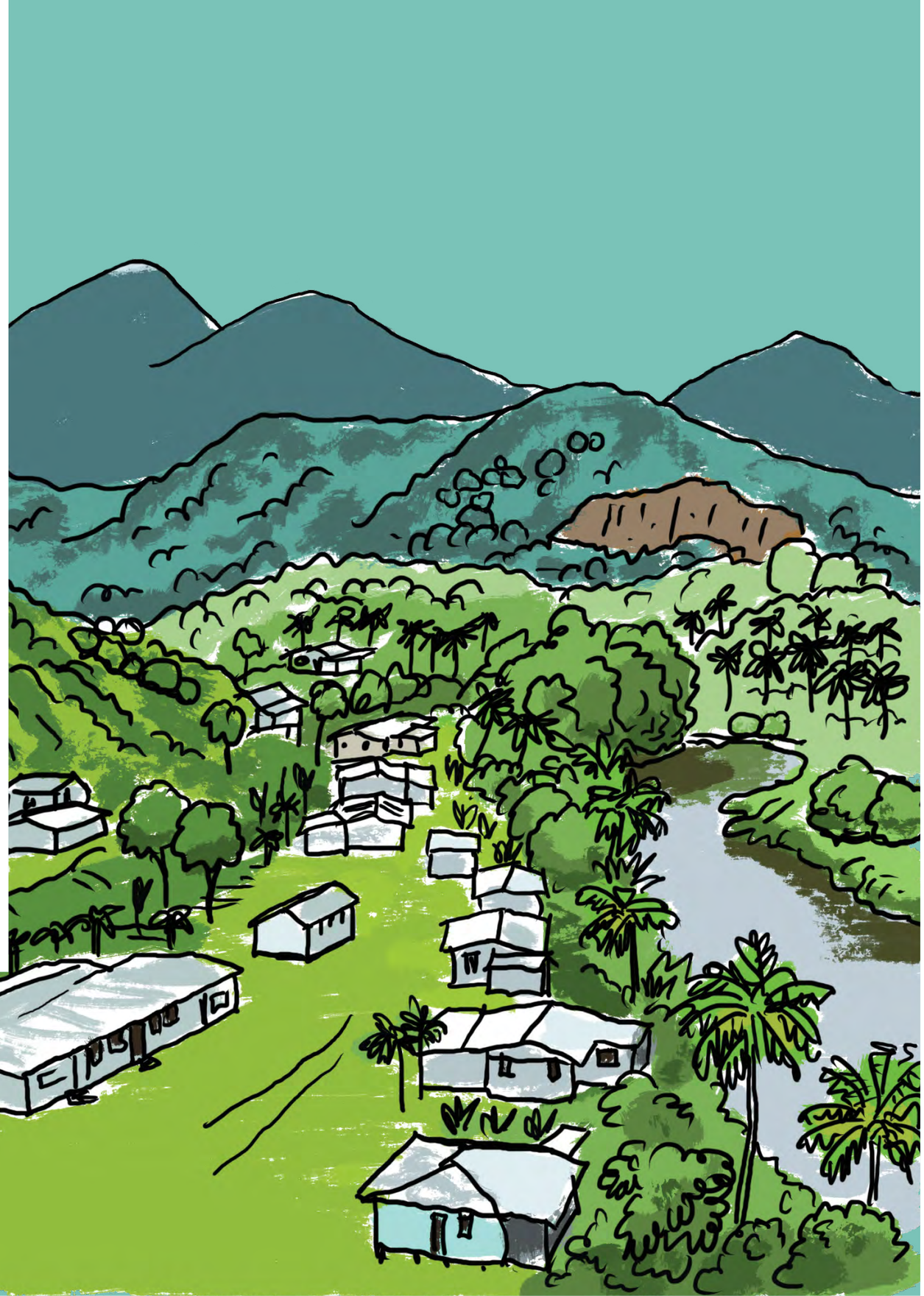
Step-by-step guide

1. Ask everyone to think back over everything covered in the training so far.
   - Remind them how forest carbon is a program that rewards landowners for managing land in a way that reduces greenhouse gas emissions or increases the amount of carbon stored in forests.
   - Remind them that forest carbon projects can only happen if the carbon benefit is 'additional'.
   - Remind them that there are opportunity costs associated with doing forest carbon projects.
   - Remind them that forest carbon projects can only happen with their free, prior and informed consent.
2. Ask the group if they have any questions about anything covered so far. Does anything need to be explained again or clarified for anyone?
3. Introduce the film *Forest carbon for communities*. Tell the group, 'This is a fun, simple way of looking again at everything that we have covered in our training. It is a good way to refresh and review everything so far'.
4. Watch the short film.
5. Run a question and answer (Q&A) activity to address any questions. Encourage knowledgeable participants to contribute to answering the questions of others.

OUR LAND, OUR FUTURE, OUR DECISION

SECTION **4**

4



SECTION

4

OUR LAND, OUR FUTURE, OUR DECISION

Indigenous Peoples have a strong connection to land and the natural environment. Forests, rivers, land and sea have always provided a means of living, through the provision of food, clean water, building materials, medicines and cultural identity.

Increasingly, land now also provides opportunities for benefits from the cash economy. Communities may have new ways to earn an income, including from logging, gardening, agriculture and mining. Often it is outsiders who bring ideas and opportunities for developments that exploit land and natural resources, but these developments may also provide some benefits to the community. It is also often the case that communities find it difficult to meet basic needs in a globalised world, and that any development that promises income is difficult to refuse, irrespective of the long-term consequences.

Section 4: Our land, our future, our decision engages participants in thinking about forest carbon projects in a more holistic way. Rather than starting with forest carbon and then looking for how it may lead to benefits for communities, this section encourages communities to investigate their values, needs, wants and development aspirations. Economic and non-economic values of land receive equal attention. Participants will be better placed to consider if a forest carbon project is a good fit, and how these projects measure up to alternative economic opportunities.

