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SPREP

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GRIFFITH UNIVERSITY

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Ecosystem and Socio-economic Resilience Analysis and Mapping (ESRAM) - SUMMARY REPORT

South Malaita & Maramasike Passage
Solomon Islands

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1. Ecosystem and socio-economic resilience and planning

This report presents a summary of an Ecosystem and Socio-economic Resilience Analysis and Mapping (ESRAM) project in three communities in South Malaita, Malaita Province, in the Solomon Islands: Tapa'atewa, Eliote, and Ori Ore (Figure 1). The ESRAM process was designed and carried out by Secretariat for the Pacific Regional Environment Programme (SPREP) and Griffith University, in Australia.

ESRAM sets out to

1. Establish a baseline for ecosystem and socio-economic risks, resilience, and opportuntities for Tapa'atewa, in the central highland forests and Eliote and Ori Ore along the Maramasike Passage.
2. Make recommendations for ecosystem-based adaptations to climate change, environmental pressures, and other human impacts.
3. Assist the communities by providing information to make decisions about their future uses of their natural resources.

This report presents the ESRAM process, analyses environmental and climate risks, establishes community values and preferences, maps the ecosystems and ecosystem services and establishes the economic values of those ecosystem services. These lines of evidence are brought together to put forward recommendations for ecosystem-based adaptation options.

This ESRAM was part of the Pacific Ecosystem-Based Adaptation to Climate Change (PEBACC+) project, funded by the **Kiwa Initiative** and the French Facility for Global Environment. The process for ESRAM is set out in Figure 2.

Figure 1: Location of the communities Tapa'atewa, Eliote, and Ori Ore on South Malaita island, Malaita Province, Solomon Islands.

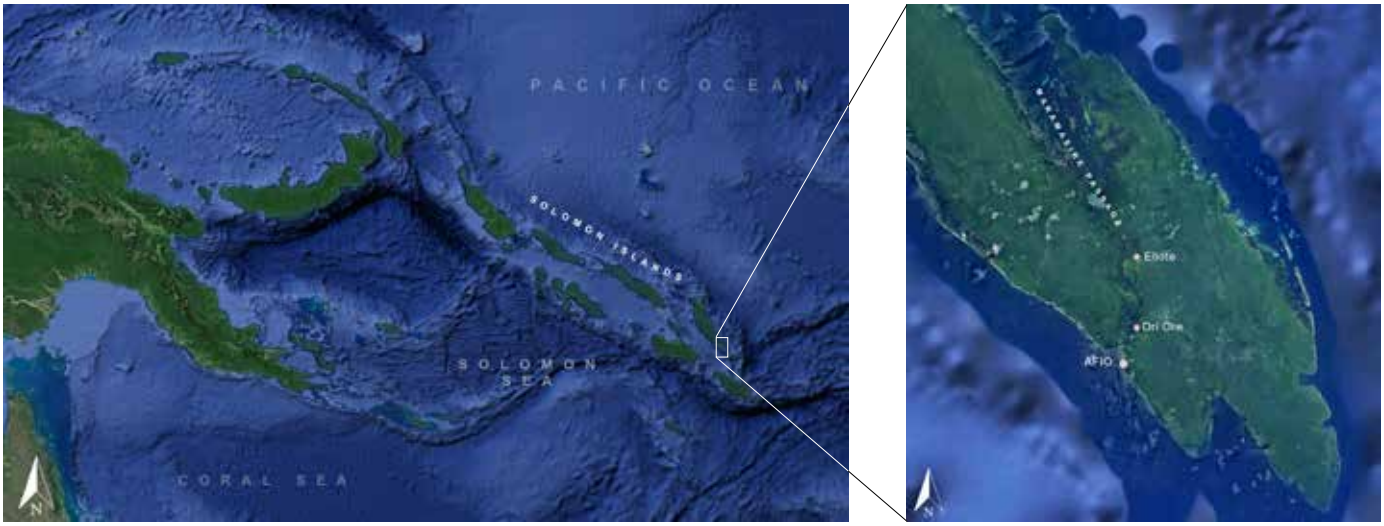
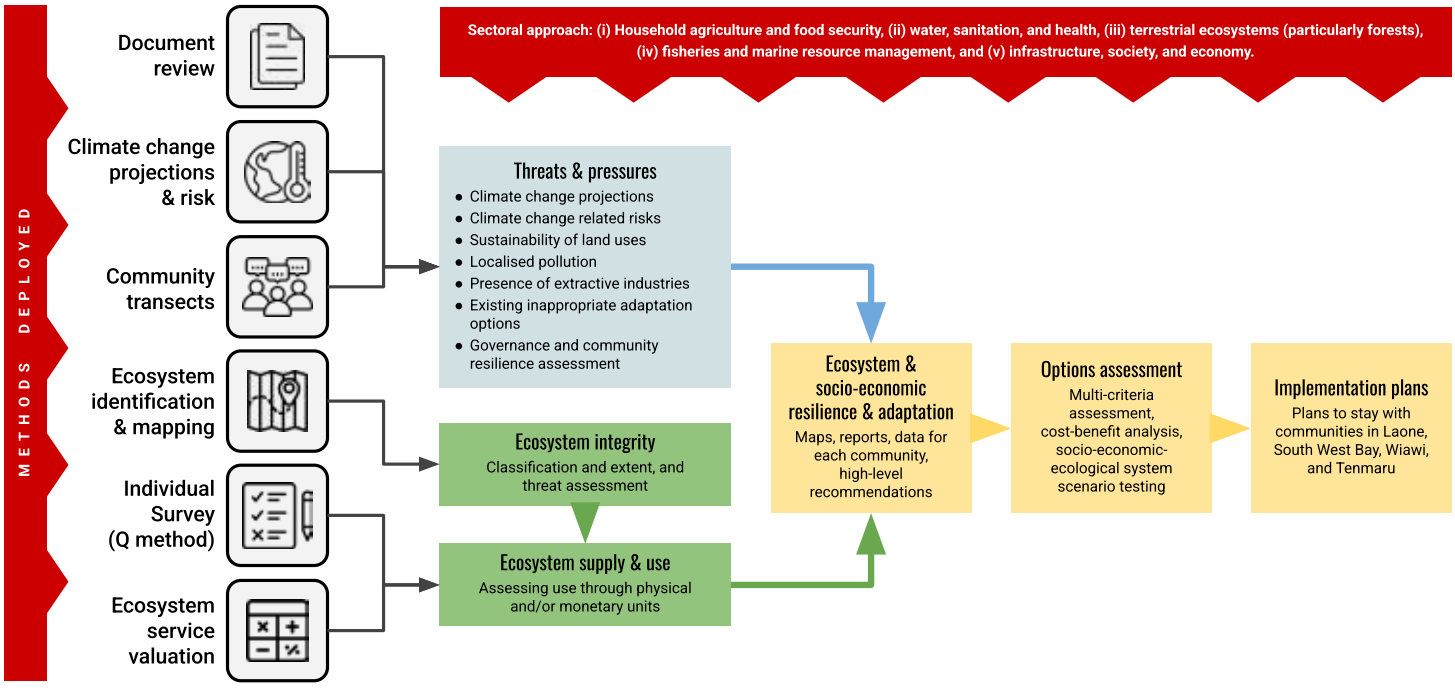


Figure 2: Our approach to this study comprised a number of data inputs (left) and a series of steps (coloured boxes), using a series of engagement activities, across a range of sectors (red box) to establish a range of ecosystem-based adaptation options.



2. Adapting to climate change in the Solomon Islands

Pacific Island nations have a long history of resilience and adaptation to extreme weather and environmental and climate changes. However, as the changes accelerate, rural communities will face a range of threats to the sustainable management of their natural resources.

Climate change related threats include:

- more rapid climate warming and extreme weather events; and
- impacts on and from the ocean, including warming oceans, sea level rise, coastal inundation, erosion, and ocean acidification.

In addition, increasing pressures on natural resources from over-exploitation as new markets open up, demographic change, and falling agricultural productivity from household gardens are being magnified and compounded by these climate-related impacts.

In the Solomon Islands, these pressure have been made worse by non-climate change related risks, such as earthquakes and volcanic activity.

Finally, social changes, economic development, and demographic pressures also play their part. The population of Solomon Islands is growing and on the move.

Adaptation to climate change

Building resilience to climate change is based on adaptation. Climate change adaptations are adjustments to social systems and ecosytems in response to both the actual, or expected future changes. These changes should mitigate adverse effects of change, or take advantage of new opportunities.

In the Solomon Islands, where people and communities rely heavily and directly on their natural resources, by adapting management of ecosystems, communities can reduce risks and lessen potential climate change risks and reduce damage that might otherwise occur without adaptation.

Nature based solutions and Ecosystem-based adaptation

Nature-based solutions (NbS) are options that use nature and ecosystems to achieve community wellbeing, nature conservation, and sustainable development. Where NbS are used for climate change adaptation, they are known as **ecosystem-based adaptations**, or EbA.

EbA connects nature conservation with broader social and economic development ideas to help communities to adapt to both long terms trends and shocks associated with climate change. In parallel, EbA should improve social and economic well-being.

EbA interventions are not rigidly defined, but can be best understood in terms of their position on a continuum from 'hard', infrastructure-based interventions to those that solely deploy ecosystems in adaptation.

Therefore, EbAs work with nature and natural processes (even when containing some 'hard', engineered, or capacity- and institutional components) and therefore provide the support and space to assist species and ecosystems to adapt to changing conditions in ways that are beneficial to human society. EbAs can also take the form of approaches that reduce pressure on natural systems to enable them function and potentially migrate. Therefore, EbA is an approach, rather than a prescribed set of solutions.

Figure 3: Mangrove rehabilitation and conservation can be a popular ecosystem-based adaptation (EbA) for coastal protection from storms and sea level rise. In addition to these coastal protection services, mangroves generate many other natural resources that are harvested for food and materials and store very significant amounts of carbon, which grows over time to help mitigate climate change. Therefore, mangroves as EbA, generate many co-benefits.

EbAs also generate many 'co-benefits' - that is, further benefits, such as food, or carbon storage, above and beyond their adaptation benefits (Figure 3). When well-managed, EbAs can be cost-effective, use appropriate infrastructure, and should be self-sustaining.

Taking a 'systems approach'

When considering EbA it is useful to take a systems-approach - a way of thinking that links links things such as households, markets, ecosystems, and national and international institutions, in a complex system, where each of the these components influence each other.

For example, when considering implementation of marine protected areas as an EbA to secure the sustainability of a fish catch, or to improve the potential tourism values of the reef, it may require a reduction in the wild fish catch from a local reef. This means community needs for some protein must be found from other sources. This might require complementary interventions that generate new sources of food, or sources of cash to buy alternative protein. This might include poultry management or harvesting fish away from local reefs, which needs investment in more robust watercraft, diesel supplies, and technicians to maintain the fleet.

Gender and social inclusion

Climate change-related risks are not equally shared by everyone in the community. In addition, the benefits of EbA are not automatically shared equitably. The needs of different members of the community are often different. Women, particularly poorer women in rural areas can experience greater vulnerability to climate change due to a range of inter-related social factors, including community power dynamics, views about traditional family roles for women, and risks of being alienation from land and economic resources. Therefore, thinking about gender needs to play a role in deciding on the best form of adaptations.

Throughout the ESRAM process we were careful to make sure women were especially invited to take part and have their perspectives recorded. Our community engagement activities used a range of methods, including individual exercises and group activities.

National and international context of ESRAM

Supporting the conservation of functioning habitats and ecosystems is vital for improvements in the livelihoods of the people of the Solomon Islands. ESRAM aligns with national strategies to manage climate change impacts and at the same time provide opportunities for communities in Solomon Islands to progress towards the international *2030 Agenda for Sustainable Development* and the goals set out in the United Nations *Convention on Biological Diversity*.

The government of the Solomon Islands has also made greenhouse gas mitigation and adaptation commitments to the international community through the *United Nations Framework Convention on Climate Change* (UNFCCC) in its *Nationally Determined Contribution* (NDC) statement 2021 (Solomon Islands Government, 2021).

The NDC commits the Solomon Islands to:

- Strengthen capacity for community activities that relate to reducing carbon emissions from deforestation and degradation and to drive engagement with carbon projects that directly benefits resource owners.
- Supporting communities in sustainable forest management, including monitoring, reporting, and verification of standards.
- Integrate gender considerations into planning of climate actions.
- Develop information systems that document 'livelihood assets' (natural, human, financial, social, and physical capital) to tackle climate change, increase adaptive capacity, and inform natural resource and environmental management.

3. Climate change hazards and risks

As tropical developing island nation, the Solomon Islands has particular vulnerabilities and exposures to the current and future impacts of climate change. This section highlights country-level data, projections, and general climate risk

At a glance...

Rainfall

Unknown change in total rainfall but greater likelihood of extremes in rainfall patterns (high confidence).

Temperatures

Annual mean temperatures and extremely hot day wil increase by up to 1.0 °C by 2030, and up to 4.0 °C by 2090 (very high confidence).

Sea level rise

Sea level is projected to rise 8–18 cm by 2030, and 41–88 cm by 2090 (very high confidence).

Cyclone activity

Possibly fewer cyclones, but the cyclones that occur are likely to more intense (medium confidence).

Ocean acidification

Oceans will become more acidic and damage coral and shellfish (very high confidence).

Coral bleaching

More ocean heat waves will cause coral bleaching and coral death (very high confidence).

Forest fires

Heat and drought will cause drying forests and potential bush fires (medium confidence).

Current climate

As it is near the equator, the Solomon Islands experiences a relatively stable climate. Average temperatures are between 24.5 °C and 26.5 °C year-round. Average monthly rainfall is also quite consistent, ranging from 150–350 millimetres (mm); peaking between January and March. Year to year, the climate of the Solomon Islands is influenced by large-scale climate phenomenon, such as the El Niño–Southern Oscillation (ENSO), which alters multi-season rainfall patterns, temperatures, and wave direction.

Projected future climate changes

Climate change projections are based on 'Shared Socio-economuc Pathways' (SSP), which are scenarios that combine carbon emissions and economic models, created by scientists at the United Nations International Panel on Climate Change (IPCC) (See Box 1).

