



Macuata Province Learning Site

MACBIO Introductory Field Visit to the Mali District



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In partnership with the International Union for the Conservation of Nature (IUCN), the Secretariat of the Pacific Regional Environment Programme (SPREP) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the Marine and Coastal Biodiversity Management in the Pacific Island Countries (MACBIO) project aims to strengthen the sustainable management of marine and coastal biodiversity in 5 Pacific Island countries – Fiji, the Solomon Islands, Vanuatu, Kiribati and Tonga.

The main goals for the MACBIO project include:

- To undertake economic assessments of marine and coastal ecosystem services, integrating the results into national development plans
- To support partner countries in setting up and expanding national protected area systems that are representative of existing marine and coastal ecosystems and habitat types, through the development and provision of a spatial planning framework for territorial waters and EEZs
- To mainstream and extend re-designed MPA networks using seascape-level planning, and to demonstrate effective approaches to site management, including potential payments for ecosystem services
- To adopt tried and tested concepts and instruments throughout the project countries and the wider Oceania region.

In order to support national efforts to acknowledge and replicate good management, the project aims to document existing management practices in each of its learning sites in the 5 partner countries. “Learning sites” were chosen over “pilot sites” since MACBIO believes in highlighting great examples of communities who have been recognized for their effective marine management approaches, in the hope that such practices may be replicated in other communities. Within Fiji, 2 learning sites and 1 integration site were proposed by national stakeholders, these include the Vanua of Navakavu, as well as the provinces Macuata and Kadavu.

The province of Macuata has long been acknowledged as one of the success stories in Fiji to develop *tabu* areas as no-take zones and generate economic benefits for the community as well as sustaining their marine resources for well over a decade. Hence, MACBIO was advised to include Macuata as one of the Fiji learning sites and plans to assist stakeholders in their efforts to document and celebrate this success. Together with partners from WWF and local communities the MACBIO team would like to document lessons learnt based on the contributions from practitioners and community members.

With the help of communities and based on what they wish to share, MACBIO aims to support efforts by current stakeholders to highlight some of the effective approaches the villagers of Macuata have carried out throughout the years, in relation to the management of their marine *tabu* area. National government and other stakeholders hope that successful approaches may inspire other communities to conduct similar management practices, leading to more resilient coastal and marine ecosystems, further contributing to adaptation required to compensate anthropogenic climate change.

MACBIO efforts in Macuata

A team consisting of 6 MACBIO staff conducted field visits to Macuata and in particular Mali District, from the 6th to the 10th of June, 2016. The team was accompanied by a WWF staff member during visits to the village. Macuata was proposed as a learning site by the Fiji Government since local communities and involved stakeholders have successfully collaborated on effective approaches for coastal marine resource management for more than 10 years. The aim of this visit was to gather stories highlighting successful management and general impressions about how communities felt about their *tabu* areas. In addition, the team observed some of the current challenges faced by the community and noted suggestions made on tackling these issues to further improve management.

Although Macuata Province is a success story at provincial level, Mali District was chosen as the first of several sites to be visited by MACBIO due to its recent, but well established Development Committee and the rather recent establishment of a network of six *tabu* areas.

A total of 4 villages were visited in Mali - Matailabasa, Vesi, Ligaulevu and Nakawaga before field work commenced, a meeting in the Provincial Office in Labasa Town was held with the MACBIO team, the Commissioner of the Northern Division (CND), the Fisheries Department, Community Centred Conservation (C3) and the Conservation Officer to discuss the aim of MACBIO's visit and to exchange the knowledge about the past work that was already done, mostly by WWF, in the last decade (See Appendix 1 for meeting minutes).

Introduction

Macuata is one of Fiji's 14 provinces situated along the north-western coast of the second largest island of Vanua Levu, consisting of 114 villages spread across 12 districts. According to the 2007 Fiji census, the province has a total population of 72,441 many of which reside in the main town of Labasa. The main industry the Labasa populace are engaged in is the agricultural sector, namely sugar cane farming. The local sugar mill is owned and operated by the Fiji Sugar Corporation (FSC) which was established in 1894 (Fiji Sugar Corporation, 2014) contributing to the national economy and providing employment to the people of Labasa.

The coast of Macuata is lined by Fiji's Great Sea Reef (GSR) which is known to be the third largest consistent barrier reef in the world. Hosting such a large reef system, Macuata is home to a diverse range of marine biodiversity (for e.g. corals, fish, invertebrates and seagrass beds). However, as a result, it has over time been exposed to increasing fishing pressures from residents and outsiders of Macuata, as well as to agricultural runoff from farming activities. Therefore, marine management approaches were introduced to maintain fish stocks and work towards achieving sustainability for future generations. Led and driven by the late Tui Macuata, Ratu Aisea Cavunailoa Katonivere and under the technical guidance from the World Wide Fund for Nature (WWF) South Pacific, 59 km² of the marine area in Macuata was established as protected zones (*tabu* areas) within the approximate 1,344 km² *qoliqoli* (WWF, 2013) (Figure 1) and a management plan was developed in 2004. In addition, the setup of these *tabu* areas in the province aims to contribute toward the country's national target of achieving 30% protection for Fiji's oceans by the year 2020 (WWF, 2013) set by the Fiji Government in 2005.

