



AREA-BASED MANAGEMENT TOOLS FOR
COASTAL RESOURCES IN FIJI, KIRIBATI,
SOLOMON ISLANDS, TONGA AND VANUATU
Volume 2: Country reports



Hugh Govan

July 2015

AREA-BASED MANAGEMENT TOOLS FOR COASTAL RESOURCES IN FIJI, KIRIBATI, SOLOMON ISLANDS, TONGA AND VANUATU

Volume 2: Country reports

Hugh Govan

July 2015

Contents

Kiribati.....	1	Strategies for LMMAs and CBM (inshore MSP)	11
Jurisdiction	1	Vanuatu.....	12
Institutional capacity.....	1	Jurisdiction	12
Kiribati Protected Areas.....	2	Institutional capacity.....	12
Commentary	3	Vanuatu Protected Areas.....	12
Strategies for LMMAs and CBM (inshore MSP)	3	Commentary	15
Tonga.....	5	Strategies for LMMAs and CBM (inshore MSP)	15
Jurisdiction	5	Fiji.....	17
Institutional capacity.....	5	Jurisdiction	17
Tonga Protected Areas.....	6	Institutional capacity.....	17
Commentary	7	Fiji Protected Areas.....	18
Strategies for LMMAs and CBM (inshore MSP)	7	Strategies for LMMAs and inshore Marine Spatial Planning	19
Solomon Islands	9	The" other" Aichi targets	20
Jurisdiction	9	References	21
Institutional capacity.....	9	Appendix 1: Characteristics of marine Community Conservation Areas in different islands of Vanuatu: summary of a survey by George Petro and Wan Smol Bag ...	24
Solomon Islands Protected Areas	9		
Commentary	11		

Kiribati

Jurisdiction

Area	Institution	Instruments	Effect
200nm EEZ, 12nm territorial sea	Ministry of Fisheries and Marine Resource Development (MFMRD)	Fisheries Act 2010 , Marine Zones (Declaration) Act 2011	Regulation of fishing activities, protection of customary fishing grounds.
Conservation and environmental management	Ministry of Environment, Lands and Agricultural Development (MELAD)	Environment Act 1999 (amended 2007)	Conservation of natural resources including marine life threatened by human activities.
Lagoons and 3nm from the low water line seawards	Island Councils supported by the Ministry of Internal Affairs (MIA)	Local Government Act 1984 with 2006 amendments	Local councils assigned jurisdiction for resource management and control of pollution
Land, coastal and community affairs	Communities and traditional rights holders	Laws of Kiribati Act 1989, Customary and traditional rights and practices	Provides basis for the application of customary law in cases it does not conflict with the constitution or other national legislation.

Institutional capacity

Institution	Budget	Staff
Ministry of Fisheries and Marine Resource Development (MFMRD)	Recurrent budget allocated to “licencing and fisheries” is estimated at AU\$1,249,000 (79% to personal emoluments) in 2013 though this excludes the proportion of services provided by the administration and ministerial section (AU\$560,000).	Some 103 staff have functions directly related to Fisheries management or development (2013). Staff estimated that around 7% of effort went in to coastal fisheries management and another 14% to coastal fisheries development. The rest was tuna-related (Govan 2014).
Ministry of Environment, Lands and Agricultural Development (MELAD)	The recurrent budget allocated to “Environment” in 2013 is estimated at \$AU373,800 (80% to personal emoluments)	Thirty with environment functions including 9 wildlife officers in Kiritimati, 14 with the Environment and Conservation Division (ECD) and 7 supernumerary officers (waste, climate change, enforcement, biodiversity) (2013)
Island Councils	23 councils receive between \$AU35-110,000. Councils are able to raise their own revenue through licences, fees and other fund-raising activities. No budget recorded for conservation	6 seconded staff plus staff from key ministries including in 1 cases MFMR but none from MELAD except in Kiritimati. Special constables (paid by the Police) and Village wardens or kaubure (paid by the Island Council) are present in each village

Kiribati Protected Areas

Name	Designation	Type	Cat	Marine Area	Terrestrial area	Total Area	Year	L MMA	Sources	Nationally listed in:	Valid marine km ²
Line Group											
<i>Kiritimati Atoll (Christmas Island)</i>											
Kiritimati Atoll (Christmas Island)	Multi Use Cons. Area	National	Ia	320	203.7	523.7	1999		WDPA	E(PA)R2008	320
Cook Islet Closed Area (Kiritimati WS)	Bird Reserve	National	Ia	22	0	22	1975		WDPA	E(PA)R2008	
Motu Tabu Islet Closed Area (Kiritimati)	Closed Area	National	Ia	0	0	0	1975		WDPA	E(PA)R2008	
Motu Upua Closed Area (Kirimati)	Closed Area	National	Ia	0.2	0	0.2	1975		WDPA	E(PA)R2008	
North-west Point Closed Area (Kiritimati)	Closed Area	National	NA	0.13	0	0.13	1975		WDPA		
Ngaontetaake Islet Closed Area (Kiritimati)	Closed Area	National	Ia	0.3	0	0.3	1979		WDPA	E(PA)R2008	
Asur lagoon, Pelican lagoon, Isles lagoon, The Tonga Channel and the adjoining Artemia Ponds	Prohibited Fishing Area	National					1978			PFAR1978	
<i>Malden Island (Closed Area)</i>	Wildlife Sanctuary	National	III	39.3	0	39.3	1975		WDPA	E(PA)R2008	39.3
<i>Starbuck (Closed Area)</i>	Wildlife Sanctuary	National	III	162	0	162	1975		WDPA	E(PA)R2008	162
<i>Vostock Island</i>	Wildlife Sanctuary	National	III	0.2	0	0.2	1979		WDPA	WCO1977	0.2
Phoenix Group											
Phoenix Islands	Protected Area	National	Ib	410,500	0	410,500	2006		WDPA	PIPAR2008	410,500
<i>Phoenix Islands Protected Area</i>	<i>World Heritage Site</i>	<i>International</i>	<i>Ib</i>	<i>408,250</i>	<i>0</i>	<i>408,250</i>	<i>2010</i>		<i>WDPA</i>		
Birnie Island	Wildlife Sanctuary	National	III		0.2	0.2	1938		WDPA	WCO1977	
McKean Island	Wildlife Sanctuary	National	III		0.6	0.6	1938		WDPA	WCO1977	
Rawaki (Phoenix) Island	Wildlife Sanctuary	National	III	65	0	65	1975		WDPA	WCO1977	
Gilberts Group											
Bonriki Island Water Reserve	Marine Reserve	National	V		0	0			WDPA		
North Tarawa	Conservation Area	National	VI		12.7	12.7	1996	Yes	WDPA		
Nooto-North Tarawa Ramsar Site	Ramsar site	National		8.31	2.02	10.33	2013	Yes	SPREP/ Ramsar		8.31
Illegal Fishing Te Ororo By-Law - N. Tarawa	Island Council Ban	Island Council					2003	Yes	Eutan Tarawa Council		
Total				[819,359]	217	[819,576]					411,030

