A manual on how to sustainably manage sea grapes in Western Province, Solomon Islands

Australian Government

Climate Resilient by Nature

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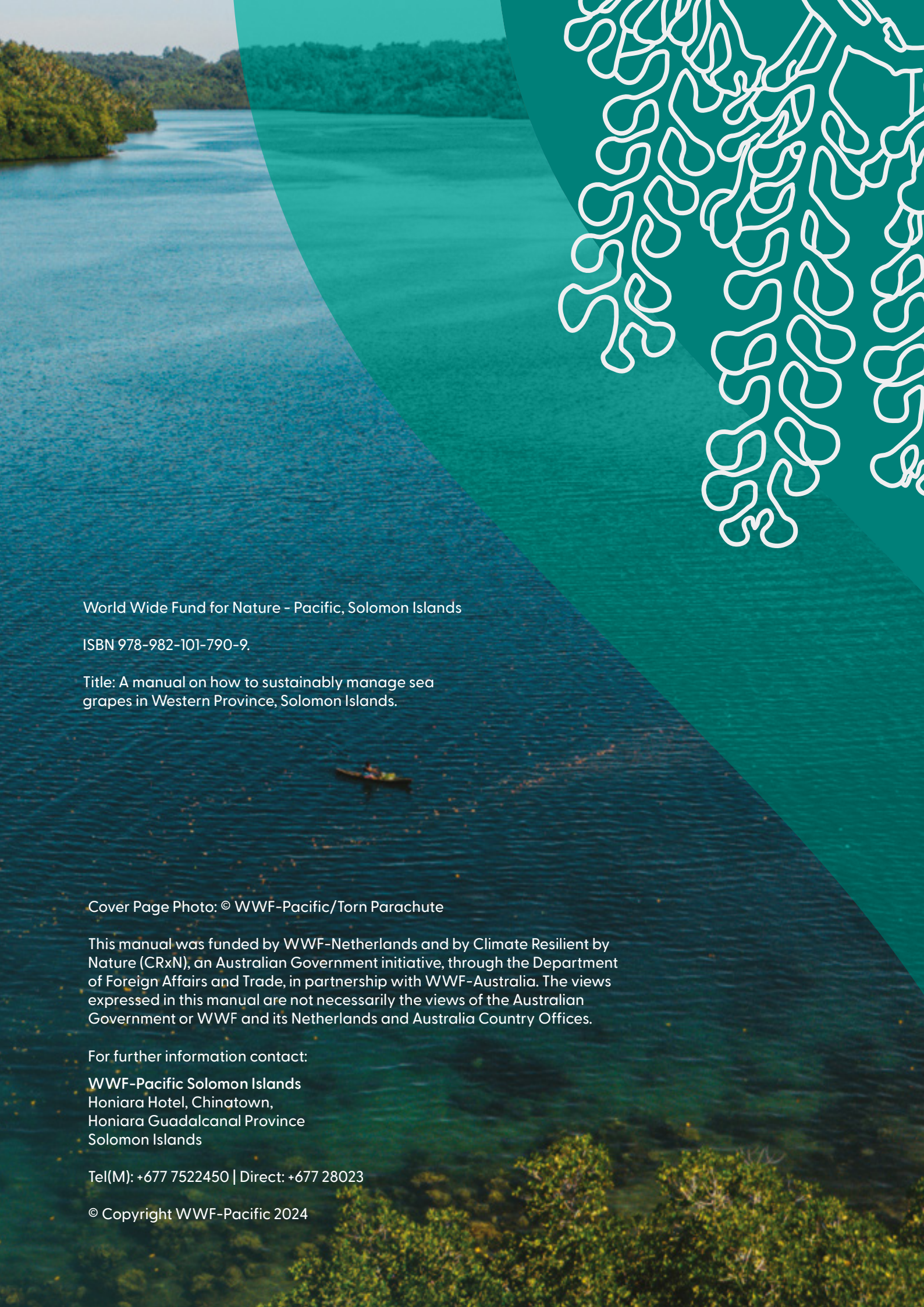

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- This manual is supported by WWF-Netherlands and Climate Resilient by Nature (CRxN), an Australian Government initiative in partnership with WWF-Australia. CRxN supports nature-based solutions that restore and protect critical ecosystems, build sustainable livelihoods, and increase resilience to climate shocks.

- Authors - Sea grape harvesters, marine resources management committees and the community in Sairagi, Boboe, Kongulavata and Pusiju.

- Note on quotes: all quotes have been translated to English from pidgin The women harvesters use seaweed and sea grapes interchangeably to mean the same thing.

INTRODUCTION

In our communities of Boboe, Sairagi, Kogulavata and Pusiju, sea grapes (*revo* or *ime* in our local languages) form an important part of our diets and they make up a large part of our weekly household income. We have been working together with WWF to improve the quality and quantity of our sea grapes by protecting the reefs and mangroves where they grow and develop more opportunities for us to benefit from this resource.

We have put in place management plans for our marine resources, including mangroves, and started monitoring the health of our sea grapes. We have nominated Community Facilitators to coordinate our activities and Community Rangers to monitor sea grape health and coordinate enforcement of our management plan rules. We are using monitoring data and our own understanding of how the seasons, the tides and other environmental factors impact on our sea grapes to make decisions about how we better manage them. We are working together to share our experiences and knowledge on how to best harvest and prepare sea grapes for sale in local markets. For the first time, we are using our sea grapes to make products like body lotion and soap.

We are seeing that if we look after our sea grapes and other marine resources we can continue to benefit from them and find new opportunities to use them to support our future and the future of our children. By conserving our marine resources, we are ensuring we have healthy food for our families, strong coastal ecosystems to build our resilience to climate shocks and new and improved livelihood opportunities.

We want to share our experience and knowledge with you so you can do the same.