Into the future the Solomon Islands climate will get hotter and hotter faster. Between 1962 and 2012 the rate of average temperature increase was around 0.14 – 0.17 °C per decade (Figure 4). From the chart, you can see this rate of warming is accelerating (the lines are getting steeper).

By the year 2090, temperatures in the Solomon Islands will have rised by between 1 °C (in a low emissions SSP) and 4 °C (in a high emissions SSP). (See Figure 5.)

There is some evidence that rainfall will increase slightly, however, there is uncertainty around future changes, as climate models disagree, particularly around the future impacts of ENSO. However, there is science that suggests a hotter atmosphere will lead to an increase in the frequency and intensity of extreme rainfall events.

Impact of climate change

Higher temperatures

Higher temperatures will have a range of impacts. There will be more extremely hot days that will:

- affect human health and make it more difficult to work outside;
- change the seasons in which some crops can be grown; and
- enable the spread of pest plants and animals.

Tropical cyclones and extreme weather

Tropical cyclones have historically impacted the Solomon Islands at a rate of around 21 cyclones per decade, with around a quarter categorised as Category 3 and above. Cyclone frequency is also influenced by the ENSO cycle. Climate change is projected to see a decrease in cyclone frequency of between 6%–35% by 2100. However, there is also evidence that the intensity of the cyclones that do occur will increase.

Sea level rise

Global warming heats the ocean, which makes it expand, and will melt ice caps. Around the world sea level rise is accelerating and it is projected to continue to do so long into the future (even if carbon emissions start to fall, as). Sea levels have risen by about 200 mm this centruy and are currently rising at a rate of about 3.6 mm per year. This rate is expected to increase 4 - 9 mm per year in a low emissions scenario and 10 and 20 mm per year under a high emissions scenario by 2100. Global mean sea-level rise is estimated in the range of 0.44–0.74 metres (m) by 2100.

Local changes also have an effect. The Solomon Islands are in a

Figure 4: Solomon Islands average mean surface air temperature annual trends. The chart shows that temperatures have been increasing and, over time, have been increasing at a faster rate.

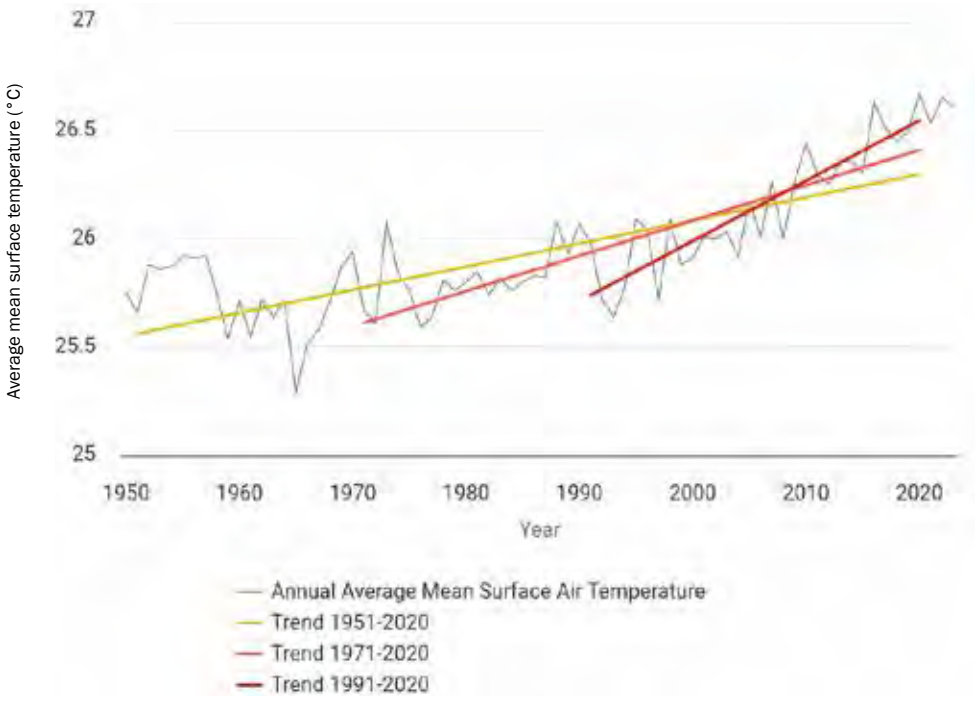
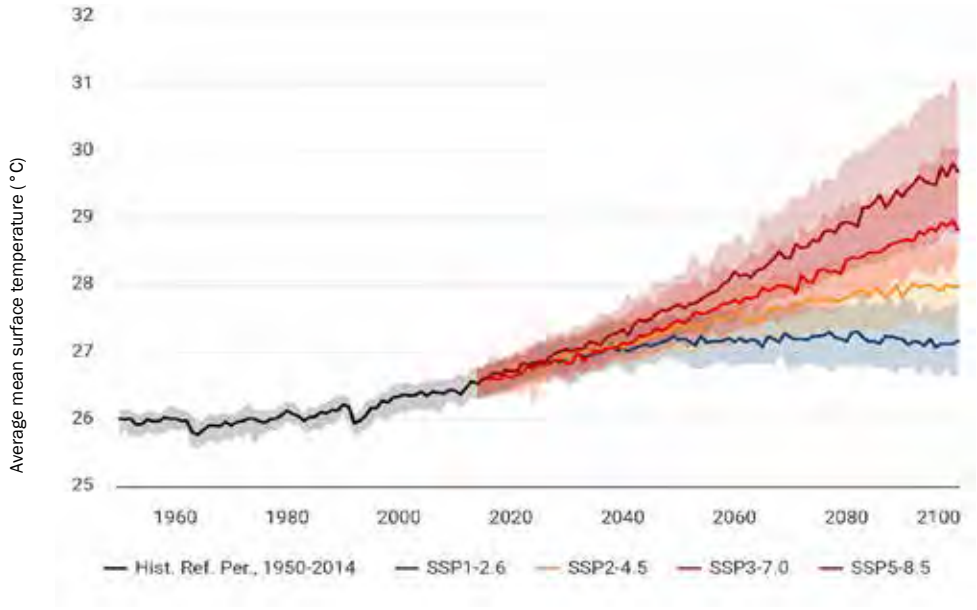


Figure 5: Solomon Islands average mean surface air temperature annual trends under different Shared Socio-economic Pathways. SSP1-2.6 is an optimistic future, where emissions begin to fall after 2050 and SSP5-8.5 is a less optimistic future where emissions continue to rise. The global community's current trend in emissions is closer to SSP2-4.5.



region that has seen above average rates of sea-level rise in recent decades. This is *relative* sea level rise, as locally sea levels are effected land uplift or recession that is common in volcanically active areas, such as the Solomon Islands.

Whilst much of South Malaita is relatively hillly and will not be permanently affected by sea level rise, low laying houses, gardens, and mangrove forests maybe impacted. In particular, during extreme weather events, the sea level rise, on top of storm surges, may put even more land and infrstructure at risk. Such increases are a significant threat to low lying coastal areas in the Solomon Islands.

Ocean acidification

With more carbon dioxide gas in the atmosphere as a result of carbon emissions, more of it dissolves into the ocean. This increases the acidity of the water. Whilst this will never be a direct health risk to humans, it does impact the ability of corals to form the structure that makes up a coral reef and shell fish to create their shells.

Box 1: Climate change projections

Climate change scientists at the International Panel on Climate Change's (IPCC) use different scenarios to demonstrate future changes to climate and the impacts on society.

The IPCC uses scenarios called 'Shared Socioeconomic Pathways' (SSPs). SSPs provide a comprehensive framework that includes the interactions between social, economic, and environmental factors.

There are SSPs (see Figure 5). These represent four plausible futures, based on the rate of emissions growth and/or reduction as a result of different economic and social futures, through to 2100.

4. Ecosystem services and valuation

Ecosystem services result from natural ecological processes that provide beneifts to human communities. Ecosystem services can generate benefits directly, such providing wild fish or materials, which also require human effort to generate the benefit, and indirectly, where human effort is not needed, such as the water filtering and retention services provided by forests.

Types of ecosystem services

Ecosystem services are categorised as: (1) provisioning; (2) regulating; and (3) cultural. These are all underpinned by supporting biochemical and physical processes, known as 'supporting' services (see Figure 6).

Provisioning services are tangible things that are directly harvested from nature and contribute directly to a community's material well-being. They are often 'common pool resources' (e.g., wild fish), which can be over-harvested and eventually eliminated. Provisioning services provide direct economic benefit to communities, even if they are not sold for money.

Regulating services are indirect benefits communities get from the functioning of natural processes. The benefits from regulating services is related to the integrity of the habitat generating the ecosystem services (e.g., natural forests store more carbon and retain more rainwater than plantation forests). Regulating services provide indirect economic benefits, such as prevent damage from climate change.

Cultural services are both material and non-material benefits. They are generally not diminished by human use and can generate economic benefit through, for example the value of eco-tourism, research, education, social capital and social and cultural reproduction.

Economic values of ecosystem services

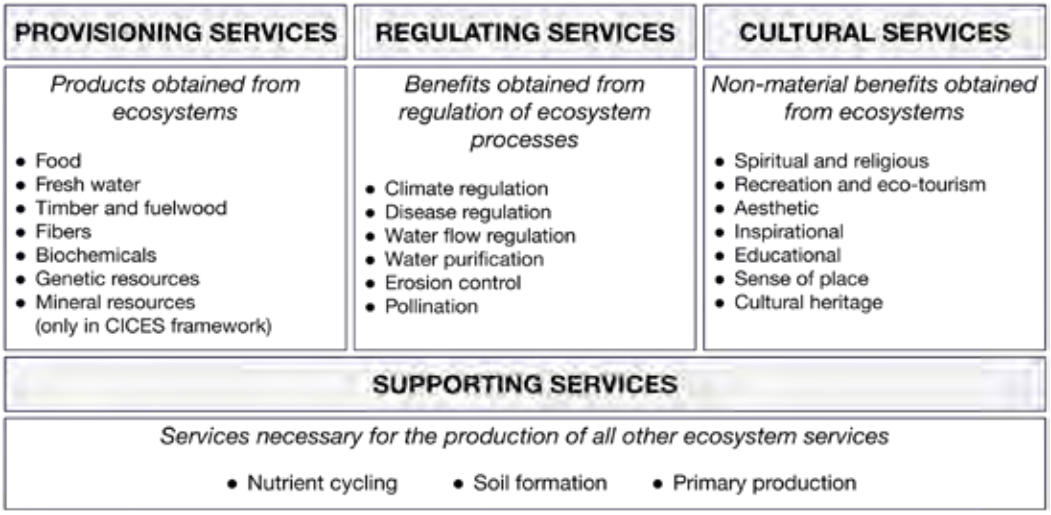
Ecosystem services are important socially and culturally but they also have economic values. These values are based on their 'usefulness' in achieving a goal for someone. For example, the economic value of forest can be based on its role in improvement in societal wellbeing, which can include people's livelihoods and other material needs.

The economic value of forest ecosystem services can be based on the range of ecosystem services that are used by the commuity - and the world. Some economic values are complementary (they can be enjoyed at the same time); in other instances, enjoying one ecosystem service prevents other ecosystem services from being enjoyed. For example, the economic value can be estimated by the value of its timber *or* in its value to maintaining a stable climate into the future (but often not both at the same time, as the removal of timber will reduce a forest's ability to store carbon).

There are social science techniques that can translate economic values into money values. This enables people to compare the value of ecosystem services with the value someone might attach to their own labour, recreation, shelter, sustenance, or health. (See Box 2.)

In Section 8 (ecosystems, ecosystem services uses, and threats) we report on these economic values of ecosystem services.

Figure 6: Ecosystem services classification along functional lines of provisioning, regulating, and cultural ecosystem services, underpinned by support ecosystem services.



Box 2: Are we putting a price on nature?

When we put an economic value on ecosystem services, particularly when we money value on it, we need to understand exactly what we are doing. In most instances we are estimating how much nature is 'worth' - both to both the local communities that manage the resource and also to the world, particularly in terms of storing carbon and protecting biodiversity, We are estimating how much it 'costs'.

We are not putting a price on nature so we can sell it to the highest bidder!

Economic valuation of ecosystem services has a series of interlinked purposes:

1) Help with decision-making: Helping policymakers, courts, governments, and businesses to better understand and prioritise trade-offs involved in land-use decisions, resource management, and environmental policies, particularly using social cost benefit and cost effectiveness analysis.

2) Measuring non-market environmental benefits: Traditional economic indicators often fail to account for the environmental benefits provided by ecosystems. Valuation can help integrate nature's benefits into economic decision-making.

3) Raising awareness or political support: Helping to build support from the public, businesses, and policymakers about the importance of preserving nature and biodiversity.

4) Attracting conservation funding: To support the development of conservation systems that use markets to guide value, such as payments for ecosystem services programs (where beneficiaries compensate providers for the maintenance or enhancement of specific ecosystem services).

5. Ecosystem identification and mapping

ESRAM studies rely on mapping habitats, ecosystems, and ecosystem uses for both land-based and ocean ecosystems. The purpose of the mapping is to understand what ecosystem services are important for communities and to estimate their economic value.

Land use and land cover

Land use (what the land is used for) and land cover (what vegetation covers the land) can be combined to identify what ecosystems are present. For South Malaita, a range of sources from both existing international data sources and from mapping completed by Griffith University. Additional information was provided by the three communities through workshop activities.

Land based ecosystems can be identified and mapped using various criteria. In South Malaita, the pattern of land cover and land use remains complex, dynamic and changes rapidly with transitions between forest, rotational subsistence gardens, secondary forest regrowth, and logged areas. Thousands of years of shifting cultivation and regrowth has left only the remotest areas and steepest terrain completely unmodified. Nonetheless, South Malaita and the Solomons Islands, generally, still contains very significant tracts of primary forest.

Data sources

The main source of data of our land based ecosystems was satellite data through Google Earth Engine. Software can identify the colour and pattern of pixels to determine whether the area is, for example, natural forest, plantation forest, household subsistence gardens, grassland, and built up area. An example of terrestrial ecosystem mapping and ecosystem key is in Figure 7. In this example, you can also see blank patches that result from persistent cloud cover and for which there is insufficient data to classify the ecosystems.