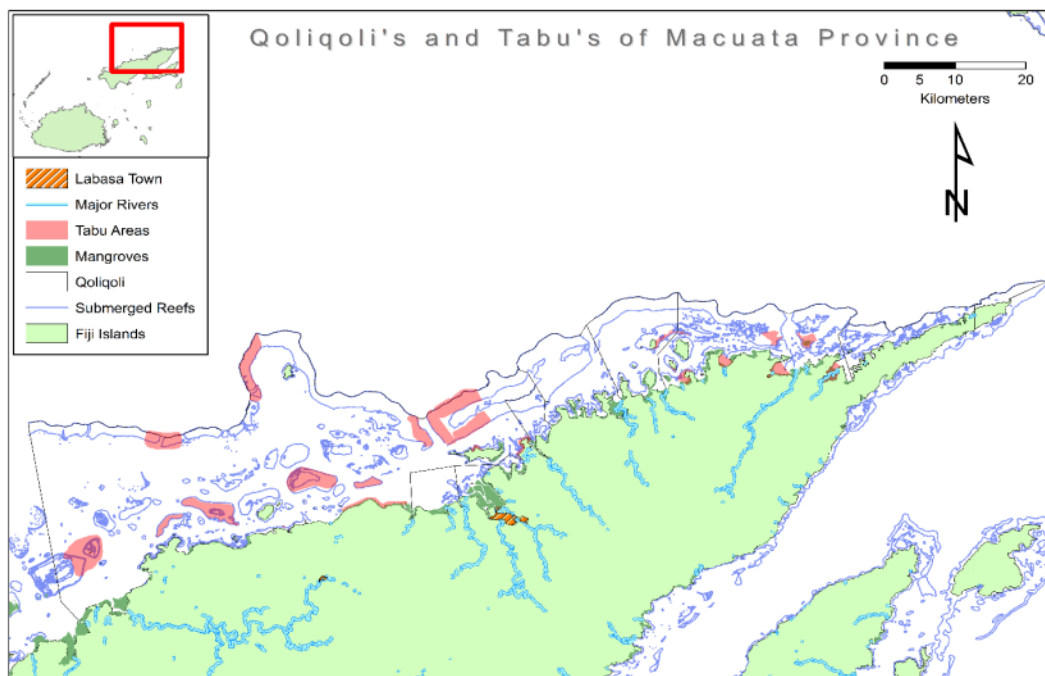


Figure 1. Qoliqoli and tabu areas within the Macuata Province

Qoliqoli Cokovata

Covering a total land area of 2,064 km² and a marine area of 1,349 km² (WWF, 2011), the Macuata Qoliqoli Cokovata (Figure 2) is located in the mid region of the northern coast of Vanua Levu. It is home to a population of 4,000 residents (WWF, 2011). This boundary consists of four districts – Macuata, Sasa, Dreketi and Mali, as well as the Yavusa Nabeakavu. Within these districts lie a total of 37 villages on the mainland together with 3 outlying islands of Macuata-i-wai, Kia and Mali (WWF, 2011). The people within the 4 districts retain custodial ownership over fishing grounds for part of Fiji's Great Sea Reef (GSR), one of the world's longest reef systems. Stretching over 150 km across the Province, the GSR is home to exceptional levels of marine biodiversity and endemism. The Qoliqoli Cokovata (**Error! Reference source not found.**) encompasses some of the largest *tabu* areas within the greater Macuata Province crossing the GSR comprising permanent and seasonal closure zones.

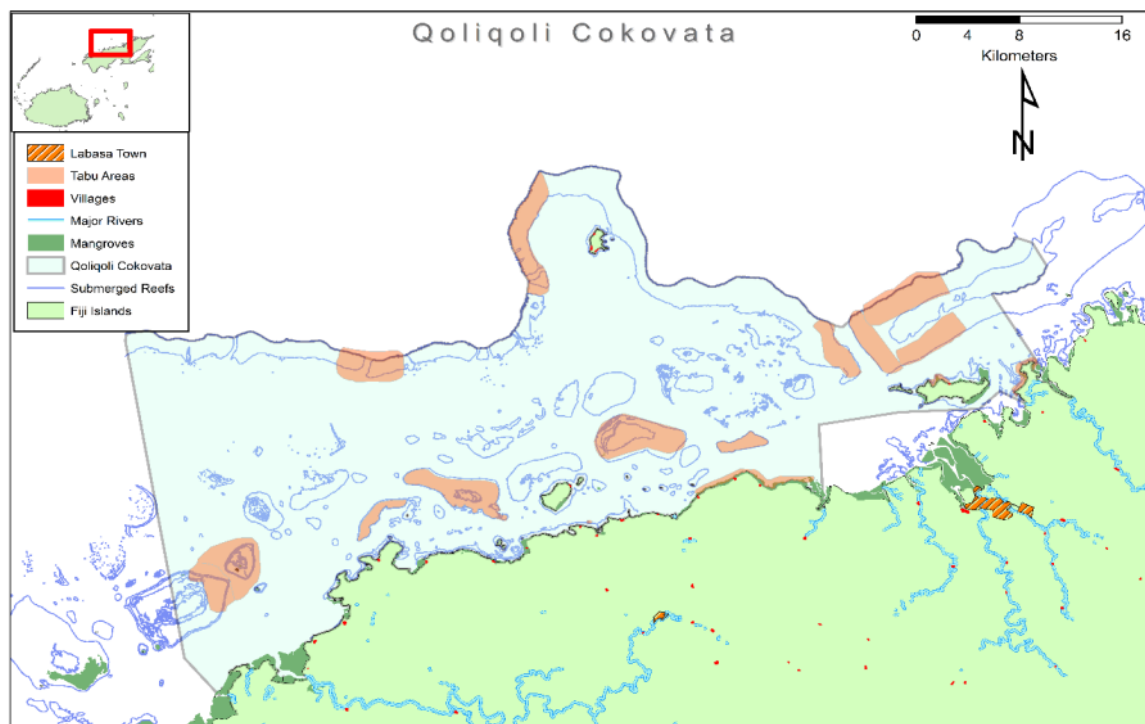


Figure 2. Tabu areas within the Qoliqoli Cokovata

Mali District

The Mali district is made up of 4 villages including Matailabasa, Vesi, Nakawaga and Ligaulevu which the team visited. Approximately 2 km from the coast on mainland Vanua Levu and part of the Mali District, Matailabasa is surrounded by sugarcane fields with a majority of residents being farmers. Vesi village is situated on the north eastern side of Mali Island, densely covered by mangrove forests. The village (like all other villages on Mali) is largely dependent on fishing for semi subsistence purposes. The only school on Mali is positioned in Ligaulevu, the smallest in population (Table 1), located centrally in the north on the island. Nakawaga, the largest of the 4 villages, lies west of Ligaulevu (Table 1). Assisted by the World Wide Fund for Nature (WWF), a watchtower was built on the north side of a cliff close to Nakawaga overlooking 4 of their *tabu* areas out on the reef and near the Mali Passage (Cakau Vuata, Cakau Sese, Deladravu and Bulewa Vula).

Village	Households	Population
Matailabasa	12	69
Nakawaga	27	118
Ligaulevu	12	55
Vesi	14	75

Table 1: Number of households and population per village (TNK Report 1st quarter 2016, Matailabasa, Nakawaga, Ligaulevu and Vesi)

Tabu Areas in Mali

Of the 15+ *tabu* areas in the Qoliqoli Cokovata, 6 were formed by Mali within the waters traditionally belonging to the Mali District (Figure 3). These 6 *tabu* areas although respected and accepted by all districts in the Qoliqoli Cokovata are primarily under custodial protection by Mali District. The first *tabu*, Cakau Vuata *tabu*, was established in 2004 and covers approximately 10 km² of the Vuata reef. The Cakau Vuata reef is a complex reef structure with sand and seagrass beds, larger and smaller reefs and stand-alone coral structures. Large portions of the Cakau Vuata are exposed during low tides.

Deladravu and Bulewa Vula *tabu* were established in 2010 through an initiative by WWF to protect *kawakawa* and *donu* (groupers) spawning sites. The Deladravu *tabu* is located east of Mali passage and covers the entirety of the Deladravu reef, approximately 9 km². The Bulewa Vula *tabu* covers approximately 7 km² of the Bulewa Vula reef, situated west of the Mali passage. The Cakau Sese *tabu* covers approximately 15.5 km² of the Sese reef, the outer most barrier reef beyond which the open Pacific Ocean is situated. It begins from the north western edge of the Deladravu *tabu* and extends approximately 7 km eastward. Large portions of the Cakau Sese are also exposed during low tide. As with the Deladravu *tabu* and the Bulewa Vula *tabu*, the Cakau Sese *tabu* was established in 2010 however not properly enforced until 2014.

The Mali mangrove *tabu* lies slightly west of Ligaulevu village and covers an area of approximately 0.8 km². The village of Matailabasa together with help from WWF established the Matailabasa mangrove reserve in 2010. This reserve covers an area of approximately 2 km². Although the reserve was due to be opened in 2015, it remained closed due to the efforts of the Mata ni Tikina Mali and the chief of Matailabasa.