Nerolyn, Freda, Oneidah, Grace

Nerolyn Loni, Sairagi

Freda Kamikera, Kongulavata

Oneidah Panda, Boboe

Grace Poele, Pusiju

PURPOSE OF THIS MANUAL

This manual is designed to support coastal communities to better manage their sea grapes. Healthy and abundant sea grapes will allow communities to develop livelihood and enterprise options that incentivise improved environmental resource management resulting in positive conservation, climate resilience and sustainable benefits to communities. The manual documents for the first time in Solomon Islands the indigenous and traditional knowledge that these communities in Western Province use to inform their sea grape management, harvesting, processing and selling and how this can be combined with conservation tools to enhance outcomes for people and planet. There is a summary of key threats to sea grape health; an overview of sea grape monitoring methods and sea grape management plans and a step by step guide with photos on the harvesting process. Sea grape growing communities in other parts of Solomon Islands, other Pacific island countries and Asia can use the manual to support them in better managing their own marine resources.

Management rules

BOBOE

20 harvesters

5 baskets per household per week

PUSIJU

6 harvesters

They harvest only for community fundraising events

KONGULAVATA

30 harvesters

3 baskets per week for each harvester

SAIRAGI

100 harvesters

2 baskets per week for each harvester

Sea grape project in numbers

406

hectares of marine ecosystem under improved management in 4 sea grape communities (Sairagi, Boboe, Pusiju and Kongulavata)

%

Increase in % average sea grape cover, indicative of increased presence of sea grapes, production and expansion since WWF engagement on improved sea grape management began.

40-90%

of the total weekly income earned by women harvesters from the 4 communities comes from the sale of fresh sea grapes at Gizo, Ringi, Noro and Honiara markets.

AN OVERVIEW OF SEA GRAPES IN WESTERN PROVINCE

Known as *ime* or *revo* in the Western Province of Solomon Islands, sea grapes, a species of seaweed in the algae family *(caulerpa)* is eaten in many coastal cultures in the Pacific Islands and Asia. They are high in iron and other nutrients.

In Solomon Islands, women and girls are the key harvesters and sellers of sea grapes and in some communities this is an important livelihood activity that pays for household needs and school fees. Sea grapes are sold in Gizo, Noro, Ringi, Munda and Honiara markets.

WWF has been working with the Sairagi community on Gizo island for the past 10 years - and the community has established a very successful plan to support the sustainable management of their sea grapes area. They have also come up with innovative ways to harvest in a sustainable manner, and how to replant sea grapes in areas where sea grapes thrive or have been over harvested. The communities of Pusiju, Boboe and Kongulavata are also involved with wild sea grape harvesting for livelihoods and were experiencing a decline due to various threats such as over harvesting and habitat destruction. This project has brought the communities together to collaborate and learn from each other.

Seagrapes form an important part of a healthy diet for many communities in Western Province.

"When I work in the garden, it is long, hard work but for sea grapes, you can harvest immediately, clean them and go and sell them. It's a good income for the amount of work that goes into it. I don't plant them, they grow themselves. Seaweed is big money for the future for our kids and grandkids and it will be their main income. We need to manage it so we keep this income into the future".

Freda

Background: Freda and her husband on their jetty in Kongulavata
©WWF-Pacific/Torn Parachute

Map of the Solomon Islands - WWF Pacific Solomon Islands CRxN Sites

Sea grape species and their uses

There are two species commonly eaten and sold in Western Province - *Caulerpa racemosa* known locally as the strong or crunchy species and *Caulerpa racemosa var. turbinata* known as the soft species. Many more species have been identified during the baseline monitoring of sea grape patches in each community but these are not usually eaten or sold.

Studies have found that sea grapes have a number of key micronutrients important for a healthy diet including iron, iodine, magnesium and potassium. In Western Province, communities use sea grapes as a supplement for pregnant women.

Caulerpa racemosa var. turbinata known as the soft species.
©WWF-Pacific/Torn Parachute

Caulerpa racemosa known locally as the strong or crunchy species.
©WWF-Pacific/Torn Parachute

"Some people don't know what seaweed is but doctors tell them to go to the market and to ask for seaweed so they can eat it to give them strong blood. Lots of customers come and ask what benefits can you get from eating seaweed and we tell them it has lots of iron and can make your body strong. We eat it and we are very healthy",

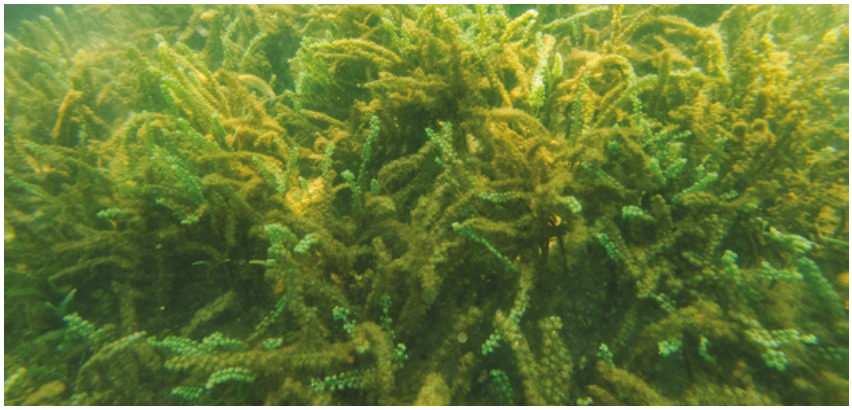
Hezlyn Suimae, has sold sea grapes in Honiara since 2018 and sells Boboe sea grapes weekly at the Honiara city market.