Further online global datasets were also used:

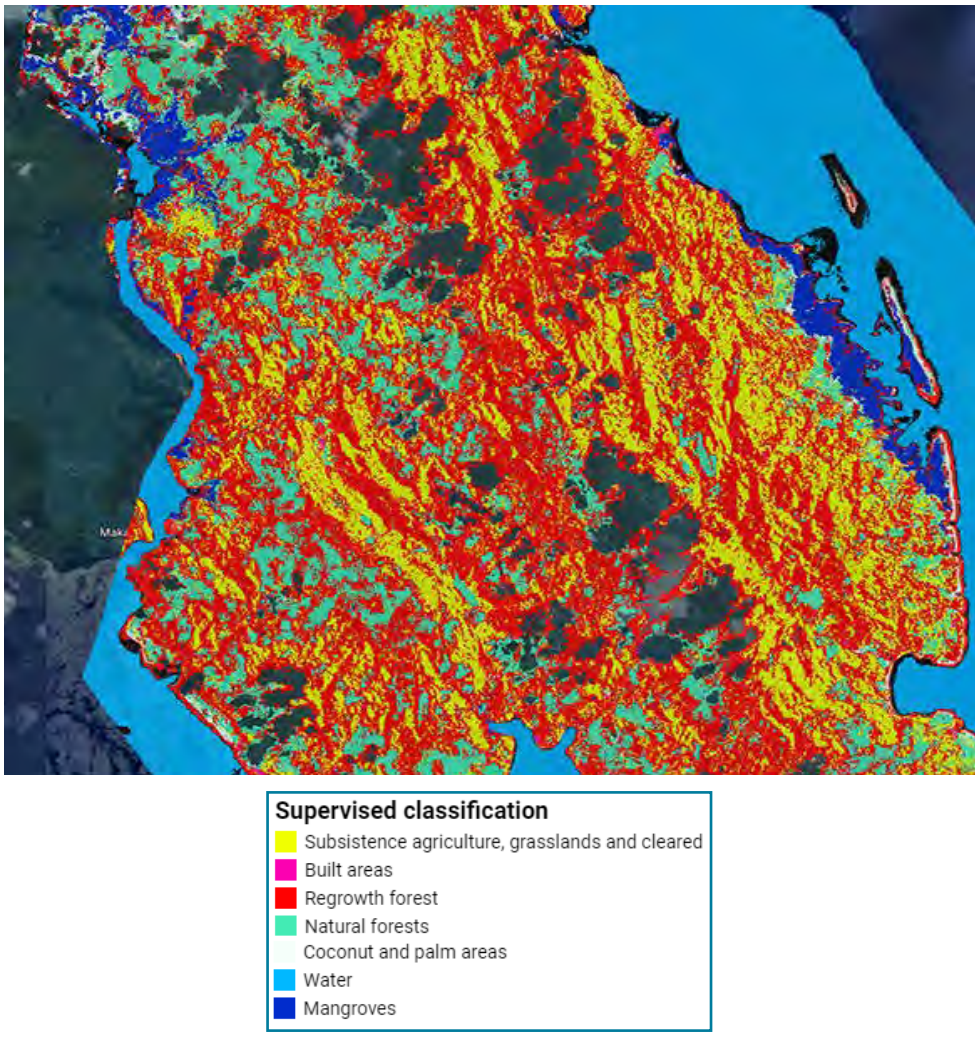
1. Tree cover loss data was extracted from Global Forest Watch.
2. Coral reef data we used extracted extent data from the Allen Coral Atlas.
3. Mangrove extent and loss data we used extracted date from Global Mangrove Watch.
4. Sea grass extent is data extracted from Allen Coral Atlas.

From these data sources we were able to identify the location and size of different ecosystems. These are reported in the Section 8.

Commercial logging activity in South Malaita

South Malaita has been subject to significant historic and continuing commercial logging. This logging can change the ecosystem and ecosystem services very quickly and may not be represented in the latest satelliet data.

Figure 7: Exampe of the ecosystem mapping from South Malaita, in particular showing household subsistence gardens (yellow), regrowth forests (red), and natural forests (light green).



6. Community engagement

The project team undertook two site visits each to Tapa'atewa, Eliote, and Ori Ore in July 2024 and April 2025 to undertake a range of community engagement activities and workshops.

Individual surveys

The first line of enquiry was an **individual survey** where participants were asked to rank issue statements in order of priorty from most important to least important. The purpose of this was two-fold. The first was to find out which concerns were the most and least important, and the second was to group people around their shared concerns, which can help to understand how they might feel about broader issues, such as their attitude towards culture, kastom, business and commerce, and conservation. (See Figure 8)

Community transect and community asset inventory

A second line of enquiry was a **community transect**. Community transects create a record of community-wide environmental conditions, especially those arising in the natural, built, and experienced environments.

The transect walks took approximately 2 hours each and were completed with members of the community with sufficient local knowledge and technical skills to identify broad, community-level issues and propose high level solutions. The transect covered a structured set of subject matters but also enabled community members to also lead the team to the areas of interest.

As the community transects were being undertaken, a **community asset inventory** was completed. The inventory was done in questionnaire style and was aimed at documenting important community assets, such as infrastructure, communications, market access and social capital assets, such as community cooperatives, womens' groups, and church associations, which can be valuable vehicles for social change in the community.

Validation workshops

Durng the second site visit enabled the community to take part in a series of validation exercises. The purpose of these sessions was to:

1. Report back to the community on the main findings of the ESRAM process so far and to provide information on the identified climate risks and findings from the individual survey and community transects.
2. Confirm with the communities the perceived risks to key ecosystems and resources/uses presented by climate change and general environmental and socio-economic change.
3. Present initial ideas for EbA interventions.
4. Make recommendations on the prioritisation of EbA projects.
5. To thank the community and close off this stage of the PEBACC+ project.

Engagement at a glance...

6 EVENTS in the 3 COMMUNITIES

of Tapa'atewa, Eliote, and Ore Ori.

117 PEOPLE

taking part in surveys, transects, and validation exercises.

58 WOMEN and 59 MEN

taking part in all exercises.

Figure 8: The community at Ori Ore undertaking community decision making over ecosystem-based adaptation options.

7. South Malaita communities

7.a Tapa'atewa

Tapa'atewa is a forested community in South Malaita's central highlands. It is a community of between 125 and 180 people with around 35 households. The village sits on a ridge above the Tapa'atewa river at 200m of elevation. The area has steep valleys and ridges and the community is quite exposed to high winds and heavy rainfall. The surrounding forest is highly degraded secondary regrowth (and fallow), agroforestry gardens, and cultivated gardens, with only small pockets of remnant primary forest patches and individual rainforest tree species. Commercial logging operations have historically been widespread, but at the time of the visit had been temporarily suspended due to a dispute over incursion of loggers into customary gardens. There is good quality road access to local trading centres, which are maintained by the logging companies.

Household and commuity data collection took place in Tapa'atewa took place on 24th July 2024 and 9th April 2025 (Figure 9).

Statement ranking exercise

Most agree with...

Our community needs better places to throw away non-compostable waste, such as cans and plastics.

Protected areas in forests is an effective way of stopping logging on customary lands.

Improving roads access to the community will help business opportunities.

Our rivers and streams are drying up more frequently than before.

Most disagree with...

Enforcing protected area rules and taboos in my community is very hard.

The benefits from logging are shared fairly across everyone in the community.

Mining and forestry offer enough benefits to make up for their environmental impact.

What did the community tell us?

Community demographics

- Migration in and the village is common, with people working in, going to school in, and migrating to Honiara (in particular).
- New household formation is common from marriages. There's an increase in children, suggesting that population is either growing, or is at least stable (considering outward migration).

Community hazards

- Rainfall is frequent and regular. In heavy rains the rivers silt-up.
- Village is commonly impacted by disruptive strong winds and wet weather. (The village is situated high on a ridge.) It was reported that one traditionally built house was destroyed by high winds.
- The community is aware of logging activities and link it to poor water quality in watercourses, particularly during wet weather. When water sources are silted-up, community members must travel further to water sources that are known not get affected.
- No reported (major) landslips but the community is very aware of the potential for it.
- Logging activities have incurred on areas that have used as household gardens. There is generally poor community engagement by and information provided about commercial logging activities.Logging ended in early 2024 due to a local dispute.
- Changes in overall climate (heat, wet, drought etc.) is not especially noticeable.
- There are no community plans for hazard management.

Infrastructure

- Road network was mostly constructed by and services the logging industry. There was addition support from the Member of Parliament.

Pollution

- Community suffers from poor water quality after heavy rain. This is linked directly to nearby logging activity, which has now (reportedly) ceased, though the pollution events continue. There is currently no answer to this issue; the community instead just travels further to source non-polluted water.

Exposures & vulnerability

- There are many (more than half) solidly built houses with steel roofs that can provide amply shelter during a cyclone. The school and the church buildings can also provide shelter.
- Community leaders are aware of actions to take during natural disaster preparation, response, and recovery.

Water resources and sanitation

- Most households get water for drinking and cooking from local piped in water source. Direct from rivers and streams is an alternative option. Recently, it has been relatively wet and so there are currently few pressing water supply issues.
- Heavy rain impacts water quality but also can disrupt the local piped water (debris getting stuck and breaks in the pipe).
- Some houses have a private water tanks.

Waste management

- An increasing amount of consumables is now purchased in non-biodegradable packaging. This prompted community action to encourage people to bury waste tins and plastic that people reluctantly followed.
- Non-biodegradable waste is currently buried in informal household pits. There are no plans for any investments in alternative waste options.

Power sources

- Households use a combination of stand-alone 20W solar units, butane cans and collecting firewood. They mostly cook using firewood obtained from nearby forests. This source does not seem to be diminishing.

Conservation efforts

- There is a latent demand for forest conservation activities in the community. However, there is no current plans for, nor management committee to support any formal forest conservation efforts.
- Tribal boundaries are relatively well-defined, which supports the possibility of conservation projects.

Gardens and farming

- The extent of the cultivated gardens is increasing. There is access to nearby markets (at Matangasi, on the waterfront on Maramasike Passage) for an outlet for surplus and wild-harvested betelnut.
- Household plots are both nearby and far away from the village centre.
- Fallow periods are getting shorter. Reported to be between 5 and 10 years. (This seems quite normal.)
- There has been no recent agricultural extension programs but there are often new varieties and techniques being tried.

Tourism

- There is no tourism; no plans; nor any known activities for tourism.
- Forest conservation may bring tourism opportunities.

Figure 9: The community at Tapa'atewa undertaking community decision making over ecosystem-based adaptation options.

7.b Eliote

Eliote lays midway along the Maramasike Passage at the end of a spring-fed and tidal inlet through a mangrove forest. This mangrove forest provides key food resources for the community, including mud crabs and shellfish. There are approximately 69 households and a population of around 400 people. The village is not connected to the wider region by any roads and access by boat is restricted to high (and near-high) tide only. The community lies on higher ground, well above the high-water mark (5-6m above) on a narrow ridge extending towards the passage.

Household and commuity data collection took place in Eliote took place on 23rd July 2024 and 8th April 2025 (Figure 10).

Statement ranking exercise

Most agree with...

I would like the equipment to catch fish further out sea, to reduce pressure on the reef fishery.

I would like to grow surplus food, but I cannot get the food to markets to sell it.

Neighbouring communities trespass on our customary land and marine resources without our permission.

There are less traditional medicine plants growing than there used to be.

Most disagree with...

If our community protected its marine resources in a protected area, it should be paid for that work.

Improving roads access to the community will help business opportunities.

The benefits from logging and mining are shared fairly across everyone in the community.

Figure 10: The community at Eliote undertaking community decision making over ecosystem-based adaptation options.

What did the community tell us?

Community demographics

- 69 households. This excludes those households that live more permanently in Honiara, which would increase the number to around 90-100 households
- Migration in and out the village is common, with people working in, going to school in, and migrating to Honiara (in particular).
- New household formation is common from marriages.

Community hazards

- Reported rising temperatures; dry seasons (4 to 6 months of the year) are become hotter (and therefore drier). Overall, the weather patterns and seasons are becoming less predictable.
- Local logging has degraded the forest. Logging is accepted as a short-term way of generating income, but the community accepts unsustainable logging practices are not viable in the long run. Licences are usually held by parties external to South Malaita communities. Some community members have worked in the logging sector.
- Unusually high tides are become increasingly more noticeable.
- Heavy rain sometimes causes flooding.

Infrastructure and risks

- Primary and secondary school (up to Form 3); the land on which the school sits belongs to the tribe (not the government). School population is around 130-140 students. The secondary school lacks sufficient classrooms and administrative buildings and does not have a direct water supply, for which grants have been sought.
- Jetty at access channel has sunk into the mud and has not been replaced. Otherwise, most infrastructure is not subject to particular hazards (apart from a few older buildings).
- Few houses are located on slightly lower ground, which may become subject to inundation in the long term.

Pollution and waste management

- Littering and waste pollution is become a serious issue with little community cooperation around planning for managing the issue. Imported food is main culprit.
- There is no centralised waste management of separation of waste streams.

Exposures & vulnerability

- There is not sufficient shelter for cyclone protection.
- Limited support available to community following natural disaster. There is currently no disaster committee.

Water resources and sanitation

- Water supply for the community is from shared taps. There is a permanent spring close to the mangrove channel out of the community.
- Alternative sources are more than 30 minutes walk away.
- A bore hole was recommended as a project.
- Some houses have rainwater tanks.
- Shared community toilets., which was funded by World Vision, however, it took around three years to build four small toilets! Installed toilets were flush toilets but there was no installed water tank and supply water for flush.

Power sources

- A few small solar systems.
- People mainly use firewood for cooking, sourced from both the forest and the mangrove forests. This is coming under pressure and people are travelling further to find firewood.

Conservation efforts

- Eliote has hosted a number of conservation efforts, including MESCAL, EREPA, and now PEBACC+.
- There has also been (4) tribal owned conservation efforts, but implementation has been very slow and inconsistent. Weak provincial coordinators were implicated. Support begins strongly, but then slows, and stops.