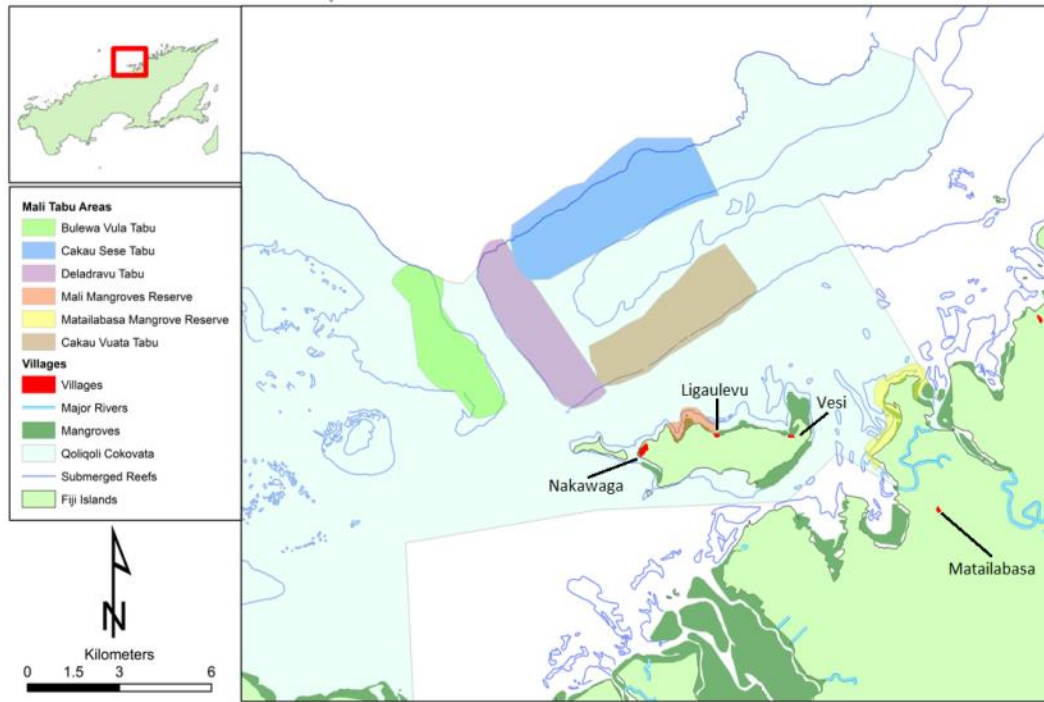


Figure 3. The 4 villages visited along with the 6 tabu areas in the Mali District

Objectives

- i. Consultations with key stakeholders and villages including Matailabasa, Vesi, Ligaulevu and Nakawaga
- ii. Informal discussions/interviews with community members on lessons learnt in terms of *qoliqoli*/tabu management and best fishing practices based on their experiences
- iii. Field visits to *qoliqoli*/tabu areas within the Mali District

Methods

MACBIO visited the 4 villages of the Mali district as part of the Macuata learning site from the 6th of June 2016 until 10th of June 2016.

Informal Interviews

The team carried out a number of informal interviews with men, women and youth within the 4 villages of Mali – Matai Labasa, Vesi, Ligaulevu and Nakawaga village (Figure 4).

Site Observation

Quick reef assessments were conducted via snorkelling at 3 different *tabu* areas within the Mali *qoliqoli* area (Figure 4). To get a proper overview of the condition of the reefs notes were taken of the general live coral cover, algae cover, fish abundance and diversity as well as indicators of pollution, fishing activities, breakage and coral diseases. Snorkelling surveys took place at different spots along the *tabu* areas Cakau Vuata and Deladravu in order to cover as much of the area as possible. The site visitation was always conducted during high tide.



Figure 4. Informal interview with a fisherwoman from Nakawaga village (left) and site observation of the Cakau Vuata tabu area (right).

Findings

The findings are divided into 2 parts: Interviews and Site Visit Observations.

INTERVIEWS

SUCCESS STORIES

The Mali District has been deemed by several stakeholders to be one of the key districts in the Macuata Province to take lead on the management of their marine resources. Although there are several aspects, which would make Mali a role model for other districts in the region, the few aspects listed below seem to be paramount in regard to their success.

WWF

The World Wide Fund for Nature (WWF) Pacific has been working within the Qoliqoli Cokovata since 1999 and was most likely a key driver towards the success of the province and in particular the Mali District. Through various activities, WWF managed to train and teach villagers about the opportunities and importance of community based resource management. This resulted in the formation of a group of fish wardens, *tabu* areas, alternative sources of income and action plans, etc. Several interviewees stated that WWF was paramount to how the people of Mali now treat their marine resources and stated that without WWF they would likely be living like how they did 20 years ago.

Strong Leadership

Although WWF played such an instrumental role over the last decade and a half it is perhaps the work by the Mata ni Tikina over the last 2 years that has really set Mali apart from other districts in Macuata and perhaps even Fiji. Since taking up the role of Mata ni Tikina, Mr. Seru Moce (Figure 5) has taken it upon himself to carry on and amplify the work that WWF began in Mali. It is primarily through the influence of Mr. Moce that all 6 *tabu* areas were closed again in 2013 without the possibility of reopening for special functions. Through carrying out awareness of marine and environmental issues in all of the villages several times a month, Mr. Moce together with the Mali Development Committee hope to keep the *tabu* areas closed for longer than 5 years such that the people of Mali will reap long term benefits. Mr. Moce is an instrumental figure in terms of resource management and one whose opinions and decisions are all in favor of the long term livelihoods of his people.



Figure 5. Mr. Seru Moce, the Mata ni Tikina of Mali (centered) with children from Ligaulevu village and a member of the MACBIO staff.

Strong Sense of Ownership

*“To take care of your environment, is to show your love to the future generation”
~ Mr. Saiasi (Turaga ni Yavusa)*

The people of Mali have always had a strong sense of ownership over their marine resources as they have always been highly dependent of their *qoliqoli* as a source of income and food. However, due to the increase in fishing pressure from outsiders over recent decades, the people of Mali have found that it requires a lot more effort to catch a decent catch. As a result, the sense of ownership over their resources has been amplified and is now one of the key drivers of Mali being subsequently vocal and protective over their resources.

Tabu Surveillance

“We should protect our tabu because it is not only for us fish wardens. It belongs to all of us.” ~Matthew (Fish Warden, Nakawaga)

Even though there are 20 trained fish wardens in the Mali District, the entire community keeps an eye on the *tabu* areas. Vessels entering the *tabu* area hardly go unnoticed and it usually does not take long for fish wardens to be made aware of poachers.

In addition to surveillance becoming a communal activity, WWF together with AUSAID sponsored the construction of a watchtower (Figure 6) which oversees four of the *tabu* areas. This watchtower, erected on the north face of a cliff next to Nakawaga Village, is used several times a month primarily on Thursday and Friday nights and allows clear and unobstructed view of the Bulewa Vula, Deladravu, Cakau Sese and Cakau Vuata *tabus*.

The combined efforts of the entire community and the added range of surveillance from the watchtower are instrumental in the success in the surveillance of the *tabu* areas.

