

What influences the form that community-based fisheries management takes in Vanuatu?

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Abstract

Vanuatu has a long history of efforts to manage coastal fisheries, from customary practices to various forms of contemporary community-based fisheries management (CBFM) promoted by non-governmental organisations and government projects. In this article we summarise how the experiences and lessons over the last 25 years have shaped the CBFM model Vanuatu now uses. The process of CBFM with communities commences with a diagnosis across four pillars: environment and resources, economy and production, socioculture, and institutions and governance. Activities and management measures are then designed with communities and with consideration to these four pillars. Management arrangements are recorded in written management plans, and at this stage formal links are made with the national government through nominated wardens and monitoring activities. The strength of the CBFM model is that it can adapt to different contexts and so differs among provinces and communities. We illustrate these differences in experiences in three islands in Vanuatu. These three islands were provided with support through an Australian Centre for International Agricultural Research-funded project that was delivered by the Vanuatu Fisheries Department, the Pacific Community and WorldFish. Long, consultative processes arrived at agreed on management plans in some sites, whereas in others there were external shocks that meant CBFM was not achieved despite the processes we followed. The lessons we present here are valuable for assessing and refining the form and potential of CBFM for addressing coastal fisheries concerns in Vanuatu and other Pacific Island countries.

Introduction

As Johannes (1998) noted, if fisheries management means regulating who may fish, when, where and how they may fish, and what they can catch, then fisheries management has been widespread and longstanding in the Pacific Islands region. The region is well known for its traditional fisheries resource management systems that still function in many nations today (Amos 2007; Ruddle 1998). These customary foundations for controlling resource use have been harnessed by communities, non-governmental organisations (NGOs) and governments for application within contemporary community-based fisheries management (CBFM) (Govan 2009). Attention to CBFM has recently stepped up a notch in the Pacific, with the recent Heads of Fisheries endorsement of “A new song for coastal fisheries – pathways to change: The Noumea strategy” (Anon. 2015), which proposes CBFM as the principle strategy that should be employed to address small-scale fisheries concerns within the region.

In Vanuatu, a range of terms is used to describe community-based or local forms of fisheries, marine and coastal resource management. These include:

tabu area, marine protected area, community-based coastal resource management, community-based resource management, and community conservation area. In this paper we use the term CBFM in a broad sense (i.e. one that captures many of the ideas and strategies captured in the terms above) because this is consistent with project documentation, and is broadly used (but not exclusively) in Vanuatu and the Pacific Islands region.

Contemporary forms of CBFM often involve partnerships between communities and governments, NGOs or research organisations that draw together different knowledge, expertise and institutions. There is, however, no single objective, set process or design for CBFM (Cohen et al. 2014; Jupiter et al. 2014). This is a strength of CBFM; it can be designed to fit different local ecological and social contexts, and can be responsive and adaptive to local change. One of the first steps in improving our understanding of the performance and potential of CBFM for addressing coastal fisheries concerns is to clarify the logic behind the processes that have been followed to design CBFM with communities, and to share experiences and lessons from implementation.

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This paper describes the processes followed, the engagement tools employed, and the local contexts that interacted to influence the way CBFM arrangements developed. The paper has two overarching objectives: 1) to describe the current model for CBFM used in Vanuatu, and to touch on the factors and history that have influenced its form; and 2) to describe the application of this model in three sites in Vanuatu. In doing so we illustrate how the engagement between the Department of Fisheries (and partners) and communities:

- collectively developed an understanding of local resource management concerns and their causes;
- integrated local knowledge and practices with contemporary science and management to formulate rules and activities to be applied locally to address concerns;
- strengthened governance (leadership, decision-making, enforcement) locally and built links to external support; and
- promoted broad participation in and local ownership of CBFM.

We discuss our experiences with each of these in the four corresponding sections under Results and discussions.

CBFM in Vanuatu — then and now

Customary rules and controls over fisheries resources have been practiced in Vanuatu long before settlement by Europeans (Raubani 2006). Customary marine tenure was a fundamental component of these institutions (Johannes and Hickey 2004). One well-described example of a particular management measure (e.g., see Govan 2009) is the historical use of tabu areas; where a village would declare an area tabu (forbidden) by erecting a 'Namele' leaf (the local name for the cycad *Cycas seamanii*) on the coastline showing that the area is

out of bounds to all fishing or for specified species. A chief from Pelongk Village, on Uliveo Island (a site where we worked), stated that: "our chiefs for a long time have used tabu areas for each fishery species; if the area is tabu for trochus, they will erect a wood with a Namele leaf and the trochus shell on it. Anyone who sees this knows it's tabu to collect trochus". Many studies explain that customary tabus are still practiced by communities in Vanuatu, and tabus are arguably the most common management measure used in contemporary CBFM in Vanuatu (Bartlett et al. 2009; Léopold et al. 2013, and throughout the Pacific (Cohen and Foale 2011).

Although centralised, government-led management of fisheries has been the principle model formally promoted in Vanuatu in recent decades, the model was found to be challenged by geographical and financial constraints. This encouraged the emergence of more collaborative forms of fisheries management during the 1980s and 1990s. In 1988, Johannes promoted a type of cooperative management where the government, through the Fisheries Department should work more closely with communities and their local knowledge and customary practices to improve coastal fisheries management. Since then, a range of coastal fisheries projects have been undertaken in Vanuatu, and each of them have had a different approach to and influence on the way in which communities were engaged in management (Table 1). These approaches - focused particularly on endangered species, species of commercial value in the 1990s (e.g. turtles, trochus), turned towards priority fisheries resource management in the 2000s, and moved on to coastal ecosystem management in more recent years. For a detailed account of the history of coastal fisheries management and CBFM in Vanuatu see Raubani et al. (forthcoming).