Notes:	E(PA)R2008	Prescribed Protected Areas according to Environment (Protected Areas) Regulations 2008
	PIPAR2008	Phoenix Island Protected Area Regulations 2008
	PIPAMP2010	Phoenix Islands Protected Area Management Plan, 2010-2014
	WCO1977	Wildlife Conservation Ordinance 1977
	PFAR1978	Prohibited Fishing Area (Designation) Regulations 1978
	WDPA data from July 2014	

Commentary

At the time of writing there were no complete and correct lists of Kiribati protected areas and the above probably represents the most complete list to date. A number of sites need to be considered for omission, in particular Bonriki Island Water Reserve and N. Tarawa Conservation Area.

The total area ascribed to MMAs is 411,030 km² though only 530 km² is outside the PIPA and of this 320 km² is in Kiritimati. 8.3 km² can be attributed to regimes equivalent to LMMAs but this comprises the recently declared Ramsar site on N. Tarawa.

The WDPA counts PIPA twice which effectively doubles the country's area under MMAs, and with much less serious effect WDPA double counts the areas of Kiritimati and Phoenix Islands and atolls under the larger PAs.

An effective tool for conservation is the inclusion of licence conditions for Distant Water Fishing Nations as for example the existing restrictions on longliners and pole and liners are from fishing within 12nm of all islands as are purse seiners who additionally excluded from within 60nm of Tarawa, Kiritimati and Kanton. These pre-existing restrictions have been the main conservation tool associated with PIPA until recently.

There are virtually no LMMAs in Kiribati though the long defunct North Tarawa Conservation and the recent No'oto-N. Tarawa Ramsar Site fall under Island Council jurisdiction and would therefore technically be LMMAs. In addition, any bye-law restricting fishing for conservation or management purposes that was duly discussed and approved by an Island Council would technically render the 3nm coastal zone concerned an LMMA.

Strategies for LMMAs and CBM (inshore MSP)

MELAD and MFMRD have long expressed interest in promoting CBRM as a strategic approach given the remote situation of most atolls and around half the population. However, there are indications that the intent from the government side is to ensure compliance and smooth the implementation of various policies. Little allowance seems to be made for the major driver of CBM relating to flexibility to accommodate community self-interest, usually for improved livelihoods.

Another more surmountable issue is the intent to use similar CBRM tools in the very distinct situations predominant in Kiribati. At least two broad situations should be distinguished:

1. Peri-urban situations such as Tarawa and nearby islands, and Kiritimati which will require more organized co-management approaches with relatively strong involvement of government institutional stakeholders
2. Rural or atoll situations which rely more on local government and traditional organization which can be expected to respond to more bottom-up CBRM approaches at the Island Council level.

The relationship between MFMRD/MELAD and the outer islands seems strongly patron-client oriented – i.e. the relatively light presence of government in the islands interacts with the self-sufficiency and opportunistic reliance on multiple livelihood options of island communities in such a way that government, like it or not, is constantly put in the position of provider of short-term benefits and not as a long term partner in development. This is evidenced in interventions such as seaweed farming or FADs in which subsidies are expected and communities do not generally provide match funding or counterpart contributions.

With this background it would seem very difficult for MFMRD and particularly MELAD to provide the lead in establishing CBM as their current roles are likely to confuse or disempower communities and the potential for staff to derail CBRM processes appears large even after several training events.

However, Island Councils supported by a far more facilitatory Ministry of Internal Affairs and taking into account their 3nm jurisdiction provide an excellent opportunity for the promotion of simple and sustainable local management and ultimately atoll-wide LMMAs.

For this rural or atoll situation (#2) the most promising strategy for achieving sustainable coastal management would involve supporting MIA to in turn support Island Councils in simple and sensible fisheries and later on more general environment management planning to address locally identified burning needs. This would require:

- Provision of basic information on resource management: Ensuring that this is through the most appropriate channels in terms of strengthening the long term institutions that should fulfil the functions of two way communication and management advisory. This may include the Island Councils and staff, fisheries officers, churches or agriculture officers. This would be a no regrets basic approach and plenty of materials exist already (SPC, FSPI, etc) which would need to be translated in most cases and bearing in mind the preference for audio-visuals.
- Provision and piloting of very simple issues-solution/tools-planning-byelaw processes in islands with a clearly identified resource issue other than Tarawa and Kiritimati.
- MIA partnering with MELAD and MFMRD in a constructive triangle.