Gardens, farming, fishing, and collecting

- Household gardens is generally on higher (but flat) ground well above the high water level. Some gardens are in and around the community, others are a significant (2 hour) paddle away.
- Forested areas are being cut to make way for gardens.
- It was suggested that this might be an indicator of falling soil fertility. Fallow periods have been “disrupted” and have been shortened.
- There is agricultural extension services and field officers in Afio, but there are no regular visits to Eliote. There have been new crops and varieties introduced from other communities and islands.
- Produce, such as betelnut, is sold into local markets and to Honiara.
- Mangrove forests are used extensively for mud crab and shellfish collection. Mud crabs are sold (live) to markets in Honiara and are becoming increasingly scarce. People must travel further to secure the same numbers, making access to mud crabs more inequitable, as not everyone has motor boats. It wasn’t made clear what taboos existed on collecting mud crabs (e.g. are there taboos on collecting female carbs.) Shell fish also extensively collected.
- Fish catch changes over season.
- Cattle paddocks were established in the 1960s but ceased operation around 20 years ago. This has left a significant patch of grassland that is only slowly recovering.

Tourism

- There is no tourists and no planned tourism ventures.
- There is a perceived potential for tourism through mangrove and forest.. conservation efforts.

7.c Ori Ore

Ori Ore is a small settlement towards the southern end of the Maramasike Passage. There are approximately 19 households and a population of around 35 people in the village itself and a further ~125 people who live either in settlements along the passage, away in Honiara, and overseas, in Australia. Parts of the village is low laying, spreading up the hill well above the high-water mark. There are significant nearby mangrove forests, which provide significant livelihood resources to the community. The village is serviced by a jetty that is serviceable at both low and high tides and day and night (these is a key advantage).

Household and commuity data collection took place in Ori Ore took place on 23rd July 2024 and 8th April 2025 (Figure 11).

Statement ranking exercise

Most agree with...

Mangrove and marine conservation will be more successful once people are secure and economically prosperous.

Protected areas in forests is an effective way of stopping logging on customary lands.

Sediment in our rivers from logging and mining is causing pollution in our lakes, rivers, and ocean.

Climate change is making it too hot and dry, and sometimes too wet, to grow our usual crops.

Most disagree with...

I get enough good, reliable drinking water in my community.

Improving roads access to the community will help business opportunities.

The benefits from logging and mining are shared fairly across everyone in the community.

What did the community tell us?

Community demographics

- The population is now growing, after having fell for a while.

Community hazards

- There is a reported change in the weather and climate, with abnormal droughts (during dry season), cold and wet, and shifting seasons.
- Nearby logging has caused degradation of nearby forests and has increased sediment deposition in the mangroves.
- Reported falling fish stocks and damage to reefs.
- Sea level rise is detected, with increased erosion and inundation of lower laying areas.
- Mangrove forests are being cut for building materials.
- No community / collective action to begin to manage emerging risks.
- Some concern over fish stocks.

Infrastructure

- There are no houses that are specifically vulnerable to sea level rise. There is also further higher ground available to which to retreat.

Pollution

- Main pollution risk is from sedimentation of water courses from upstream logging. There is noticeable blanketing in the mangrove forests.

Exposures & vulnerability

- There is sufficient cyclone sheltering for the village but a low level of knowledge about disaster readiness, response, and recovery.
- There is no disaster management committee (or natural resource management committee).
- Water resources and sanitation––All water is sourced from streams and rivers. When there is no rain for two or three weeks, many sources begin to dry up. (This is being exacerbated as the climate warms.)
- Water quality is sometimes compromised during high rainfall.
- There is currently only one house that has a rainwater tank as a back-up.

Waste management

- There is no proper non-compostable waste management system; much of it ends up in the mangroves and the oceans. There are no plans for improved waste management.

Power sources

- All households use solar for lighting.
- Households cook using firewood from forests and mangroves, which is sourced nearby. There is no apparent shortage. (However, one respondent reported that they are having to walk further for collections.)

Conservation efforts

- There is no current forest, mangrove, or fisheries conservation efforts though collective management systems are in place. However, there is early discussions around what more formal arrangements might look like.
- There are some rules of mud crab catch.
- Demarcation of customary areas is done through marker sticks.

Gardens and farming

- Cultivation still uses a fallow system, rotated every 5 to 6 years, which is getting shorter.
- There is reported falling soil fertility – yams and taro is not growing as well as before. Gardens are expanding into forests and are getting further away, as the community pushes deeper into the forest.
- There is little or no new technological inputs or ideas; merely incremental changes. There are extension services in Afio but no formal arrangements.
- Produce is sold into markets in Afio, which occur 2-4 times each week. It is mostly betelnut, fish, crab, and garden produce.
- Fish stocks are falling. People must travel further for same catch.

Tourism

- There is no tourism or tourism ventures. Only family visits.

Figure 11: The community of Ori Ore on the Maramasike Passage. (Photo: Stuart Chape.)

7.d What the people said

The groups listed below show what people from across all three communities told as what they thought and felt about bigger issues that were important to them. This is based on the issue ranking exercise. The responses were analysed and then the placed in group that best represented them.

This kind of exercise is useful for understanding how groups of people share concerns about 'big picture' things, such as economic development, climate change, resource management, activities. Often the way people think about one thing is closely related to how they feel about other things, and these feels are shared amongst a group. Therefore, we can start to make some conclusions about open they might be to certain EbA interventions, or about what concerns they might have about particular interventions that might not directly

Group 1: Climate change concerns

Social, economic, and environmental concerns:

- Unsupportive of logging and mining activities; relatively concerned about climate change and the impacts of climate change on agricultural productivity and community safety during more intense natural disasters; concerned about kastom places falling into disrepair; concerned about waste management.

Links made between these concerns and outside pressures, such as climate change, or commercial logging and mining:

- Benefits of logging are not shared fairly, nor are they sufficient to make up for environmental impacts; sediment from deforestation from logging damages water quality in rivers and oceans.

Activities, projects, or institutions that best support management of these concerns:

- Protected areas / conservation areas can effectively prevent logging activities in forest areas and marine conservation will be good for the community.

Relative indifference about...

- Little concern about access to good drinking water, business and business opportunities, and loss of traditional medicines. There is sufficient firewood and the impact of collection from forests is low; no concern about trespassing of neighbouring tribes; and no demand for introducing more livestock.

Group 2: Food concerns

Social, economic, and environmental concerns:

- Concerns about generating more surplus food and getting to market; concern over food gardens reducing in productivity; concern over rivers and streams drying up; and concern over young people leaving the community.

Links made between these concerns and outside pressures, such as climate change, or commercial logging and mining:

- Livelihood improvements can be linked to conservation through tourism but overall, there is relatively low support for greater conservation efforts; and this factor was more sanguine about logging, believing the benefits are relatively fairly shared.

Activities, projects, or institutions that best support management of these concerns:

- Improving access (e.g. roads) to markets and other business opportunities will be a benefit; conservation areas can attract tourists; conservation areas will not necessarily keep loggers at bay, nor will conservation make people prosperous.

Relative indifference about...

- Access to good quality drinking water is adequate; there is equal share of housework; waste management options are adequate; there is little concern over climate change; or loss of kastom knowledge of dances and ceremonies; and little interest in earning more cash from sale of produce and products.

Group 3: Conservationists

Social, economic, and environmental concerns:

- Very concerned that the benefits of logging not shared fairly, nor are the benefits sufficient to make up for environmental impacts; concerned about passing down kastom knowledge of culture and ceremony; concern about fairness in the allocation of domestic labour; concern about rivers drying up more often and gardens are not producing sufficient food.

Links made between these concerns and outside pressures, such as climate change, or commercial logging and mining:

- Conservation of resources will improve people's well-being and protected area status will be effective in keeping logging at bay.

Activities, projects, or institutions that best support management of these concerns:

- Improving road access is most important; improving roads can also help business opportunities; conservation areas will assist in natural resource conservation; and more livestock will improve food security.

Relative indifference about...

- Growing surplus food for sale to market; little concern over the sufficiency of water for sanitation and washing.

Group 4: Pro-tourism

Social, economic, and environmental concerns:

- Not supportive of logging and mining and very concerned about the environmental impacts and the lack of benefit sharing; concerned about mangroves and forests being cut down to make room for gardens; concern over rivers and streams drying up and there is insufficient access to water for drinking, sanitation, and washing; there is insufficient enforcement of rules and restricting trespass maybe difficult; and there is a loss of kastom knowledge and ceremony.

Links made between these concerns and outside pressures, such as climate change, or commercial logging and mining:

- Reducing use of natural resources through conservation will be good for the community; and conservation is linked to community prosperity. However, if there was greater commitment to conservation, new livelihood options would be needed (e.g. tourism).

Activities, projects, or institutions that best support management of these concerns:

- Factor feels that they do have impact over decision making in the community and subsequent conservation activities; there is desire to earn more cash from sale of products and produce; tourism can generate business opportunities; and conservation efforts will attract tourists.

Relative indifference about...

- More tourists would not put pressure on local natural resources; not concerned about climate change nor the impacts of natural disasters.

8. South Malaita ecosystems

8.a South Malaita food gardens

Most food and nutrition of the people of South Malaita is harvested from household subsistence gardens. These gardens are part of a complex agroforestry and horticultural system of shifting cultivation that includes fallow periods and forest regrowth.

Status

Household subsistence agriculture holds significant importance for the people of South Malaita. Nearly all households perform some form of cultivation for their own consumption and sometimes for generating surpluses to be sold in markets, where they are accessible. Most households source around 80% of their nutrition and nourishment from their own labour and land. Therefore, this ecosystem is crucial for ensuring food security and it provides a steady supply of nutritious foods, in contrast to processed, imported goods, for which supply chains can be interrupted and prices rapidly vary.

In addition, household cultivation is deeply embedded in the cultural practices of the communities and is a traditional skill passed through generations that involves methods and crop varieties that are specific to heritage. Maintaining these gardens preserves cultural identity and kastom practices. In times of economic hardship, or natural disasters, agriculture act as a buffer, providing a reliable source of food when external supplies may be disrupted.

Cultivated areas are typically managed in a shifting cultivation-fallow cycle, where secondary forest regrowth reestablishes the soil and helps maintain soil fertility and biodiversity. Cultivated gardens are commonly combined with agroforestry practices and the maintenance of key fruit and nut bearing trees. Livestock, including hens and pigs, and wild harvested food and produce form further parts of the household food production system.

Ecosystem services used

Provisioning ecosystem services: Household subsistence gardens generate food, traditional medicines, and fibres for building. From a risk management perspective, these household gardens provide a vital food security benefit.

Regulating ecosystem services: The primary ecosystem service value of household subsistence gardens is food, but also by the way they are managed they also generate some regulating ecosystem services associate with vegetated areas, such erosion control and other catchment stability services. There are no economic valuation estimates for these ecosystem services.

Ecosystem service valuation

The economic value of household subsistence gardens to the communities of South Malaita is very significant. The per hectare per year value is SBD$ 70,176 (middle estimate). (This estimate derives from a study of household agriculture from Papua New Guinea.) The tota area of gardens in South Malaita is 8,459 hectares (ha), therefore our estimate of the economic value of subsistence agriculture in South Malaita is between SBD 593,618,784 per year. Whilst this seems like an extraordinary amount of money, the estimate is based on how much a household would have to spend in cash at a market to replace all the food they would otherwise grow in a garden.

Threats to household subsistence gardens

Threats to household subsistence agriculture are both local pressures and from global climate change. The productivity of the system and integrity of the adjoining tropical forests are at the centre of a complex web of interdependencies that have an impact on overall village community resilience, within which climate change is a significant factor.

- Chronic pressures, such as population change, which is increasing across each of the three local wards in South Malaita, put pressure on the existing cultivated areas, which encourages both the shortening of fallow periods and the further incursion into forested areas.
- Access to new markets, which for South Malaita and the Maramasike Passage includes markets at Afio and at Matangasi, provide further outlets for local surplus, which also increases pressure on cultivated areas. However, current regular sale of produce and food out of South Malaita and into Honiara mostly consist of betelnut.
- Pest species, such as the Giant African Snail (*Achtatina fulica*), is suspected to be present around Afio. It is believed the snail will present a very threat to fruits and vegetables grown by households, as it has around Honiara. (However, our data collection reveal no reported concern for this species.)
- Climate change will likely have significant negative impacts on agricultural on South Malaita due to both higher temperatures and potential changes in rainfall variability. Crop yields of staples, such as taro, are projected to diminish over time due to increased heat and the heat's impacts on soils, perhaps demanding increased inputs, such as artificial fertilisers.
- Further significant risk arises from changes in river catchment health that may result from a combination of heighten temperatures and prolonged periods of low rainfall and high heat, that impacts flow rates of water in streams and rivers. South Malaita is a relatively small island, with similarly small catchments. No flow periods during extreme conditions will likely be challenging for communities.

8.b South Malaita forests

Much of South Malaita is forested with dense tropical forest. However, over thousands of years this forest has been highly modified and degraded both from local pressures and from commercial logging. Forests provide many ecosystem services, the quality and quantity of which is related to their condition.

Status

South Malaita is highly modified from centuries of cultivation and agroforestry, and in more recent years, significant levels of commercial logging causing residual forest degradation. As a result, the landscape is predominantly secondary forest regrowth and cultivated areas with a patchwork of taller, remnant primary forest species (Figures 12 and 13). The extents of different forest types is as follows:

Natural/primary forest:	7,479 ha (20.3%)
Regrowth forest:	19,719 ha (53.6%)
Plantation forest:	718 ha (2.0%)

These are presented in map form in Figure 14.

From 2001 to 2023 South Malaita lost 2,720 ha of tree cover (forest with 30% canopy cover), which is the equivalent of 6.4% of forest (Figure 16). Between 2002 and 2023 South Malaita lost 1,710 ha of *primary* forest, making up 64% of its total primary forest tree cover loss in that period. (Primary forest is previously undisturbed forest.)

Ecosystem service used

Provisioning ecosystem services: South Malaita tropical forests provide the local communities provisioning ecosystem services, including materials for building (both frames and less durable material), traditional medicines, nuts, and fruits.

Figure 14: Land cover analysis of South Malaita.