Table 1. Some milestones in the history of community-based fisheries management in Vanuatu.

1606	Colonisation by first Europeans contributed to weakness and demise of CBFM. This was attributed to a Western belief system and modern fisheries management regime, which gave rise to an autocratic and centralised system.
Vanuatu Independence 1980	
1990	Moses Amos (Research Officer, Vanuatu Fisheries Department) announced on national radio that communities interested in managing their trochus fishery could receive assistance to reseed juvenile trochus. Communities bolstered their customary rights, and some communities established tabu areas for trochus.
1995	Vanuatu turtle monitors carry out countrywide awareness on the protection of sea turtles, and awareness on the importance of marine resource protection and management. This project was led by Wan Small Bag, where the Pacific Regional Environment Programme (SPREP) was the implementing agency.
2000-2009	Global Environment Facility funded the "International Waters Program" where fisheries and environment departments throughout the region collaboratively implemented activities.
Environmental Protection and Conservation Act 2010	
2010-2014	Mangrove Ecosystems for Climate Change Adaptation and Livelihoods Project where fisheries and environment departments continued IWP collaboration into the Japanese-funded "Promotion of the Grace of the Sea project", which was implemented by the Vanuatu Fisheries Department.
Fisheries Act 2014	
2014	Improving community-based fisheries management project "PacFish", which was funded by the Australian Centre for International Agricultural Research and WorldFish.

Raubani (2006) states that the reasons that Vanuatu increasingly turned to CBFM are two-fold: 1) growing difficulty that governments face in successfully managing fisheries, particularly in rural areas; and 2) that communities hold *pro forma* property rights, enshrined in Chapter 12 Article 73 of the Vanuatu Constitution (i.e. "...all land in the republic belongs to the indigenous custom owners and their descendents"). The Vanuatu Department of Environmental Protection and Conservation (DEPC) and the Vanuatu Fisheries Department (VFD) now see CBFM as a key strategy to improve management of coastal resources (as indicated by policies and the National Biodiversity Strategy and Action Plan, 1999). These departments also recognise that their role is to provide communities with advice and information, enforcement support, and legal backing. There are two legal instruments available to these departments that can be used to back community management efforts: 1) the Environmental Protection and Conservation Act (Cap 283) section 37 "registration of community conservation areas", and 2) the Fisheries Regulation Order No. 28 of 2009.

The most recent, relatively large-scale CBFM project ("Grace of the Sea", funded by the Japanese International Cooperation Agency) supported CBFM implementation on Efate, Lelepa, Malakula and Aneityum islands (Nimoho et al. 2013). Subsequent to this, VFD and DEPC received an additional 12 requests from communities for management assistance in 2014, 11 in 2015, and so far 7 requests in 2016. This stream of requests indicates that willingness and demand to undertake CBFM is spreading throughout Vanuatu. Most recent estimates of the number of communities carrying out CBFM activities in 2016 is 105, which is a substantial increase from the 44 community-managed areas that Govan estimated were active in 2009. Despite these successes, CBFM still faces several challenges: 1) where CBFM has been implemented, the improvements for fisheries are not known; 2) some communities have not felt a strong sense of ownership over CBFM that they implemented with project support; 3) in some cases, CBFM ceases after projects end or only a few management measures are sustained (Léopold et al. 2013); and 4) many communities' requests for assistance with CBFM are unmet, owing to capacity limitations of support partners (NGOs and government departments). It is important to reflect on these four challenges as Vanuatu moves forward with its commitment to its "new song", and attempts to address the challenges facing coastal and inshore fisheries,

and the communities that rely on those resources.

Study site and methods

This paper is based on case studies from three islands in Vanuatu: Aniwa, Santo and Uliveo (Fig. 1). Site selection followed the formal processes agreed to by the government (i.e. there must be a request from a village chief for assistance to manage marine resources). Because these requests are numerous, if sites are selected for a project, consultations are conducted between VFD and DEPC to determine if there are already activities ongoing in sites, but also to identify opportunities for cross-agency collaboration. Sites are also selected based on project objectives and priorities. For example, Santo was identified as a priority site because lobsters and coconut crabs provide an important source of income for the people of Santo, yet these resources were in decline, owing to the high demand from the tourism industry. Uliveo was selected because it has one of the largest reef areas in Vanuatu and the island has recently shifted from agriculture to fisheries as a main source of income, largely as a result