While Sections 2 and 3 are presented as training with the facilitator as trainer, this section is about giving participants the time and space to consider and critically discuss what they want for themselves. This section could be presented before Sections 2 and 3, however it will be difficult for participants to weigh up the costs and benefits of forest carbon projects against alternative developments unless they have an understanding of forest carbon.

People rely heavily on local forests to provide them with materials for fuel and construction.

Section 4 Learning outcomes

4.1 Identify existing values, attitudes and future aspirations for themselves, their families and their community

4.2 Recognise the positive and unintended effects of having increased access to money

4.3 Identify financial and non-financial benefits women and men want to receive from forests and broader community development

4.4 Identify the 'ecosystem services' provided by forests and understand the financial and non-financial benefits provided by these services

4.5 Recognise the effects of forest destruction or degradation (personally, locally and globally) and the different ways this impacts community members (men, women, youth, elderly, people with disabilities or non-landowners)

4.6 Identify land-use change in their community or region over a period of time

4.7 Recognise the drivers (root causes) for deforestation or degradation of forests in their community or region

4.8 Identify key land-use management options and recognise pros and cons, including opportunity costs, of each option

TOPIC

Values, hopes, needs and money

Topic summary

This topic provides participants with the opportunity to consider and discuss key factors that may influence individual or group choices and decision-making. Participants are encouraged to explore their own values and develop a vision for the type of community and environment they want — now and in the future. Participants also consider how the need and desire for cash income can change how decisions are made and put pressures on the environment and natural resources.

Learning outcomes

'Participants can …'

4.1 Identify existing values, attitudes and future aspirations for themselves, their families and their community

Background reading

What are values?

Values are the meanings we attach to certain beliefs, experiences and objects. Different people have different personal beliefs and values. People are defined by what they value — their attitudes, decisions and actions are guided by what they value in life. When we care about something we might say we 'value' it.

Personal beliefs and values cover our responses to a range of things, from the importance placed on family to ideas about religion, spirituality, the roles of women and men, and how we manage land. Family and cultural background as well as life experiences determine these values and beliefs. Usually, values and beliefs are formed early in our life, but they change and develop throughout our lives according to experiences. Different people have different values and beliefs because of different experiences.

Community values

Our values are shaped by who we are and our relationships with our families, friends, communities and customary systems. What we value as individuals may not be the same as what we value as a community. As individuals, we might place a high value on something that will help our families, but we might be aware this also comes at a cost to the wider community or to the environment. As a community, we might place a high value on something that helps everyone but the values of some individuals may not be met.

Values and decisions about land and natural resources

Pressures to meet immediate needs often take priority over important values when decisions are made about land and natural resources. Sometimes, communities with little income and limited economic opportunities will choose unsustainable pathways for development to meet immediate needs.

Defining values and establishing a clear vision for the future can provide an important foundation when making decisions about land and development that will have long-term impacts — such as a forest carbon project, logging or agricultural development.

Thinking about the future

Some people view the future as something that is going to happen to them. However, the ability to think about and plan is something that can be nurtured and practised. When we have a vision for what we want in the future we can make choices or take actions that are more likely to bring us the future that we want.

The choices we make today will have an impact on our future and the future of our children.

Activity 4.1a
What do we value?

Activity summary

In this activity, participants identify and compare personal, family and community values.

Learning outcomes

'Participants can …'

4.1 Identify existing values and attitudes and future aspirations for themselves, their families and their community

Suggested timing

40 minutes

Materials

- Chart (poster) paper
- Coloured markers

Step-by-step guide

Part 1: What do we value?

Facilitator's note:

This activity may deal with individual versus community values. The activity may highlight that people have different sets of values: those they think they should have, and the real values they often do not show or talk about. Real values are those that shape our behaviour. Where possible, take the opportunity to discuss this difference with the participants.

1. Ask the participants to collect any object that represents something important to them or that has significance in their life. The object could be plant material, soil, stone, money, a tool, keep-sake, clothing or any other thing that the person might think of.

2. Allow each person to explain to the group why the object is important to them. Ask each person to share their views by answering the following questions:

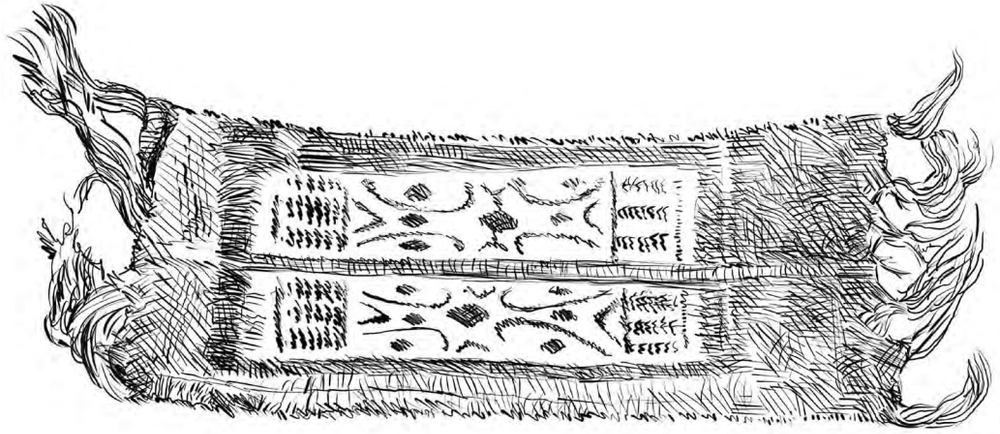
   - Why is this object significant to your life or to the community?
   - What do you think the future holds for this thing you care about?