Poaching

“Before, if you look out to sea on a Thursday or Friday night you will definitely see the lights of fishermen poaching in our tabu. It still happens now, but not as often.” ~Watisoni Morel (Fish warden, Nakawaga)

Perhaps the main issue or threat facing the *tabu* areas is the frequent occurrences of illegal fishing, both within the *tabu* areas and outside the *tabu* areas. However, due to increased efforts of the entire district, through increased surveillance, ownership and leadership the number of poachers around the Mali area has reduced over the past 2 years. The reduction of the number of poachers has in the eyes of many of the villagers been seen as a triumph and is evidence of their continued efforts paying off.



Figure 6. Watchtower near Nakawaga Village (left). Emosi Baiyanivalu, showing the way to the watch tower (right).

“When our watchtower was first built, the boys would go up 3 or 4 times a week and will almost always spot someone fishing in the tabu. Now the boys only spot fishermen in our tabu 3 or 4 times in a month.” ~ Emosi Baiyanivalu (Village elder, Nakawaga)

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Personal Views & Opinions on Tabu Areas

Personal opinions on the *tabu* areas were overwhelmingly positive. Not a single individual raised a complaint or criticized the existence of 6 *tabu* areas in their waters of the Qoliqoli Cokovata. Instead people addressed the *tabu* as an important aspect for food security for themselves and future generations and stated that if their *qoliqoli* was larger they would support the idea of having more *tabu* areas. This however, was not always the case.

Before the establishment of the first *tabu* area in 2004, many of the villagers were not keen on giving up a prime fishing location for the formation of a 5 year *tabu*. The benefits of the 5 year *tabu* on Cakau Vuata were apparently a prime instigator for the formation and acceptance of 5 further *tabus* around the Mali District. It has been quoted by a few interviewees that the success of the first *tabu* area is what convinced every villager in Mali of the importance of *tabu* areas as a source of food security for future generations.

Life Span for Tabu

Initial *tabu* areas in the region had a life span of 5 years and in some cases, the possibility of opening for special occasions. However, this resulted in a *tabu* area with a very low recovery rate. In 2013, due to a council decision by village elders and the Mata ni Tikina, it was decided that the *tabu* areas be “permanently” closed for 5 years-meaning that there is no possibility for opening for special functions. In addition to this, the Mata ni Tikina and several other villagers are now advocating for a long term closure of the *tabu* areas, whereby the usual opening after 5 years is abolished. The changes to the level of protection can be deemed a successful step towards long term benefits and management of the Qoliqoli Cokovata.

“Most people only see money. They see only the short term benefits of making a reef a tabu. They think, oh, we close the reef for 5 years and then we catch everything and sell it all. But what they should do is think long term. If a tabu is kept for more than 10 years, then they will start benefiting from spill over and maybe even new species will come.” - Watisoni Morel (Fish warden, Nakawaga)

“I see having a tabu is just like having a dalo farm. If I plant my dalo and harvest it prematurely I will get low yield. If I plant my dalo and harvest it after 1 year I will get high yield. But if I plant my dalo and leave it for many years I will get lots of dalo plants growing around it. My farm will grow.” ~ Viliame (Matailabasa)

Other Success Stories

Various other aspects can be deemed to be a success story or at least play a role in the success of Mali District. These include but are not limited to:

- **Willingness to learn:** Perhaps it is due to their dependence on marine resources that many of the villagers are motivated and inspired to learn about the ecology and biology of various marine resources. As a result, villagers were able to identify the linkages between different habitats of the Qoliqoli Cokovata and subsequently were able to zone out the *tabu* areas.
- **The congregation:** The church and its congregation are key platforms of communal decision making. The current minister at Nakawaga is passionate about protecting and preserving the environment for future generations and often spends time talking with members of the congregation about matters concerning the Qoliqoli Cokovata and alternative livelihoods.
- **Respect for the 4FJ movement:** Most interviewees discussed how the Mali Passage is a key spawning site for Groupers and that the Deladravu and Bulewa Vula *tabu* areas were put in place solely for the protection of the spawning sites. These same interviewees said that most fishermen in the Mali area won't target species of grouper during the months of June through September.
- **Mali Development Committee:** The Mali Development Committee was set up through assistance from WWF and aims at continuing and supporting their work after WWF reduces its efforts and/or leaves the Macuata Province.
- **Alternative livelihoods:** To reduce pressure and dependence on marine resources various stakeholders have over recent years offered assistance in founding various alternative sources of income. Some of these alternative sources include but are not limited to: Women's Club Canteen, apiculture, pine farming, mat and *masi* production and most recently seaweed farming.
- **Quotas:** In order to live by their motto "fish for the future", the women of Matailabasa have set up a quota system to help manage their resources. Each woman in Matailabasa is limited to catching no more than 20 fish within a 3-day period.
- **Fishing gear:** This rather coincidental management strategy allows for very selective fishing. Almost all fishermen in the Mali District are spear-fishermen and therefore only targeted individuals are being caught. This prevents the capture of undersized, unwanted or excess fish.

CHALLENGES FACED

Poaching

Poaching seemed to be the biggest issue that villagers saw as a threat to their *tabu* areas and to the overall decline in fisheries. Night diving in particular was said to have resulted in a number of problems including fish size declines, overexploitation and reef damage from anchoring within the *qoliqoli* and in the *tabu* areas. Fish wardens from the villages in Mali have volunteered their time in an attempt to prevent poaching in the *tabu* spots. These however, have not come without setbacks. For instance, boat engines of fish wardens are not fast enough to catch poachers fishing in their *tabu*. On numerous occasions, wardens head out in a 40 horse powered motor boat attempting to catch the perpetrators who usually make a clean get away in a higher speed outboard motor boat.

In some cases, poachers behaved aggressively toward fish wardens when confronted for trespassing, making it increasingly difficult to resolve the poaching problem. The Turaga ni Koro of Nakawaga village expressed a deep concern that wardens are in a constant battle with poachers but remained strong in protecting their *tabu*. "Sometimes it can get very dangerous. I

am really sad about people missing respect (for the *tabu*) but we (will continue to) fight for our *tabu*".

Moreover, wardens do not have the authority under law to prosecute anyone fishing in prohibited waters. They are only allowed to escort poachers to the mainland where they are taken over by the police and then later are prosecuted in a court of law. The penalties imposed vary with each case based on evidence given by the fish wardens

Perspectives from a Fisherman

Matthew is a 26-year-old fish warden from Nakawaga village who has spent 13 years of his life fishing in Macuata. He decided to volunteer to become a fish warden because he felt it to be his duty to help protect the *tabu*. The responsibility of being a fish warden in these parts (and perhaps likely in many places around Fiji) however, comes with its challenges.

Matthew reckons the village fishing grounds have been affected mainly by activity of night divers. As a fish warden, he mentions that he has been on the receiving end of threats from poachers who use spear guns and stones to chase fish wardens away when they get close to them. If poachers are caught fishing in prohibited areas, it is the duty of the wardens to apprehend them and transport them to the respective officials who will deal with them and issue fines when appropriate.