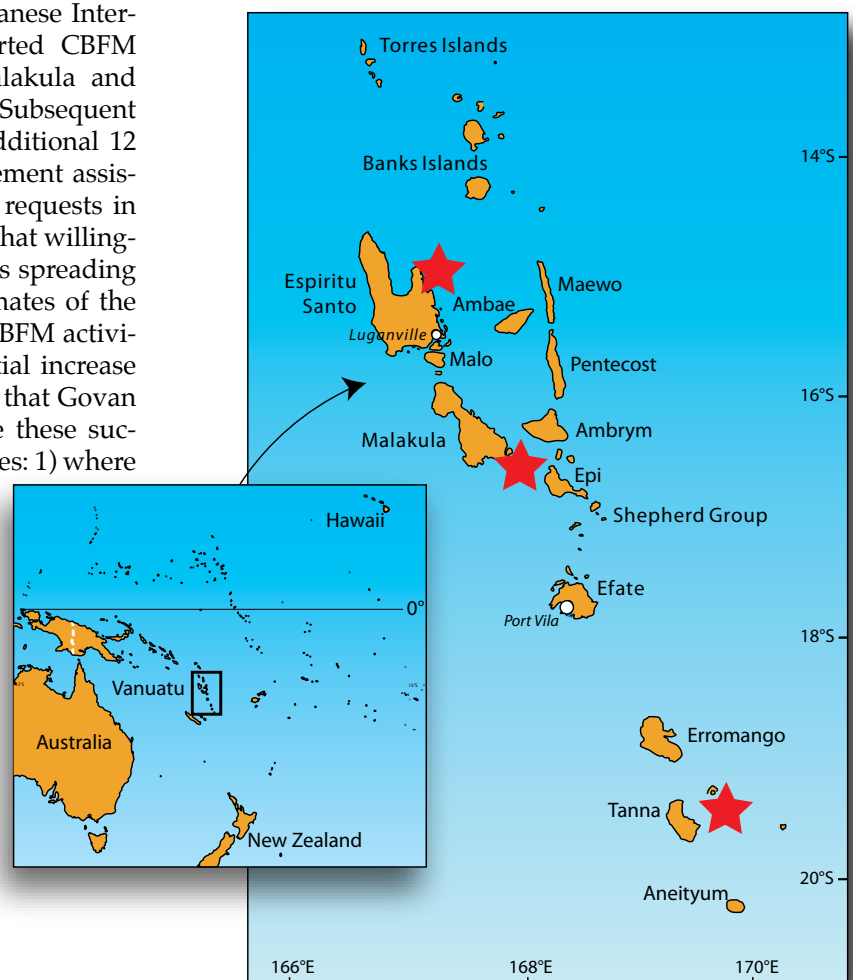


Figure 1. The islands and villages in Vanuatu that formed project sites for the Australian Centre for International Agricultural Research-funded "PacFish" project sites.

of fluctuation in copra and cocoa prices. Aniwa was chosen because it is a small island where people have few livelihood options and are highly dependent on fisheries for income. All three islands have experienced declines in fisheries resources, report weak local governance, and have received relatively little national management support.

As part of Vanuatu's Decentralisation Act (1994), implementation of all new projects must be presented to the respective provincial government to ensure their priorities are being addressed, and that they are involved in a working collaboration. In our case, the project was well received and approved by the provincial government. A project officer in Tafea Province said:

On behalf of the province and Secretary General I would like to express our gratitude to you project officers for taking the right approach to visit the province as the province is the gateway to Aniwa Island. Many projects do not come through the province and when they got into issues with the communities, it's hard for the province to assist them as we do not know how or what they are doing with the communities.

We then visited each site to confirm their interest and their approval to commence.

The data used in this paper are from a series of community meetings and workshops held during 2014–2016, and commencing with the project introduction meeting. Meetings and workshops

followed a participatory learning and action approach (PLA; Govan et al. 2008) where communities reflect on resource trends, identify challenges experienced locally, and clarify their objectives and intentions for establishing management. Where a high number of women and youth were present they would form their own group discussions; however, there were occasions where few young people and women attended, and in these instances discussion groups were mixed. Data were also collected through unstructured methods such as observation and informal *storians* (a Bislama word meaning informal discussions) with key informants such as a village chief, women leaders or resource monitors. These data were recorded in field notes and included in trip reports filed with the VFD subsequent to field trips.

The process we used to examine issues and design solutions with communities was influenced by the Grace of the Sea project. The main insight from

this project was that we should not focus narrowly on a single species, or even just on fisheries resource issues, but to identify threats and solutions according to four pillars (below). Each of these pillars should be discussed, analysed and addressed separately to ensure the project team has a thorough understanding of the community situation, and that project activities are designed and implemented in a way that is sensitive to this context.

1. "Resource and Environment" refers to the environmental status of a community's resources, especially fisheries resources and the environment.
2. "Economic and Production" deals with the economic and production aspect of resources.
3. "Institution and Governance" deals with the village's rules, national regulations and governance system in place.
4. "Sociocultural" deals with the social and cultural aspect of the community.

Project implementation was also influenced by experiences with CBRM elsewhere (e.g. Albert et al. 2013) that in turn were influenced by frameworks that suggested breadth and participation in diagnosis (e.g. Andrew et al. 2007). In summary, we followed a simple process (Fig. 2) to design and implement activities with communities.



Figure 2. The process employed in community workshops in Vanuatu to identify management issues, provide support measures, address issues, and develop monitoring and enforcement strategies.

Results and discussions

a/ Pre-implementation – Community diagnosis

The three communities we worked with identified and articulated resource issues and a desire to establish resource management in their initial requests for support. Nonetheless, they sought assistance to progress, design and formalise management. Johannes (1998) stated that villagers may not have adequate awareness of the full range of management solutions they might need to address contemporary fisheries concerns, or the ability to independently implement them and formalise them into written plans. These are common reasons why communities seek assistance from external NGOs or government agencies. For example:

We are happy that the project chose us as a potential community to work with to help support and improve community based resource management in the rural areas. Our resources have greatly decreased since the population started increasing, therefore it is right timing that the project has come to rescue us to save our resources. We heavily depend on our resources, such as coconut crab and lobster for our tourism sector; however, we have now started importing these resources from the Banks group and South Santo. Therefore, it is important that our chiefs as resource owners agree to this idea for the project to help us protect and manage our resources. Chief, Hog Harbour Village

