



WWF

CASE
STUDY

FIJI

2017

An aerial photograph of a tropical island, likely in Fiji, showing a lush green island with a white sandy beach, surrounded by a vibrant coral reef. The water transitions from shallow turquoise near the reef to deep blue further out. In the background, more islands and mountains are visible under a blue sky with scattered white clouds.

THE GREAT SEA REEF WEAVING TOGETHER COMMUNITIES FOR CONSERVATION

WWF-PACIFIC VISION

Our vision is for empowered and resilient Pacific island communities living our unique culture to conserve and manage our ocean, forests and rivers for improved food security, human well-being and a sustainable future.

WWF MISSION

WWF’s mission is to stop the degradation of the planet’s natural environment and to build a future in which humans live in harmony with nature by :

- Conserving the world’s biological diversity;
- Ensuring that the use of renewable natural resources is sustainable;
- Promoting the reduction of pollution and wasteful consumption.

Text compiled by Seema Deo.

Layout and Graphics by Kalo Williams.

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Front cover: Cakaulevu, Fiji’s Great Sea Reef, as seen from the air. © Juergen Freund / WWF-Pacific

Page 4: Corals of the Great Sea Reef.

Page 8-9: Aerial view of the Ba River.

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CAKAULEVU FIJI'S HIDDEN GEM

Gleaming a vivid turquoise blue in aerial and satellite imagery, Cakaulevu, known more widely as the Great Sea Reef, winds along 200 km of Fiji's northern region covering an area of 202,700 km². This length of coral reef (the third longest reef in the Southern Hemisphere) runs along the island of Vanua Levu from Udu Point at its north eastern tip, to Bua on the north west edge, across the Vatuiria passage, veering off along the way

from the Bua, Ra, and Ba provinces coastline and into the Yasawas, where it hugs the coastline. The reef provides protection to Fiji's northern coastal areas and hosts the marine biodiversity that has sustained communities in the area for hundreds of years. Today, it supplies almost 80% of fish that feeds the domestic markets, and is also a valuable tourist attraction for its diving, snorkelling, and pristine sandy beaches. The traditional owners of Cakaulevu Reef (i.e. those with customary rights to fish there) are the people of the Provinces of Macuata, Bua, Ba, and Ra.

Despite its size, its spectacular biodiversity, and its commercial and traditional importance, Fiji's Great Sea Reef had not been well documented until a scientific assessment was conducted in 2004. The survey, which was the first ever systematic effort to document the marine biodiversity of the Great Sea Reef, was undertaken by WWF, Wetlands International, the Wildlife Conservation Society, the University of the South Pacific (USP), local community members, and international experts.

The 2004 survey found that the reef contains 55% of the known coral reef fish in Fiji, 74% of the known coral species in Fiji, 40% of all known marine flora in Fiji, and 44% of all Fiji's endemic reef species¹. The number of species recorded was the highest of any other reef area in Fiji. Populations of at least 12 species listed in the IUCN Red List of threatened species were observed, including 10 species of fish, the IUCN endangered green turtle, and the spinner dolphin.

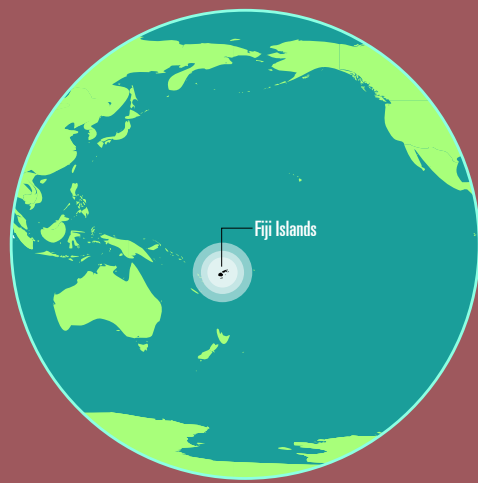
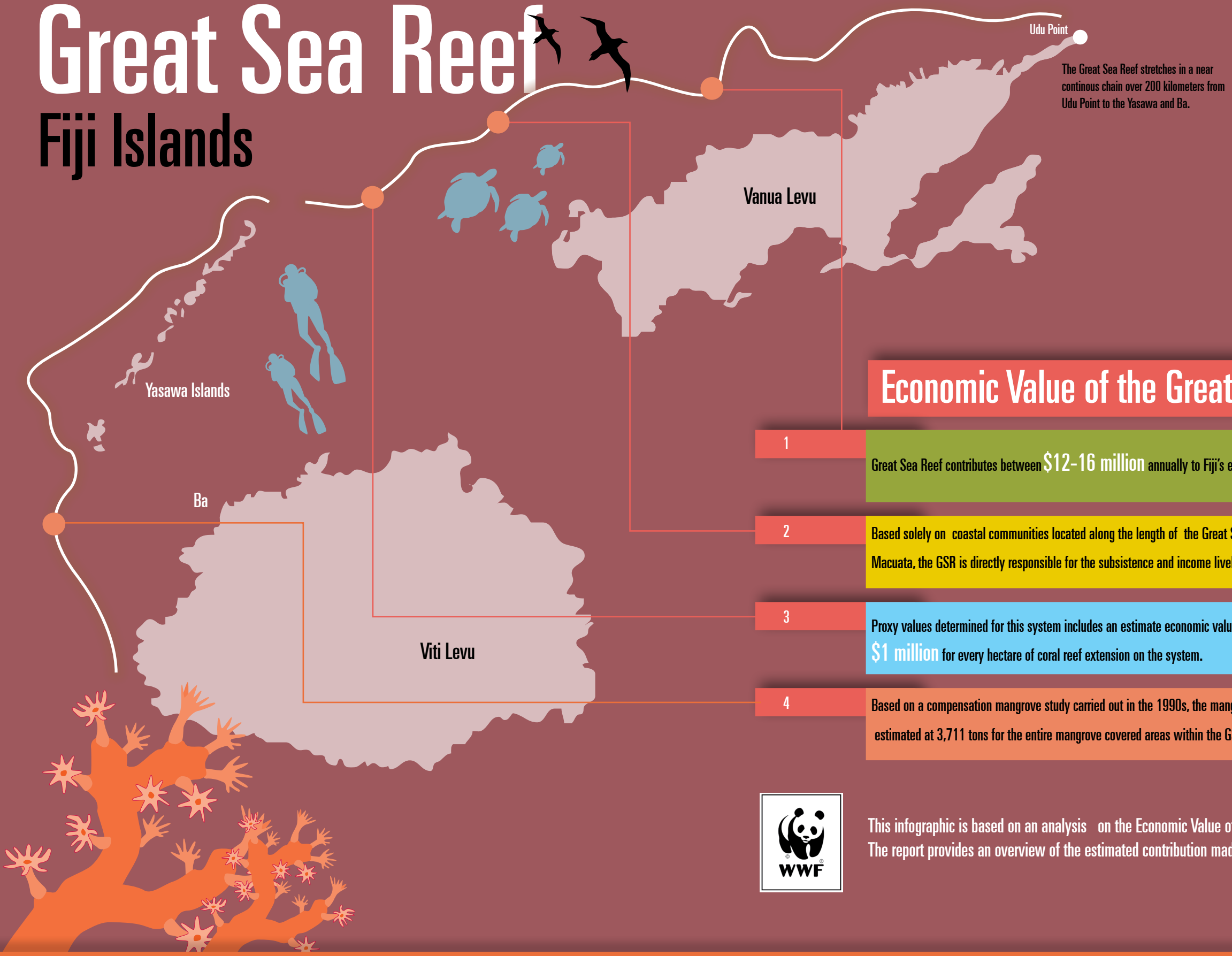
Figure 1: Fiji's Great Sea Reef