Despite the challenges of being a fish warden, he understands the importance of maintaining the *tabu* for the community's benefit. When asked about what he pictures fishing to be like in the future for the next generation, he pauses, smiles and says "I think that there should be enough fish for the future. This is under the condition that fishermen and women follow seasonal bans on *kawakawa*, *donu*, *varivoce* (and other species). We should protect our *tabu* because it is not only for us fish wardens. It belongs to all of us".

Most villagers interviewed claimed that the majority of the poachers are "outsiders" who have moved to Labasa to either catch for the national market or provide fish to the growing Labasa economy. To some, this is a "Pirate System". These outsiders are apparently told by fisheries officers where *tabu* areas are when applying for fishing licenses however do not respect the waters in which they fish. When asked why poachers do not respect the *tabu* areas and if respect can be taught to the poachers the answer was mainly, "it is how they were brought up; they were probably not taught to respect their own property when growing up. You can't teach them respect now but efforts should be made to teach their children respect."

Pollution and Land Runoff

Runoff from mainland Vanua Levu was considered to be another big issue that affects the health of their *qoliqoli*. According to a few villagers, the cultivation of sugar cane is a major industry in Macuata but the wastewater from the processing factories contains fertilizer, pesticides and other plant protection products, which is thought to potentially threaten the Great Sea Reef. This may explain the large amounts of *Padina* (brown algae) that dominate the Cakau Vuata *tabu* and the large amounts of *Sargassum* growing along the reef flat between Nakawaga village and Vorovoro Island. The yearly harvest of the sugar cane has been blamed for the aggregation of silt within the bay resulting in the smothering of the fringing reef.

Education

Parents in Mali send their children to boarding schools, mainly in Labasa. Despite free tuition for public schools, boarding fees need to be paid and such fees are paid for mainly through the sale of finfish and shellfish. To allow for continuous financial support, parents of children value the *tabu* areas as this is a source of recruitment for the fish that they depend on for money. Similarly, it has been suggested by various villagers that the cost for better education for kids is what is driving the poachers to go fishing within the *tabu* areas or to go fishing without their license. To one parent, the reality is simple - "At the end of the day we all want our children to go to a good school, how is better education financed? Easy, just catch a few bundles of *kawakawa* and you have enough money to pay the board for 1 term."

Need for More Background Knowledge

In most of the interviews carried out, conversations surrounding the importance of *tabu* areas generally circled back to food security for future generations and as a quick source of income during the opening of the *tabu*. These reasons were enough to drive the residents of Mali to view their *tabu* areas as a positive entity in their fishing grounds. However, the fact that a *tabu* or a healthy reef has far more benefits is either largely unknown or ignored by most. When the linkages between different marine environments and the behavior of certain organisms were described villagers seemed to take a genuine interest in learning more.

Other Challenges

Vulnerability to recent natural disturbances – Although Tropical Cyclone Winston posed no major direct threat to the people in Mali District in February 2016, it was expressed that the 2014-2015 drought caused problems with water supply and small scale farming (*dalo, yaqona*) practices within Macuata. This was adding pressure on fishing activities. Similar future weather and climatic disturbances leave communities concerned about the potential impact on their way of life.

Farming issues - Villagers from Vesi, Ligaulevu and Nakawaga have stated that they lack space and fertile soil to properly plant crops and extensively farm on the island, limiting them to fishing only. Others claim that there is little urgency to fish and farm at the same time.

Tabu monitoring and data sharing – Non-continuous monitoring of the *tabu* and non-*tabu* areas has made it difficult to determine whether the *tabu* areas are working. If such assessments were regular, poaching would further decrease and more community members may be convinced of its effectiveness.

Sole source of income – For most villagers on Mali Island, fishing is essentially the main source of earning a living. If fish stocks were to decrease dramatically, they would need to seek alternative sources of income. When asked about other ways to make money, should fishing no longer be sufficient in the future for her children, one mother passionately stressed the importance for her kids to be educated so they may have a chance to get a job in Labasa town.

Tabu surveillance – A pair of night vision binoculars donated by WWF was used to aid in night surveillance of the *tabu* areas from the watchtower close to the village. However, the binoculars have a limited range of 100 m. This makes it impossible to view even the nearest *tabu* (approximately 2.3km away from the tower). During the day, a pair of old binoculars was used for surveillance however these are now defective and deemed useless. The lack of proper binoculars is said to be the reason for the limited use of the watchtower.

SITE OBSERVATIONS

Cakau Vuata *tabu* area

Cakau Vuata was established in 2004 and covers approximately 10 km² of the Vuata reef. It is a complex reef structure with sand and seagrass beds, reef patches as well as coral bommies. Large portions of the Cakau Vuata are exposed during low tides.

The site visitation revealed a clearly algae dominated reef with a massive coverage of mainly turf and macro algae that could be seen all over the reef on abiotic substrate (rocks, dead corals and rubble) and made up more than 90% of the reef (Figure 7). Most of the extensive turf algae fields were defended and cultivated by the damselfish species *Plectroglyphidodon lacrymatus* (Jewel damsel) and *Chrysiptera biocellata* (Twospot demoiselle).



Figure 7. Deladravu tabu area. Corals overgrown with turf and macro algae.

Amongst the large patches of sand were relics of former large and healthy coral reef structures and bommies. These however have been overgrown to such an extent by various species of algae that there is near to no live coral coverage. Therefore, healthy coral colonies were rare or completely absent with only a few branching *Acropora* spec., Alcyoniidae soft corals, *Porites* spec. or *Lobophyllia* spec. whereas a relatively high abundance of Fungiidae made up the highest proportion of living corals. Some of the *Porites* colonies also showed clear signs of stress in the form of light spots and dead parts.

Fish abundance and biodiversity was low all over the area. Due to the lack of coral diversity few fish species could be found along the reef. As mentioned above the majority of fish consisted of

the damselfish species *Plectroglyphidodon lacrymatus* and *Chrysiptera biocellata* (Pomacentridae). The high number of these species can closely be linked to the high abundance of turf algae at this reef because they cultivate the algae within their aggressively defended territory.

Although several schools of juvenile herbivorous fish like parrotfish (Scaridae), surgeonfish (Acanthuridae) and rabbitfish (Siganidae) species were present in the seagrass patches, there was a lack of species diversity and larger fish. Some areas showed an aggregation of snapper (Lutjanidae) species and within the sandy areas rays (Batoidea) species were seen.

Furthermore, almost no invertebrate species could be found, except for a few sea cucumbers (Holothuroidea) and sea stars (*Linckia laevigata*, Asteroidea).

Deladravu *tabu* area

The *tabu* area consists of a broad spectrum of different habitat types such as sandy areas, reef patches, bommies, rubble fields (all towards the southern end), a seagrass area, a gentle seagrass slope (along the western side of the *tabu* area), a steep reef drop off (towards the northern end).

The reef in the southern part showed a high abundance of mainly young branching *Acropora* colonies which were in good health condition. Some older and big *Porites* colonies (> 100 years) could be observed in excellent health condition without any signs of predation (feeding scars) or stress. Moreover, there was no significant algal cover in most of the areas. Although some damselfish cultivating fields of turf algae were seen, the majority of the abiotic substrate was uncovered, which is what generally allows coral recruits to settle down and grow at many spots on these reefs.