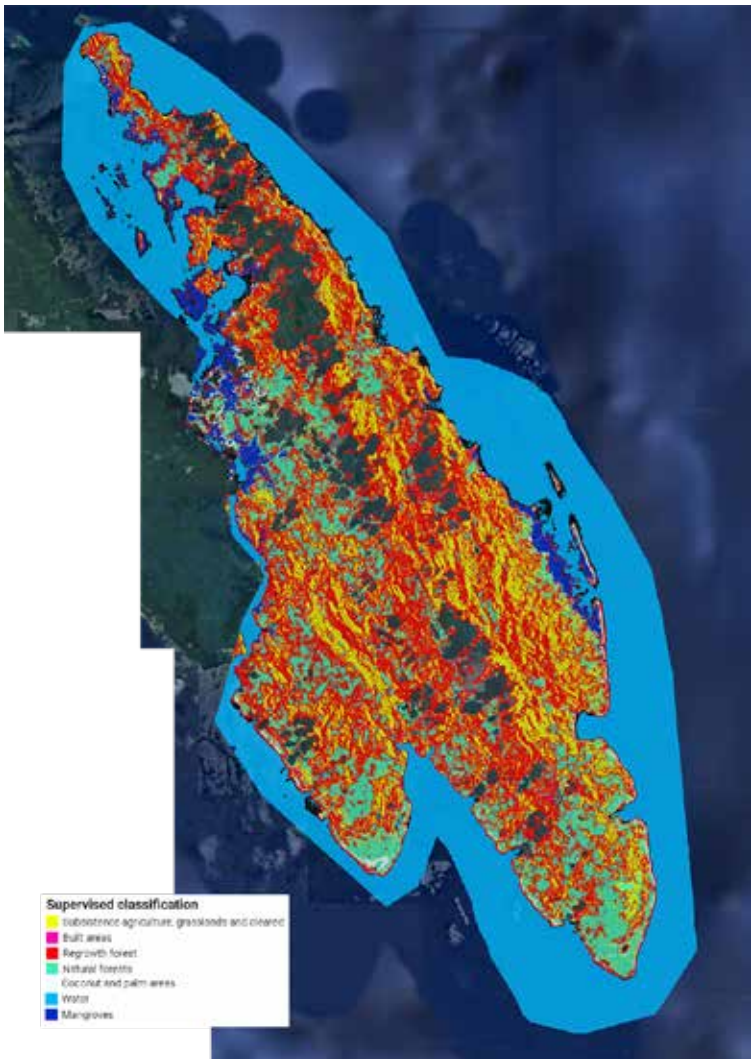


Figure 12: Highly degraded forest as a result of commercial logging in South Malaita. (Photo: Stuart Chape.)

Figure 13: Evidence of recent commercial logging near Tapa'atewa.

Regulating ecosystem services: Forests store very significant amounts of carbon in the biomass and soil. The less degraded the forest, the greater the quantity of carbon stored, with the greatest stability. This provides significant global benefit in terms of climate change mitigation, but can also provide local benefits, in terms of potential generation of carbon credits in the future. Forests also provide very significant catchment-based ecosystem services, including prevention of soil erosion, air quality, and pollination services. They also ensure high water quality and a regulation of the flow of river through wetter and drier periods, which is very important to all communities. No tourism values have yet materialised.

Ecosystem service valuation

Ecosystem service valuations are reported in Figure 15. They are very considerable. (Remember, this is how much the forest is *worth* to both the communities of South Malaita and the world, not necessarily how much someone will pay for it!)

Threats to forest ecosystems

Threats to South Malaita forest ecosystems are from incursion of both commercial logging, new roads (often built by logging companies), and expanding agriculture, which create both direct threats (from deforestation) and indirect threats, such as from the drying of forests (Figures 17 and 18, overleaf).

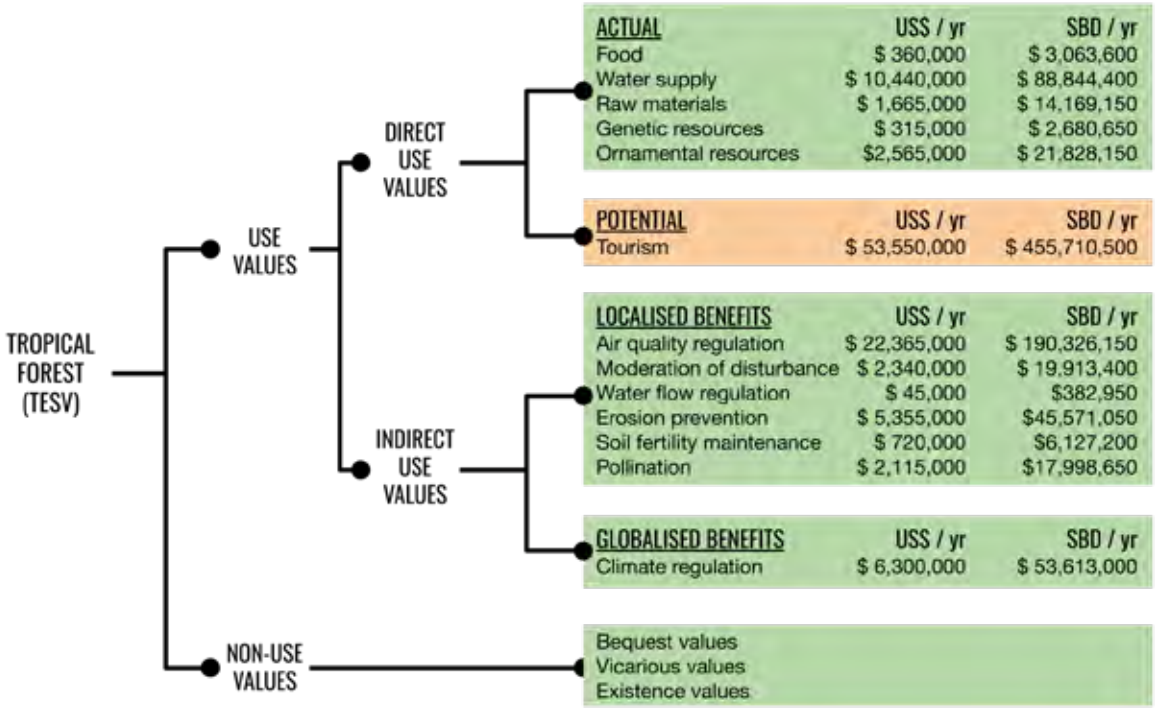


Figure 15: Actual and potential total ecosystem service value of tropical forests in South Malaita. Note this for both primary forest and secondary forest.

In addition, climate change also presents threatening processes, such as increases in temperatures and changes in rainfall patterns that will likely have impacts on the nature and humidity of the forest, which will impact on the capacity of the forest to generate ecosystem services, such as carbon sequestration, water flow regulation, and erosion control. Higher temperatures and prolonged periods of low rainfall and high heat will likely cause a drying of the forest, which can result in forest fires. Given the already relatively degraded status of the South Malaita's forests this will include greater drying through the disturbed forest fringes resulting in potentially greater risks from wild fires and invasive species incursion.

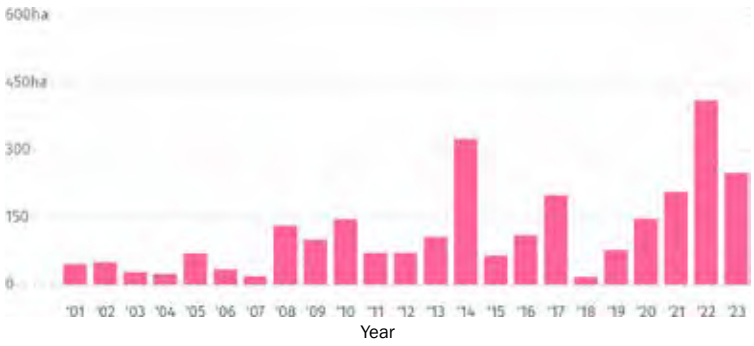


Figure 16 (above): Forest loss in South Malaita between 2001 and 2023 (Global Forest Watch).

Figure 17 (below): Aerial view of Tapa'atewa. (Source: Stuart Chape.)

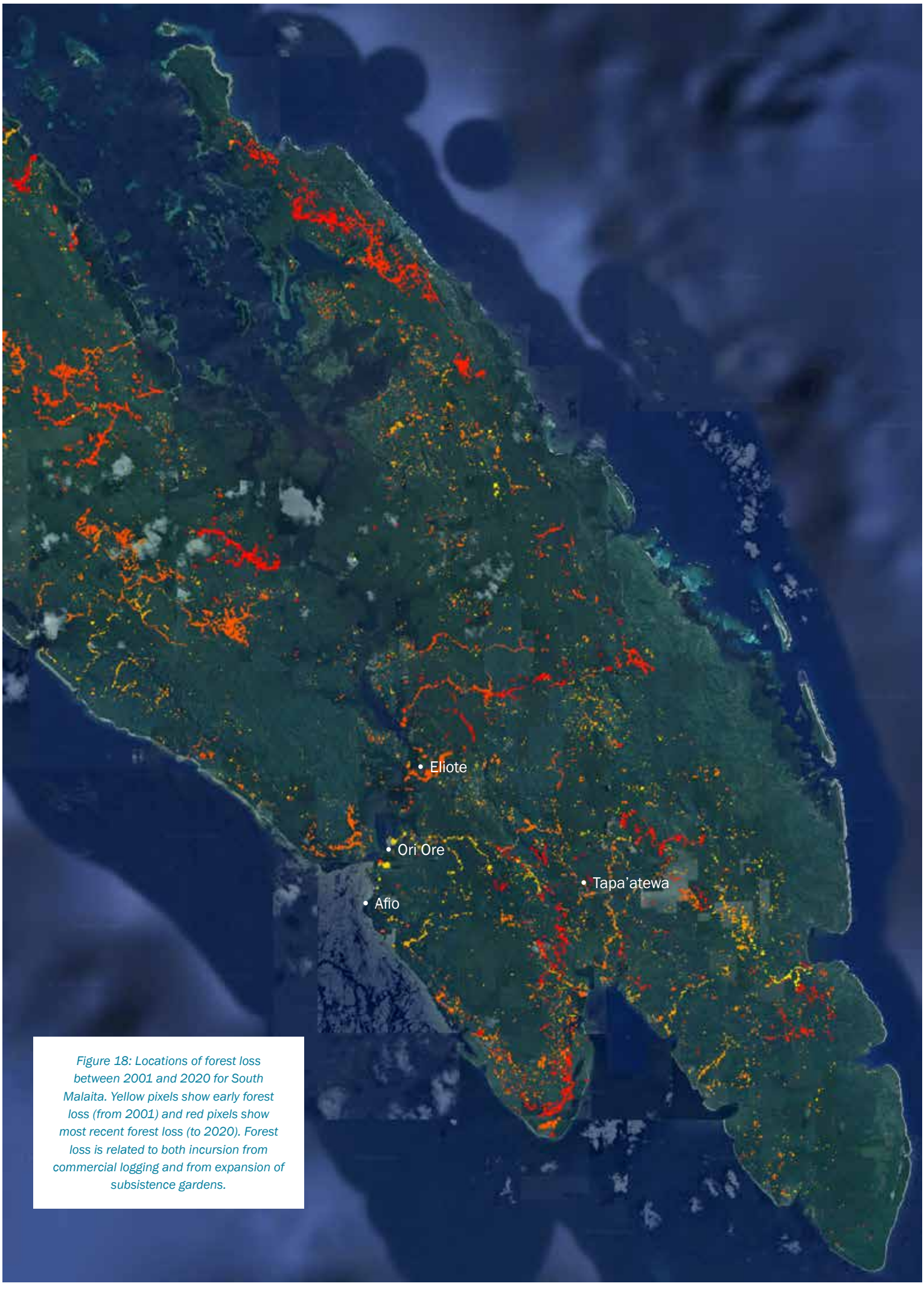


Figure 18: Locations of forest loss between 2001 and 2020 for South Malaita. Yellow pixels show early forest loss (from 2001) and red pixels show most recent forest loss (to 2020). Forest loss is related to both incursion from commercial logging and from expansion of subsistence gardens.

8.c South Malaita inter-tidal habitats

South Malaita's inter-tidal ecosystems consist mainly the mangrove forests of the Maramasike Passage. These mangrove forests are provide the communities of Eliote and Ori Ore with incredibly important ecosystem services.

Status

Mangrove forests inhabit lowland estuaries and river mouths where there is sufficient freshwater supply (Figure 19). The Maramasike Passage hosts a large proportion of the Solomon Islands' mangrove forest inventory. There is approximately 4,269 ha of mangrove forest along 184.21 km of coastline (Figure 20).

Ecosystem uses

Provisioning ecosystem services: Mangrove forests provide vital support for fisheries, providing significant economic benefits to local communities through resources and sustainable livelihoods. Between 50–80 % of commercial and subsistence fish species spend some part of their life cycle in mangrove forests. For Eliote and Ori Ore, the mangroves provide food and livelihoods from the shellfish and mud crab fisheries, and the mangrove bean. Mud crabs provide income when sold into the markets of Honiara. Mangroves are also harvested for timber and non-timber products, such as firewood (sometimes charcoal) and traditional medicines.

Regulating services: Mangrove forests offering coastal protection from storms and erosion, which safeguards properties and reduces repair costs. Mangroves also protect the shorelines and defend the settlements and infrastructure behind, Mangrove forests are very significant sinks for carbon, in both the above ground biomass and in the soils. This is recognised in the growing recognition of the importance of 'blue carbon' to the planet's climate stability and the role that mangrove forests may play in global carbon markets. Mangrove forests' role as carbon sinks applies as both a flow of carbon sequestration into new biomass and soil and as a permanent store. It is likely mangrove conservation will offer sources of income for local communities in global carbon and biodiversity markets.