¹Jenkins, A., et. al. (2006).

Great Sea Reef

Fiji Islands



The Great Sea Reef stretches in a near continuous chain over 200 kilometers from Udu Point to the Yasawa and Ba.

Economic Value of the Great Sea Reef


- 1 Great Sea Reef contributes between **\$12-16 million** annually to Fiji's economy through the inshore fisheries sector.
- 2 Based solely on coastal communities located along the length of the Great Sea Reef within the provinces of Bua and Macuata, the GSR is directly responsible for the subsistence and income livelihoods of **1/10 of Fiji's population**
- 3 Proxy values determined for this system includes an estimate economic value of **\$47.5 million** or roughly **\$1 million** for every hectare of coral reef extension on the system.
- 4 Based on a compensation mangrove study carried out in the 1990s, the mangrove related fisheries annual production is estimated at 3,711 tons for the entire mangrove covered areas within the GSR boundary, translating into **\$19.2 million** annually.



This infographic is based on an analysis on the Economic Value of the Great Sea Reef compiled by WWF-Pacific. The report provides an overview of the estimated contribution made by the Great Sea Reef to Fiji's national economy.

Design by Kalo Williams / WWF-Pacific

Figure 2: Economic value of the Great Sea Reef



The findings of the survey highlighted the value of the reef, not just for those with direct access to it, but for the people of Fiji, who rely on marine resources and productive fisheries as sources of food, income, employment, foreign exchange, and cultures. The reef, with its high biodiversity count, serves as the nurturing grounds for unique marine biodiversity found only in Fiji.

A subsequent desktop study in 2014 by WWF² found that, in fact, the Great Sea Reef is responsible for the subsistence and income livelihoods of one-tenth of Fiji's populations. Furthermore, it contributes between \$FJ12–16 million annually to the country's economy through the inshore fisheries sector (*see Figure 2*).

However, as far back as 2004 and, despite the relative intactness of the reef and high levels of biodiversity, there was growing evidence of threats to the health and integrity of the reef. The Great Sea Reef fringes coastal areas of many sugar cane and pine plantations as well as the growing townships of Labasa, Rakiraki, Tavua, and Ba. Four of the six major rivers in Fiji (Labasa, Dreketi, Ba, and Nadi) drain into the Great Sea Reef. Parts of the reef were also fished commercially for live reef fish, beche-de-mer, and trochus. The most damaged sites in terms of siltation, rubbish, and high fishing pressures were observed around Labasa. Commercially important fish were found in very low numbers and considered to be small in size.

²WWF (draft 2013).

Several threats were identified by the survey team and communities:

- Over-fishing and poaching by illegal fishers.
- The use of small-mesh fishing nets (regulated three inch mesh size).
- Fish poisoning – an old fishing technique which uses the root of a coastal plant 'duva' (derris plant).
- Use of hookah for beche-de-mer collection.
- Siltation of near-shore environment caused by erosion and upland activities, especially near Malau timber factory.
- Dredging of sand for construction purposes at Mali Passage.
- Development activities such as drainage of ballast water by large vessels in Nadamu Passage.
- Untreated waste water from factories and Labasa town.