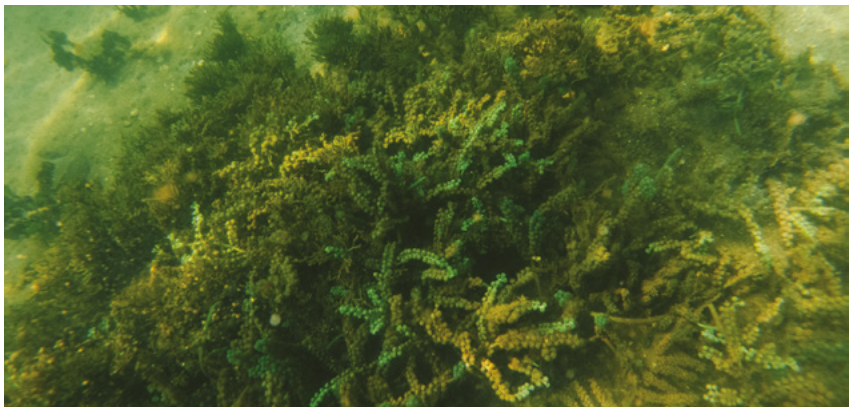
Understanding the relationship between sea grapes and healthy marine ecosystems

Sea grapes grow on reef stones and in mangrove areas. Healthy mangroves support food security in communities, offer coastal protection and help to mitigate climate change. Sea grapes also provide food and habitat for a wide range of marine species, filter the water and reduce coastal erosion.

Sea grapes growing on coral in Boboe

Sea grapes growing near mangroves in Kongulavata





Discovering the threats to sea grapes

Cutting down mangroves to build houses, taking reef stones out to make paths, or overharvesting the sea grapes are things which damage them. Sairagi has been managing their marine resources for over a decade, including their sea grapes. They now have a stable and abundant supply and use monitoring data to make decisions to close the harvest to allow the sea grapes to regrow.

In Kongulavata, Pusiju and Boboe, they all experienced a reduction in sea grapes over the past few years. The Kongulavata community said that many years ago, their sea grapes grew well in the reefs and mangroves and harvesters did not need to dive deeply to find it but they noticed that the sea grapes are now growing in deeper places. The tsunami in 2007 swept the sea grapes out of the bay and while they have come back, the community thinks overharvesting has meant it hasn't regrown as well as before.

In Pusiju, the community spoke about cutting down mangroves to build houses, removing reef rocks to make paths and pulling out the entire plant when harvesting the sea grapes. They feel this has negatively impacted the sea grapes. Damsel fish have been eating the replanted sea grapes - they would usually eat the algae on reef stones instead. When Community Rangers from Sairagi visited Pusiju, they suggested that sediment from streams and logging activities may have a negative impact on the growth of sea grapes - Sairagi experienced this when the 6 Mile road was being developed. Community members also said that a growth in population may have an impact on sea grapes - there are more gardens to feed the larger population and maybe the rain takes sediment into the sea.

Paths made out of reef stones in Pusiju © WWF-Pacific

How the climate and tides impact on sea grapes

Sea grapes are also impacted by the climate and tides. In Sairagi and Pujsiju, the sea grapes die back during periods of low tides. In Sairagi they have low tides in June/July and algae grows on the sea grapes and it makes it difficult to harvest. The Pusiju community feels that the low tide season now lasts longer and this has meant their sea grapes are not as healthy. In Boboe, the high tides that come in October/November result in reduced sea grape coverage and poor growth.

Aerial shot Sairagi
© WWF-Pacific/Torn Parachute

Longer low tides in Pusiju impacting sea grape health

In Pusiju, sea grape health is impacted by climate variability - in the middle of the year, the sea is usually warmer and the sea grapes die back and in the last quarter of the year, the sea becomes cooler and the sea grapes flourish. However, they are noticing that this is changing. Previously, the Ngali nut fruit falling from the tree used to signal the arrival of high tides and cooler waters, but now the nuts fall and the low tides continue for longer periods than they used to. Pusiju elder, Mrs Everlyn Paebara said *"Last year, we experienced low tide - previously only in June we got low tide but now it is almost November and it's still low tide. So that's one of the reasons why the sea grapes are not going as well. When it is low tide, the sea water is hot and they die down. We have started to notice that seaweed is now growing in deeper places. Seaweed follows the season - when it is low tide, seaweed starts to die and when high tide comes, it grows back well."*

Everlyn Paebara, Pusiju.
© WWF-Pacific

How to implement improved sea grape management in your community

To address the threats to healthy sea grapes and ensure communities have a sustainable supply which enhances their climate resilience and future livelihood options, the communities have developed sea grape management plans. To develop their management plans, they followed these steps:

- WWF provided communities with an overview of the benefits of conserving their marine resources
- Communities set up committees to oversee the development and implementation of the Management Plans
- Nominated a female and male Community Facilitator to coordinate activities
- Identified Community Rangers to monitor sea grape health and implementation of management rules
- Demarcated sea grape management zones, mangrove conservation zones and protected reefs
- Identified rules for sea grape harvesting and use of mangroves and coral reefs.

Each community worked with their Management Committee and community members to define the vision of their management plans.

Vision

"Managing sea grapes and key habitats responsibly and sustainably to ensure the long term health and abundance of the resource while supporting the livelihood of local communities and improving wellbeing for current and future generations"

They defined their management objectives under 5 key areas:

- Enhance the production of healthy sea grapes by implementing sustainable harvesting practices, ensuring the long-term health of sea grape ecosystems while improving the nutritional quality of the harvested produce.
- Foster increased income generation by promoting alternative sustainable livelihood opportunities, empowering communities to diversify their sources of revenue in an environmentally conscious manner.
- Safeguard crucial habitats like mangroves from improper sanitation practices, implementing measures to preserve these key ecosystems and maintain a healthy environment for sea grape
- Monitor and combat poaching activities by actively engaging rangers and community members, encouraging collaborative efforts to protect sea grape resources and maintain ecological balance.
- Strengthen community capacity in marine resource management through targeted workshops and training programme, empowering individuals with the knowledge and skills necessary for sustainable practices in the cultivation and protection of sea grape resources.

Each community also has set up enforcement mechanisms to ensure the management plan rules are followed - these include the Management Committee issuing warnings and harvest suspensions and fines to anyone found breaking the rules. The Management Committees will also produce and share with the community an annual report documenting the progress made in achieving the objectives outlined in the management plan, ecosystem health from monitoring of sea grapes, mangroves and reefs and any challenges faced and overcome during the management plan implementation.