When we talk about something but did not see it, it does not make sense, but a [fieldtrip] makes more sense, its helps us to understand what is in the area and to see clearly the problems that we were talking about during the workshop. Thank you VFD for responding to my request which was lodged 10 years ago. We will work together with Vatthe Conservation Area to ensure there is a sustainable management of our fishery resources. Chief and land owner, Lolathe

Our initial workshop was for “community diagnosis”, which aimed at introducing some scientific explanation for the status and reasons for management of fisheries resources such as species life cycles, anthropogenic impacts on fisheries resources, and management options. We also discussed the role that government can play in helping communities manage their fisheries resources. At these times we also encouraged discussion of local perceptions and knowledge. Some of these discussions illustrate that people believe that abundance of fish was supernaturally controlled. For example a youth in Uliveo said: “I never knew that fish can swim far away. I thought if God blessed this village with this fish, it will be here until we die, it never moves to other villages.”

We facilitated a trend analysis exercise to understand the status of various marine resources for communities’ priority fisheries; comparing the current status to that of pre-independence (i.e. before 1980). The view across all sites was that resources had declined. Aman from Hog Harbour Village recalled that: “One day I went fishing for lobster in the sea in 1972. I collected 25 lobsters under one stone only, but now you can spend almost a half day and come back with only 10 lobsters”. Similarly, a participant on Peskarus stressed that: “The sizes of fish are different from what they used to be 20 years ago and also today it takes longer to catch the same amount of fish as we caught 20 years ago”. In Hog Harbour, one participant made a link between resource decline and tourism: “We stated in our graph that in 1980 many of our resources started to decrease, in the case of deep sea fish, around that period. The owner of a business has a commercial fishing boat that fishes outside here, it can stay here for close to a week; the graphs illustrations are correct because after 1980 our fishery dramatically dropped, that’s because that was when we started receiving cruise ships.” The ultimate purpose of these “diagnostic” activities was not to simply confirm resource decline or the causes; the purpose was to start to identify solutions that will fit the issues and the local situation.

To design pathways forward, discussions spanned the four pillars (i.e. resource and environment, economy and production, institutions and governance, and social culture) (Table 2). For example, information collected on institutions and governance helped to demonstrate how management can be designed to fit best with existing governance structures. Participants found this a useful process, and a former chief in Hog Harbour Village said: “I think this is the right timing for this project to help us develop a community structure together with the provincial area secretary so he can take it back to his high village and tell other projects this is how we operate in the village”. It became clear that the common issue across all project sites was weak enforcement, and that enforcement was generally considered to be the role of village chiefs. A chief from South Malakula stressed that “Chiefs have too many things to do in one full year, and they are responsible for the governance of the village; therefore, delegating too many activities to them will be unrealistic”. Issues that spanned the pillars included a lack of understanding of natural resource laws, lack of diversification in fishing methods, and a lack of management plans. One of the most important issues raised was the need for money, given that people in communities need to provide for their family by finding resources to fund school fees and basic needs. The result was that they put heavy pressure on their fishery resources for cash.

Table 2. Issues identified by communities and action plans showing similarity and differences between issues across project sites.
 Site 1 = Aniwa, Site 2 = Peskarus, Site 3 = Pelongk, Site 4 = Lutes, Site 5 = Hog Harbour, Site 6 = Port Olry, Site 7 = Lolathe

Issue	Aniwa			Uliveo			Santo			Actions
	1	2	3	4	5	6	7			
Limited knowledge on gear management	X									Improve knowledge on gear management
Limited traditional fishing knowledge	X									Increase knowledge on traditional boundaries; Improve traditional fishing methods
Limited cooperation between chiefs	X			X				X		Improve cooperation between village chiefs by involving everyone in project
Poaching in tabu areas	X	X	X	X				X		Develop community management plans/rules, including suitable penalties and enforcement, and enforce fisheries regulations
High population		X			X	X	X	X		Awareness by health department of family planning issues and involve everyone in project
Lack of diversity in fishing techniques		X	X		X	X		X		Provide training on new fishing techniques for encouraging people to diversify fishing methods, encourage traditional fishing methods
Land disputes		X						X		Involve customary landowners in workshops and increase awareness and importance of conservation
Community does not understand role of tabu areas				X	X	X		X		Produce and distribute awareness materials on the role of tabu areas, their benefits and challenges
Lack of cooperation between chiefs and people to enforce rules in tabu areas			X					X		Involve chiefs, youth and women in project activities, workshops and awareness raising workshops
Lack of respect for each other				X	X	X		X		Involve everybody in workshops and wider awareness workshops on importance of conservation
Influence from people from other islands settling in the village					X			X		Involve settlers in project activities
No cooperation between environment committee and chiefs		X								Encourage chiefs and environmental networks, such as Vanua'tai resource monitors, to work together
Fishermen's association		X	X	X	X			X		Strengthened fishermen's association
People in village do not know much about natural resource laws		X	X	X	X	X		X		Awareness on the Fisheries and EPC Act and a half-day workshop session with communities in all sectors about laws
Limited institutional cooperation		X						X		Encourage and increase involvement and informing all institutions about the work of the project in each site
Conflict of interest		X								Improve mainstreaming between government departments and institutions
Lack of island development plan		X								Develop island development plan
Weak resource monitors in the village					X					Build capacity of resource monitors in the village
Lack of documented community structure					X	X	X	X		Document community structure to identify roles of different institutions within the village and understand governance system
Weak attendance at awareness workshops that focus on resource management						X				Chiefs and community leaders should encourage participation of everyone in project activities
Lack of documented management plan		X	X	X	X	X		X		Document community management plan/rules for all three communities