On learning of the size and significance of the reef, the then Tui Macuata, Ratu Aisea Katonivere, Paramount Chief of Macuata Province, determined that immediate action was needed to protect and conserve Cakaulevu. Already a marine conservation advocate, and having noted concerns about diminishing fish catches, Ratu Aisea requested WWF, USP, and the Fiji Locally Managed Marine Areas network (FLMMA) for assistance.

PROTECTING CAKAULEVU EVERYONE’S BUSINESS

Threats to the Great Sea Reef include not only direct threats from unsustainable fishing practices, but other land-based threats such as soil erosion from unsustainable land use and pollution from farm run-off and from urban and industrial waste. These issues must be addressed together if real change is to be made.

Ecosystem-based management emphasises the connectivity between people and their natural environment and works across all components of the system, including forests, freshwater, and marine environments. This holistic approach recognises that one system cannot be treated in isolation because they are all linked. For example, forest soil filters rainwater, which feeds into freshwater bodies and flows as clear water into the ocean.

Similarly, from a human perspective, there must be recognition of the economic, social, spiritual, and cultural importance of natural resources for local inhabitants, as well as of people’s own aspirations for progress.

WWF believes that supporting an ecosystem-based management approach can help communities to sustainably manage their natural resources while ensuring livelihoods and ecological/environmental services are not compromised.

Ecosystem-based management requires identifying and understanding the different players, different territories, and different aspirations of the people. In the case of Fiji, different tikina (groups of villages/districts) have fishing rights over particular areas (qoliqoli³) and these are managed according to the village chiefs and decision makers.

Cakaulevu, thus presented a mammoth challenge: how to effectively manage 200 km of reef across four provinces of Fiji where everyone is quietly managing their own qoliqoli in their own way, without benefit of any significant funding over a long period of time.

Following initial discussions, the decision was made to start “small” and to work on only a part of the Great Sea Reef through the customary boundaries that were already in existence, that is, in the case of Macuata Province, the Qoliqoli Cokovata.

The Qoliqoli Cokovata is the “joint” qoliqoli areas of the Macuata Province districts of Dreketi, Macuata, Sasa, and Mali. Traditionally, the Qoliqoli Cokovata is under the oversight and jurisdiction of the Tui Macuata (the Paramount Chief of the Province). The Qoliqoli Cokovata covers a land area of approximately 2,064 km², with a total marine area (or qoliqoli) of 1,344 km². The site encompasses 5,000 people living in 1,700 households in 40 villages and settlements located on the mainland of Vanua Levu and three outlying islands, Mali, Kia, and Macuata-i-wai within their qoliqoli. Also included within the boundaries of the Qoliqoli Cokovata is a number of cane farming homesteads and settlements⁴. Approximately 75% of households in the area derive an income from the extraction of natural resources.

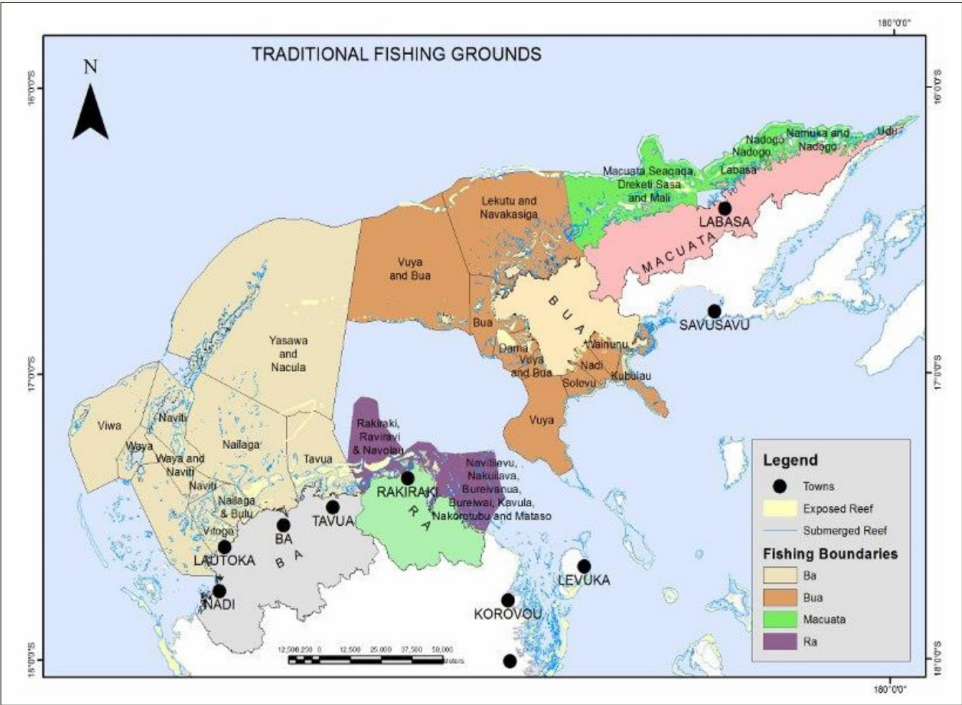
Given the diversity of stakeholders and the types of threats identified, it followed that multi-pronged management approaches would be needed.

From the earliest stages, there was clear recognition of the imperative role that customary governance would play in the success, or otherwise, of the management initiative. These pre-existing structures and relationships were the binding force in decision-making and the qoliqoli owners were able to appreciate the value in working together as one unit when it came to conservation of their collective marine resources.

The initial management focus was thus on building capacities of communities to understand the systems and processes and to make their own decisions on natural resource management through changing behaviour, policies, and systems.