A number of options may also be considered:

- Further investigation into the current situation in the remote and highly populated islands (Southern Gilberts) to better understand the types of local management being carried out there. This may provide the best leads for appropriate strategies and governance mechanisms on other islands that may not require or rely on government support too much or be too costly to sustain.
- Further discussion and exploration of the requirements and constraints of MELAD and MFMRD in terms of their ability to support processes of community empowerment within the current legal and institutional setting as well as the prevailing mentalities of “them vs us”.
- Potential training events in medium term – potentially tailored on PICCC course sandwich model over a year or two and including participants from Tonga and possibly other MACBIO countries (+Tuvalu?).
- Explore and develop roles of various stakeholders for example:
 - Ministry of Internal Affairs: Provide national lead and ongoing support for Island Council resource management planning
 - Island Council or Mayors: Probably the lead at island level and need to be fully engaged
 - Village leaders/Maneaba: Probably CBM will operate at village level, most islands have between 3-8 villages unless island wide mechanisms can be secured.
 - NGOs: Potential neutral facilitators of CBM approaches, able to operate and exit – particularly KILGA.
 - MFMRD: potential good primary partner for long term support owing to their mandate of livelihoods closer to communities hearts and the presence of officers in many islands
 - MELAD: important support role and ensuring that relevant environmental advice is integrated into approaches. ECD is unlikely to be able to provide consistent staffing support and therefore should aim to mainstream support unless Agricultural Officers or Lands Officers (also from MELAD) can be brought into play.
 - Churches: Key stakeholder with own networks and major local influence. Are one of the main drivers for fishing in terms of church contributions but equally stand to lose these contributions should stocks become less productive. Churches have preached stewardship and closed areas elsewhere in the Pacific.
 - LMMA Network: assuming the better understanding of the local situation and potential stakeholder roles the LMMA can fulfil different and key functions in terms of selecting appropriate communities for exchange visits, peer to peer practitioner or government officer exchanges.

Tonga

Jurisdiction

Area	Institution	Instruments	Effect
200nm EEZ, inshore areas	Fisheries Division (Ministry for Agriculture and Food, Forests and Fisheries)	Fisheries Management Act 2002, Fisheries Management (Conservation) Regulations 2008, Fisheries (Coastal Communities) Regulations 2009, Special Management Orders	Management of all fisheries, declaration of Special Management Areas for fisheries (or conservation i.e. strict reserve)
Environmental impacts, protected areas, deep sea minerals	Ministry of Environment and Climate Change	Parks and Reserves Act 1979 (Rev. 1988)	

Institutional capacity

Institution	Budget	Staff
Fisheries Division	T\$1.68m (73% on salaries) in 2010. Govan (in prep.) estimates around 25% spend on coastal fisheries of total budget of T\$1. 8m in 2013/14.	Fisheries Department reported to have 54 staff (Taholo 2010) most in Nuku'alofa, greatly reduced from 107 in 2005 (Ministry of Fisheries 2005)
Ministry of Lands, Environment, Climate Change & Natural Resources.	T\$40.0m for entire ministry, no breakdown for MECC (2013-14)	122 positions occupied for whole Ministry in 2013/14 23 in Environment and Climate Change Divisions 2013/14

Tonga Protected Areas

Name	Designation	Type	Cat	Marine Area	Terrestrial ai	Total Area	NTZ	Year	LMMA	Sources	Listed in:	Valid marine km2
Parks and Reserves (Parks and Reserves Act 1979)												
Ha'atafu Beach	Reserve	National		0.71	0.00	0.71		1979		WDPA	MECC2011/NBSAP2006	
Hakaumama'o Reef	Reserve	National		1.28	1.32	2.60		1979		WDPA	MECC2011/NBSAP2006	
Malinoa Island Park and Reef	Reserve	National		0.91	0.00	0.91		1979		WDPA	MECC2011/NBSAP2006	
Monuafe Island Park and Reef	Reserve	National		0.50	0.00	0.50		1979		WDPA	MECC2011/NBSAP2006	
Mui Hopo Hoponga Coastal Reserve	Reserve	National		0.00	0.89	0.89		1972		WDPA	MECC2011/NBSAP2006	
Pangaimotu Reef	Reserve	National		0.35	0.14	0.49		1979		WDPA	MECC2011/NBSAP2006	
Ha'amonga Trilithon Park	Park	National		0.00	0.23	0.23		1972		WDPA	MECC2011/NBSAP2006	
Vava'u Coral Gardens Marine Park	Park	National						N/A		WDPA	MECC2011/NBSAP2006	
Volcanic Island forest reserves	Faunal Reserve	National						N/A		WDPA	MECC2011/NBSAP2006	
Fanga'uta and Fanga Kakau Lagoons	Marine Reserve	National		28.35	0.00	28.35		1974		WDPA	MECC2011/NBSAP2006	
Ha'apai	Multi/Multiple Use Conserve	National		9,879.00	121.00	10,000.00		1994		WDPA	MECC2011/NBSAP2006	
'Eua	National Park	National		2.25	2.25	4.50		1992		WDPA	MECC2011/NBSAP2006	
Kao	National Park	National		0.00	12.50	12.50		2001		WDPA	MECC2011/NBSAP2006	
Mount Talau National Park	National Park	National						N/A		WDPA	MECC2011/NBSAP2006	
Tofua	National Park	National		0.00	49.90	49.90		2001		WDPA	MECC2011/NBSAP2006	
Vaomopa	Nature Reserve	National		0.00	0.20	0.20		N/A		WDPA	MECC2011/NBSAP2006	
Neiafu Harbour Wreck	Other Area	National						N/A		WDPA	MECC2011/NBSAP2006	
Swallows cave	Other Area	National						N/A		WDPA	MECC2011/NBSAP2006	
Mounu Reef	Sanctuary	National		0.00	0.20	0.20		N/A		WDPA	MECC2011/NBSAP2006	
Falevai	Designation Not Known	National		2.50	2.50	5.00		N/A		WDPA		
Nukuhetulu	Designation Not Known	National		0.00	3.00	3.00		N/A		WDPA		
Subtotal				9,915.85	194.13	10,109.99						
Special Management Areas (Fisheries Management Act 2002)												
Ha'afeva	SMA	National		11.28	0.00	11.28	1.51	2007	SMA	WDPA	MECC201	11.28
Felemea	SMA	National		16.27	0.00	16.27	1.53	2008	SMA	WDPA	MECC201	16.27
Ovaka	SMA	National		9.56	0.00	9.56	2.95	2008	SMA	WDPA	MECC201	9.56
Eueiki	SMA	National		2.18	0.00	2.18	0.88	2008	SMA	WDPA	MECC201	2.18
Atata	SMA	National		6.18	0.00	6.18	1.15	2008	SMA	WDPA	MECC201	6.18
O'ua	SMA	National		47.41	0.00	47.41	2.04	2006	SMA	WDPA	MECC201	47.41
Nomuka	SMA	National		52.67	0.00	52.67	0.48	2011	SMA	F. Webster		52.67
Taunga	SMA	National		7.40	0.00	7.40	1.13	2013	SMA	F. Webster		7.40
Fafa	Marine Reserve (no fishi	National		4.85	0.00	4.85	4.85	2013	SMA	F. Webster		4.85
Subtotal				157.80	0.00	157.80	16.52					157.80
Total				10,073.65	194.13	10,267.78	16.52					
Total (excluding Ha'apai)				194.65	73.13	267.78	16.52					