Sociocultural

Governance and institutions

Table 2. continued

Issue	Aniwa		Uliveo				Santo		Actions
	1	2	3	4	5	6	7		
Economy and Production									
No central fish market in urban centres					X	X	X	X	Liaise with the Fisheries Department on a way forward for this
No fish market facility	X								Purchase a solar freezer for fish preservation for transport to main market on Tanna
Limited knowledge of resource value-adding	X	X			X	X	X	X	Increase capacity for resource value-adding (e.g. Fish Café and shell craft for tourism)
Poor management of fish market infrastructure (e.g. ice machine)	X						X		Improve infrastructure management through basic management and finance training
Buyers buy undersize fish		X	X	X					Increase price of fish per kilo
Weak finance management skills to manage fish markets and income		X		X					Use fisheries department networks with cooperative to provide basic financial training for small-scale fishing businesses
Too many buyers		X	X	X					Charge an access fee for all buyers and increase the price of fish per kilo
Lack of training on other fishing techniques		X	X	X	X	X	X	X	Fishing technique training
Poor fish quality due to poor market facilities					X	X	X	X	Provide fish handling training
Lack of understanding on safety measures for fishing around FADs							X		Liaise with VFD North and Central region to address communities' concerns for a better fish market for fishers
Lack of understanding on importance of fisheries resource life cycles and management		X				X			Awareness raising as part of every workshop in the village and special awareness raising workshop on the life cycles of priority species
Lack of information on and understanding of ecological status	X	X	X	X	X	X	X	X	Improve information on ecological status
Poor waste management	X	X					X		Promote waste management in all sites
Crown-of-thorns damaging reef	X	X	X	X	X	X	X	X	Conduct regular clean up campaigns
Coastal erosion increasing		X							Rehabilitate coastal areas, where necessary
Increased deforestation	X								Raise awareness and encourage replanting of other trees
Limited protein source	X	X	X	X					Promote small-scale farming, such as poultry and piggy projects
Decrease of fisheries resources (based on catch and effort data)	X	X	X	X	X	X	X	X	Establish a total ban on collecting clam shells within tabu areas
No tabu area	X					X	X	X	Establish tabu areas
Decrease numbers of lobsters and coconut crabs (based on catch and effort data)						X	X	X	Observe fisheries regulation (coconut crab closed season, rock lobster size limits). Conduct coconut crab assessment to update quota
Tabu areas are periodic; add permanent tabu areas		X	X	X					Tabu areas remain periodic for some communities but rules are added for gear types, size limits, fishing periods
Climate change		X							Protection of coastline for climate change adaptation
Size of tabu area is too small		X	X	X					Extend tabu areas
Resource and Environment									

b) CBFM activities — Designing management measures and providing support measures

The next stage of the process was to work with communities to clarify their specific objectives for implementing management measures and to refine the actions they wanted to take. For example, in Peskarus Village on Uliveo Island, women and men separately identified four objectives of their management measures, which focussed primarily on establishing a tabu area. Both men and women sought to increase fishery stocks to enable them to earn more money in the future; their reasoning, however, was different. The women wished to protect their resources for future generations, whereas the men wished to attract tourists to their villages for income, and stressed that their managed area should be used as a study site for students to develop their knowledge about marine resources and management.

Some rules and management measures were designed based on local contexts and locally designed solutions. The export of fish from Uliveo Island (roughly 100 kg of fish every week to Port Vila) is an important way for residents to earn income. People harvest every week during the open season (April and October) each year in the hope of earning an income. However, communities were concerned that this was becoming a sustainability issue. During the village diagnosis it was decided that there was a need to put some control measures on the buyers who bought fish from Uliveo fishers. The decision made by the community was to increase the price of fish per kilogram from 300 vatu/kg to 350 vatu/kg. Their logic was that this would decrease the amount exported. They also enforced a buyers' fee or annual entry fee of 5,000 vatu to limit the number of buyers operating on Uliveo Island.

We have increased the fish price on the island because we think that the number of fish that is being exported from this island is very high. Although the money is good, it's getting harder for us to find fish now compared to what it was like 30 years ago. Resource monitor, Peskarus Village

Some of the buyers have stopped buying fish from us, because we asked them to pay 5000 vatu for an annual fee for importing fish from Uliveo. But it's a good thing because that means that less fish will be coming out of from our reef each week, this also made some buyers decide not to import fish from us anymore. Chief, Pelongk Village

Rule selection and design was also influenced by scientific knowledge and increased awareness of national fisheries and environment regulations.

In all sites, "awareness raising" was an important element of our project and included presentations, videos and school quizzes that comprised information on life cycle of marine resources, the importance of habitat and ecosystem conservation and management, relevant requirements of the Fisheries Acts, fisheries regulations and the Environmental Protection Act, and information from the Community Conservation Area handbook. In addition, we shared information that each community had specifically requested.

We do not know about the life cycle of some of the marine resources. Is the project willing to make awareness workshops that will help us understand this? Because if we know about the life cycles it will make us think about how long it takes for the animal to mature when we go fishing. Participant, Hog Harbour

We do not know much about the fisheries and environmental laws because we are in villages. We do not always get good radio transmission, so most of the time we do not know that we are harvesting undersize fish; We do not know as well that certain resources are banned by the laws, therefore we need continuous awareness on the laws. Female participant, Port Olry

Once a range of management measures had been decided on (see Table 3 for example from Pelongk), the arrangements were developed into community management plans that detailed where people can fish, when they cannot fish, gear restrictions, what can be harvested, and what cannot be harvested. In sum, some rules reinforced existing fisheries and environmental regulations (e.g. trochus size limits). Some rules related to cultural management measures (e.g. use of tabu areas). The design of certain rules was influenced by quantitative habitat assessments carried out by VFD and the resource trend analysis which, for example, influenced the closure of and the position and extent of coverage of tabu areas.