3. When everyone has had a chance to speak, organise participants into small groups. Ask each group to discuss and write down (using words or pictures) important things or values they would like to maintain as a community. When they have completed this task, allow each group to present their ideas to the whole group.

Follow-up discussion questions

Use strategic questioning to facilitate discussion about the role of values in making decisions about land and resource use in the community.

- In the past, to what degree has this community made decisions according to the values that have been talked about today?
- Is it possible to always act on our values alone when making decisions? What other factors are important?



Mats are an important cultural item on the island of Ambae in Vanuatu.

Activity 4.1 b
Aspirations and 'the money life'

Activity summary

This activity asks each participant to identify their aspirations for their own and their family's future. They are then asked to reflect on the pros and cons of having increased access to money (for example, from development such as logging, agriculture or forest carbon projects). In Part 2, participants will start to address the questions 'How can money help us to achieve our hopes and dreams? How much money do we need? What are the unintended or negative aspects of having money?'.

Learning outcomes

'Participants can …'

4.1 Identify existing values, attitudes and future aspirations for themselves, their families and their community

4.2 Recognise the positive and unintended effects of having increased access to money

4.3 Identify financial and non-financial benefits all community members want to receive from forests and broader community development

Materials

- Chart (poster) paper
- Markers

Suggested timing

- 40 minutes

Step-by-step guide

Part 1: What do we want?

1. Ask participants to close their eyes and explain you are going to take them on a journey to the future. Explain that they are going to visit the future they want to see; it is not necessarily the same as the future they might expect to happen. It is their ideal future.

   Say to them, 'Imagine it is the future, 20 years from now. You are now 20 years older, and 20 years wiser than you are now. Imagine you are standing in your own house. What do you want to see in your house?' Pause to allow people to think. 'Now imagine you step outside your house into the village. What do you want to see in your village? What are the people doing? What buildings do you see? What are the houses like? How many people are in your future village?'

   Continue, 'Now take an imaginary walk on your land. What does the land look like? Is it covered by forest? What is the forest like? What do the gardens look like? What activities are taking place on the land?' Again, allow time for people to think and imagine.

2. Ask participants to open their eyes. Organise the participants into several small groups and provide each group with a large piece of chart (poster) paper and coloured markers. Ask each group to discuss and write or draw a list of things that they would ideally like to see in the future in their homes or village or on their land. When each group is ready, ask them to present their ideas to the other groups.

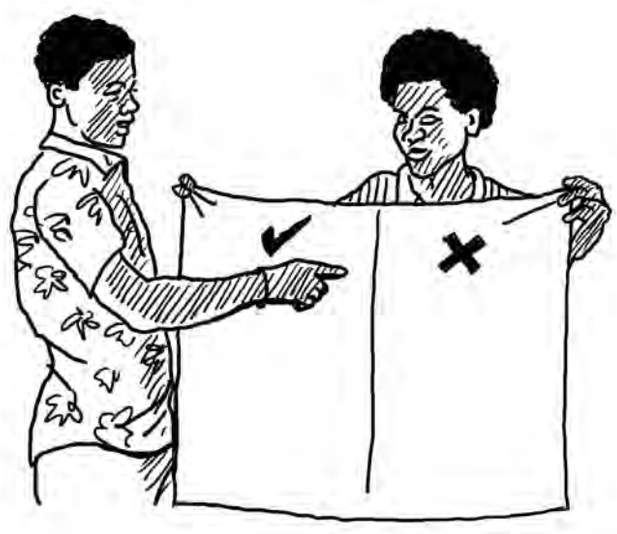
Part 2: 'The money life'

3. When participants have discussed their various ideas about the future, initiate a discussion about the role of money. Ask them, 'What role does money have in realising the things you imagined for the future?' What are the positive effects of money? What are the negative effects or problems associated with having money?'.

4. Read aloud *Case study: Impacts of 'the money life'* (see p. 162). Discuss the case study and ask participants if they can relate to the experiences of the people in the case study.

5. Provide each group with another sheet of chart (poster) paper. On the left-hand side of the paper, they should write the heading 'positive changes'; on the right-hand side, they should write 'negative changes'. Ask them to think of and draw or write lists of positive changes that could be achieved with more money and negative changes that might occur because of increased money.

6. When groups have finished the task, ask them to present and discuss the posters. Facilitate further discussion by asking questions such as 'Do you want money, or do you want the things money brings (for example, good healthcare)? Do women, men, young people want to receive different benefits? Why? How important is money to decisions about how to use your land?'.



In this activity participants are asked to consider the positive and negative changes brought about by an increase in money coming into their community.

In this optional activity participants get a practical demonstration of why it is important for a community to have a shared vision about the future.

Optional activity: Shared vision game

This is a brief and fun activity that highlights why it is important for a community to have a shared vision. The activity demonstrates how conflict arises in a group in which members have very different visions. It also shows how a shared vision leads to cooperation and teamwork.

1. Stand in a circle, with each person holding hands with the person next to them. Tell participants to choose a corner of the room. This must be done in silence and participants are not allowed to tell anyone else which corner they have chosen. If you are outside, the participants could each choose a different tree or landmark.

2. When each person has chosen a corner, explain the following: 'Everyone in the circle is in the same community. This is represented by your linked hands. You are not allowed to let go of the people standing next to you — this is a rule. Now, on the count of three, I want you to move to the corner or landmark you have selected .. 1, 2, 3, go!'

3. When everyone has calmed down, ask the group, 'Did you get to the place that you wanted to go? Who did get where they wanted to go? How? If you were pulled into someone else's corner, how did you feel? Did the group have a shared vision?'.