More detail on 8 of the 9 Special Management Areas in Tonga: population and fishing activity

Name	Locally managed area (Km2)	NTZs	Population	Fishing households	Number of fishing boats
Ovaka	8.39	2.15	85	25	6
'O'ua	46.06	2.03	109	30	6
'Atata	7.45	1.78	189	-	-
Ha'afeva	972	0.18 and 1.31	261	-	-
Felemea	16.33	0.56 and 0.95	137	-	-
'Eueiki	1.19	0.77 and 0.99	87	15	5
Nomuka	52.67	0.48	477	-	-
Taunga	7.4	1.13	39	-	-

- = Not available

Commentary

The last decade has not seen an increase in the numbers of Parks and Reserves while efforts have seemed to concentrate around the support of Special Management Areas (SMAs) under the Fisheries Management Act (2002). There are now 9 SMAs with three new SMAs declared since the last WDPA update in 2011, the latest addition is Fafa which is a no-take reserve proposed and supported by a resort.

There are 22 applications for SMAs at present waiting to be processed in order of receipt. However there appears to be neither staff or budget available to support existing SMAs let alone process new ones. It is also stated that short term trainings and long term absence for study leave considerably reduce department capacity.

The SMAs are notable for the relatively small population of the local communities and presumably relatively low fishing pressure. With a coastal population of some 80,000 and inshore fishing areas of some 8,500 km² the SMAs at 157.80 represent a very small contribution at present.

The SMAs each have a management plan and, different to Fiji but similarly to Samoa, these assume regular visits from Fisheries staff. These visits do not occur and this demoralises communities at best.

The WDPA protected areas list shows some notable features, particularly a massive area covered at nearly 10,000 km² however, this is almost completely attributed to the Ha'apai Conservation Area (HCA) which was declared in the 1990s as part of the South Pacific Biodiversity Conservation Project. Govan et al (2009) proposed that a minimum criteria for inclusion as an MMA might be evidence that the area designated shows more resource management than previously and other comparable nearby areas and on that basis proposed that HCA not be included in calculations pending clarification. However, a source of confusion amongst some correspondents is that 2 of the new SMAs are in the Ha'apai group and deemed relatively successful (cf. MacBio trip report November 2013), but these cover only 23.8 km².

Excluding the Ha'apai Conservation Area leaves the Tongan PA statistics at: 194.65 km² under MMAs, 73.13 km² terrestrial area protected and a total of 267.78 km².

Strategies for LMMAs and CBM (inshore MSP)

A strategic evaluation of the performance, and most importantly, cost-effectiveness of inputs to SMAs is required in order to determine appropriate levels of government support would be, key roles and activities and support from other potential stakeholders. This should also take into account recent studies on the performance of inshore fisheries management in general.

Alternative support mechanisms for communities involved in SMAs and other relevant grass roots level conservation activities should be explored. The establishment of a civil society network of communities should be considered as a counterpart to government functions. It will be important to get the right balance of governance as if there is too much reliance on the currently poorly funded institutions the bottleneck will not be resolved.

Potential structures and functions of a Co-management support unit either within DFF, MECC or as a joint body with civil society should be explored as well as mechanisms for decentralised management through provincial governing structures.

More information is required on the potential role of the Ministry of Internal Affairs' Provincial governing structures such as the "Ha'apai Development Committee" and various sub-committees as well as Island groups in Fisheries management e.g. Vava'u Fisheries Council.

Solomon Islands

Jurisdiction

Area	Institution	Instruments	Effect
200nm EEZ	Ministry of Fisheries and Marine Resources (MFMR)	Fisheries Act 2015 awaiting regulations.	Conservation, management, and development of Solomon Islands fisheries
3nm	Provincial governments	Provincial Government Act 1997 and Ordinances	Protection, improvement and maintenance of fresh-water and reef fisheries
Conservation & environmental management	Ministry of Environment, Climate Change, Disaster management and Meteorology (MECDM)	Environment Act 1998, Protected Areas Act 2010	Provide integrated systems of development control, environmental impact assessment and pollution control and reduce risks to human health.

Institutional capacity

Institution	Budget	Staff
Environment and Conservation Division of Ministry of Environment, Conservation and Disaster Management (ECD-MECDM)	Recurrent SBD2.12m (2012)	13 (2011) all Honiara based
Ministry of Fisheries and Marine Resources (MFMR)	Recurrent SBD 13.16m (2012) of which SBD5.4m is HQ and admin. Development budget was around SBD 10m. Govan et al (2013) estimate 5-6% may support coastal fisheries management	73 staff, 97 established posts in 2014 of which 18 are vacant. 26 of these posts are based in the provinces but 8 vacancies.
Provincial governments	Budgets in the range SBD132,000 to SBD490,000 in 2012 - mainly for repair and operation of fisheries centres.	Provinces directly employ fisheries staff, these may number 2-6 per province.