Fines were also detailed in these plans, and in the case of Pelongk, for example, fines varied for infringements, ranging between 5,000 and 20,000 vatu. The management plan stipulated that infringements would be dealt with through village court processes, and ultimately through state legislation, if necessary. Once rules were established we organised further awareness-raising activities that explained the different rules, how they were enforced via the village court system and fines, and how rules might affect women, children and men. These awareness-raising activities were conducted within the project communities and with surrounding communities, to ensure there was a good understanding of the new arrangements and their purpose.

Table 3. Pelongk Village management measures, including locally designed management measures, measures that are customary practices adapted for community-based fisheries management, and national fisheries regulations reinforced in local management plans.

Area or temporal closure	Gear restrictions	Species restriction
Total ban on harvesting in tabu area during close season	Do not use traditional/natural fish poison in tabu area	Do not disturb or harvest eggs from birds
No harvesting of or destroying mangroves	Do not use undersize hooks in tabu area	Do not harvest mud crabs during their breeding season
No harvesting of mud crabs during their breeding season	Use spear only in tabu area	Only harvest crabs that are a harvestable size (according to national fisheries regulations), which can be cross-checked by placing your four fingers over crab; if your fingers do not cover crab, do not harvest it
All other shell fish must not be harvested from tabu area	Only catch enough fish for family; do not over harvest	
No harvesting of small oysters	Only use 2-inch mesh size nets during open season	Only catch enough fish for family; do not over harvest
No harvesting of parrotfish and Napoleon wrasse in tabu area	Use bow and arrow only in tabu area	Follow national legal size of 9-13 cm for trochus shell
No harvesting of juvenile species outside of tabu area	Do not use iron bars to harvest octopus	Harvest only mature giant clam shells
Total ban on harvesting sea cucumbers in tabu area		Turtles are only harvested after permission is sought from the Director of Fisheries for annual cultural ceremonies
Total ban on harvesting trochus in tabu area		Do not harvest rock lobster in daytime; do not use an iron bar to destroy their habitats; only harvest at night as per legal size
Total ban on harvesting giant clams in tabu area		Do not disturb or capture any mammals in the sea as stated in the fisheries regulations
Total ban on harvesting shellfish in tabu area		Do not disturb, kill or capture dugongs anywhere
Total ban on harvesting triton shells in tabu area		Only collect dead coral from the reef; do not harvest live coral; do not drop anchors on coral

In giving advice to communities about the design of their management measures, we stressed that the performance of management was not assured and that some of the management measures should be monitored and potentially adjusted later (i.e. consistent with adaptive management principles). Many of these adjustments are pending, but there were some more immediate changes made to management measures. For example, on Uliveo Island a habitat status assessment was carried out by VFD's research section with community-based Vanua'tai resource monitors and members of the Reef Check Committee on Uliveo. The results were discussed with the communities two weeks later. Before this assessment, the communities' tabu area was small and extended only 20 meters out from the mangrove fringes. However, the results of the assessment helped to add weight to the communities' own observations (i.e. that when fish move out from mangrove habitats it is likely they are immediately susceptible to capture in the open areas, and that this did not allow sufficient opportunity

for them to reproduce). This assessment, and the discussions that followed, guided the community in adjusting their management arrangements and ultimately to extend the size of their traditional tabu areas.

We did not realise that we are only protecting our nursery; maybe that is why the sizes of our fish are smaller. From the presentations on the results of the habitat assessment, I think we need to extend out tabu areas and instead of having five-month periods we will now close it for three-to-four years before we open it again. This is to cover some reefs to protect our fish, trochus and green snails. Chief, Pelongk Village

While designing the plan, we were sensitive to the feasibility of the activities in the village. Community concerns frequently extended beyond marine resource-related issues (see Table 2 for example). As a result, some concerns and the activities the community proposed were outside the scope of the support we could provide, given that our project had a

fisheries and CBFM focus. In these situations, we played more of a connecting role to help identify appropriate government or NGO stakeholders who might be able to support the community in realising its broader visions. This was possible because we had some flexibility in our project that allowed us to dedicate some time and resources to make these connections. In some cases, we were able to adapt our plans to account for community requests. An example of this was that we were able to support the deployment of a fish aggregating device (FAD) off of Santo. The aim of deploying the FAD was to increase fisher catches and to reduce fishing pressure from coastal fisheries by encouraging fishers to switch from fishing in coastal areas into deeper waters. In total, the project deployed four FADs (one in Uliveo, two on Santo, one in Hog Harbour and one for Lolathe) and provided fishing technology training to give fishers the skills to fish around FADs. Notably, this training and the FADs benefited only men directly, due to gender norms associated with fishing practices. This new technology and training was well received.