Especially in the sandy area with regularly occurring big coral blocks (bommies) (Figure 8) species hotspots consisted of planktivorous fish, i.e. Redtoothed triggerfish (*Odonus niger*), Anthias (*Pseudanthias* spec.) and different damselfish species (Pomacentridae) revealing comparatively high fish biodiversity in this area. Big parrotfish species (Scaridae) were also seen at different Bluestreak cleaner wrasse (*Labroides dimidiatus*) cleaning stations along the reef. Predatory fish like grouper (Serranidae) and snapper species (Lutjanidae) and a balanced number of herbivorous species from different families (i.e. Scaridae, Acanthuridae, Siganidae) were major parts of the fish community. Also found inhabiting the areas in quite a high abundance and number were shark species like Whitetip reef sharks (*Triaenodon obesus*), Zebra sharks (*Stegostoma fasciatum*) and Grey reef shark (*Carcharhinus amblyrhynchos*) (Figure 8). Along the seagrass drop-off, next to the deep sea channel, some pelagic species like narrow-barred Spanish mackerel (*Scomberomorus commerson*), Indian mackerel (*Rastrelliger kanagurta*) and Great Barracudas (*Sphyraena barracuda*) could be observed.

Additionally, a high quantity of indicator species for healthy coral reefs like Bluestreak cleaner wrasse (*L. dimidiatus*) and different butterflyfish species (Chaetodontidae) as well as a good abundance of juveniles of targeted fish species could be observed during the surveys.

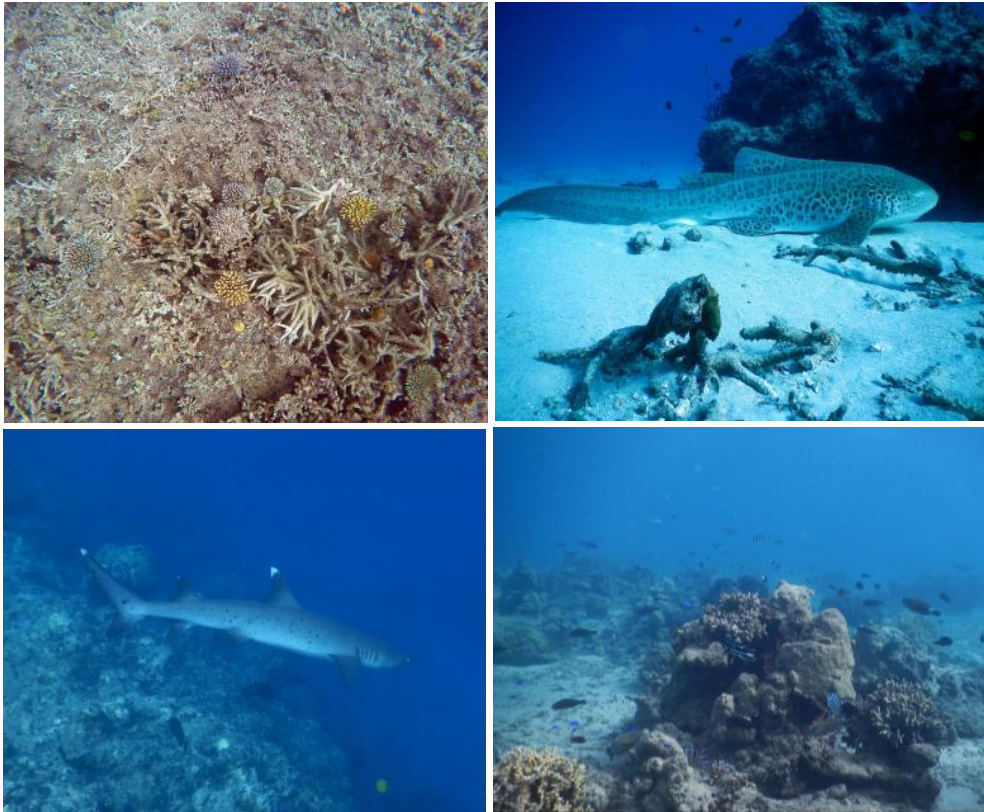


Figure 8. Deladravu tabu area. Colonies of *Acropora* between bleached and broken corals (top left). A zebra shark (*Stegostoma fasciatum*) at around 11 m depth (top right). A white tip reef shark (*Triaenodon obesus*) near a drop off (bottom left). Bommies surrounded by sandy area (bottom right).

Recommendations and Next Steps

This report intends to inform stakeholders and the villagers about MACBIO's visit to the Mali district, and aims to support the Mata ni Tikina, the Mali district and the Conservation Officer to review its observations and address potential ways forward.

- It is suggested to support the Mata ni Tikina, Mr. Moce from Macuata district and to assist him by drawing on the lessons learned from Mali that could be used to educate and inspire other people to spread knowledge and awareness.
- It is planned to introduce Mr. Moce to the Mata ni Vanua Mr. Balawa of Navakavu to enable the two conservation champions to share their own experiences and the lessons they have learned to achieve continuous management success.
- As a next step for Mali it is recommended that it identifies an appropriate monitoring method, which can be used to assess the success of the *tabu* area.
- It is suggested to support collaboration among Mr. Moce and the Conservation -, Fisheries-, Provincial- and District Officers to identify useful areas for permanent transects within and outside the *tabu* area. To carry them out committed volunteers would need to be chosen and trained.
- The next envisaged step in Macuata will be to visit other sites within the Qoliqoli Cokovata to collect more information to document the present situation in Macuata.
- In collaboration with WWF MACBIO intends to carry on with interviews and would also like to collect videos of personal success stories.
- In the longer term closer collaboration among WWF, C₃, the Conservation Officer and Fisheries should be supported.
- It would be recommendable to communicate with C₃ on possible future collaboration and to invite the C₃ youth group "Reef Rangers" to Navakavu to share their knowledge and activities with Navakavu's youth groups and school students.
- The collaboration with the Reef Rangers might inspire and encourage youth in Navakavu to establish their own reef ranger group and to support their villages.
- It is proposed to meet with the Department of Fisheries to discuss the current situation of poaching. Poaching was the most mentioned threat that villages face. Unless Macuata receives support from the Fijian Government or other stakeholders the districts will continue to struggle with this problem as they are not properly equipped and empowered to defeat them.

Conclusion

The initial meetings with the stakeholders revealed why Macuata Province is considered a success story in and beyond Fiji. Various efforts and projects, which are being carried out by government and non-governmental organizations, strive towards improving the lives of communities while strengthening sustainable management of land and marine resources. Although not the entire province is involved in most of the projects, the successful efforts carried out in certain key areas such as Mali can be used to highlight these areas as a role model for the rest of the province and other provinces in Fiji. It is this aspect, which the MACBIO project aims to support and work towards.

By visiting the community and carrying out interviews within the different villages of the Mali District, various success stories and challenges were identified. Most of these success stories have been described in this report and are points which Mali should take pride in and could be considered as motivational points for other villages and districts within and beyond the Mali area. Alternatively, the challenges faced by the Mali District, many of which are not limited to Mali, are aspects, which Mali stakeholders can work towards to improve management strategies for the entire Macuata province.