A key feature of the ecosystem-based approach for the people of Macuata Province has been the recognition that the protection of the reef is everyone’s responsibility. Whether you are directly fishing off the reef, whether you are a wholesaler purchasing fish for the hotel market, or whether you are a sugar cane farmer — everyone has a role to play in ensuring the long-term viability of the Great Sea Reef. Understanding these different “roles” and impacts of activities, and learning from and adopting tested best practice has been essential in developing sound management plans.

Figure 3: Traditional fishing grounds along the Great Sea Reef.



³Qoliqoli – traditional/customary fishing grounds.
⁴Tamata, L. (Internal Report 2017).

TOOLS AND APPROACHES BEYOND SMALL TABU AREAS

The approaches and tools in management of the Great Sea Reef have evolved as understanding of the science and of drivers and barriers has grown. In addition to establishing Marine Protected Areas (MPAs); providing training and capacity; and enforcing licensing and other control mechanisms, focus is turning to identifying alternative livelihoods; marketing sustainably harvested seafood; and improving processing and handling along the supply chain to maintain high value fish for the end user. This market transformation relies greatly on forging real partnerships with the private sector. At the same time, there is even greater need for coherence within the communities and for willingness to work together.

Marine Protected Areas – the tabu system

The first step in addressing management of the Great Sea Reef by the people of Macuata was the establishment of a network of MPAs or tabu sites in the Qoliqoli Cokovata, in 2004.

In 2004, a workshop organised by the FLMMA network, with joint funding from USP and WWF, brought together community leaders, traditional fishermen (Gonedau), traditional heralds (Matanivanua), traditional religious advisors (Bete), traditional warriors (Bati), village headmen (Turaga ni Koro), tribal leaders (Turaga ni Mataqali), and other members of the community. Participants, who had been fishermen for most of their lives, had an in-depth knowledge and understanding of the fishing areas and of the threats to their fishing grounds, and the workshop resulted in the development of a Management Plan for Dreketi, Macuata, Sasa, and Mali.

The Fiji Locally Managed Marine Area Network (FLMMA)

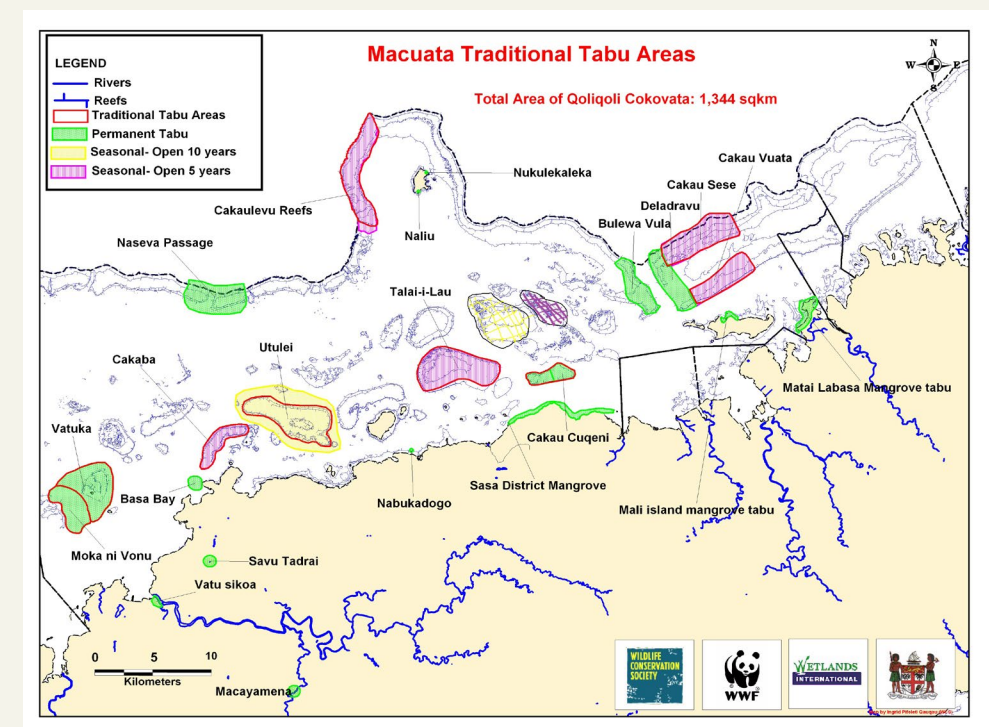
FLMMA is a network of community-based marine protected areas, established mainly through traditional tabu, which aim to revive an area's biodiversity by restricting certain activities within the area. FLMMA has been active in Fiji since 2001 when it was first trialled by USP and others. FLMMA was established as a registered entity with Fiji government endorsement in 2004. As at April 2017, 466 no-take zones have been designated by 135 qoliqoli covering an area of 79% of Fiji's inshore fisheries.

The management plan outlined a series of protected areas (referred to as tabu areas) with specific protection periods for each area. Fishing quotas were stipulated, and environmentally harmful fishing practices were banned. WWF, USP, FLMMA, and the Fiji Department of Fisheries helped facilitate the development of new regulations. Implementation of the management plan involved a series of capacity building and training activities to equip the community to manage its resources.

In 2012, the MPA boundaries were redefined based on both scientific and traditional knowledge and an understanding of communities' income and livelihoods.

Scientific knowledge was ascertained from marine biological surveys which considered biodiversity, spawning areas, fish abundance, types of fish, and endangered fish species. A socio-economic survey also helped confirm which marine areas to protect that would not adversely impact on the income and livelihoods of community members. As a result, new areas were identified as being biologically significant areas which communities agreed to conserve (*Figure 4*).