For a long time since independence until today, we only hear about FADs, but today I am happy and a proud chief to say that we are happy that the project has deployed a FAD in the bay, which will help our young people to fish out of the coast to relieve the pressure on our reef fish.
Chief, Matantas Village

I would like to make a trial on the FAD, so I went fishing at the FAD to get some fish for the school closing. To my surprise within 1 hour between 7am and 8am I caught one barracuda and four wahoo altogether weighing in at 32 kg.
Chairman, Big Bay Fisherman Association

c) Monitoring, wardens and linking to government to support implementation and enforcement

Amos (2007) stated that the responsibility for management, development and control of fisheries resources ultimately lies with the Department of Fisheries. Although the government supports CBFM, the current Fisheries Act (2014) does not provide any mechanism to back community management plans per se and, therefore, the development and implementation of community management plans are the responsibility of communities. The Fisheries Act does, however, contain a provision (Section 108 subsection A) to declare a community member as an Authorised Officer (AO), who is delegated responsibilities to help enforce fisheries regulations in remote areas. The AO will be given an identity card and provided with training to understand their role. We supported communities to develop management plans that meet the requirements of both the Fisheries and Environmental

Protection and Conservation acts and associated regulations so that both avenues (registering a community conservation area, or having AOs) were open to them. Many communities expressed concern about their ability to enforce their management plans on their own, and so making communities aware of these options for legal backing is a vital part of our role.

In addition to AOs, communities may rely on more local enforcement. Pelongk Village on Uliveo Island has a community governance structure that includes a committee responsible for marine resource management. If anyone is found breaching the community's management rules, the infringement will be dealt with following the village court system. When the offender is caught on his or her first offence a chief will issue them a fine that has been stipulated in the management plan. In this situation, all fines collected are managed by the local committee. The village Council of Chiefs is the secondary avenue for enforcement, and the police are the third.

A third and common element of a CBFM enforcement strategy is the use of resource monitors. Resource monitors assist with enforcement of the rules and promote compliance and understanding of management objectives. This was an important strategy to promote local ownership of CBFM. For example, a Vanua'tai resource monitor from Lutes Village said: "I am glad about the outcomes of the participants. There's a feeling of ownership and opportunities from the participants which is positive to manage our resources. I know most of the villagers are eager to harvest the sea cucumber but I urge them to think of the future generation."

Despite these three strategies there remain enforcement and sanctioning challenges, and community success with enforcing their management plans needs to be critically assessed through time. Providing centralised enforcement and sanctioning support to communities remains a challenge, and we found there to be difficulties because officers are based in Port Vila and the project sites accessible only by planes.

d) Promoting broad participation

It is the norm in many village contexts in Vanuatu that only chiefs and other male leaders in the village attend meetings with government or NGO visitors. In addition, at times, meetings are called when women are occupied with managing home affairs and have no time to attend. Youth these days think that chiefs are the ones making the decision and that they have no voice. This was the case during our first and second visits to the communities. As a result, in our early engagements in 2014, the participation of women and youth was relatively low (Fig. 3). However, our project had an emphasis on encouraging wider participation and consultation

with women, youth and people with disabilities. In the first consultation meeting in Port Olry on Santo, the president of the women's association said: "As representative of women in this village, I would like to say that this project will help us women and our children, therefore I am in full support of the project to be implemented in this area". In Port Olry, women's participation in project activities increased substantially as the project went on, where initially only the president of the women's association attended. We found that in Port Olry, once women's attendance had increased, the women were quite vocal in meetings (i.e. more so than at Uliveo) and we attribute this to the higher levels of women's education and their prior experience with external project activities.

Schwarz et al. (2014) stress that involving men and women in CBFM may require deliberate strategies to ensure all people are involved in sharing perspectives and receiving information. This is particularly important for CBFM because men and women often perform different roles in fisheries and rely on different zones and species to different extents (Kronen and Vunisea 2009). If there are no explicit strategies to include more marginalised voices in decision-making, management decisions can impose a burden on some resources users (more than others) or may not address issues that those resource users are experiencing (Vunisea 2008). Therefore, in our facilitation of workshops and consultations we encouraged

participation of women and youth through a number of deliberate strategies. This included clearly articulating in our community invitation letters and phone calls that women and youth were invited and that their attendance was valued. When hosting workshops we were flexible with start times and waited until there was a satisfactory number of women and youth present before we commenced, and we considered women's availability in the times and venues we selected for meetings. Further, in most of our workshops we had at least two facilitators, one male and one female, where the female facilitator spent more time with the women in their separate group. An important, but more informal, strategy was that the female facilitator would make the most of break times, meal times and evenings to engage women in discussions and hear their perspectives. The participation of women and youth had been increasing since the project commenced on Uliveo Island, and in a relatively recent meeting called to revise the management plan, a substantial proportion of attendees were women. In this forum their voice was heard and their ideas about management were accepted by men.

We women use resources differently, and we collect more species from the reef compared to the men. We spend so long in the water to try our best to get fish for our meals. Female participant, Peskarus Village

While the original management plan focussed on fish and resources of economic value, once the women had shared this view the men agreed to include other invertebrates (i.e. those important to women) in their community management rules. For example, on Uliveo, common equipment used by women for gleaning is an iron rod, which is used to break reefs to collect octopus. The women requested this practice be banned in the