Solomon Islands Protected Areas

The Solomon Islands has one of the most complete and up to date databases of MMAs. The original inventory and mapping carried out as part of Govan et al. (2009) has been updated over the last 3 years through a series of workshops by Nate Peterson for the Coral Triangle Atlas and now includes new MMAs and terrestrial areas as well as various project sites. It is perhaps the only country in which inactive sites are being tagged for delisting though the inventory does not have official status. In 2014 there were 185 records of PAs in 2014 of which 174 were marine or marine-terrestrial and all qualify as LMMAs. Data continues to be updated and as of July 2015 there were 348 listed sites of which 63 are confirmed no longer active. The recent data are available online:

data: <http://ctatlas.reefbase.org/mpadatabase.aspx?country=Solomon%20Islands> visual/graphic: <http://maps.tnc.org/asiapacificmapping/>.

The increase in number of sites is reportedly due to a number of factors including more intense and provincial level searching, improved mapping tools, the inclusion of a greater variety of sites and projects and real increases in numbers of community based management (Nate Peterson pers. comm. 2015).

Table 1 provides an overview of the data up to July 2014 though datasets are not complete and are under constant revision. Of the total reported MMAs 26 (11,805ha) had been designated “no longer active” and the status of a further 52 (3,418ha) was unknown. Therefore of a total of 108,731ha recorded 96,926ha were potentially active. The figure of 96,926ha included the designated but not seemingly implemented marine area of the Rennell World Heritage site (44,400ha) and the Arnavon Marine Conservation Area (15,200). The area of 36 of the “active” sites was unknown.

The sites reported as “no longer active” largely comprised 4 sites established in 1998 by WWF in Western Province and sites established in 2008 by WorldFish in Kia, Isabel (Table 2). This may constitute a bias towards sites with more rigorous reporting as other inactive sites may be less monitored.

148 sites report no-take areas covering some 21,751ha the majority of which are either total and permanent no-take or of unknown (65 and 61), of the remainder 13 are seasonal (Table 3).

There are records for the approximate establishment date of 149 MMAs and a plot of these (Figure 1) demonstrates a steady increase in the establishment of MMAs with particular surges in 2004, 2008 and 2011 corresponding most likely to large projects underway at those times.

Figure 1: Cumulative plot of Solomon Islands MMAs by establishment date up to 2014 (Peterson pers. comm. 2014)

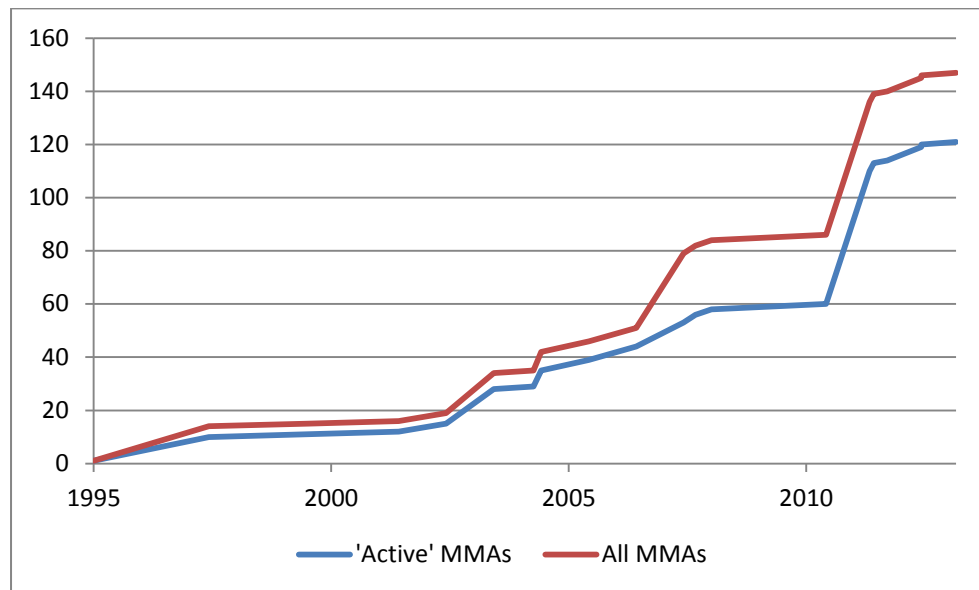


Table 1: Numbers and status of MMAs in Solomon Islands (Peterson pers. comm. 2014).

Status *	Number	Reported Marine Area (ha)
Designated	4	15,643.39
Dispute	2	1,471.28
Draft	70	71,840.14
No Longer Active	26	11,804.92
Proposed	3	653.29
Unknown	52	3,417.53
Voluntary	17	3,900.38
Grand Total	174	108,730.94

Table 2: MMAs in Solomon Islands reported as inactive

Date Established	Total
1998	4
2004	2
2005	1
2008	19
Grand Total	26

Table 3: Reported no-take areas in MMAs in Solomon Islands

No Take	No Take Area (ha)	No Take Area #
All	16,182.31	65
All - Seasonal	4,097.59	13
None	0.00	7
Part	0.00	2
Unknown	1,471.28	61
Grand Total	21,751.19	148

Commentary

In many ways Solomon Islands is poised to make serious advances in resource management, the ECD has long supported and facilitated increased and coordinated investments in wide-scale community based management and LMMAs in particular but is limited by very low internal resourcing and the need to rely on NGO partners to implement national policy priorities (MECM/MFMR 2009, Govan 2013a,b,c). The long-awaited Fisheries Management Act was finally passed by Parliament in 2015 and this Act contains a number of provisions that should increase support for community-based fisheries management and MPAs. National and provincial fisheries officers are increasingly aware of the need to support management strategies but there will be an urgent need to come up with cost-effective service delivery oriented strategies to translate the policy into effects on the ground in a meaningful and sustainable manner.

However, despite the rhetoric resources allocated by government to coastal management continue to be very low and the draft inshore fisheries strategy, which incorporates simple strategies to support sustainable management, remains to be approved. At the higher levels political interest in coastal areas continues to be strongly focused on extracting more cash in an eerie parallel to the now virtually defunct logging industry.