Figure 4: Traditional tabu areas in the Macuata qoliqoli cokovata



Tackling Poachers in the District of Mali

One of the major challenges for managing MPAs is poaching, with people from neighbouring areas taking fish from the more abundant MPAs.

“The poachers are an additional problem. While we set up our marine protected areas to make sure that we have a continuous supply of fish, they creep in and steal from us,” says Ratu Meli Bogiso, Traditional Head of Mali District.

For the small district of Mali, it is all-important that their marine resources are protected as the land is too rocky and barren for agriculture. The fish resources enable people to earn incomes for building homes and educating their children. Guarding the bounties of their qoliqoli is therefore considered a matter of survival.

Although community fish wardens have been identified and trained by the Department of Fisheries, they cannot do their job of enforcing MPA rules without tools and support.

To address the issue, the people of Mali district have built a watchtower, which sits on a hillside, overlooking their fishing area and provides added visibility for surveillance. Fish wardens are stationed on a roster basis at the watchtower that gives them a bird's-eye view of the fishing grounds and MPAs. The fish wardens are equipped with mobile phones, a fuel quota, and other related equipment to help deter poachers.

The watchtower was built with the support of WWF and the people of Australia through the Department of Foreign Affairs and Trade.

Adapted from: “A Bird's Eye View Over Illegal Fishing”. WWF Media Article, 22 September 2014. <http://www.wwfpacific.org/media/news/?229470/A-Birds-Eye--View-Over-Illegal-Fishing>

Turtle Monitors – from hunter to guardian

Five of the seven species of marine turtle occur in Fiji. These are the green (*Chelonia midas*), hawksbill (*Eretmochelys imbricata*), leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), and olive ridley (*Lepidochelys olivacea*) turtles. The Great Sea Reef is an important foraging and nesting area for the turtles.

The turtle was traditionally used for ceremonial presentations and hunted by the more elite of fishers. However, the use of the outboard motor made the species accessible to more fishers and this has hastened the decline of the species in Fiji waters. Concern over this decline led to the Fiji Government placing a series of bans on turtle harvesting commencing with a one-year ban in 1995. This was followed by a three-year ban from May 1997 to December 2000, and a subsequent amendment to the Fisheries Act in 2004, which provided for a moratorium, effective from February 2004 until 31 December 2008, on killing of turtles; digging and poaching of eggs; and all sales of turtle flesh and shell. The amendment also included a provision for exemption from the moratorium for take for traditional purposes. A ten-year Moratorium is now in place (2009–2018).

Despite the government policies, it was evident that hunting continued and there was little enforcement at the village level. Recognising this, WWF, working with the Pacific Regional Environment Programme (SPREP) and Vanuatu's Wan SmolBag, established the “Dau ni Vonu”, a network of turtle monitors to assist with awareness raising, monitoring of turtles, and enforcing the “no-take” rules within their fishing grounds. The programme was trialled with the Macuata Qoliqoli Cokovata and Bua communities in 2010.

Most of the turtle monitors were once turtle hunters and have been convinced of the need to take action to bring back turtle numbers and educating others to do the same. The work of the turtle monitor requires a great deal of dedication and spirit. Particularly in the early years, the Dau ni Vonu, who were often younger members of the community, experienced challenges in changing mindsets and attitudes, often viewed with bewilderment or scorn when suggesting keeping the turtle off the menu.

“The work of a turtle monitor isn’t easy...you have to face your elders, extended family and relatives and challenge their long held values and habits. And when you espouse a value that conflicts with long standing traditions one is regarded as ‘viavialevu’ or arrogant and sold up [sic] to Western concepts and beliefs.” Akuila Were, Turtle Monitor, Galoa and Yaqaga Islands, Macuata [from an interview in 2013].

Other challenges for the monitors is the geographical distances they need to travel and the related costs of transportation.

Despite the challenges, the turtle monitors persist with their task with singlemindedness.

The Dau ni Vonu programme has successfully helped raise awareness and almost completely reduced turtle hunting within the MPA communities. In 2013, the turtle monitoring network was introduced to the Sawaieke district on Gau island. The community, having observed and heard testimonies from their traditional kinsmen (tauvu) in Vanua Levu, was inspired to do the same for their own fishing grounds. The network has grown to 30 turtle monitors who are endorsed by their island councils and it remains a flagship of community-based marine conservation in Fiji.

“I am happy to see the change. Unlike before when I would see many rush to the nesting sites to raid it for eggs, it is changing.” Turtle Monitor reflecting on turtle conservation measures.

Sustainable Fisheries – setting smarter limits

Amid growing concerns in Macuata regarding declining fish populations, WWF commenced a 12-month Length-Based Spawning per Recruit (LB-SPR) survey in 2014 on 20 commercial target species. This information allows the setting of catch sizes that will be effective in enabling continued population growth.

The results of the survey were presented to representatives of the Qoliqoli Cokovata in 2016 and the Kasala (*Epinephelus polyphekadion*) or Camouflage Grouper fish was identified as a target species for urgent management action. The communities have decided to establish a ban (within the Qolioqoli Cokovata Macuata) on all harvesting of this fish for a one-year period to allow it time to recover. Following that, regulations on catch size will be imposed and there is hope that within a period of two to three years, the species will recover to a more robust population size.