Management rules for healthy ecosystems

Each community defined their specific rules based on the context of their community, their mangroves, their reefs and their sea grapes. They all include rules on the following:

Sea grape Management Zone

1. Harvesting sea grapes by uprooting the whole plant is strictly prohibited - harvesters should pluck the shoots only. If a plant is accidentally uprooted, they should replant it
2. Limit to the number of baskets that can be harvested per harvester or per family per week. This rule differs per community and is based on the size of their sea grape patches and the number of harvesters and basket limits can be reduced if the Management Committee has data to show that the sea grapes are being overharvested
3. Limit the number of times harvesters can dive a week
4. If the sea grape patches were divided into zones (like in Kongulavata), marketing days are shared between the zones
5. Visitors from other communities are not allowed to harvest sea grapes
6. Harvest closure periods to allow the sea grapes to regenerate will occur based on Community Ranger monitoring of sea grape health. Zones for harvesting for household consumption are identified.

Mangroves Management Zone

1. No cutting of mangroves - any harvesting of mangroves must be approved by the Management Committee
2. No throwing of rubbish in the mangroves
3. No using the mangroves as toilets. Build proper toilets at home

Coral Management Zone

1. No coral mining or harvesting corals for lime
2. No damaging corals during diving and during harvesting of seagrapes and fishing
3. Proper anchoring

Impact of improved management in Kongulavata

"I have seen that the seaweed, since we have been better managing it, is growing really well. Places where we didn't have seaweed before, it now grows.

Since we started better managing our sea grapes, women are not allowed to harvest lots of seaweed, maximum is just three baskets. Women are not allowed to market two or three times a week but just once a week.

Before, many harvesters pulled up the whole sea grape plant, but now they just prune the shoots.

When you don't harvest or prune your sea grapes and you leave it to just grow, then the seaweed will die back. When they see their sea grapes are growing really well, they have to harvest them, even if they don't go to market, and replant the shoots."

Freda

Freda harvesting sea grapes
© WWF-Pacific/Torn Parachute

In Kongulavata, the sea grape nursery for replanting is in the protected reef. Silas Lezutuni said *"If you find there is not much seaweed in your area or it is starting to die, you can come to the rangers and take an amount from them for planting in your area. Rangers are the only ones who can go there to take plants from the nursery. Rangers will dive for you and harvest it. There is no fishing allowed around the nursery and we are going to put clear boundaries there. The nursery is in a reef in the middle of the bay. We started the nursery in 2014 originally but we started it again at the beginning of this project. Turtles rest in the reef - juveniles rest there- they eat there. Old men used to keep everyone away from this reef because it was where turtles rest. This was forgotten when elders passed away but with the new management, we are starting to protect this reef again".*

Elizabeth Atasi, a sea grape harvester from Sairagi securing the *telas* to the floater.
© WWF-Pacific/Torn Parachute

A decade of sustainable sea grape management in Sairagi brings many benefits

Improved sea grape management in Sairagi has resulted in healthier sea grapes - women harvesters do not need to go as far to find sea grapes to harvest. Before management, they had to go as far as Kongulavata due to overharvesting and they struggled to find sea grapes.

The introduction of financial inclusion training and the savings club model with management was pivotal to the success - women reported that prior to management, they would use sea grape income to pay for immediate needs like food and use it all immediately but now they use the savings club to save income for longer term payments such as school fees.

Most women were either part of the savings club or implemented their own personal savings process using sea grape income - they used the savings to pay for school fees, pay for church or community programmes or host or celebrate special events like Christmas.

Sairagi women harvesters report that almost 90% of their income comes from sea grape sales in Gizo, showing the value in ensuring sea grapes are sustainably managed.

How to monitor the health of your sea grapes

To better understand how their improved sea grape management efforts are impacting their marine ecosystems Community Rangers in the 4 communities learned how to conduct sea grape monitoring, mangrove and coral reef monitoring. Biological monitoring is the systematic tracking of ecosystems to understand any changes that occur.

With the support of WWF staff, communities conducted a baseline assessment of their sea grapes using a basic transect and quadrant methodology. Six 50 metre transects (lines) were marked using a tape measure and their GPS coordinates were recorded. Community Rangers swim along the lines with a quadrat (a 50cm X 50cm frame), and every five metres estimate the percentage cover of sea grapes under the frame (for example, 40% sea grapes and 60% sand).

This methodology was used to develop baselines for each community before the project started. Every 6 months (2 times in total), the monitoring has been repeated using this methodology to assess the changes in percentage cover of sea grapes. The baseline monitoring also identified the species of sea grapes found in that community as well as the habitat it is growing in. The monitoring data was then discussed with communities to support their decisions around sea grape management.