Strategies for LMMAs and CBM (inshore MSP)

- **Enhance and support provincial approaches:** Provincial governments and provincially based staff may be able to make use of the clarified responsibilities in the new Fisheries Act and support integrated provincial level approaches to management using the improved access to data through the mapping and also information and awareness projects. In terms of implementation focus should shift the provincial level including the provincial government and provincial networks.
- **Improve and use database:** The updated database requires verification but will also be of use for provincial planning and support processes that will simultaneously be able to improve and update the data quality.
- **Carry out systematic national survey of status of CBRM:** If increases of CBRM/LMMA sites registered in the database are an indication it would be timely to independently investigate the status of these sites compared to controls and ascertain the most strategic and cost effective support actions that have guided this up-scaling.
- **Implement the National Plan of Action at provincial level:** The SI NPOA for the Coral Triangle initiative gives clear policy and strategic guidance for new projects and was approved by the relevant authorities. The NPOA may serve new projects to justify and guide implementation in a more impactful way.
- **Seek means to ensure that political leadership at ministerial level and above are firmly aware of the limits to growth in coastal extractive industries and the need for any development to be built on sustainable management systems.**

Vanuatu

Jurisdiction

Area	Institution	Instruments	Effect
200nm EEZ and 12nm territorial sea	Fisheries Department within the Ministry of Agriculture, Quarantine, Forestry and Fisheries	Fisheries Act (2014), Maritime Zones Act No. 6 of 2010, Fisheries regulations (Order No. 28 of 2009 and others)	Fisheries management, development and conservation. Foreign fishing vessels and locally based foreign fishing vessels excluded from 12 nautical miles territorial sea
Conservation and environmental management	Department of Environment and Conservation within the Ministry of Lands and Natural Resources	Environmental Management and Conservation Act 2002	Designation of Community Conservation Areas, protected species, environmental impacts and control of pollution inter alia
Up to 6nm	Department of Local Authorities and six local government councils.	Decentralization and Local Government Regions Act (1994 and 1997)	Provinces make by-laws on rules and regulations governing fishing and conditions relating to the issuing of fishing licences within six nautical miles.
Rights over water extending up to the seaward side of any offshore reef	Traditional owners	Enshrined in Constitution	Customary and traditional rights and practices

Institutional capacity

Institution	Budget	Staff
Fisheries Department	VT 95 million (2012), payroll amounts to around 74% of the budget and coastal fisheries management accounts for around 20%	54 (2012), 10% vacant posts, 5-9 based in provinces
Department of Environment	VT16.8m (2013) 95% for staff salaries	9 (1 provincially based) 2013
Local/provincial authorities	Usually no specific budget for fisheries	Some provinces house a fishing related stakeholder e.g. fisheries cooperatives coordinator in SHEFA

Source: Govan 2014

Vanuatu Protected Areas

Vanuatu doesn't keep an updated list of Protected Areas although it continues to report that this is in process through its Programme of Work on Protected Area Project which will facilitate the development of a database. In the absence of such a list the only source of information over the last years has been the WDPA database and

informal or NGO sources. Govan et al. (2009) compared the WDPA to information provided by NGOs and Johannes and Hickey (2004). The present study compares the July 2015 records of the WDPA and information provided by George Petro in 2013 collected by the Vanua Tai network associated with the NGO Wan Smol Bag.

Status in 2008

- Protected Areas: WDPA registered 26 Protected Areas with a marine component although Nguna Pele MPA was repeated. Removing duplications this totalled some 49.3 Km² although 13 sites did not provide area data (Govan et al 2009).
- ICCAs: Govan et al (2009) looked at project records and reports as well as Johannes and Hickey (2004) and suggested that 6 of the WDPA entries were ICCAs and found at least 29 additional ICCAs. The total area recorded under MMAs of any description came to 89.4 km² of which 58.1 km² was attributable to LMMAs or ICCAs.
- Overall status of managed areas: An important caveat was that the number of recorded CCAs probably represents only a small sample of the conservation activity carried out by communities across the country where traditional tabus and enforcement of customary tenure could conceivably still be the norm rather than the exception (Govan et al. 2009; Johannes and Hickey 2004).

Status in 2013-15

- Protected Areas: WDPA records for July 2015 register 21 Protected Areas with a marine component although Nguna Pele MPA is listed three times and therefore the correct total is 19 of which at least 3 are ICCAs. Taking into account this duplication the total area is less than in in 2008 and amounts to 36.2 km² though 13 sites still do not provide area data and 30 km² is attributed to Nguna-Pele without specifying whether this is managed area or NTZ. Data from Govan et al 2009 suggests that the area under NTZ may be around 2 km². Vathe appears to be the only PA formally registered (DoE) and there are only a few others that are in the process pending the long application process of the DoE.
- ICCAs: The present study has not used the now probably outdated Johannes and Hickey (2004) data but uses the more up to date sample carried out by George Petro (Appendix 1) and summarised in [Table 4](#). These data show 67 ICCAs none of which are included in the WDPA contributing at least 14.6km² of NTZ . Further details are provided below.
- Overall status: It is not clear what the basis for removing entries to the WDPA may have been. To the author's knowledge this did not originate from the Vanuatu Government and WDPA had access to the 2008 survey which in the case of other countries served to augment the numbers of Pas by including ICCAs. The caveat must also be made that there is a strong likelihood that many other communities are still practicing some form of ICCA without being detected by surveys. There are reports that a number of these at least are struggling to sustain enforcement and respect for community conservation (Govan 2014).

Characteristics of ICCAs in Vanuatu

As highlighted above and by previous studies the bulk of coastal conservation in Vanuatu is likely being carried out by communities based on their constitutionally supported customary tenure and traditional resource use practices – mainly implementing closed areas or tabus. George Petro, months before his untimely passing, coordinated a survey of the main islands in which the Vanua Tai network were able to gather information. The data gathered on 67 instances of community no-take zones or tabus constitutes an important insight into CCAs in Vanuatu. These data were facilitated by Nicolas Pascal (Appendix 1) and are summarised in [Table 4](#).

Table 4: Survey of reported marine community conservation areas in Vanuatu Islands (Source: George Petro, Nicolas Pascal and Vanua Tai Network 2012, analysis by H. Govan).