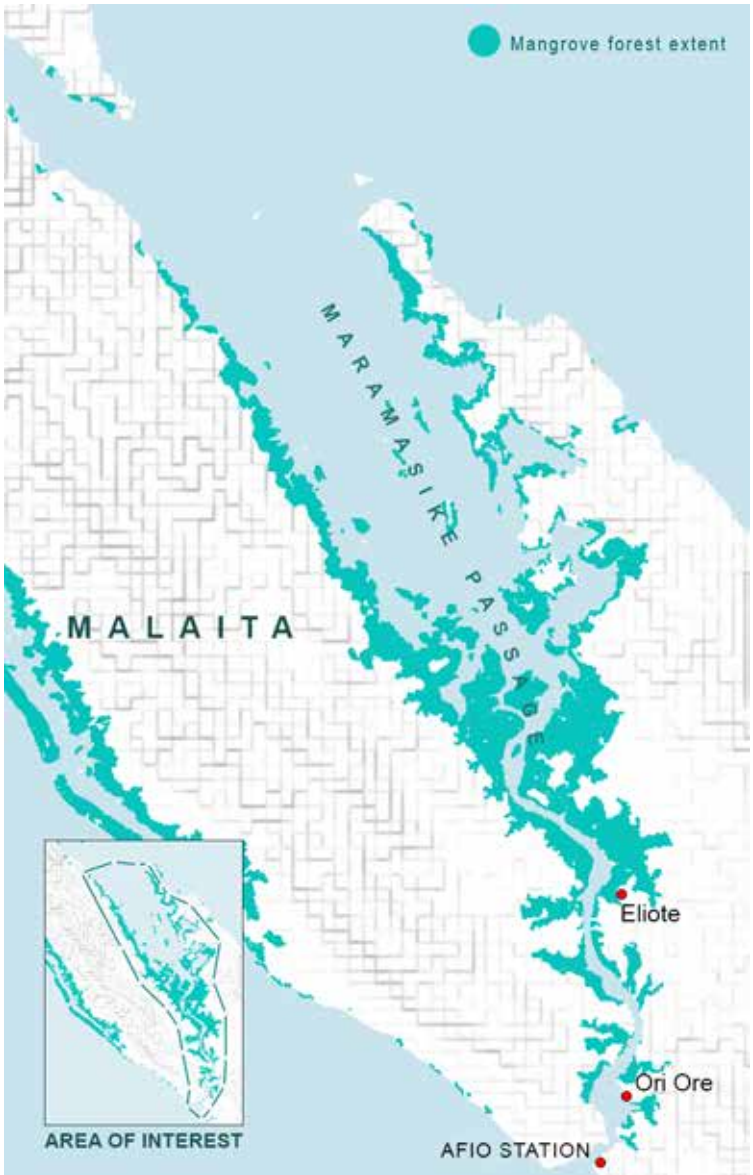
Ecosystem service valuation

Carbon storage in these mangroves forests (above and below ground) is estimated to be between 478,213 tonnes (t) and 2,000,351 t in total. This is between 1,755,043 t and 7,341,288 t CO2-equivalent. At current European Union Emissions Trading Scheme spot prices (US$ 74), this has a potential storage value of between US$ 130 million and US$ 543 million.

Ecosystem service valuations for mangrove forests are reported in Figure 21. They are very considerable. Remember, this is how much the forest is *worth* to *both* the communities of South Malaita and the world, not necessarily how much someone will pay for it!

Figure 19: Mangrove forests around Eliote.

Figure 20: Mangrove forest extent and location for South Malaita.



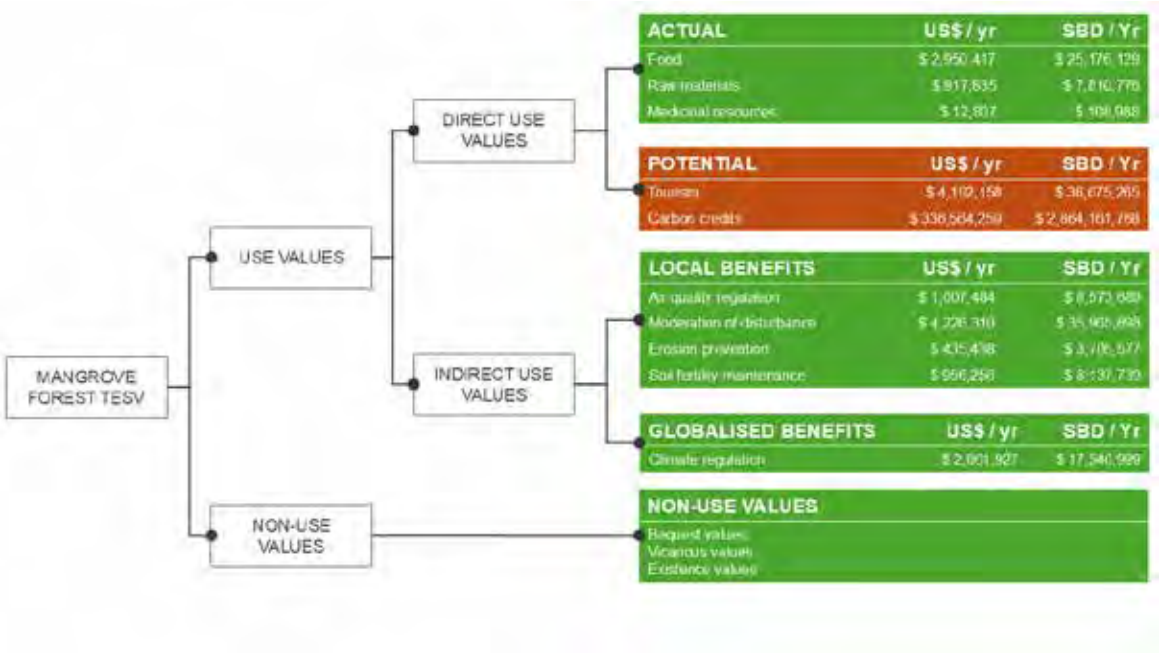


Figure 21: Actual and potential total ecosystem service value of mangrove forests of South Malaita.

Threats to mangrove ecosystems

Data from Global Mangrove Watch estimates that there is regional mangrove loss in Maramasike Passage of just 0.62 km^2 between 1996 and 2020, representing just 1.4% loss. This modest loss was reflected in the data from the community transects (see Section 7), which reported only limited incursions into mangrove forest for the cutting for firewood or loss to agriculture (Figure 22).

There are some logging terminals that are the cause of localised losses of mangroves, however, these tend to be situated on shorelines that are not dominated by mangroves. Nevertheless , the nursery habitat functions of mangrove forests can be impacted by sediments from logging activities. Currently, mangrove forests in the Solomon Island have not been subject to the intense threats that are apparent in South East Asia (including Indonesia) that include development pressures and aquaculture.

Notwithstanding existing, but limited, anthropogenic threatening processes, there are future threats to the mangrove forests of the Maramasike Passage related to climate change. Increased temperatures are associated with mangrove dieback, rapid increases in sea levels can impact the location of mangroves (for example, they may require room to migrate), and changes in rainfall patterns may affect the availability of freshwater.

Figure 22: The community of Eliote, sitting behind a substantial mangrove forest. The narrow, tidal access inlet is also visiable. (Photo: Stuart Chape.)

8.d South Malaita marine habitats

Marine habitats of South Malaita and the Maramasike Passage, including coral reefs and sea grass beds are important to the communities of Eliote and Ori Ore. They provide important ecosystems but are under threat.

Status

Coral reefs

Coral reefs are found throughout the Maramasike Passage, but particularly at the northen and southern entrances where water quality and salinity is greater and temperatures are not subject to marine heatwaves.

In terms of coral cover and fish life the coral reefs around Afio (at the southern end) were in poor condition, Therefore, these reefs are unlikely to support a healthy fishery and will provide no potential tourism value. In the long term, severely degraded coral reefs will eventually lose their coastal protection values. At the northern end of the passage, deforested catchments drain into the lagoon and likely have a measurable impact on coral reef ecosystem integrity, again reducing the potential for tourism and fisheries.

The ecosystem services generated by coral reefs is strongly related to the condition and threats, particularly that for food (fisheries) and the potential for tourism. Ecological integrity is very dependent on proximity to human settlement and reefs are highly sensitive to sediment exports from deforested catchments, fishing (particularly the harvesting of herbivorous fish), and coastal development (particularly from the impacts of poorly treated sewerage).

The location and extent of coral reefs in the Maramasike Passage is in Figure 23. We estimate reefs, of varying ecosystem integrity, cover 1,484 ha.

Seagrass beds

Seagrass beds are crucial ecosystems for habitat for marine life, in particular, for fish nurseries and so are vital for biodiversity. Sea grass beds also improve water quality and sequester carbon by trapping sediment and therefore help mitigating climate change. Their role in mitigating climate change is also being increasingly recognised in projects that support blue carbon.

The location and extent of sea grass beds in the Maramasike Passage is in Figure 24. We estimate sea grass beds cover 1,960 ha.

Ecosystem services used

Provisioning ecosystem services: Both coral reefs and sea grass beds provide for food from fishing and from providing for fish nurseries. Coral reefs also provide raw materials and some traditional medicines are sourced from reef organisms.

Regulating services: Coral reefs and sea grass beds provide coastal protection services by moderating disturbance of settlements from the impact of storms. Sea grass beds are also considerable stores of carbon, though this varies from year-to-year.

Cultural services: Around the world coral reefs provide very significant tourism opportunities. Indeed, the Solomon Islands is famed for its diving and snorkeling. However, to tap into tourism markets, coral reefs need to be high ecological integrity and be protected from over-fishing and poor water quality from deforested catchments.

Figure 23: Coral reef extent in the Maramasike Passage.

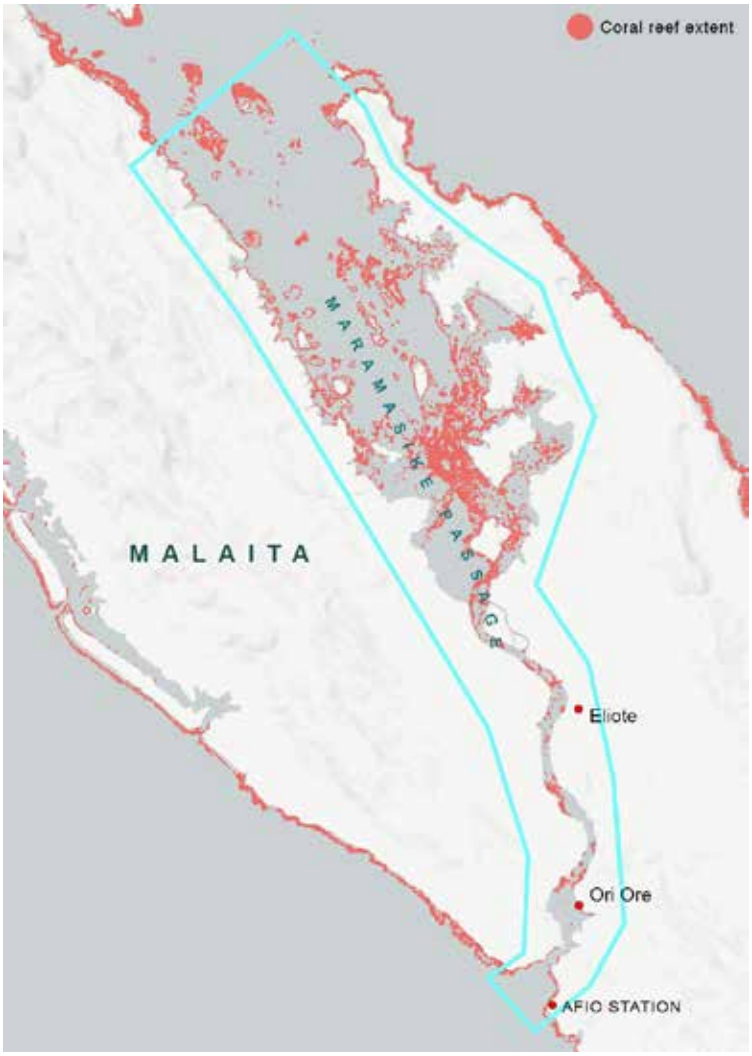
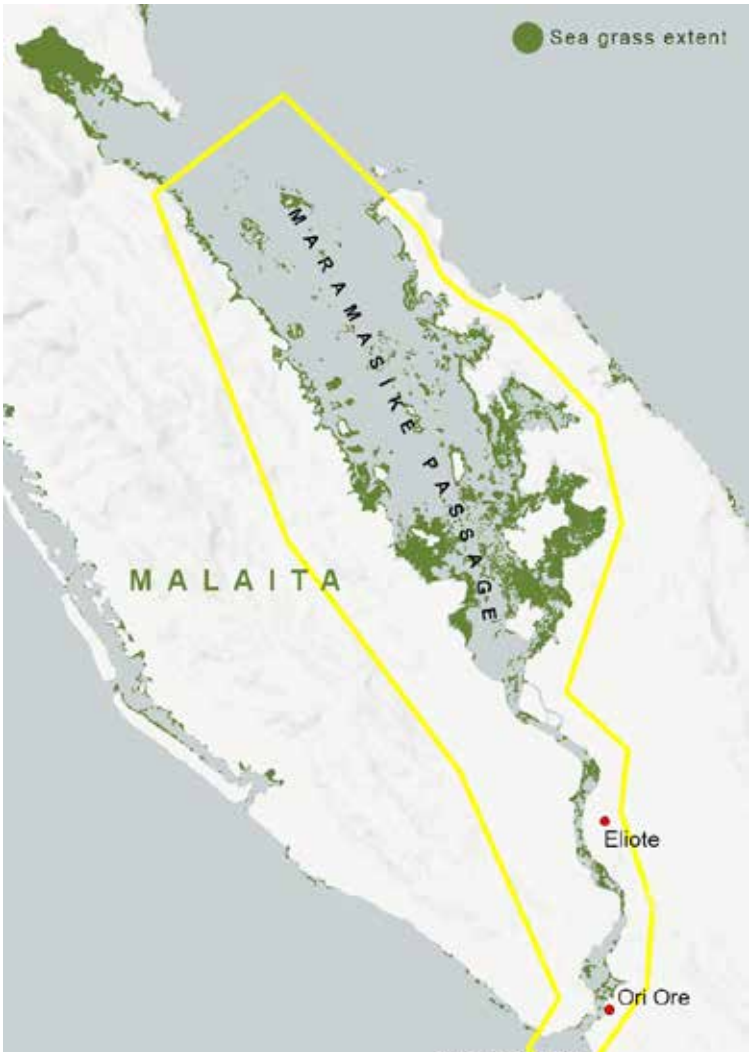


Figure 24: Sea grass extent around Maramasike Passage.