4. Tell the group that you will repeat the activity. This time, encourage them to have a discussion and work out a shared vision. Repeat the exercise when they are ready. Ask the group, 'Did you get to where you wanted to go this time? What was the advantage of having a shared vision?'.

Case Study

Impacts of ‘the money life’

In 2010, Live & Learn worked with people in a group of villages in the southern highlands of West New Britain in Papua New Guinea. Over the previous five years, the people had experienced development and increased money from logging. In return for payments from a logging company, the villages had agreed to sell their timber rights; most of the logging had already been completed. They were asked to share their views on the positive effects and negative effects of logging and the resulting income.

These are some of the things they wanted us to know:

- People felt that in hindsight the villages lost more from the destruction of the forest than was gained from having more money.
- Benefits of money included an upgraded road, a new school building, and a health clinic built using the money invested by the logging company.
- However, the buildings and road fell into disrepair when the money ran out. The health clinic was abandoned.
- Logging money allowed families to buy food like tuna and noodles; however, the people said that most money was spent on alcohol.
- Some of the leaders had lots of money, but they used it to purchase airline tickets to fly to Kimbe town for entertainment. Some people thought this was because the money was gained through royalty payments: ‘If it’s given as royalty payments it’s seen as free money; they didn’t sweat it out to get it, so then ownership and care is not there’.
- Money caused new social issues including drug use and increased drinking. Men with a lot of money married more than one wife, which was against normal custom.
- Despite the many negative effects of money, the people thought financial incentives (money) would continue to drive decisions about how their land would be used in the future.

TOPIC

The value of forests

Topic summary

This topic examines the various ‘ecosystem services’ provided by forests. Activities focus on using local knowledge to gain a new appreciation of the value of what forests provide people. Identified ecosystem services from the forest — food, clean water, building materials, medicines — are given a dollar-value equivalent to the cost of purchasing them (or substitutes) at local markets.

Learning outcomes

‘Participants can …’

4.3 Identify financial and non-financial benefits women and men want to receive from forests and broader community development

4.4 Identify the ‘ecosystem services’ provided by forests and understand the financial and non-financial benefits provided by these services

Background reading

The value of standing forests

Standing forests are considered important and valued for many different reasons. They supply food, medicine and building materials, opportunities for recreation such as walking or eco-tourism and cultural connection, and ‘services’ such as clean water or climate resilience in the form of storm protection.

People who live in or near forests have intimate knowledge of and connections to forests, and depend on the benefits they provide. Despite this, the value of forests is sometimes only noticed once the benefits are gone.

Tropical forest ecosystems provide a broad range of benefits for people, but because no-one pays to enjoy these services they can be under-valued and disregarded when decisions are made concerning land use. Cost-benefit analysis of any development affecting forests should consider ecosystem services.

Ecosystem services are all the benefits a forest provides. This can include food, clean water, medicine and building materials. It also refers to climate resilience, healthy soil, cultural connection and nature-based activities like hiking.

Clean water

Forests play a major role in keeping water clean. They maintain healthy water systems, regulate and stabilise water runoff, moderate water temperatures, and reduce erosion and sediment. People often notice a rapid decline in the water quality of rivers when forest is removed. It becomes unhealthy to drink and affects the availability of aquatic foods such as fish and prawns.

Healthy soil

Forests help form and maintain soil structure and cycle nutrients, keeping the soil moist and nutrient-rich. Removal of forests often leads to a rapid decline in soil condition because nutrients are lost through leaching and erosion.

Climate resilience

Undisturbed forest helps maintain rainfall in an area by recycling water vapour in the atmosphere, as well as locking away harmful greenhouse gases that are released by fossil fuel burning, agriculture and land-clearing. Preserving these forests and maintaining biodiversity helps stabilise the local climate and contributes to global climate change solutions. Healthy forest cover also strengthens flood and storm resilience, protecting homes, food and water sources during extreme weather.

Food abundance

Forests provide a wide variety of foods from plants and animals. These can be important as food staples or to supplement foods from gardening or markets.

Medicinal resources

Indigenous Peoples have a long history of using forest resources as traditional medicines.

This use continues in modern times and remains vitally important. When developing new medicines, scientists increasingly look towards plants to help formulate new treatments.

Timber products

Wood is a basic product used by most Indigenous communities, and is still largely harvested from forests. Many people also use wood for fuel and construction. The ability to get building materials from the local forest means they don't have to be purchased or imported.

Beliefs and identity

Many Indigenous Peoples have cultural, spiritual and traditional links to forests. These include important ceremonies and customs that are a vital part of people's identity. Beliefs and rituals are often connected to complex land management practices that can ensure sustainable use of forest resources. For example, custom 'tabu' in the Western Pacific protects various species from over-harvesting.

Recreation and tourism

Forests are amazing places that attract people for many reasons — like inspiration for film, photography or writing, or nature-based activities like birdwatching, fishing and hiking. Many people will pay for these experiences creating opportunities for income through eco-tourism.

Conservation

Many people believe forests should be preserved not just because they are valuable to humans in some way, but simply because they are valuable to nature. People who believe this feel that forests and the plants, birds, animals and insects that call them home them should be respected and protected.