Numbers reported	TOTAL	Percent																	
			N. Efate	Erromango	Ambrym	Malekula	Pentecost	Malo	Ermae	Motolava	Avok Island	Makira	Tanna	Tongoa	Maskelyne	Epi	Buniga	Santo	Aneityum
Tabus or No-Take Zones	67	100%	2	4	4	6	10	3	6	7	2	2	2	2	2	6	2	3	4
NTZs permanently closed	40	60%	2	4	4	4	9	1	5	6	1	0	0	0	1	1	0	1	1
Existence of species restrictions ¹	20	30%	3	0		0	0				1	1	0	1	1	6	0	3	4
Existence of habitat restrictions ¹	31	46%	3	0		2	2				2	1	2	2	2	6	2	3	4
Existence of gear restrictions ¹	19	28%	2	0		1	0				1	0	1	0	2	5	0	3	4
Sites with buoyage or signs	13	19%	1	4	0	1	0	0	0	0	0	0	0	2	2	3	0	0	0
Existence of management plan	20	30%	1	0	1	1	7	0	0	4	0	0	0	0	0	4	0	1	1
Include terrestrial component	22	33%	2	3	0	2	2	1	1	1	0	1	0	0	2	4	0	3	0
Empowerment rated better than 50% ²	54	81%	2	4	4	4	10	3	5	7	1	0	2	0	2	6	2	0	2
Adherence to rules rated above 50% ³	53	79%	2	4	4	5	10	0	5	7	1	1	2	0	2	6	2	0	2
Existence of management committee	30	45%	1	0	0	2	8	0	1	6	0	1	0	0	2	4	0	1	4
Poaching incidents reported in 2012 ⁴	16	24%	0	0	0	1	0	1	0	4	1	0	0	1	1	2	0	3	2
Poaching by non-community members	9	13%	0	0	0	1	2	1	1	0	1	0	0	0	0	0	0	3	0
Receive NGO visits or support	14	21%	2	4	0	0	0	0	0	0	2	0	0	2	2	0	0	1	1
Receive financial support	5	7%	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	1

1 Other rules different from NTZ (species restriction, size limits, mangrove cutting taboo,...)

2 Expert opinion about the strength of chief and customary processes inside the community rated on 4 point scale

3 Expert opinion on 4 point scale considering number of poaching events, strength of enforcement, respect of chief's decision, fines

4 Includes events in which poachers were warned, fined, or reported to police

Salient findings from these data include:

- Around 40% of NTZs are periodically opened for harvest
- A significant proportion of sites exercise management restrictions in addition to NTZs
- A third include terrestrial components
- Management plans of some form exist at 30% of sites
- Compliance and enforcement is rated as good or higher at more than 75% of sites
- Less than a quarter receive visits from NGOs or other agencies and only 7% receive financial support

It has not been possible to further verify the survey findings and there are some inconsistencies relating to units of measure for instance but characteristics relating to the size of the tabus or NTZs are shown in Table 5. The average size of NTZ for each island group ranges from 0.0001 to 1.37 Km² with an average of 0.24 Km², the largest NTZ recorded was 3 Km². The size of customary area (marine) for the 30 sites for which data were provided amounts to a total of over 100 Km² which may be significant given that between 28%-46% of sites are reported to exercise other management rules aside from NTZs. A somewhat ambitious extrapolation might indicate that potentially half of communities enforcing tabus/NTZs in the country may be practicing wider management of their marine CMT (LMMAs).

Commentary

Though communities have the strongest legal support for community based resource management of perhaps any Pacific Island Country, in practice the overwhelming majority of communities are left to fend for themselves. The challenges of modernity are steadily eroding the respect for, and authority of, traditional governance and knowledge (Govan 2014).

There is an urgent need for co-management support from government agencies but the lack of financial and staff resources combined with the absence of viable large scale strategies seem entrenched.

The situation is exacerbated by the lack of clarity over institution roles to support communities and this lack of clarity and coherent proposals contributes to the mistrust of traditional and local authorities further hindering potential dialogue and solution seeking.

The efforts of the Vanua Tai national and provincial sub-networks seem to offer successful and viable approaches to supporting communities but problems of capacity and to some extent government recognition appear to slow progress towards maximizing the utility of this avenue.

The extremely small staff and operational budget of the Department of Environment is particularly noteworthy and will reduce the role DoE can play in day to day operations (i.e. outside funded projects) or in the promotion and support of ICCAs.

Strategies for LMMAs and CBM (inshore MSP)

- Assessment of the current status of community stewardship and conservation should be carried out. This could replicate the Johannes and Hickey (2004) work which in turn refers to a longer time series but should expand to include randomly chosen sites as well as some of the more intensively supported.
- The realities of supporting community based resource management and the potential roles of the various institutions need concerted and long term consideration and optimally should maximize opportunities by taking ecosystem or cross-sectoral approaches to address climate change, natural resource management and disaster risk reduction as a minimum. Opportunities for such discussion to be sponsored at the higher political level need to be found.

Table 5: Characteristics of the No-Take Zones (NTZs) and reported Customary Marine Tenure area found in the survey of reported marine community conservation areas in Vanuatu Islands (Source: George Petro and Vanua Tai Network 2013).