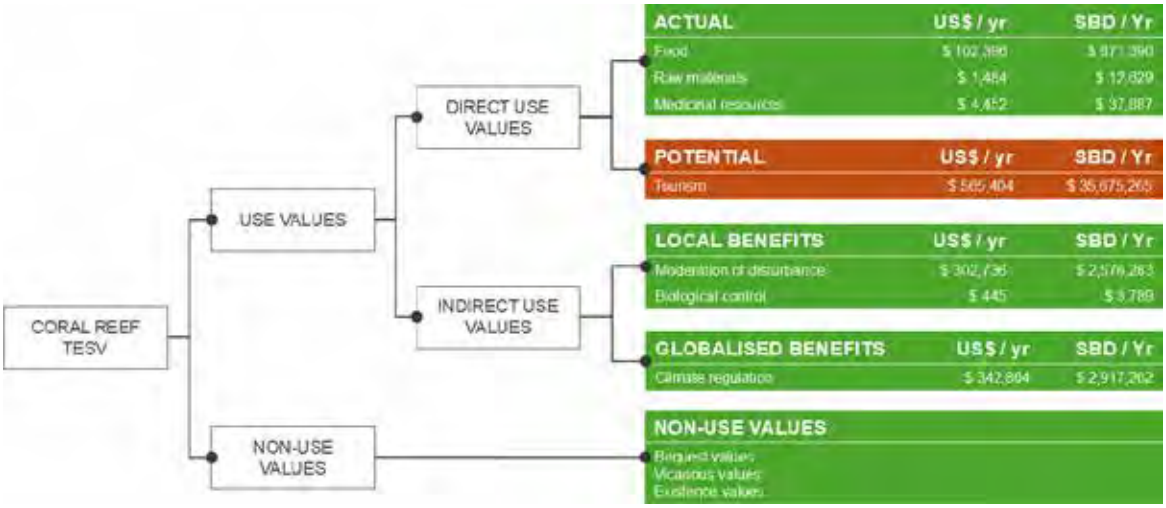


Figure 25: Actual and potential total ecosystem service value of coral reefs of Maramasike Passage.

Ecosystem service valuation

Ecosystem service valuations for coral reefs and sea grass beds are reported in Figures 25 and 26. They are very considerable. Remember, this is how much the marine ecosystems are potentially *worth* to both the communities of South Malaita and the world, not necessarily how much someone will pay for it!

Threats to coral reefs and sea grass beds

Threats to the coral reefs and sea grass beds of the Maramasike Passage are considerable.

Land based pollution and human settlement

It is widely accepted that there is a negative relationship between coral reef ecosystem condition and proximity to human populations, socio-economic development, population densities, and the mix of economic activities, largely as a result of land-based pollution exports. The reefs of the Maramasike Passage will also be impacted by sediment run-off from broadscale commercial logging, which can dramatically increases turbidity restricting light and slows new coral recruitment on reef substrate.

Over-harvesting of wild fish and marine life

Over-exploitation of herbivorous reef fish stocks also represents risks to coral reefs, particularly during re-growth phases after short-term perturbations, where algal growth is in directly competition with new coral recruitment. There are also links between loss of apex predators and general reef fish diversity. Where reefs healthy populations of herbivorous fish, they can maintain resilience to external threats. Therefore, maintaining wild reef fish catch well below maximum sustainable yields is a key to reducing threats of coral reef degradation. Where fishing is for profit this can encourage over-fishing.

Climate change

Climate change is projected to have very significant impacts on marine environments. Increased frequency of coral bleaching and ocean acidification will degrade coral reefs leading to decreased coastal protection (greater risk from extreme weather events to coastal communities) and a lower fish catch. As a result, the production of coastal fisheries from coral reefs is expected to decline by up to 50% by 2100. Climate change is expected to increase damage to reefs from more severe physical damage from storms, coral bleaching from marine heatwaces, from greater sediment nutrient run-off creating murky waters, and from too much freshwater from rivers.

The complex interplay between these factors is beyond the scope of this report, but it will suffice to say that coral cover in the Maramasike Passage will likely become under very significant increasing pressure current climate trends and activities continue.

Ocean acidifcation

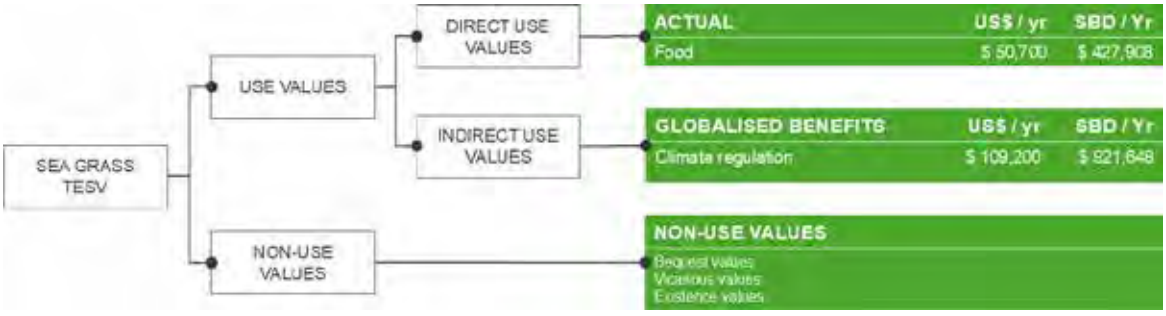
More acidic water from changes in ocean chemistry as a result of carbon emissions make it more difficult for corals to form their skeletons (the structure of coral) and for shellfish to form shells.

Threats to sea grass beds

Seagrass beds in the Maramasike Passage face a number of threats, including: coastal development (for example, commercial logging facilities), which cause habitat destruction and sedimentation that blocks sunlight. (The Maramasike Passage hosts at least two commercial logging facilities); nutrient runoff from sewage from poor sanitation, which causes algal blooms; rising sea temperatures that stresses seagrass beds and leads to increased susceptibility to disease; rising sea levels that can block light; ocean acidification that can affect the growth and structural integrity of seagrass; destructive fishing methods and poor boating practices that can physically damage beds; and increased storm activity that can reduce recovery periods.

Notwithstanding these threats, seagrass beds in the Pacific are considered to be in generally good condition, but given the limitations of the budget for this study, this could not be confirmed for the Maramasike Passage.

Figure 26: Actual and potential total ecosystem service value of sea grass beds of Maramasike Passage.



9. Priority ecosystem-based adaptations

This section identifies priority ecosystem-based adaptations (and other project ideas) for Tapa'atewa, Eliote, Ori Ore, based on asssessments of their ecosystems, climate change threats, and from commuity consultations.

As referred to in Section 2, we take an EbA approach. where we prioritise EbA, but also consider more development based interventions. Therefore, our recommendations do not specifically draw solely on pure 'nature-based solutions' but instead aim to:

- reduced social and environmental vulnerabilities;
- generate societal benefits in the context of climate change;
- restore, maintain, or improve the health of ecosystems;
- support by projects at multiple levels; and
- support equitable benefit sharing, governance, and capacity building.

Short term priority projects

Fisheries harvest and marine management

Mud crab fishery sustainability project

Mud crabs command high prices from resorts and hotels in Guadalcanal and are a desired seafood commodity for tourism guests. Higher prices can encourage some fishers to conduct more unsustainable harvest practices, such as catching and trading immature crabs or egg-carrying females.

It was widely reported in the communities of Eliote and Ori Ore that the harvest of mud crabs from mangrove forests and shallow waters was coming under pressure, resulting in people having to travel further and for longer to maintain supply (Figure 27). Economically, this increases the costs of the harvest, which can provide a localised correcting mechanism, where the harvest rate returns to a more sustainable rate. However, if market prices of mud crab continue to rise then local harvests can be pushed higher, putting the mud crab fishery at risk of failure.

It was not disclosed whether the communities of Eliote and Ori Ore held to taboos for the management of the mud crab harvest (such as closures, or taboos on bag size and the harvesting of females). As a result there is insufficient data on what volumes of mud crabs are being harvested or that can be harvested.

Figure 27: Sustainable marine resources and harvesting are incredibly important to the communities of Eliote (pictured) and Ori Ore.

A mud crab sustainability project would provide an entry point for a worthwhile EbA project. There are examples of successful implementation of modest management plans for mud crab fisheries in the Pacific region.

Fish aggregating devices

It is highly likely that local fisheries are under pressure, or the harvesting of reef fish is impacting on coral cover on the reefs of Maramasike Passage. Whilst we have included locally managed marine conservation areas in the potential longer-term priority list (see below), shorter term solutions, such as the deployment of **fish aggregating devices** (FADs) should be considered. FADs are already widely used in the Pacific as a means to improve fisheries productionfor inshore fisheries and to take pressure off coral reef fisheries.

Innovations in FAD design, deployment selection and depth have improved the potential of FADs. Studies show they can provide a very health return on investment and considerable co-benefits. The community of Eliote considered improvements in fishing equipment and technology to be their number one priority (with less emphasis on marine conservation areas).

Forest regeneration / forest heritage park

South Malaita's landscape has been very significantly impacted by deforestation from both commercial logging and clearing and regrowth from agriculture and subsistence cultivation. As a result, much of the high-ecosystem integrity rainforest and high-value tree species have been extracted and remain only in patches where the topography is less accessible. The activities of commercial logging represent an unsustainable, extractive process where the natural capital of the landscape is degraded, all for little apparent community benefit, as reported through by all communities in the survey. In all three communities, concern over the impact of the commercial logging sector was ranked with most concern. Climate change impacts and likely further commercial logging pressures are likely to compound forest integrity.

Forests capture, store, and regulate the release of rainwater, which plays a critical role in generating ecosystem services for the whole catchment. These services can include reducing downstream flooding, regulating levels of the water table by improving water infiltration, preventing erosion, and assuring a high-quality water supply for aquatic species and people and agriculture further downstream. As the planet heats these forests will play an ever-stronger role in regulating more extreme regional droughts and floods and ensuring downstream water security for both ecological and economical functions, including drinking water for hundreds of millions of people.

Tropical primary forest catchments are also integral to coastal and marine ecosystem integrity, such as coral reefs, sea grass beds, and inshore fisheries. In the tropics, this is dubbed the 'ridge to reef' concept in landscape management, whereby the integrity of forested catchments is linked to the health of inshore marine habitats and communities. Coral reefs, for example, are particularly vulnerable to disturbed catchments, which produce additional sedimentation and nutrient-laden river flows, both of which set in train damaging threatening pathways that degrade the important ecosystem services generated by coral reefs, such a coastal protection, fishing and collecting, and tourism.

Whilst coordinated forested conservation and access to funds

for reducing deforestation and forest degradation are considered amongst longer-term priorities (see below), in the shorter-term, tree planting projects should be considered, in particular, in partnership with remain commercial logging operators as part of their statutory rehabilitation requirements. High value timber trees should be considered within the mix, as well as food-bearing trees, given the likely importance of commercial logging in the area into the future.

A model for an approach to forest conservation for South Malaita is that of the **Barana Community Nature and Heritage Park** in the hinterland of Honiara. The conservation area is 5,000 ha and owned by the Barana Community. The rehabilitated area is set to generate very significant catchment-based ecosystem services to the city (especially freshwater). The extent of natural and secondary forest in South Malaita is 27,000 ha under a number of layers of customary ownership. A priority should be to identify communities for joint inclusion in managing a conservation estate as integrous as possible.

Priority should be given to forested areas where the ecosystem service benefits will be greatest; i.e., where the greatest number of people would benefit from better regulated flows, cleaner freshwater flows, and improved water quality conditions in the coral reef lagoon. Whilst, in the short term, revenue generating opportunities will be limited (this is not the case with the Barana Nature and Heritage Park), access to revenue can be linked to longer term prioritise through REDD+ and payments for ecosystem service schemes (see below).

Mangrove monitoring and replanting

Though currently the mangrove forest does not appear to be under significant pressure, it was reported that mangrove forest is being marginally lost as a result of cutting for firewood and for expansion of the cultivated area. High integrity mangrove forest is vital to the communities of Eliote and Ori Ore for food and for coastal protection.

In the future, these mangrove forests could also become the source of significant livelihood opportunities through the development of payment for ecosystem services schemes and blue carbon projects. In the shorter term, mangrove education projects and small-scale mangrove rehabilitation projects should be considered.

Longer term priorities

REDD+ and payments for ecosystem services

Given the widespread activity of commercial loggers in South Malaita and the desire for greater conservation catchment forest conservation projects remain a priority. All communities showed a desire to pursue livelihood development through income generating activities. This suggests that conservation efforts need to be linked to opportunities to further develop local incomes in alternative ways to extractive activities. This broadly supports the intent of Solomon Islands forestry and development strategies.

Payment for ecosystem services (PES) schemes are one of a suite of international policies that support forest conservation and provide for more equitable social and economic outcomes. PES schemes compensate communities for pursuing sustainable forest management practices, such as protected area status, which generate ecosystem services to the benefit of the wider community and the world, instead of extractive uses, such as logging and land conversion to agricultural uses.

PES implementation is diverse and has been targeted at reducing carbon emissions through **REDD+** (Reduced Emissions from Deforestation and Degradation) — a global initiative to provide compensation for communities to support sustainable management of forests (Figure 28). REDD+ uses activity based contracts to support livelihoods and retention and/or sequestration of forest carbon. The funding for most REDD+ projects has been provided by international development funds through national governments. Compensation can be made in cash or in kind; for example, for schools and medical facilities, or as funding to health and education services, and to individuals, households, or community organisations.

Figure 28: South Malaita has a large, but degraded forest estate, which makes it a good candidate for opportunities in REDD+ and payment for ecosystem service scheme.

Agricultural extension and agro-forestry

Projects that improve rural well-being and resilience of all people can often have very high returns on investment. As nearly all households in South Malaita undertake some form of food production, projects that improve and adapt current and future agricultural practices can make a big difference. Agricultural extension programs, run by specialist officers, sometimes using demonstration plots, can show how improvements in farming can be done without involving too many risks of failure for each household. Such projects can:

- **Improve local food security** during changes in climate and through natural disasters, ensuring the community has a reliable supply of a variety of foods but also systems in place to recover quickly or store reserves if harvesting is interrupted.
- **Decrease pressure on forest loss** by increasing the fertility of the existing land that is used for agriculture.
- Houshold agricultrure improves **nutrition** by providing access to a variety of healthy foods, such as fruits, vegetables, and meats.
- Agriculture can be a driver of **economic development**. A robust farming system can help to create jobs, generate income, and boost exports. Experimentation in new, export-orientated niche products (coffee, cocoa) can generate income but come at a risk to producing farmers, in terms of marketing investments and forgone effort towards foods that directly support their own and their community's livelihoods.
- Sustainable land-management through expansion of **agro-forestry systems** can increase the overall yield of the land by combining the production of crops, including tree crops, and forest plants on the same land. At a local level, maintaining ground cover and providing shade, reduces moisture-loss and protects soil from sunlight, and provides for a structure that enables some food plants to grow more efficiently. Agroforestry systems, featuring perennial crops can also be more efficient by demanding less maintenance than annual plants and maintaining crop diversity insures against crop diseases and pests.