Field visits to the Deladravu and Cakau Vuata *tabu* sites show that the reef system is not in the healthiest state. Although this can partially be attributed to industrial runoff from the sugar industry, it is also likely that negligence and disrespect of the *tabu* prior to 2013 has resulted in the rather poor health. The Deladravu *tabu* is the significantly healthier reef system of the two sites visited and recovery is evident in the form of young coral colonies and relatively high abundances, and larger sizes of fish species. This conclusion regarding the site can however be deemed superficial, and more detailed and prolonged surveys may be required to validate the effectiveness of the *tabus*.

Overall, the efforts made by various stakeholders in the Mali District have resulted in various successes, all of which the people of Mali should be proud of and most of which can be used to inspire or motivate areas in the Macuata Province which have not yet been supported by the government and NGO's. It is therefore hoped that these success stories can be celebrated by all stakeholders and be used as tools towards improvement of coastal management in Fiji.

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Appendix I

MACBIO INTRODUCTION (ITAUKEI)

Na cava na MACBIO ?

Na (MACBIO) - Marine and Coastal Biodiversity Management in the Pacific Island Countries (MACBIO) e cakacaka kei ira na veitabana tale eso me vaqacotaki na kena qaravi/qarauni vakavinaka na yaubula vakatabaki dua ena nomuni Waitui, Veicakau, Veidogo se Matasawa, e na kena dikevi ka vakasokumuni nai tukutuku matata baleta nai yaubula kece ka na rawa ni kilai kina nai sau vakailavo era na rawa ni rawata mai na vei yaubula oqo.

Na neitou gagadre?

Na MACBIO e tu vakarau me veivuke ka veitokoni vei kemuni kei ira na nomuni kawa e ra na qai muri mai. (Veivuke, sega ni vakailavo io vaka kilaka ga ka rawa nina wasei vei ira na Lewe ni Koro E Macuata)

Na Neitou Nakinaki na MACBIO sai koya, me tokona, ka veivuke ki na i walewale ena kena qaravi/qarauni nai yaubula (waitui), sa caka tiko mai na Veikorokoro e Macuata ka me na rawa kina vei ira na lewe ni Koro me ra qarava/qarauna na nodra vurevure ni yaubula ka vei semati talega na nodra bula ena veisiga mai na gauna ka tauyavu kina na vanua vakatatabutaki e na loma ni nomuni vanua ni *goliqoli*.

Mai na nomuni veivuke na lewe ni Koro e na kena wasei na Kilaka, e na gadrevi na nomuni vei veiwasei ena vei kilaka eso, nai walewale uasivi ka koni sa vakayagataka tiko mai na lewe ni koro yadudua e Macuata, ena vei taba yabaki kece, ka veiwekani kei na qaravi/qarauni ni vanua vakatatabutaki. Oqo e na rawa ni vakauqeta na vei vanua tale eso me ra vakayacora vaka kina nai walewale ni kena qaravi/qarauni nai yaubula, ka na rawa talega ni dusidusi/ se I vakaraitaki ki vei ira na veivanua tale eso ka semati kina nai tuvatuva vakaoqo ka sa kunei kina na veika e sa kauta mai kina na veiveisau ni draki (oqo ena rawa ni wasei na nouni tukutuku vinaka kece vei ira tale eso).

Keitou nuitaka ni o ni vakila ka marautaka na veika vinaka oni sa vakayacora tiko ena nomudou Tabu.

Na Tikina o Macuata e sa dua toka nai talanoa kilai Levu e Viti e na kena rawati ka maroroi na vakatatabu ni yaubula (MPA) ka vukea na nomuni rawa ka vakailavo ki na lewe-ni-vanua ena loma ni io na yabaki sa oti. Qori tale ga na vuna levu e raica rawa na MACBIO ni dua na vanua e rawa ni vuli kina (learning sites), ka nanumi me marautaka nai vei tukutuku vinaka eso mai na nodra veivotai mai na lewe ni koro ka biu vaka Tikina/ Yavusa, e na vei walewale vinaka duadua ni kena qaravi se qarauni na vanua vakatabui. Na veka vinaka kece oqo (vakatatabu ni qoilqoli (MPA) e vakavuna duadua ga na lewe ni Koro/ Tikina.

Appendix II

MEETING MINUTES

Courtesy Meeting with Stakeholders – Macuata

Date: 06/06/2016 **Time:** 09:30 am – 10:30 am

Objective: Introduction of MACBIO to various stakeholders

Location: Department of Environment, Conf. Room. Labasa

Present: Department of Fisheries (Alifereti Tuinamata), C3 (Maleli Qera), Department of Environment (Jone Sassen), Conservation Officer (Makelesi Raciri), Mata ni Tikina (Seru Moce), MACBIO (Andra Whiteside, Aylin Aras, Constanca Levertz, Mavileko Ramoica, Jasha Dehm, Marian Gauna)

Apologies: WWF

Opening:

Andra Whiteside:

- Introduction of MACBIO
- Macuata as a learning site
- Role of this visit – to introduce the MACBIO visit to the Mali district & get a general overview of Mali
- Accompanying MACBIO is;
 - Jalesi Korotini (WWF) who will be taking lead at each village
 - Makelesi Raciri (Conservation Officer)
 - Seru Moce (Mata ni Tikina) facilitating our visit to each village

Tour de Table – Introductions

Marian Gauna:

- Works with IUCN on the MACBIO Project
- From Vanua Balavu, went to school in Labasa
- Looking forward to working with everyone

Jasha Dehm:

- With MACBIO since January
- Worked primarily with Navakavu
- Interested to learn more about Mali, their success stories and personal stories

Constancia Levertz:

- With MACBIO since March
- Would like to focus on the role of Women and Youth with regards to *qoliqoli* management
- Also involved with Navakavu
- Looks forward to working with Macuata

Aylin Aras:

- Working with MACBIO since January
- Also involved in Navakavu
- Is looking forward to learning more from Mali and would like to carry out initial coral reef surveys
- Interested in working together with the Fishermen

Mavileko Ramoica:

- Been working with MACBIO since April
- Is from Vanua Balavu but lived in Labasa for a while
- Worked a lot with Department of Fisheries, Climate Change, Ministry of Youth and Sports on various projects in Mali and Kia
- Looks forward to showing the rest of MACBIO what Mali is all about

Male Qera:

- Program Officer for C₃ (Community Centered Conservation)
- Been working on Kia Island for the past 3 years, now based out of Labasa office
- Will be involved in C₃'s move to other districts
- Potential for collaboration with MACBIO

Makelesi Racici:

- Conservation officer for Macuata Province
- Has been working with Mali and other districts for some time
- Would like to be more involved with different districts but finds it hard to do so as the province is rather large
- Welcomes MACBIO and looks forward to working together.