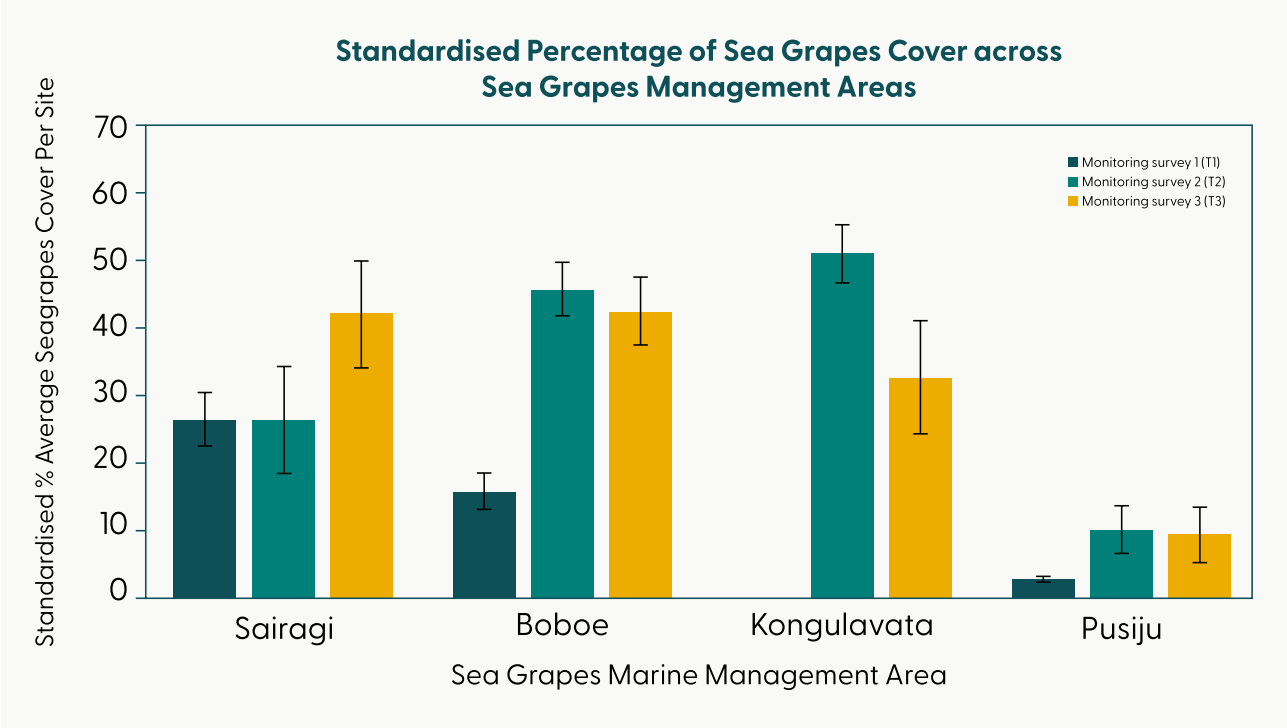
Left: Measuring sea grape shoots while monitoring. Middle: Sea grape monitoring. Right: Oneidah noting down the sea grape monitoring data for Boboe.

Kongulavata had the highest percentage of sea grape cover during the monitoring and the highest number of sea grape species identified. The sea grape harvesters said the rich diversity and high coverage inspired them to continue working on improved management of the resource. Elma Kiko a harvester from Kongulavata said: *"We didn't know how our sea grapes compared to others and we see ours is high and it makes me proud - we need to manage them and keep the new rules. We spoke to five families who were not following rules and said don't spoil the sea grapes - stop now. Families will start to stagger the harvesting."*

Sairagi women harvesters said that the monitoring data gave them confidence in their management systems and their effectiveness.

Results from the sea grape monitoring show that there has been an increase in % average sea grape cover, indicative of increased presence of sea grapes, production and expansion since improved sea grape management began.

The graph below shows that average sea grape coverage increased in surveys T2 and T3 compared to the baseline monitoring survey T1 that was completed at the beginning of the project. No baseline was taken in Kongulavata.



Community sea grapes monitoring

Between the monitoring that is done every 6 months, Community Rangers conduct extra visual monitoring to assess the health of their sea grapes and use the data to decide whether to introduce harvest closures and reduce harvest limits. Community Rangers look to assess whether the sea grapes are regrowing well after harvest or whether growth is slow. The following simple protocol is used to measure regrowth:

- Take 30 sample measurements of new sea grape growth across the different sea grape areas with a rope or a ruler- write the measurements down
- Mark with a floater where you take the measurements so you can revisit the same areas again
- Take the data back to the community to discuss. If the regrowth is consistently around 30cm, then harvesting can commence again (pruning is good to encourage more growth) but if the growth is less, then the closure should continue

Boboe uses monitoring data to inform management decisions

At the end of 2023, for the first time ever, Boboe community decided to instigate a harvest closure for their sea grapes because the sea grapes were not looking healthy. This coincided with the period of high tides when their sea grapes usually die back. "*We decided to close the harvest because we looked at the sea grapes and they were dying back, they were not really growing, so that's why we closed the seaweed harvesting – to let the seaweed grow back so we can go and harvest again*", Oneidah said.

They identified a zone where families could harvest for their own consumption and the harvesting for sale was closed. The community closed the harvest for 2 weeks and then the Community Rangers conducted monitoring to see how the sea grapes were regrowing. They took the measurements back to the community for a meeting and discussion, where it was decided to keep the harvest closure in place for another two weeks. The community reports that the sea grapes are now very healthy again.

Chairman of the Boboe sea grape Management Committee, Mr Steven Lakevu, said "*This is the first time for us to close our sea grape harvesting and we will learn from this. We think that if there is a low tide, the sea grapes grow well but when it is high tide, it dies back. We want to know if this is high tide or is it overharvesting? This closure will allow us to see the real reason. Everyone in the community is a ranger because it is all our responsibility. Sea grapes benefit everyone in the community. We need to work together and cooperate*".

Endolyn Humphrey from Boboe, sells sea grapes at Honiara, Ringi and Noro markets. "*Before the project I would take 10 big baskets every Sunday and now we go to another place which is still open and we can take one basket only to eat. When we start to manage sea grapes our income will go down. The closure is the first time and it could be for a month. But it's good because we will have more sea grapes when it opens again and we can get a good price at the market.*"

A STEP BY STEP GUIDE TO HARVESTING, PROCESSING AND SELLING SUSTAINABLE SEA GRAPES

The harvesting, packaging and selling of sea grapes is informed by traditional knowledge. The women and girls know how to handle the delicate sea grapes to ensure a top quality product reaches the buyer. There are about 6 harvesters in Pusiju, 30 in Boboe, about 30 in Kongulavata and about 100 in Sairagi. Ensuring good quality sea grapes reach their customers is important because these sales contribute significantly to household income.