Case Study

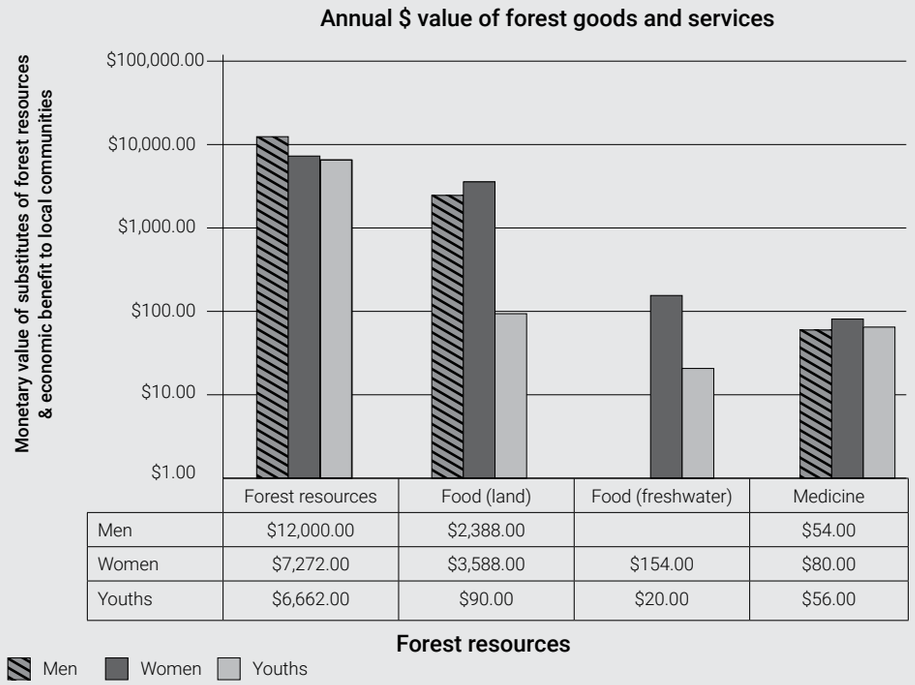
Calculating the dollar value of forest goods and services

The table below was developed during an activity with customary landowners from Drawa in Vanua Levu, Fiji.

It identifies resources from the forest they use daily (excluding those resources that are sold). The table also shows the 'alternative' products or services Drawa residents said they would pay for if needed.

Forest resources		Food (land)		Food (freshwater)		Medicine	
Freely available in the forest	Bought from town	Freely available in the forest	Bought from town	Freely available in the forest	Bought from town	Freely available in the forest	Bought from town
Building materials, e.g. timber and bamboos Sources of fuel, e.g. firewood	Timber for building houses, cement, nails, mesh wire, cement blocks Gas tanks, kerosene, benzine	Wild pigs, wild pigeons, raised livestock, rootcrops, yaqona (kava), vegetables	Chicken, pork, sausages, mutton, flour, rice sugar, canned meat	Freshwater fish, eels, prawns, freshwater mussels	Coastal marine fish, canned fish, canned meat	Herbal medicine	Medicine from the hospital (sometimes the medicine is given freely)

The Drawa residents analysed the forest ecosystem services and estimated the costs (in Fiji dollars) if they had to by these things, or their alternatives, from the market. The graph below shows the amount of money they would pay in one year if they had to pay for the forest services that are currently available for free.

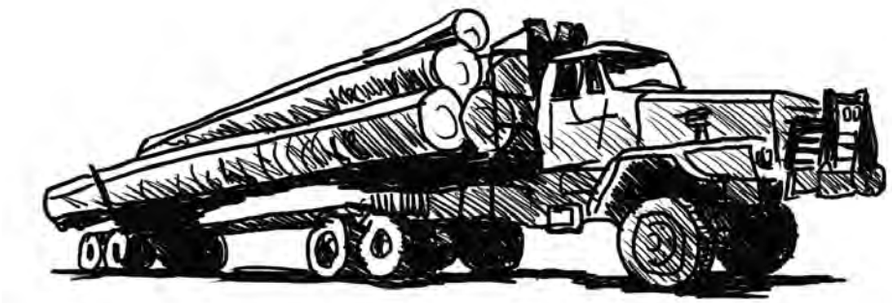


	Forest resources	Food (land)	Food (freshwater)	Medicine
Men	$12,000.00	$2,388.00		$54.00
Women	$7,272.00	$3,588.00	$154.00	$80.00
Youths	$6,662.00	$90.00	$20.00	$56.00

Forests and the cash economy

Harvesting timber from tropical forests is a significant source of income for many communities and countries. A global system of economic growth combined with increasing population has created a rapid rise in demand for timber. Many countries have developed export timber industries and some, like Solomon Islands, earn most of their foreign income from logging.

Logging can provide important benefits, but only if it is done in an environmentally, socially and economically sustainable way. Unsustainable logging and the inequitable distribution of benefits contributes to significant greenhouse gas emissions and climate change, and leads to negative long-term outcomes — destruction and degradation of natural resources, loss of traditional forest use and biodiversity decline.



In recent decades logging was the largest source of foreign income for the Solomon Islands.

Activity 4.2
Our 'free' forest goods and services

Activity summary

In this activity, participants calculate the financial value of the services provided by the local forest for free. These values are calculated by working out how much these services (or their alternatives) would cost if bought from a market or store. The activity provides an opportunity to reflect on the extent to which the true value of forests is considered — or not considered — when making decisions about land use and development.

Learning outcomes

'Participants can …'

4.3 Identify financial and non-financial benefits women and men want to receive from forests and broader community development

4.4 Identify the 'ecosystem services' provided by forests and understand the financial and non-financial benefits provided by these services

4.5 Recognise the effects of forest destruction or degradation (personally, locally and globally) and the different ways this impacts community members (men, women, youth, elderly, people with disabilities or non-landowners)

Suggested timing

60 minutes

Materials

- Large pieces of chart (poster) paper
- Coloured markers
- Calculator (optional)

Step-by-step guide

1. Introduce the concept of ecosystem services. Forests provide a range of 'services' that benefit people, and the great thing about these services is that they are free (we don't need to pay for them). Some ecosystem services are not easily noticed. These services include:
    - Keeping rivers and creeks free from silt and mud so they remain deep
    - Filtering contamination out of the water, keeping it clean
    - Cooling the local environment, including the air and water
    - Holding the soil together to prevent it washing away, which is erosion control
    - Creating oxygen for people and animals to breathe (oxygen is released into the atmosphere where it circulates so people can breathe clean air)
    - Offering protection from storms and waves (for example, in the case of mangrove forest)
    - Absorbing carbon dioxide
    - Providing homes for plants and animals.
2. Split into several small groups and ask each group to make a list of the services provided by the local forest. If possible, split into groups of men, women and youth (or even landless or non-landowner people/households), to get a broad range of perspectives on how the forest is used. Break down general uses and be as specific as possible. For example, if people say 'we hunt animals in the forest', identify which animals are hunted and put them all on the list — fruit bats, pigeons, wild pigs, etc. If plant materials are harvested, identify which plants and for what purpose they are harvested.