Alifereti Tuinamata:

- Surcharge officer for the Ministry of Fisheries in Macuata
- Has been working with Macuata for 3 years now
- Aims to improve the fisheries of all districts in Macuata
- Looking forward to hearing what MACBIO has to say about Mali
- Suggests to visit other districts too as they are very similar in their daily routine and since they are unique in the sense that they have a Qoliqoli Cokovata (shared *qoliqoli*)

Jone Sese:

- Works for the Department of Environment
- Just got transferred to Labasa
- Welcomes MACBIO to the province

Seru Moce:

- Is from Nakawaga in Mali
- Retired from the police force in 2013
- Since 2014 he is the Mata ni Tikina of the Mali district
- Looks forward to showing us his home island and what makes them special

Department of Fisheries in Macuata

Alifereti Tuinamata

- The opening and closing of a *tabu* is not against the law. If villages want to open up the *tabu* they ask their chief and it will be opened. The chief can say no, but if enough people want it open he will respect their voice. Therefore, it is important for NGO's and GO's to be involved at a grass-root level and advocate to them the importance of managing their resources. Only when the majority of a village see's the importance of having a *tabu* then it will be a successful one. In Mali and Kia, the villager's themselves are very verbal about the importance of their *tabu* to them and that is why they go out of their way to enforce the *tabu*.
- The *qoliqoli* is a Qoliqoli Cokovata, meaning that it is a shared *qoliqoli*, namely; Dreketi, Sasa, Macuata, Mali and *yavusa* Nabeakavu. This makes it a very large *qoliqoli* and it is very hard to catch poachers as regular surveillance is costly. In addition, illegal fishermen must be apprehended out at sea the Department of fisheries has no power on land. Similarly, fish wardens need to catch poachers out at sea and need to prove that they were catching fish for commercial use.
- Department of Fisheries tries to conduct as much patrols as possible but lacks the manpower and funding. There are 12 fisheries officers working at 2 stations and 1 hatchery. When the navy is in the vicinity they assist in surveillance. Surveillance efforts are increased between June and September (4FJ Movement).
- The people of Macuata strongly believe it is their right to eat turtle meat. Turtles are being caught daily with or without permits. When given a permit, the fisherman is allowed to catch smaller male turtles, however fishermen don't distinguish between male and females and in most cases larger turtles are preferred. Fisheries officers rely

on the word of mouth to find turtle poachers. In few cases confiscate turtles are still alive. It is very hard to take offenders to task because even government ministers enjoy eating turtle meat and regularly request for permits and then don't follow the restrictions on sex and size.

Cooperation with FLMMA

Alifereti Tuinamata:

- FLMMA does work in the area once in a while, however unsure of what they do

Makelesi Racici:

- FLMMA has their own study sites, unsure where in Macuata or what they do
- FLMMA usually visits their sites once a year, but do so without involving the provincial office
- Provincial office does not receive any feedback from FLMMA
- Unsure of what exactly FLMMA is (in terms of WWF being part of FLMMA)

Conservation Officer in Macuata

- Attempting to work together with C3 and WWF to review *tabu* areas (what villagers think of it, if it is successful, if catch increases).
- Assisting a student from USP with her work on Sea cucumbers. Unsure what exactly the work is on but it involves density and distribution of sea cucumbers in and outside *tabu* areas. While collecting sea cucumbers for the project it was found that density is just as low in the *tabu* as outside the *tabu* (however may not be representative since only 10 sea cucumbers were needed from each site).
- Suggests that NGO's conduct proper and regular surveys of all *tabu* areas in Macuata such that the unsuccessful ones can be altered appropriately.
- It is vital that there is increased surveillance of the Qoliqoli Cokovata and that efforts should be made to change laws such that poachers face on the spot fines and penalties.
- Would like to see more data sharing between NGO's, the government and the villagers.
- Suggests that it would be wise to reduce the number and size of the *tabu* areas such that surveillance is made easier.
- Together with WWF, C3, Fisheries and villagers has developed management plans for several sites around Macuata. These will be shared with MACBIO as soon as possible.

C3 in Macuata

- In terms of *tabu* areas or other managed areas, it is vital that the community picks sites and determines the management plan for it, only then will the community feel a sense of ownership of the site and will implement what was planned. If told by NGO's/ others what to do, then it won't be looked after.
- NGO's and government should train people within the villages to carry out monitoring. That way the villager is involved as much as possible and sustainable monitoring can take place.

- The church plays a big role in the opening and closing of the *tabu*. When the church is for having a *tabu* it will be respected and enforced by the village. The views the church has on the *tabu* changes with the minister, it is therefore key that NGO's and government work closely with the church on regular basis.
- When *tabu's* get opened up or are not successful the communities in Macuata blame the failure of the *tabu* on WWF. They don't understand that WWF is just there to facilitate the formation of a *tabu* and that the surveillance, monitoring and success of the *tabu* depends solely on the villagers themselves.
- C3 so far has only worked on Kia Island. However, plans exist to move to other districts even as far as Udu point, Vanua Levu.
- In Kia C3 has 2 main programs; namely the Educational Program and the Field Program
- For the Educational Program, C3 and the Ministry of Education have sat down together to develop a structure, which includes fun activities, themes and curriculum for marine awareness to be integrated with the current school curricula for classes 1-8.
- The Field Program involves several activities including coastal vegetation rehabilitation, formation of *tabu* areas and coral and clam rehabilitation. More recently C3 started with the Woodlock project, which similar to the Coastal vegetation rehabilitation aims to rehabilitate barren land with indigenous trees and shrubs, which according to village elders grew there in the past.
- In addition to the marine awareness being introduced to the school curriculum, C3 has started an initiative whereby village elders tell stories to children/ youth detailing what the environment used to be like.
- In 2011 C3 started the Reef Ranger project which is basically a name for those students who participate in the Educational and Field programs. Many reef rangers are now in high school in Labasa and they facilitate presentations between C3, the Conservation Officer and the school.
- In 2013 the Reef Ranger project saw 5 children from Kia Island travel to Sweden to receive the Kate Stokes Memorial Award.
- The biggest problem that Kia Island faces with regards to marine management is poaching. This is being addressed by the villagers and they regularly chase poachers away.

Brief Introduction to the *Tabu* areas of Mali Island

Seru Moce:

- Mali district is rather small as it is composed of just Mali Island and a small piece of land on Vanua Levu. Approximately 500 people spread across 4 villages and a few settlements. Only approximately 10 have jobs in and around Labasa. Those from Mali Island who don't have regular jobs depend solely on fishing as a source of income. Those who live on the mainland have slightly more farming and available to them hence are not as dependent on fisheries as those who live on Mali island.
- The First *tabu* was established in 2004 and was kept in place for 5 years. Due to a function at the Methodist church the *tabu* was opened and fish worth \$12000.00 was caught (\$6000.00 more than what was required). This was seen as a success by the villagers and from then until 2011 the *tabu* was opened regularly to finance various events.
- From 2011 until I (Seru Moce) took over as Mata ni Tikina there were discrepancies between 2 of the Vanua on the island and the *tabu* was not really implemented.

- Since 2014 I (Seru Moce) have been working with grass roots level to convince the villagers to see the importance of having a *tabu*. People are now more and more seeing the importance of the different *tabu* areas.

Effects of TC Winston on Macuata

- Apart from more than usual rain TC Winston had no effect on the greater Macuata area.
- Before that however it was significantly hotter than previous years
- No dead, washed up fish were reported

Closing Remarks

- Department of Fisheries, C₃ and Conservation officer request that we stay in touch share results from the week's activities in Mali and hopes to meet again next time MACBIO is in the area.
- C₃ invited MACBIO to Mali to see how C₃ works.
- MACBIO thanks to everyone for making themselves available for this meeting, we look forward to working with you in future and promise to pass on whatever information we gather.