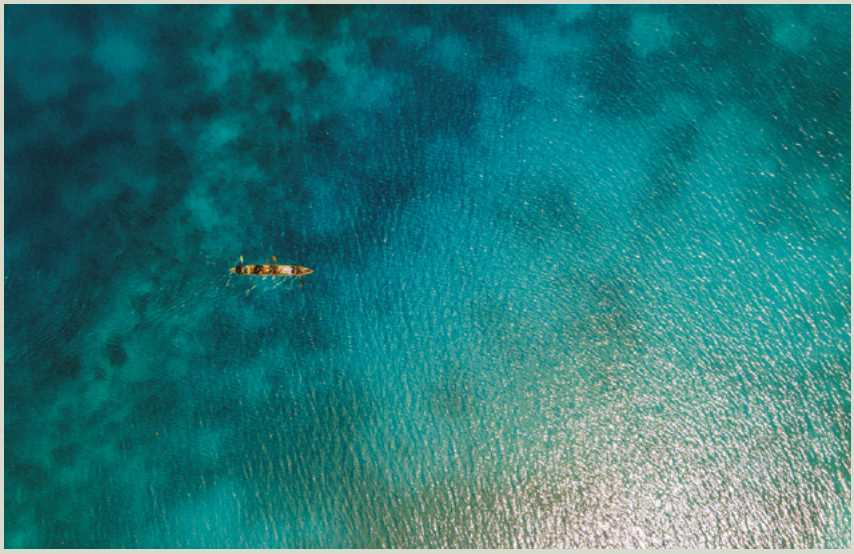
STEP 1: PREPARATION FOR HARVESTING

In preparation for harvesting sea grapes, women and girls hand make large *telas* (baskets) weaved from coconut fronds.

The size of the baskets is between 7x7 and 10x10 - measured by the number of fronds used in the weaving. The capacity of the baskets is around 15kg of sea grapes valuing roughly $300 SBD and will amount to about 20 small baskets being sold for $10 SBD in Western Province Markets.

The women gather the *kakake* (swamp taro) leaves. They wash the *tela* and *kakake* leaves in saltwater and place the leaves inside the *tela*.

Top & second rows: *Tela* weaving in Sairagi.
Background: Nerolyn, Elisabeth and Salome from WWF-Solomon Islands paddling out to harvest sea grapes in Sairagi.



"First, when we want to go and harvest sea grapes, we get the baskets ready and also wild taro leaves and plastic, some food, and water and then we use a dugout canoe to paddle and we go and do sea grape harvesting in our area. We paddle for about 30 minutes and when we reach the sea grape area, we anchor the canoe and we start to dive".

Nerolyn

Top to bottom: Oneidah heading out to harvest sea grapes in Boboe.

Freda and her husband carrying the *telas* out to the canoe for harvesting in Kongulavata and paddling out.

STEP 2: HARVESTING

Women harvesters paddle the canoe out to the sea grape patches, taking their masks and *telas*. They dive into the water and pluck the shoots of the sea grapes at the correct length to encourage regrowth. By doing this, sea grapes regrow their shoots within a couple of weeks.

"When we harvest, we don't just go and grab the seaweed, but we do proper harvesting, we just take off the new shoots of our sea grapes and we do harvesting wisely in our sea grape farm".

Nerolyn

"If you rush too much when holding the seaweed it will be weak. You must be gentle with the sea grapes."

Freda

It is important to harvest (prune) the sea grapes when they reach about 30 cm to encourage new growth.

Top & middle: Diving for sea grapes in Boboe.
Bottom: Elisabeth harvesting sea grapes in Sairagi.

They harvest the sea grape shoots gently, placing them in the prepared *telas*. They avoid damaging them to maintain freshness - meaning they don't hold the sea grapes too tightly. Sometimes the *telas* are hung on the side of the canoe and sometimes the baskets rest inside the canoe.

They separate different species of sea grapes into separate baskets to preserve their freshness and quality. Combining sea grapes of various species in one basket can lead to damage, particularly for the softer varieties. Therefore, it is advisable to store each species separately to prevent any potential harm.

"During harvesting, we usually tell the women to cut or pick the top of the sea grapes but they must be the long ones because when you cut off the shoots of sea grapes, after one week they will grow and you will have nice sea grapes for us to pick and collect next time we want to dive. We practice that method and it really works – it helps us to be able to go back to the same place to harvest again. We don't just harvest it when it has short shoots."

Nerolyn

Freda harvesting sea grapes and placing them in *telas* and on kakake leaves in Kongulavata and Freda washing the black plastic in sea water.

They cover the coconut basket with sea grapes with black plastic to protect them from excessive heat or rain, which can spoil their quality.

"After we do our harvest and fill up two baskets, we cover them with plastic to protect them from rain and sun. Because when it rains, it kills our seaweed if the seaweed is too wet. If it is too sunny, we cover it to protect it from the sun."

Nerolyn

Top: Freda harvesting sea grapes and covering them in plastic to protect them in Kongulavata. Middle & bottom: Elisabeth harvesting sea grapes in Sairagi.

Top left & right: Nerolyn harvesting sea grapes in Sairagi
Second (right column): Boboe sea grape harvesters
Bottom left: Harvested sea grapes from Boboe.

STEP 3: HEALING HARVEST WOUNDS

Tie the basket full of sea grapes with a rope and sink it into the sea at a level where it won't be affected by sunlight or rain.

Soak it for a day. This heals the harvest wounds enabling the sea grapes to stay fresher for longer.

"When it rains, they know it is raining but they don't know that they need to anchor their basket of seaweed with stones so it goes down deep because when it is floating on top, rain water mixes with the sea and it kills their seaweed."

Freda

"After diving, we come back and reach home and we tie the seaweed well with a rope and we anchor it in the sea with a floater."

Nerolyn

Left column: Elizabeth Atasi, a sea grape harvester from Sairagi securing the *telas* to the floater. Opposite background: Sea grapes soaking in Boboe.

"We do that because the sea grape roots where we plucked off the shoot, when we soak it overnight, the place where we picked the shoot closes over and the seaweed keeps the water inside the roots."