3. With input from the group, enter the information into a table (as shown). For each specific good or service record the following:
    - Use. For example, food, medicine, building, cultural activity
    - An alternative, if applicable. What would the community use if this was not available from the forest?
    - Cost to purchase the item or service, or to purchase an alternative
    - Cost to a typical family over one year (this is an estimation based on the amount normally consumed in a year).

Forest item or service	Use	Alternative	Cost to purchase at store or market	Cost to family over one year
e.g. Pigeon	Food	Chicken	$5	$130
			TOTAL	

4. Add up the value of the ecosystem services that can be calculated (noting it is not possible or meaningful to calculate the value of some services). Ask participants to suggest the approximate annual wages received by well-known (or locally familiar) jobs in their country (for example a teacher, health worker or labourer). How do these annual pay rates compare to the value of the ecosystem services that families receive from forests in one year?
5. Use strategic questioning to stimulate discussion about the value of ecosystem services.
    - Do any of the items and services have a value that cannot be measured in terms of money? How can you describe their value?
    - Which of these services cannot be replaced by purchased varieties?
    - Do you think forest services are properly recognised?
    - How important is the forest to your daily life today?
    - How would it affect you if you couldn't use the forest in these ways?
    - To what extent have the services provided by your forest been considered in past decision-making about land and development?
    - Has this activity challenged your view about what is 'good' development?

A large proportion of food eaten by Pacific Islanders is collected from the local environment.

TOPIC

4.3

Our changing forests

Topic summary

In this topic, participants reflect on the historical uses of land over time in their community. They look into the activities that have led to the decline, destruction or degradation of forests in their area and examine the root causes of such activities. Participants then examine the main activities that could lead to further deforestation or degradation in the future.

Learning outcomes

'Participants can …'

4.5 Recognise the effects of forest destruction or degradation (personally, locally and globally) and the different ways this impacts community members (men, women, youth, elderly, people with disabilities or non-landowners)

4.6 Identify land-use change in their community or region over a period of time

4.7 Recognise the drivers (root causes) of deforestation or degradation of forests in their community or region

4.8 Identify key land-use management options and recognise pros and cons, including opportunity costs, of each option

Background reading

Deforestation

Deforestation is the removal of tropical forests because of changes in land use, such as commercial logging, large-scale agriculture, grazing and mining. By general definition, deforestation means permanently turning forested land into non-forested land.

Degradation

Forest degradation is the depletion of tree cover within a forest due to human activities. It describes the changes within the forest, which negatively affect the structure or function

Many tropical lowland rainforests are being cleared to make way for oil palm plantations. This is an example of deforestation.

of the forest or site, reducing the capacity of the forest to supply ecosystem services. Activities such as selective logging, the harvesting of timber for local use and shifting cultivation methods are often causes of forest degradation. In the context of forest carbon projects, forest degradation can be seen as activities that decrease the carbon stocks within a forest, which occur while the forest remains, by definition, a forest.

Why does deforestation and degradation occur?

The reasons behind deforestation and forest degradation are often termed the 'drivers'. The drivers are the root causes of the activity that impacts on the forest, rather than the activity itself. For example, conversion of forests to oil palm plantations is not a driver of deforestation; to understand the driver, we need to know why this occurred and what allowed this activity to take place.

Economic drivers

Most activities that cause deforestation and degradation are economic. In most cases, landowners and developers decide to deforest when it offers higher financial returns than maintaining the land as intact forest. The value of different land-use activities, like agriculture or logging, is ultimately linked to the level of demand for their products. Demand for products from forested land often comes from overseas.

When the global market price for palm oil increases, for example, so does demand for new land to grow oil palm. Together, the rapid growth in the world's human population (now 8+ billion) and increased economic growth contribute to higher demand for products produced by deforesting or degrading forests.

Legal and policy drivers

Government policies and laws affect decisions made about forests. In many countries, efforts are being made to strengthen forest law enforcement, governance and trade. The laws that are put in place and how they are enforced have a significant impact on the activities that take place in a forest. For example, some countries will not allow round log exports and many countries have regulations relating to logging codes of practice. However, illegal logging practices occur in countries where laws are not properly enforced, regardless of whether the law is in place.

Rights and land tenure

The security of land tenure is a significant driver of deforestation and degradation in some countries. When forest-dependent people have clear rights to their land, they also have rights to exclude other people or interests from using their forest.

In some parts of the world, governments and powerful commercial interests have excluded forest-dependent people (including Indigenous Peoples) from decision-making about forests and development. This has provided the opportunity for land-clearing for large-scale agriculture, grazing and commercial logging. The recognition of forest-dependent and Indigenous Peoples' land rights through legal tenure could reduce pressure on forest resources by giving an Indigenous customary landowners' perspective on how and what sort of development should proceed on forested land.

Opportunity costs

Before agreeing to a forest carbon project on their lands, communities or landowners must think carefully about their options. While a forest carbon project can provide many benefits, it may come at the expense of other benefits — these are referred to as opportunity costs. Opportunity costs are explained further in Topic 3.4.