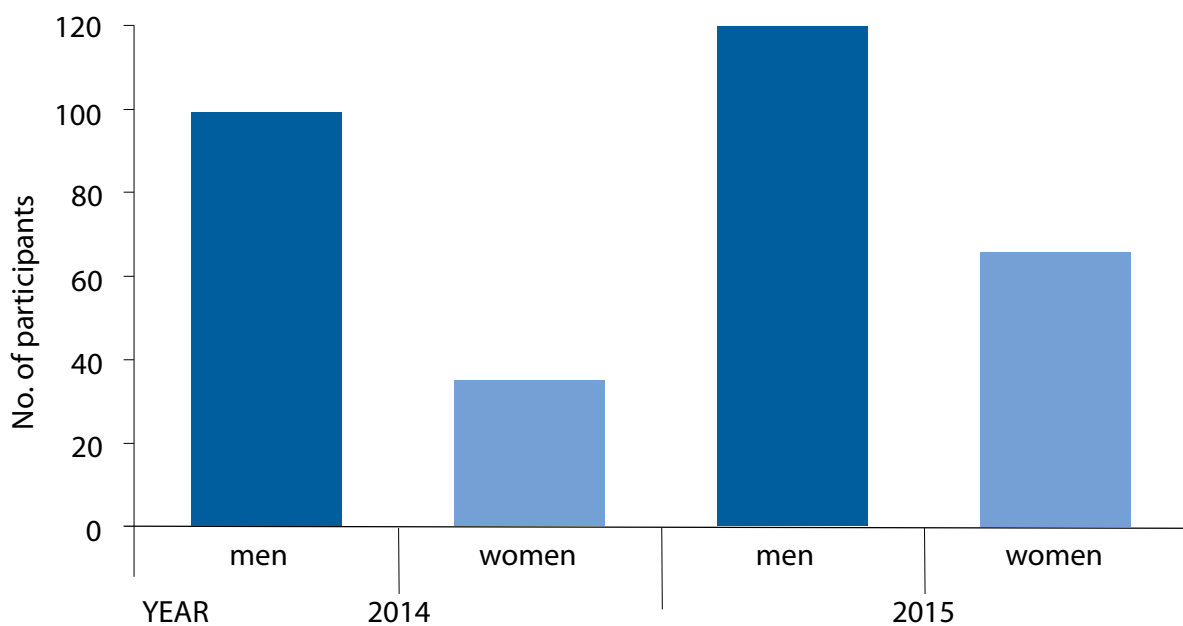


Figure 3. Number of participants in all project sites in Vanuatu, showing how the participation of women increased in later stages of the project.

newer version of the management plan because they know that in the long term, it would affect their livelihoods. Simultaneously, however, there was some resistance and reluctance to add this rule because women felt that the rule would make their lives harder in the short term.

Women and youth were also active in helping men to raise awareness and arrive at community-wide agreement with the management plan. The draft management plan was presented to the whole community (in the local dialect), which generated discussions. This also acted to promote further participation, given that anyone who had not had the chance to attend a workshop gave their view; there were some cases where this did in fact lead to changes to management plans. We observed a range of different roles that women were playing in CBFM (i.e. roles that were outside of the norm). For example, a woman from Pelongk Village provided voluntary help to her husband to collect fish data from artisanal and subsistence fisheries as part of monitoring efforts. On Santo, women were included in the current Big Bay Fishermen's Association and the FAD committee was fully represented by the youth of that area.

Conclusions

The process we used to select communities and work with them to design and implement CBFM is influenced by 25 years of experience and lessons on participatory processes, local fisheries management, and linking communities with government for appropriate and workable forms of technical and enforcement support. A foundation of CBFM is to work with the community to understand local resource concerns and their causes. Our experiences applying the four-pillar "diagnosis" process in the islands of Uliveo, Aniwa and Santo illustrated how we collectively came to an understanding of local issues and concerns. Some of these issues and concerns could be addressed by CBFM. The local context was influential in identifying opportunities and designing CBFM strategies, and local solutions were also influenced by the information we provided, and by the guidance provided by national regulations. While our results suggest there was satisfaction with the project at the national government, provincial government and community levels, we have yet to determine the success or challenges communities experience in implementing and sustaining their CBFM from this point. Further, it is yet to be seen in these cases what impacts and outcomes are realised from management and whether these have helped to realise the social and ecological objectives that communities are seeking.

Within the process we employed it was initially difficult to meaningfully include women and youth. Our engagements emphasised and encouraged

the participation of women and youth in all project activities by employing approaches that enable women and youth to speak freely. The participation of women and youth increased with project support, in part due to strategies that made the most of local strengths such as strong female leaders and women's groups. However, our engagements did not lead to more fundamental changes regarding gender norms or youth participation (that we observed), given that the balance of decision-making power still rested with local, typically male, leaders.

Our experiences highlights that no matter how clear, participatory and well-received a process is, there are always some challenges that communities and partners will face in realising their objectives. Some external challenges are substantial and cannot be easily overcome. For example, we were forced to cease activities in one of our project sites as a result of Tropical Cyclone Pam; it was not possible to focus on CBFM after communities were devastated by natural disasters as large as a category 5 cyclone. In this instance we were lucky enough that funding from the Australian Centre for International Agricultural Research could be used to help carry out fisheries assessments in all areas affected by Tropical Cyclone Pam and respond with fishing gear as part of relief supplies within the first three months after the cyclone. Furthermore, in some instances, community concerns fall outside the scope of the project that is supporting them. For example, deploying FADs was not in the original project scope, however fishing pressure is quiet high in all project sites, and establishing and extending tabu areas or implementing other resource management measures will not address the core issues of fishing pressure or lack of livelihood options. The role of linking communities to other forms of support is arguably as important as the role a partner can play in supporting the local implementation of CBFM.

Given the region-wide focus on community-based fisheries management, it is an important time to clarify the processes being followed, the logic behind them and the challenges that are faced in supporting the establishment of CBFM. Our experiences highlight that while communities can be successful in designing and implementing forms of CBFM, there are substantial challenges along the journey to realising community objectives.

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