Nerolyn

"When we harvest in the morning, we break the sea grapes and if we put them directly into the container, they will die. The sea grapes have liquid – if you look where you break off the shoot, you will see liquid dropping out so we sink them overnight, sea goes inside and refills the liquid where it was broken and seaweed takes back salt and grows back. So the next day, it is fresh."

Kilu Sumbo from Boboe

STEP 4: CLEANING

The sea grapes are first cleaned during the harvesting process beside the canoe.

In Sairagi, after the sea grapes have been floated overnight the next day, the women gently clean the sea grapes by taking out any sand or rocks and transfer them to another clean basin of sea water. They then return the clean sea grapes to the *tela* and sink it again, awaiting market day.

Nerolyn untying the sea grapes from the floater and cleaning them with fresh sea water.

"After one night, the next day we take out the basket and untie it from the floater and we clean the sea grapes. We use salt water with a clean basin. After that, we anchor it to the same floater in the sea."

Nerolyn

"Because sea grapes grow in sand, we take out the sand and other dirt from the sea that goes into the sea grapes. People eat sea grapes directly so we like to clean them so people don't get sick from them."

Kilu, Boboe harvester

Top & bottom: Bringing the sea grapes in from floating in Boboe.

STEP 5: PREPARATION AND TRANSPORTING TO MARKET

Plastic clip lock containers are lined with clean *kakake* (or *kakame*) leaves. The sea grapes are gently transferred from the *telas* (coconut basket) to the container (*nalibin*). The *nalibin* needs to be lifted with care into the truck or the boat. Ensure no objects or people sit on the nalibin during transportation to the market.

Transportation time to markets in Western Province can range from 30 minutes to 1 hour. The wrapped sea grapes should be stored between 25-30 degrees celsius and in the shade.

"After that, the next day, we wake up in the morning and get up and prepare to sell them at the market. We use nalibins (big plastic clip lock containers) and also eskys with clean wild taro leaves, kakake in local language. We use kakake to cover the sea grapes but before we put them inside the nalibin we lay the leaves, then we rinse the sea grapes in clean saltwater and put them inside the clean containers.

After that, we cover them well with the clean leaves that we have washed in sea water. Then we prepare saltwater from Sairagi inside a clean bucket so that we can wash hands to be ready for the market. After rinsing and cleaning up then we are ready."

Nerolyn

Nerolyn packing the sea grapes into the container in Sairagi for transport to the market.

Packing the *telas* (top row) and plastic containers (bottom row) in Boboe to prepare the sea grapes for transport to the market.
© WWF-Pacific/Torn Parachute

Freda and niece in Kongulavata cleaning the sea grapes before sinking them overnight to heal the harvest wounds.

STEP 6: DISPLAYING AND SELLING AT THE MARKET

The sea grapes are then carefully transported to markets in Gizo, Noro, Ringi and Honiara. The women wash hands frequently with saltwater when handling sea grapes for customers at the market. They display a few sea grapes prepared in *susus* (smaller coconut front baskets) with *kakake* for customer viewing. The rest of the sea grapes are kept fresh in the container under the table for sale.

In the 1990s, baskets were sold for $ 2 SBD and now they usually sell for $10 SBD if it is a good day at the market. If there are too many sellers or not enough buyers, the baskets might be reduced to $ 5 SBD to ensure they sell them all. Women harvesters from these four communities report that these sales make up 40-90% of household income - other income sources include selling vegetables from the garden, fishing, firewood, fresh coconut, copra, carving, mangrove and reef shells.

"We put our sea grapes in small baskets (susu) and put them in a small dish and we sell the sea grapes."

Nerolyn

Top row: Nerolyn weaving the *susu* baskets in Sairagi.
Bottom: Sea grapes displayed at Gizo market.

Sea grapes are sold in small *susu* baskets weighing about 500 grams.

"When we sell them at the market, sometimes the number of sea grape parcels we have is 28 susu (small) baskets out of two big baskets of our seaweed."

"At the market, when we sell them, they are 10 dollars for one susu basket but sometimes it depends on the customers, when we don't have enough customers, the price is reduced to 5 dollars but the price we put is 10 dollars."

Nerolyn

Top & second row: Sea grapes displayed at Gizo market
Bottom left: Nerolyn with sea grapes in susu baskets at Gizo market.
Bottom right: Kongulavata sea grapes being prepared for sale at Gizo market.

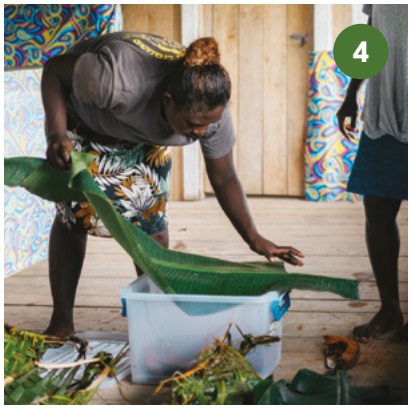
Supplying Honiara with sustainably harvested sea grapes

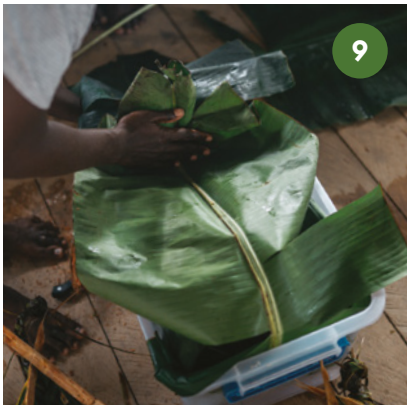
Some women from Boboe harvest and send the sea grapes to Honiara by ship from Noro. The seawater from the *telas* needs to drain out of the baskets and dry for a couple of hours before packing for Honiara and the container needs to be lined with dry leaves, wood and coconut husks so that any excess water doesn't touch the sea grapes during transit. The strong and the soft species need to be packed in separate containers. The sea grapes normally arrive on Tuesday afternoon and are on sale in Honiara until Friday or when they sell out. If stored properly, sea grapes can last up to 7 days.