Deforestation is increasing worldwide as the demand for timber and timber products rises.

Activity 4.3a
Forest change and its drivers

Activity summary

In this activity, participants draw on their local knowledge to examine land-use change in their community and identify the common reasons driving change. This leads to a discussion about the positive and negative impacts.

Learning outcomes

'Participants can …'

4.5 Recognise the effects of forest destruction or degradation (personally, locally and globally) and the different ways this impacts community members (men, women, youth, elderly, people with disabilities or non-landowners)

4.6 Identify land-use change in their community or region over a period of time

4.7 Recognise the drivers (root causes) of deforestation or degradation of forests in their community or region

Materials

- Pieces of chart (poster) paper with a table drawn on them
- Markers

Suggested timing

40 minutes

Step-by-step guide

1. Organise participants into several smaller groups and provide each group with a large piece of paper containing a table and columns (as shown on p. 174). You may use the same groups of men, women, youth, etc from activity 4.2 (or you can mix the groups if you feel everyone will feel confident sharing their perspective). Tell each group to discuss how land use has changed in the area over the past 30 years. Ask each group to nominate the three most significant activities that have increased over the past 30 years that have led to deforestation (conversion of forested land to something else) or degradation (thinning of the forest). These activities should be written in the left-hand column of the table under the heading 'activities that contribute to forest clearing or thinning'.

2. Explain the concept of a 'driver' of an activity (refer to the background reading). Explain drivers are the underlying causes or reasons why an activity takes place. Ask each group to discuss the drivers of the three identified activities and to record their findings in the second column of the table. Ask them to be as specific as possible. For example, rather than suggesting 'economic' they could identify something like the need to pay for new infrastructure development or the opportunity of income from a certain cash crop.

3. Ask each group to present their tables and summarise their discussion about the drivers. Ask them to explain how their three activities cause deforestation or degradation and to explain why the activities took place (or continue to take place). Discuss and ask questions of the group such as:

    - What is the most significant activity that causes deforestation or degradation?
    - What are the most significant drivers?
    - Are the drivers from within the community or outside?
    - If they are from within the community, are there differing drivers for different groups within the community (men, women, other social groups) or are they the same across all groups?

Table 4.3a: Activities that contribute to forest clearing or thinning

Activities that contribute to forest clearing or thinning	'Drivers'
1.	
2.	
3.	

Activity 4.3b
Pros and cons of alternative land uses

Activity summary

In this activity, participants examine locally relevant land-use alternatives to identify advantages (gains) and disadvantages (losses). This activity enables participants to draw on their experiences and local knowledge when thinking about past and potential future development alternatives.

Learning outcomes

'Participants can …'

4.5 Recognise the effects of forest destruction or degradation (personally, locally and globally) and the different ways this impacts community members (men, women, youth, elderly, people with disabilities or non-landowners)

4.8 Identify key land-use management options and recognise pros and cons, including opportunity costs, of each option

Suggested timing

40 minutes

Materials

- Pieces of chart (poster) paper, with two columns drawn on them ('advantages' and 'disadvantages')
- Marker pens

Step-by-step guide

Facilitator's note:

Wherever possible, attempt to move this exercise from theory to real situations in which participants already have experience or may gain experience in the future. Encourage participants to consider a range of possible outcomes (for example, social, environmental and economic outcomes) but be careful not to lead participants to answers. If gaining money is mentioned as an advantage, encourage participants to break this down to identify what goods, services or opportunities they want the money to provide.

1. Organise participants into several smaller groups. Again, use the same groups of men, women, youth, etc from activity 4.2. Explain to them, 'Each group will need to choose two or three land-use activities (or developments) that already take place or could take place in the future. We are then going to look at the advantages (gains) and disadvantages (losses) that we might have experienced or would expect to experience from these activities.' Encourage participants to consider choosing the land uses that were identified and analysed in Activity 4.3a: Forest change and its drivers; however, they may choose to analyse an activity that has not taken place before but is proposed or possible in the future.

    Examples of land use:

    - Logging (commercial or local)
    - Agriculture (for example, oil palm or copra)
    - Subsistence gardening
    - Forest carbon (a protected area).

2. Give the small groups pieces of chart (poster) paper. Each piece should be divided into two columns with the headings 'advantages' and 'disadvantages' (consider including a picture of a hand with its thumb up and a hand with its thumb down). Explain the purpose of the activity is to think about the good things ('pros') and bad things ('cons') that could come from different types of activities on their land. Explain, 'For example, if you use logging, you'll need to draw or list good and bad things that have or may come from logging'. Ask each group to complete the table based on their own experience, using the examples of the land-use alternatives they have identified.

3. When all relevant land uses have been analysed, the groups should present their ideas to the larger group. Facilitate discussion with strategic questioning.
    - What are the most significant advantages that you would seek? Why?
    - What are the most significant disadvantages that would concern you? Why?
    - In what ways do the advantages and disadvantages differ between different groups within the community (men, women, youth, elderly, non-landowners, people with a disability etc).
4. Explain the concept of an 'opportunity cost' (see background reading). Ask participants if they can identify any opportunity costs, where undertaking one activity might reduce the opportunity to undertake another alternative activity.

Gardening or agro-forestry are examples of land use that remain important to communities during forest carbon projects.

*** Indicates definitions taken from 'The REDD glossary' (Pact 2012).**

A

Additionality: The requirement that an activity or project generate additional benefits, specifically carbon benefits, to what would have occurred in the absence of the activity or project. Under sound voluntary market standards, carbon credits will be awarded only to project activities where emissions reductions are 'additional to those that otherwise would occur', i.e. additional reductions compared to the 'baseline scenario'.

B

Baseline: The trend in rates of deforestation and degradation (and emissions) over a period of time in the past and predicted in the future. See also 'business as usual', which assesses what would have occurred in the absence of a forest carbon project.