To support enforcement of the ban, new licensing conditions are being introduced for those fishing within the waters of the Qoliqoli Cokovata to be managed by the Department of Fisheries. Under the licensing agreement, catch return forms will need to be submitted for monitoring of the fish stock. The Qoliqoli Cokovata Macuata are one of the first traditional custodians of a fishery ground to allow the Department of Fisheries to take a lead role in the issuing of licenses rather than the qoliqoli owners dealing directly with the fishers, which is the general practice in most of the other qoliqoli. This is a mutually beneficial arrangement, ensuring that the Department of Fisheries has responsibility for vetting all fishermen by checking their compliance with marine safety codes, their catch data, boat master license, and safety equipment. The Tui Macuata then receives recommendations based on this technical/legal assessment before giving his consent.

“We are blessed to witness this event, and to be part of history in contributing to inshore fisheries management especially in the province of Macuata,” Laitia Tamata, WWF.

Raising the Fish Value – improving postharvest handling

To attract higher prices from premium markets such as hotels and resorts, fishers must be able to guarantee the quality of their fish. The obvious answer is to place freshly caught and cleaned fish directly on ice and keeping it as cold as possible until it reaches the buyer.

However, this does not always occur in practice. Out on the smaller islands, ice is seldom easily available. If ice is available, the quality of the ice itself may be questionable. Fishers are also often reluctant to carry large containers of ice, claiming that these are heavy and eat into their fuel budget. Instead, they choose to cover up the fish and rush the catch to Labasa town, where it is sold at nominal rates to a limited market.

As part of its Sustainable Seafood Project, WWF is coordinating a series of training initiatives in post-harvest fish handling to teach fishers correct and hygienic fish handling and storage techniques to help raise the market value of the fish. While emphasis is on maintaining the “cold chain” by using ice, fishers also learn to use brining at sea (which involves gill-gutting the fish and dipping it in a saltwater-ice slurry) for journeys of under six hours.

The lower income from low quality fish means that fishers tend to try to increase their catch in an effort to make a profit. The workshops aim to show fishers that greater catches are not necessary and that they can “fish smarter rather than harder” by taking on board good handling practices.

In parallel with this training, WWF is working to connect chefs and hoteliers and restaurant businesses with the fishers to provide a consistent market for sustainably caught, high quality fish.

“As they improve their fish prices with good handling practices, they will reduce the pressure on fishing because they are earning more from the same sizes of catch. WWF is emphasising that you don’t have to necessarily fish harder, just smarter.” Francis Areki, WWF.

Ice plays an important role in proper post-harvest seafood handling practices.



© Vilisite Tamani / WWF-Pacific

Sustainable Seafood – a reef-to-resort approach

Enabling communities to earn more from a reduced level of fish harvest is one possible approach towards achieving sustainable fisheries management. The challenge is in identifying viable ways to achieve this.

A partnership between WWF-New Zealand, WWF-Pacific, Le Cordon Bleu New Zealand Institute, the New Zealand Aid Programme, and hotel owners is exploring some options. Through the partnership, WWF provides Le Cordon Bleu chefs and trainers with an understanding around the concept of sustainable seafood sourcing, and training in utilising local seafood. Le Cordon Bleu in turn, provides training to Fiji chefs to upgrade their culinary skills with the aim of adding value to the seafood being prepared and sold in hotels and high end restaurants. The training also focuses on fine tuning chef skills in the art of handling, filleting, storing, and portioning specific local species of fish, including freshly caught whole fish. Chefs are from local participating hotels, which have expressed interest in encouraging more locally sourced and sustainable seafood.

Hotels and resorts have often been reluctant to purchase locally sourced inshore fish due in part to health and safety concerns. Limited knowledge and experience regarding using local fish species in cuisine also contributes to this reluctance. The chef training initiative hopes to increase demand for sustainably produced local fish species and thus provide more reliable income for fishers.

A recent beneficiary of the programme is 28 year old chef, Losevati Sewale from Macuata, who has acquired two certificates in French cuisine from the prestigious culinary training programme. Losevati is a little different from previous trainees on the programme – she hails from a smaller, boutique resort, is the first woman to participate in the programme, and is from Macuata province. She is now putting her new skills to good use, producing creative dishes using food sourced from her own community fishing grounds. She states that such programmes would not be possible without the encouragement, involvement, and active support of the resort owners and management.

Upskilling local chefs in this manner provides an opportunity to showcase seafood derived from sustainably managed fishing grounds and to potentially open the doors to new markets in sustainable culinary tourism, thus generating greater income from the same fish.

Losevati Sewale (middle) at her graduation ceremony in Fiji, with Le Cordon Bleu NZ’s Robert Oliver (left), and Jenny Jenkins (right)



© Raxai Valouu / WWF-Pacific

Exploring Alternatives to Fisheries – support through microfinancing

Many coastal communities have traditionally been almost completely reliant on fisheries for their livelihoods and income generation. Increasing education, medical, and transport costs place increasing pressure on fish stocks. Identifying alternative income-generating initiatives that reduce reliance on fisheries is therefore an imperative for many small communities.

WWF has established a microfinance revolving fund scheme with the aim of providing start-up funds for small businesses in chicken farming, piggery, bee-keeping, pineapple farming, and canteen sales of small goods. Whilst the impact on overall fisheries management is yet to be established, there are some positive indications of women in the Qoliqoli Cokovata becoming more independent and starting up successful micro businesses, better able to support everyday family needs and overall contribute to household income and better livelihoods. The fund works on a loan system and to date, 80% of recipients were repaying their loan on time.

Rufina Naivalu of Sasa has used a small loan to help grow her pineapple farm from a few beds to a thriving income generating business that employs several workers.