Agricultural extension programs demand significant resources and are complex to set up but have proven to be successful in the Solomon Islands, across the Pacific and in the wider world.

Community-based marine conservation areas

Marine conservation was strongly supported by Groups 3 and 4 (Section 7.d) and moderately supported by Group 1. There was considerable support for marine (and mangrove) conservation in Ori Ore.

Community-based marine protected areas (MPAs) are zone-based, mixed management marine areas, targeted at ensuring sustainability in the management of fisheries and integrity of coastal coral reef ecosystems. Zones can be managed along a spectrum from 'no-visit' and 'no-take' to temporary closures or gear restrictions. In social cost benefit analysis, marine conservation does not appear to generate significant economic benefits, however, when combined with broader conservation planning, where the formal structures can work across both biomes, they can provide net benefits.

It is likely that marine conservation will require a high degree of coordination amongst the communities of Maramasike Passage as it will involve the differentiation of a range of marine zones, which may include the demand for high integrity / low harvest zones focussed on marine tourism. This significantly adds to the complexity of such arrangements and likely requires further coordination with existing and potential tourism operators in Honiara and tourism strategists from the Solomon Islands government.

10. Prioritisation of EbA

During the second site visit, the communities of Tapa'atewa, Eliote, and Ori Ore were asked to rank their favoured ecosystem-based adaptation and resilience options (Figure 29).

Whilst ESRAM processes are designed to identify EbA projects, through our engagement activities we also helped the community identify key climate, environmental, and anthropogenic risks to ecosystems and communities.

Therefore, when ranking project ideas we include some projects that are not strictly EbA and instead have a bias towards short term livelihoods generation.

EbA projects can have long implementation lead times, which need to be considered against more immediate needs of communities. Notwithstanding some project outcomes can be achieved through combined infrastructure and EbA approaches (e.g., water security) by solving immediate needs (a new, or more reliable water source) at the same time as preparing for and investing in more sustainable, landscape level EbAs, such as catchment afforestation.

The priorities from each of three communities is reported in Tables 1, 2, and 3, below.

Table 1: Prioritisation of projects by the Tapa'atwa community

Rank	Project	Description
1	Water and sanitation improvements	The community's primary, and overwhelming concern (both groups ranked it first, independently) is for access to secure clean water and sanitation. It was recognised that this could be achieved through short term, engineering approaches (e.g., exploration for bore water, septic tanks, rainwater capture) and through longer term approaches (e.g., catchment rehabilitation following the recent logging activity). There was concern for the quality of sanitation, which can impact water courses and ground water. Sanitation projects are specifically about engineered infrastructure.
2	Forest conservation areas	Though there is virtually no primary forest remaining on South Malaita, forest rehabilitation associated with the implementation of forest community conservation areas will begin to regenerate greater forest integrity, which will increase ecosystem service flows. A key objective will be to ensure that remaining and rehabilitating forest is managed in a way to ensure that it does not cross critical (downward) thresholds (e.g., fire and drying) to maintain catchment integrity. Following a period of relatively intense commercial logging (and subsequent cessation, following a dispute) the community prioritises forest conservation and rehabilitation. This can be achieved through pursuit of immediate actions (establishing a seedling nursery and a replanting project) and medium term objectives, such as setting up formal forest community conservation areas and protected areas.
3	Tree re-planting	
4	Tree nursery	
4	Agricultural extension program	Improved productivity of household agriculture can be achieved through adaptations in management of gardens, such as incorporating new crop varieties (climate-resilient crops) and growing techniques, irrigation, improving soil fertility, and introducing higher value crops (Buckwell et al., 2020). This can be achieved through extension officers and demonstration plots.

Figure 29: Validation exercises in the community of Ori Ore in April 2025.

Table 2: Prioritisation of projects by the Eliote community

Rank	Project	Description
1	Access to more food markets	Eliote has poor access to markets. It has no roads and boat access is limited to higher tides. Improving access could improve livelihoods that can improve community resilience; but can also lead to further unsustainable degradation of resources as new markets can absorb greater surpluses.
2	Mud crab sustainability study	Mud crab harvesting is an important part of the community economy and a local food source, though one of high status. Mud crabs are sold into markets in Honiara and can fetch a high price. As a result, they are over-harvested, with people travelling further to find them. It is highly likely mud crabs are being harvested beyond the maximum sustainable yield and there was little evidence of any specific taboos (such as bag limits, limits on size, and harvesting only males). Understanding the state of the mud crab population would be an important input into a broader program of work to establish a marine protected area.
2	Sea weed farming support	The community of Eliote has recently begun trialling sea weed farming in the waters of the Maramasike Passage. It is currently on a small scale trial, with no external support, with production aim at cosmetics industry. So far, there has been no harvests. The community sees sea weed farming as an opportunity to develop a low impact (arguably, a positive impact) industry to support cash incomes and livelihoods. Aquaculture extension programs could support research and development of sea weed farming.
3	Forest conservation areas	Though there is virtually no primary forest remaining on South Malaita, forest rehabilitation associated with the implementation of forest community conservation areas will begin to regenerate greater forest integrity, which will increase ecosystem service flows. A key objective will be to ensure that remaining and rehabilitating forest is managed in a way to ensure that it does not cross critical (downward) thresholds (e.g., fire and drying) to maintain catchment integrity.
3	Mangrove carbon project	In the longer-term options will become available for the development of mangrove conservation projects that are linked to carbon and biodiversity investments, such as payments for ecosystem services schemes. These projects are complex and have a long lead time and demand a high level of community capacity to promulgate, implement and monitor and evaluate.
3	Marine conservation areas	Marine protected areas (MPAs) are zone-based, mixed management marine areas, targeted at ensuring sustainability in the management of fisheries and integrity of coastal coral reef ecosystems. Zones can be managed along a spectrum from 'no-visit' and 'no-take' to temporary closures or gear restrictions. Implementation and effective management of MPAs can increase fish diversity and biomass in the wake of climate change and threats to coral reefs.
4	Mangrove replanting	Mangroves are in a good condition and are not necessarily particularly threatened by human pressures (see Section 6.1.2). Nevertheless, mangrove replanting can generate an easy entry point for community development to establish community capacity to tackle larger projects of greater complexity in the future.
4	Tree nursery	Establishment of tree nursery can be a relatively modest investment to generate community capacity to support the development of more complex, longer term projects, particularly associated with the establishment of forest community conservation areas. In Eliote, a tree nursery should focus on food trees, such as nuts, oils, and fruits.
5	Fish attracting devices	FADs increase fish availability, making it easier for local fishers to catch fish and reduce fishing pressures on local coral reefs (thereby massively improving reef resilience and ecosystem services). FADs increase catch efficiency, saving fuel and time for fishers, thus improving livelihoods. Eliote fishers would have to travel significant distance to access FADs in oceanic waters outside the passage.
6	Agricultural extention program	Improved productivity of household agriculture can be achieved through adaptations in management of gardens, such as incorporating new crop varieties (climate-resilient crops) and growing techniques, irrigation, improving soil fertility, and introducing higher value crops (Buckwell et al., 2020). This can be achieved through extension officers and demonstration plots.
6	Tourism development	Low priority was associated with development of tourism activities in the community.

Table 3: Prioritisation of projects by the Ori Ore community

Rank	Project	Description
1	Mud crab sustainability study	Mud crab harvesting is an important part of the community economy and a local food source, though one of high status. Mud crabs are sold into markets in Honiara and can fetch a high price. As a result, they are likely over-harvested, with people travelling further to find them. It is highly likely mud crabs are being harvested beyond the maximum sustainable yield and there was little evidence of any specific taboos (such as bag limits, limits on size, and harvesting only males). Understanding the state of the mud crab population would be an important input into a broader program of work to establish a marine protected area. Mud crab fisheries in the Pacific is under studied, with very little information on population status, distribution patterns, abundance, threats, and economic value (Mangubhai et al., 2017).
2	Fish attracting devices	FADs increase fish availability, making it easier for local fishers to catch fish and reduce fishing pressures on local coral reefs (thereby massively improving reef resilience and ecosystem services). FADs increase catch efficiency, saving fuel and time for fishers, thus improving livelihoods. Ori Ore would be able to easily access FADs that are positioned in oceanic waters outside the passage.
2	Community-based marine protected area	Community-based marine protected areas (CBMPAs) are zone-based, mixed management marine areas, targeted at ensuring sustainability in the management of fisheries and integrity of coastal coral reef ecosystems. Zones can be managed along a spectrum from 'no-visit' and 'no-take' to temporary closures or gear restrictions. Implementation and effective management of MPAs can increase fish diversity and biomass in the wake of climate change and threats to coral reefs.
3	Forest conservation areas	Though there is virtually no primary forest remaining on South Malaita, forest rehabilitation associated with the implementation of forest community conservation areas will begin to regenerate greater forest integrity, which will increase ecosystem service flows. A key objective will be to ensure that remaining and rehabilitating forest is managed in a way to ensure that it does not cross critical (downward) thresholds (e.g., fire and drying) to maintain catchment integrity.
3	Mangrove replanting	Mangroves are in a good condition and are not necessarily particularly threatened by human pressures (see Section 6.1.2). Nevertheless, mangrove replanting can generate an easy entry point for community development to establish community capacity to tackle larger projects of greater complexity in the future.
3	Mangrove carbon project	In the longer-term options will become available for the development of mangrove conservation projects that are linked to carbon and biodiversity investments, such as payments for ecosystem services schemes. These projects are complex and have a long lead time, and demand a high level of community capacity to promulgate, implement and monitor and evaluate.
4	Agricultural extention program	Improved productivity of household agriculture can be achieved through adaptations in management of gardens, such as incorporating new crop varieties (climate-resilient crops) and growing techniques, irrigation, improving soil fertility, and introducing higher value crops (Buckwell et al., 2020). This can be achieved through extension officers and demonstration plots.
4	Honey development	Honey was mentioned as a niche product that could provide possibilities that improve livelihoods and also for ecosystem services provided by the bees. As Ori Ore has reasonable access to markets to Honiara, this would provide a good outlet for the product.
4	Access to food markets	Eliote has poor access to markets. It has no roads and boat access is limited to higher tides. Improving access could improve livelihoods that can improve community resilience; but can also lead to further unsustainable degradation of resources as new markets can absorb greater surpluses.

11. Adaptation pathways

An adaptation pathways approach to climate change adaptation is designed to schedule adaptation decision-making over time, particularly identifying the decisions that need to be taken now and those that may be taken in future. It can also be sensitive to budget needs and increases in the community's capacity to take on more complex projects over time.

The approach supports strategic, flexible and structured decision-making. It also allows for decisions to be made at the most appropriate time as more certainty over the impacts of climate change becomes greater. In this instance, we assessed the priorities in terms of:

Budget available

The level of investment required (e.g., small, modest, significant, very significant

Project complexity

Level of complexity in implementation of the project; also relative to the likely level of community preparedness (e.g., low, medium, high, very high).

Social return on investment

Evidence from social benefit cost analysis (e.g., unknown, modest, high, very high).

Timing

The potential for timing for implementation; relative to budget, project complexity, community preparedness and social return on investment (immediate, short term, short to medium term, medium term, long term).

Tapa'atewa

Immediate actions (small budget, low complexity)

1. Pursue funding to establish tree nursery.
2. Pursue funding for tree planting program.
3. Preparation work for setting up forest community conservation areas; setting up committees, beginning the mapping work, and establishing boundaries.
4. Explore international donor funding options for water and sanitation project from community development sector in conjunction with the Provincial Government and the national government.

Medium term options (larger budgets, high complexity)

5. Establish forest community conservation areas; maintain tree nursery and tree planting to support catchment rehabilitation, which will support high quality water security.
6. Explore options for funding of agricultural extension program.

Eliote

Immediate actions (small budget, low complexity)

1. Pursue funding for mud crab fishery sustainability assessment (in conjunction with Ori Ore community).
2. Seek support from the Provincial Government and national government for optimising sea weed farming.

Medium term options (larger budgets, higher complexity)

3. Marine conservation program of work, bringing together knowledge from mud crab study, setting up management committees, establishing rules (taboos, maps, zones etc), potential implementation of FADs.
4. Seek support for establishing mangrove and forest conservation schemes linked to international schemes for payments for ecosystem services (particularly for carbon).

Ori Ore

Immediate actions (small to medium budget, low to medium complexity)

1. Pursue funding for mud crab fishery sustainability assessment (in conjunction with Ori Ore community).
2. Setting up local cooperatives to install and manage FADs in open water outside the Maramasike Passage.

Medium term options (larger budgets, higher complexity)

3. Marine conservation program of work, bringing together knowledge from mud crab study, setting up management committees, establishing rules (taboos, maps, zones etc).
4. Seek support for establishing mangrove and forest conservation schemes linked to international schemes for payments for ecosystem services (particularly for carbon).

2025 5th ANNIVERSARY

KIWA INITIATIVE

Nature-based solutions for climate resilience

The Kiwa Initiative - Nature-based Solutions (NbS) for Climate Resilience aims to build the resilience of Pacific Island ecosystems, communities, and economies to climate change through NbS by protecting, sustainably managing and restoring biodiversity.

It is based on simplified access to funding for climate change adaptation and biodiversity conservation actions for local and national governments, civil society, and regional organizations in Pacific Island Countries and Territories.

The Initiative is funded by the European Union, Agence française de développement (AFD), Global Affairs Canada (GAC), Australia's Department of Foreign Affairs and Trade (DFAT) and New Zealand's Ministry of Foreign Affairs and Trade (MFAT). It has established partnerships with the Pacific Community (SPC), the Secretariat of the Pacific Regional Environment Programme (SPREP), and the Oceania Regional Office of the International Union for Conservation of Nature (IUCN - ORO).

For more information: www.kiwainitiative.org