Buffer: The amount of carbon credits, determined by risk analysis or the rules of a particular standard, which are set aside and not commercialised to ensure validity of carbon credits from a project in the event of leakage or impermanence.

Business as usual (BAU): An assessment of rates of deforestation and degradation (and emissions) expected in the future without a forest carbon project. See also 'baseline' and 'reference level'.

C

Carbon benefits: The quantity of emissions avoided or carbon sequestered above the business-as-usual scenario, after appropriate deductions are made for leakage and impermanence. Usually measured in tonnes of carbon dioxide equivalent (tCO_2e).*

Carbon credits: A generic term used to describe a unit of carbon that can be sold or traded. One carbon credit is equal to one tonne of carbon abatement (carbon that has not been released into the atmosphere due to human actions).

Carbon dioxide equivalent (tCO_2e): Not all greenhouse gases warm the atmosphere equally; some gases (such as methane) have a greater global warming potential, or warming effect, than carbon dioxide. To account for this, the term CO_2e is used. It means that greenhouse gases other than carbon dioxide can be converted to the equivalent amount of CO_2, based on their relative contribution to global warming. This provides for a single, uniform means of measuring emissions reductions for multiple greenhouse gases.*

Carbon market: The market in which carbon credits are traded. There are voluntary and mandatory carbon markets

Carbon offset: Credits issued in return for a reduction of carbon emissions through projects such as forest carbon. By paying for emission-reducing activities, individuals and organisations can use the resulting credits to offset their own emissions, either voluntarily or under the rules of most emissions trading schemes. One offset credit is equivalent to an emission reduction of one metric ton of CO_2e.*

Certification: In relation to forest carbon projects, certification is the process of the project design meeting and being validated against a particular certification standard. See also 'validation'.

Core-benefits (co-benefits): The benefits that arise from a forest carbon project in addition to carbon abatement. Co-benefits may be environmental, such as biodiversity benefits or clean water. They may also be social, such as adaptation to climate change, improved local livelihoods or strengthened community governance systems.

D

Deforestation: The conversion of forested land to non-forested land.

Degradation: While there is no official definition of degradation, in relation to forest carbon projects it can be seen as the reduction of carbon-storing capacity within forested land.

E

Emissions: The release of greenhouse gases into the atmosphere.

Ex-ante crediting: The issuance of credits in expectation of future emission reductions.*

Ex-post crediting: The issuance of credits after independent verification of emission reductions that have already been achieved.*

F

Fossil fuel: A hydrocarbon deposit, such as petroleum, coal or natural gas, derived from living matter of a previous geologic time and used for fuel.

Free, prior and informed consent (FPIC): A requirement for forest carbon projects relating to the engagement of local forest-dependent peoples. According to the United Nations Declaration on the Rights of Indigenous Peoples (2008): 'When making policies, laws or undertaking activities that affect our peoples, governments and others should negotiate with us with the aim of obtaining our consent. For government, this is much stronger than an obligation to just provide information or 'consult'. Governments and companies should not impose their position onto our peoples, without first taking our rights into consideration.'

G

Greenhouse gases (GHG): A group of gases that control energy flows in the Earth's atmosphere by absorbing infrared radiation. Some GHGs occur naturally in the atmosphere (for example, H2O), while others result from human activities or occur at greater concentrations because of human activities. The main GHGs increased because of human activities are carbon dioxide (CO_2), methane (CH4) and nitrous oxide (N2O).*

M

Market: A place where people gather to trade and sell commodities or services.

Measuring (or monitoring) reporting and verification (MRV): The collection of data and information at a national (or sub- national) level, and performance of the necessary calculations for estimating emission reductions or enhancement of carbon stocks and associated uncertainties against a reference level.*

Methane: A greenhouse gas, which is odourless, colourless and flammable. Methane is 20 times more effective at trapping heat in the atmosphere than carbon dioxide.

O

Opportunity cost: The loss of potential gain from other alternative livelihood opportunities when one alternative is chosen.

P

Permanence: The requirement for greenhouse gas reductions to remain permanent for a set period of time.

Project developer: The person or organisation in charge of developing a forest carbon project.

R

Reference emissions level: The trend in rates of emissions of a forest over a period of time in the past, and predicted in the future. See also 'baseline' and 'business as usual (BAU)'.

Removals: The opposite of an emission of greenhouse gas. This occurs when greenhouse gases are removed from the atmosphere, for example, by trees during the process of photosynthesis.*

Reversals: Unplanned carbon emissions from a forest carbon project, for example, due to wildfire, cyclone, poor management or illegal logging.

S

Sequestration (bio-sequestration): The storage of carbon by plants, trees and other flora, which absorb carbon dioxide from the atmosphere as they grow, release oxygen and store the carbon.

V

Validation: In relation to forest carbon projects, validation is the process of the project design meeting and being validated against a particular certification standard. See also 'certification'.

Verification: In relation to forest carbon projects, verification is the process of having an independent third-party auditor verify that a monitoring report is accurate. This happens during the forest carbon project monitoring cycle associated with the issuance of credits.

Voluntary Emission Reductions (VERs): The general name given to carbon-offset credits in the voluntary carbon market. These are tradable credits for greenhouse emission reductions generated to meet voluntary demand for carbon credits by organisations and individuals wanting to offset their own emissions.*'certification'.

Verification: In relation to forest carbon, verification is the process of having an independent third-party auditor verify that a monitoring report is accurate. This happens during the forest carbon project monitoring cycle associated with the issuance of credits.

VERs: The general name given to carbon-offset credits in the voluntary carbon market. These are tradable credits for greenhouse emission reductions generated to meet voluntary demand for carbon credits by organisations and individuals wanting to offset their own emissions.*

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