© Tui Mareau / WWF-Pacific

Women in Fisheries – building a business approach to small-scale fisheries

Women in coastal communities play a major role in providing families with daily protein through coastal fishing and gleaning. They have not generally been involved in the retail aspect of fisheries.

An initiative is currently under way in the districts of Macuata and Sasa to strengthen the capacity of women to participate and engage in domestic fish and seafood market opportunities. Twelve women from the two districts have received financial literacy and business development training to help establish small businesses in fish and seafood retailing.

The small retail businesses are involved with selling fish in the nearby Labasa market and to Suva through middlemen. There is hope to sell to the higher end market of resorts and hotels, however, more sustainable fishing practices need to be demonstrated and quality handling and storage standards met before fish from the area will be acceptable by hotels. The business training, which is supported by the Northern Development Programme, WWF, and the New Zealand Aid Programme, also focuses on building

awareness on sustainable fishing, allowable limits, and other standards.

Ms Vilimaina Nakete, one of the beneficiaries of the initiative, said that being involved in the fish retail business is an empowering experience for women and has also opened her eyes to some of the unsustainable practices involved in the fish trade within her district.

“Fishermen are still bringing in undersized fish but...I have decided not to buy undersized fish as it will continue to encourage the practice. It’s not good for business and we have to think about our grandchildren as well; I want them to enjoy fish to eat and still be able to sell fish for income,” Vilimaina Nakete, Seafood Retailer.

Greening Sugar Farming – trialling a ridge-to-reef-approach

Fiji’s sugar industry has been at the heart of the country’s political and socio-economic history for the past 125 years. However, it has also impacted greatly on the country’s land and marine environment, not least in the Qoliqoli Cokovata, into which Labasa’s Qawa River drains.

Water pollution from chemicals used in cane growing, sedimentation through soil erosion, and waste from sugar production not only threaten the biodiversity of river systems and coastal areas but the cultures and livelihoods of communities that rely upon them.

Research into climate change impacts suggests that there will be more challenges for the Fijian sugar industry resulting from increases in the frequency and intensity of floods, droughts, and tropical cyclones. Cane farmers in Fiji are some of the poorest groups in the country and the situation has been worsening. In addition, increasing input costs for the sugar industry further impact negatively on the socio-economic situation.

In August 2014, WWF commenced a partnership with Bacardi Limited, the world’s largest family owned spirits company, to establish two model sugar cane farms with the aim of reducing the ecological footprint of cane production on coral reefs while potentially finding niche global markets for Fiji’s sugar by working towards certification with Fair Trade and Bonsucro.

“While we employ conservation measures at sea, it is imperative that sustainable land management practices are also carried out, acknowledging the ridge to reef approach, that whatever happens on land affects efforts at sea,” Vinesh Kumar, WWF.

The two model farms are at Korotari, in the upper catchments of the Labasa River and at Waiqele, just outside Labasa town. The farms focus on incorporating a number of practices designed to green the sugar farming industry and potentially reduce pollution of the river and marine environment.

These practices include, in part, putting a stop to burning cane trash, and reducing the use of inorganic fertilisers and chemicals. Land is ploughed only

where necessary, and vetiver grass is being planted to prevent erosion into rivers and streams that wind their way down to the sea. Manual weed control is being trialled (as opposed to use of weedicide) and leguminous crops such as beans and lentils are planted to revitalise soil fertility by fixing nitrogen in the soil. Farmers are also able to earn supplemental income from the sale of these crops.

The scale of farming at the two model farms are on the extreme ends of the scale, one producing 500 tonnes while the other only 150 tonnes of cane, parameters within which farms with a similar level of production can relate to.

WWF hopes to use the lessons from the two model farms to encourage other farmers, particularly those farming near rivers and creek systems, to engage in a collaborative effort to protect the Great Sea Reef and the food security of the hundreds of livelihoods that depend on it.

The Sustainable Sugar project seeks to green the sugar farming industry and potentially reduce pollution of the river and marine environment.



© Theresa Fox / WWF-Pacific

LESSONS LEARNED

Building on Existing Systems of Governance – the strength of culture and community

At the core of management and conservation of the Great Sea Reef is the intrinsic and cultural connection that binds the people to their ocean and marine environment. No amount of government regulation or ecological understanding alone could have wielded the level of enthusiasm, commitment, and drive that has been shown

by the people of the Qoliqoli Cokovata in the last decade. The traditional management system of the qoliqoli is a web of intricate relationships that has tied the people together through history, tradition, and culture and it has remained in place through the years.

Leadership, rule-making, enforcement, and penalties are conducted as part of the system and the focus on protecting Cakaulevu has perhaps “revived” a certain pride among the people in their qoliqoli area. It is this collective pride that has enabled enforcement of regulations and introduction and exploration of innovative conservation tools.

Transparency and Clarity

The task of managing Cakaulevu relies on the strength of relationships and networks. These relationships in turn, are dependent on mutual respect, trust, and transparency.

Transparency and clarity on all aspects of the management plan, particularly with regard to income and expenditure, is essential to ensuring that all stakeholders have confidence in the initiative and in the leadership. Given that the relationships in the Qoliqoli Cokovata are primarily through traditional ties, the introduction of a monetised system into the equation (e.g. in the form of project funds) carries with it risks of misgivings and questions from among the community about the use and equitable sharing of the funds. If not managed, this can lead to dissent within the community and unnecessarily detract from the focus on conservation and management.

Addressing this from the very beginning with clear lines of communication and accountability is essential. For the Macuata Province, the Qoliqoli Cokovata Management Committee is the key body with responsibility for overseeing management of all matters relating to the collective management of the qoliqoli. There is potential to strengthen the role of this body to manage finances.