"We use coconut husks or any firewood to make a pallet and then we put banana leaves and we start to lay the seaweed in the container. We need to pack them well and we select the best sea grapes when we pack – the weak ones we take out and the quality ones we put inside. After packing the containers, we close them. The container must be filled to the top and we wrap it up with the leaves and close the lid."

Oneidah

1. Coconut husks, sea grapes and banana leaves ready to pack the container for shipping to Honiara. 2 & 3.Packing the container with coconut husks to soak up any water that drips out of the sea grapes during.





"We don't lay the sea grapes just any way, we lay them straight. The roots of the seaweed must face up so that it doesn't die. If we lay them with the root underneath, it will die. So we lay them straight and we cover them well. The container must be full before you shut the container."

Kilu

4&5.The hard spine of the banana leaves is cut out of them before they are put in the containers to line them.
6&7. Sea grapes being carefully placed root up inside the banana leaf lined container.
8&9. Filling the container and wrapping the banana leaves over the top.
10. Closing the lid and its ready to send to Honiara on the ship.

Opposite page from top: Sea grapes are kept fresh in plastic containers under the table at Honiara market. Second: Plastic containers are used to protect the sea grapes from flies. Third: Hezlyn talks to a sea grape customer Bottom: Boboe harvesters send swamp taro leaves with the sea grapes for packaging for sale in Honiara

"From Boboe the sea grapes come to Honiara on Tuesday by ship. We go down and get the sea grapes and transport them to the market. We sell them and we have to and look after them well because they can be easily spoiled. Every morning we need to come early to the market and make sure there is no water underneath them. If there is water touching the sea grapes, they die, so we have to keep them well. We need to put them in the container and cover them from flies and we look after them every day.

The first customers we had were from Western Province and now the customers are not just from Western province anymore they are from Honiara and elsewhere. We have lots of customers now and the market for sea grapes has improved"

Hezlyn

STEP 7: DECIDING WHETHER A HARVEST CLOSURE IS NEEDED

Normally 2 weeks after harvesting, the sea grapes easily grow back, however sometimes the climate or tides impact their growth and a harvest closure is put into place. If the sea grapes are not looking healthy - their regrowth is not good, they are white or the harvesters are not able to fill a full basket, women harvesters discuss with the Community Rangers and the Management Committee about whether a harvest closure might be required.

The maximum closure of the seagrapes harvest is usually around 2 months. If the closure of the sea grapes area is more than 2 months, they will experience overgrowth of the sea grapes and they will die. The decision to open harvesting will be based on monitoring reports back to the Management Committee from Community Rangers.

"When we manage seaweed we look at how they grow. Seaweed has time when it dies back. So harvesting must continue but when sea grapes go down and we are short of sea grapes we should close the harvest and after we close it we need to do monitoring in the management site. We must do monitoring so that we can see how the quality of the sea grapes is going and to see whether we should open the harvest again or not yet."

Nerolyn

HOW TO ADD VALUE TO SUSTAINABLY HARVESTED SEA GRAPES

Sea grapes are fragile and have a short shelf life. In addition, it is sometimes important to close the harvest of sea grapes to allow them to grow back. In order to add value to the sea grapes and still have sea grape products to sell when the harvest is closed to allow sea grapes to regenerate, the communities of Boboe, Sairagi, Pusiju and Kongulavata are using sea grapes to make body lotion and soap.

This means the product is easier to transport and has a longer shelf life. The communities are piloting the production and sale of these products and ensuring the sea grapes are still harvested in a sustainable way to enable a good supply into the future.

There are many more things that can be done with sea grapes such as making noodles, syrup and dehydrating and vacuum packing them. The communities will continue to develop livelihood and enterprise options to incentivise improved environmental resource management resulting in positive conservation and climate outcomes and benefits to communities.

Left & second column: Processing the sea grapes for soap and body lotion production.

"We never imagined sea grapes could be turned into any other product but when WWF partnered with us, we got partners who came and introduced this product like soap and body lotion and other products we learnt to make out of sea grapes. I never dreamed of seeing such things before but now I am so happy that we've gone into making that product."

Nerolyn

"Sea grapes used to be something we just ate or used to sell at home, but now it is very important because we have joined the workshop and now we can make them into lotion and soap."

Grace

Top: Body lotion at Gizo launch
Second: Customer testing and buying products made from sea grapes at Gizo launch.
Third: Invited guests and customers looking at the products at the Gizo launch.
Bottom: Body lotion and women sellers at Gizo launch.

Common sea grape handling mistakes to avoid

- Dont pull up the whole plant - this causes wastage
- Prune the sea grapes so they stay healthy and keep growing new shoots
- Don't expose the sea grapes to the sun or rain - they will turn white
- Don't put the sea grapes in the fridge or wash them in freshwater
- Wash the sea grapes in clean saltwater from the sea (not saltwater taken from near the market in town
- Sink the sea grapes in saltwater rather than keeping them at home between harvesting and selling them

"If we use leaves but we don't cover our sea grapes properly, the sea grapes we sell at the market are not fresh and customers will not like to buy them because they look weak and not fresh.

You will see the freshness – it will look green and they will look really green and fresh but the sea grapes that look white and weak, you will see this and know the difference so you will choose the fresh one.

When we sell the sea grapes in the market, we usually tell the customers that when you buy sea grapes from us you should look after them well, wrap them in the leaves so that they stop for a long time and they stay fresh for 5 or more days.....

Sea grapes are different from any other fruits and vegetables because we collect it from the sea, we harvest it from the sea so they cannot stay in the fridge, they should stop out of the fridge in a container or any place where it can stay on its own.

If we like to eat sea grapes, you can use saltwater to rinse or wash them again but in saltwater because freshwater will kill them quickly." Nerolyn

'Weak' sea grapes that have been exposed to freshwater (top) and sun (bottom).

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