Building Resilience and Preparing for Change

The onslaught of Cyclone Winston in 2016 was a stark reminder of the vulnerability of small coastal communities. Cyclones, storm surges, erosion, droughts, and climatic changes are constant threats to the sustainable development of such communities. When communities are focused on responding to the impacts of such events, conservation efforts will most likely take a low priority.

Conservation efforts and initiatives must take into account such risk factors and consider how resilience may be built into the programmes. In the case of the MPAs, the process of managing the tabu areas could be assessed in terms of policies for temporary opening of areas if there are cases of food shortage.

Several climate change adaptation and resilience initiatives are being rolled out across Fiji by WWF in partnership with USAID. These include food preservation and storage techniques to ensure that coastal communities do have access to food during times of disasters. An erosion control mechanism based on woven coconut fibre is also being trialled in the Yasawa islands and in Ba to protect eroding coastlines and riverbanks as part of these initiatives.

LOOKING TO THE FUTURE

Seventeen years have passed since the Paramount Chief of the Province of Macuata and representatives from the Qoliqoli Cokovata first conceived the plan to protect their great reef for future generations. While there have been no further comprehensive scientific assessments of the reef biodiversity, anecdotal evidence suggests that the initial conservation measures were indeed successful in the qoliqoli areas.

Perceptions surveys of the value and impact of the MPAs were conducted by WWF in 2009 and 2014 in the Qoliqoli Cokovata. The 2014 survey suggests that fishers view MPAs positively⁵. For example, 90% of the fishers consider MPAs as important to the future of their families and 98% see them as providing security in difficult times. In 2014, 91% of fishers indicated that an increase in fish size was attributed to MPA presence and 93% also suggested that fish populations have increased because of the MPA.

A study conducted in Mali in 2016 by the Marine and Coastal Biodiversity Management in the Pacific Island Countries (MACBIO) project, also found that there continues to be overwhelming support by the people for the establishment of MPAs in their fishing grounds, with most people seeing their MPAs as essential to food security for themselves and future generations⁶.

Despite these positive perceptions, the WWF study also found that community members believe that more benefits and far greater success would be achieved through more effective MPA management. This would tend to be confirmed by biological reef assessments conducted in Mali by WWF in 2014⁷ and through the MACBIO assessment. The WWF study found that the overall status of the finfish resources in the Mali back reef area has changed very little over the past 10 years while the MACBIO report shows depleted coral ecosystems in at least one of the sites. Additionally, a pilot survey carried out by WWF in 2015 found that at least three species of commercially targeted fish in the Qoliqoli Cokovata area are below the recommended 20% spawning levels. Significant management work is needed to increase the spawning level to a more sustainable state (i.e. above 30%).

The caretakers of Cakaulevu Reef are well aware that their aspirations for economic growth and development will impact on the well-being of their marine environment and they must remain ever-vigilant if they are to realise sustainable green growth. Increasing populations and economic development activities of mining, unsustainable farming, annual fires, logging, and urban spread are constant threats to the health of the reef and the surrounding ecosystem — as well as to the communities themselves.

Land-based mining and exploratory activities pose threats of erosion and siltation of rivers, leading to negative impacts on marine life. Deep Sea Mining (DSM) is a new area of interest with exploration licenses being granted for several sites in the vicinity of the Great Sea Reef. A report on the cost benefit analysis of DSM in Fiji has recently outlined that the risks involved in the DSM industry far outweigh the other positive contributions from industries such as fisheries and tourism, and recommends reconsideration of DSM as a development measure⁸. Issues such as this will need to be addressed through strong and decisive leadership and well-informed communities.

⁵Simpson et al. (2014).
⁶MACBIO (2016).
⁷WWF (Internal Report, 2014).
⁸Binney and Fleming (2016).

It is important to be reminded that the Macuata Qoliqoli Cokovata is but one of 26 qoliqoli that share Cakaulevu. Protecting the entire reef system requires that all qoliqoli owners are equally committed – and supported in their ventures.

Already, other qoliqoli communities have been motivated to take similar measures to manage their marine resources, and the lessons learnt from the Macuata experience have been instrumental in informing these initiatives.

The establishment of the Cakaudrove, Bua, Macuata (CBM) provincial level qoliqoli network further underscores the determination and drive of the current Tui Macuata (Ratu Wiliame Katonivere) and other provincial leaders to continue their commitment to the long-term sustainable management of their reef and its resources.

WWF has commenced work with qoliqoli owners in the Ba Province with the aim of supporting alternative livelihoods and building resilient communities in a changing climate. This is an opportunity to raise awareness of the Great Sea Reef and to help reduce pressures on fisheries. The experience of community members from Macuata and lessons learnt from implementing the different tools and approaches to marine conservation will help guide the work in new sites.

Organisations such as the World Conservation Society are working with qoliqoli owners along other areas of the reef, in Bua and Ra, while MPAs and/or Locally Managed Marine Areas (LMMAs) have also been established in many qoliqoli through the FLMMA network.

In the long-term, the protection and sustainable management of the Great Sea Reef will depend on effective planning and decisive leadership, supported by strong policies and partnerships and governance frameworks founded on existing traditional structures.

“The challenge is to ensure that we conserve some resources for our children and their children. We should take action now, and I am proud that we have been given the challenge to manage the third longest reef in the world.”
Ratu Aisea Katonivere, Late Paramount Chief of Macuata Province.

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