	#NTZs	Total size NTZ (Km ²)	Avg. size NTZ (Km ²)	N	Total size CMT (Km ²)	Avg. size CMT (Km ²)	N
N. Efate	2	0.11	0.06	(2)	4.00	2.00	(2)
Erromango	4	0.88	0.22	(4)	37.60	12.53	(3)
Ambrym	4	0.01	0.00	(4)			
Malekula	6	3.10	0.62	(5)	6.00	3.00	(2)
Pentecost	10	0.01	0.00	(8)			
Malo	3	0.00	0.00	(3)	3.50	1.75	(2)
Emae	6	0.31	0.05	(6)			
Motolava	7	0.00	0.00	(7)			
Avok Island	2	1.10	0.55	(2)	13.00	6.50	(2)
Makira	2	0.12	0.06	(2)	1.50	1.50	(1)
Tanna	2	1.00	0.50	(2)	2.00	1.00	(2)
Tongoa	2	0.01	0.01	(2)	0.03	0.01	(2)
Maskelyne	2	0.01	0.01	(1)	4.00	4.00	(1)
Epi	6	3.14	0.52	(6)	9.00	1.50	(6)
Buninga	2	0.70	0.35	(2)	3.85	3.85	(1)
Santo	3	4.10	1.37	(3)	16.00	5.33	(3)
Aneityum	4	0.05	0.05	(1)	8.00	2.67	(3)
	67	14.65	0.24	(60)	108.48	3.62	(30)

- The compilation of a nationally relevant list of Protected Areas is challenged by the diverse and undocumented forms of community management likely to already contributing. Perhaps the most constructive approach would be to parallel the Solomon Islands database and compile a complete geospatial list of all relevant activities or reports at the community level. This database would be of considerable use during local or provincial implementation and strategic planning.

Fiji

Jurisdiction

Area	Institution	Instruments	Effect
200nm EEZ and 12nm territorial sea	Fisheries Department (FD) of the Ministry of Fisheries and Forests (MFF)	Marine Spaces Act (Cap. 158A) Fisheries Act (Cap. 158) Offshore Fisheries Management Decree 2012	Fisheries management, development and conservation including MPAs.
Conservation & environmental management	Department of Environment and Conservation within the Ministry of Lands and Natural Resources	Environmental Management and Conservation Act 2002	Protection of natural resources and control and management of industrial and agricultural development and waste. Requires Environmental Impact Assessment for all development activities.
I Taukei (native Fijians)	Ministry of iTaukei Affairs	iTaukei Affairs Act	Make regulations to be obeyed by all iTaukei, providing for peace, order, welfare and good governance which includes Conservation Officers.
Customary fishing rights within the customary fishing areas or I qoliqoli for the I Taukei (native Fijians)	Fisheries Department (FD) iTaukei Fisheries Commission under the jurisdiction of the Ministry of iTaukei Affairs Registered Qoliqoli fishing right holders	Fisheries Act (Cap. 158)	Permission must be obtained from the registered communal qoliqoli members if a person wishes to fish that area

Institutional capacity

Institution	Budget	Staff
Fisheries Department	Recurrent FJD 5,991,500 in 2012 (excludes capital exp.). Budget that may effectively relate to coastal fisheries management estimated at around 15% (Govan 2013)	147
Department of Environment and Conservation	Recurrent FJD 1,860,200 in 2012 (excludes projects and costs of running the Naboro waste fill)	22
Ministry of iTaukei Affairs	Recurrent FJD 16,100,000 in 2012 (excludes capital costs but includes FJD 13.4M unspecified "Operating Grants and Transfers")	111 (2013)

Note: Data from published Government Budget Estimates. To account for the inclusion of development budgets in Fiji's budget estimates in the case of Fisheries the headings pertaining to capital have been deducted from the overall budget and in the case of Environment the amounts attributed to externally funded projects and obvious capital expenditure (Naboro dump).

Fiji Protected Areas

The large number and wide coverage by LMMAs in Fiji is indisputable. More recently the desire to improve effectiveness especially of other management measures beyond NTZs has led to attempts to use the existing recorded datasets. By 2015 a variety of different figures were available for the coverage of marine protected areas and LMMAs but a number of inconsistencies have become apparent. The various available figures as of July 2015 are summarised in Table 6.

Table 6: Area and numbers of No-Take Zones and overall Locally Managed Marine Area in Fiji from different sources in recent years.

Source	Year	#NTZs	Area NTZs (Km2)	#LMMAs (other MPAs)	Area of LMMAs	Notes
WDPA (2008)	2008	NA	NA	16(29)	355(64)	Total of 45 PAs with marine component. Area data largely missing with inconsistent units
Govan et al. 2009	2008	222	593	217	10,816	Based on FLMMA figures (though discrepancies noticed)
Mills et al. 2011	2010	216	567	149	17,726	Based on independent assessment of FLMMA database
Presentation to Packard Foundation Workshop	2014	437	567	192	17,726	Presented by Brad Carte, FLMMA coordinator
FLMMA database (Sep. 2014)	2014	466	1,061	135	23,722	Extracted from FLMMA database, qoliqoli with NTZ counted as LMMAs
FLMMA database (July 2015)	2015	434	975	NA	NA	Database under review – work in progress
WDPA (July 2015)	2015	103	498	103(20)	10,839	123 marine areas. 20 are not classified as LMMAs but include several. None of the 20 provide area data

Examination of the various datasets raises the following issues:

- **Substantial area is classified as No-Take Zone and has increased:** The substantial area under NTZ is evident from all datasets. The rate of increase is variable perhaps owing to changes in strategy (e.g. decentralized Yaubula Management Support Teams -YMST) or entry of new organizations (Figure 2).
- **A large area is reported to be “managed” and has steadily increased over the years but there are major inconsistencies.** The wide variation in estimates of managed area is of concern and merits urgent attention. The basis for adding traditional fishing areas (Qoliqoli) to the database as managed does not seem to be consistently or reliably applied.
- **Diverse organizations have been part of FLMMA in supporting communities.** At least 10 organizations are associated with site support activities in Fiji. However two such organizations account for three quarters of the recorded area of NTZ and one accounts for two thirds of the number of sites. (Figure 3).
- **The WDPA database is inconsistent.** There does not seem to be a systematic or coherent approach to determining which sites are included in the WDPA database.
- **FLMMA database is not comprehensive.** FLMMA does not consistently record sites that are not supported by members of FLMMA in particular resorts, implemented by NGOs such as Partners for Community Development Fiji or communities that may be implementing tabus or other management measures on their own.
- **The FLMMA database and thus the overall Protected Area database for Fiji has long experienced challenges.** Some of the technical reasons for the challenges include:
 - Variety of data sources and quality owing to diverse organizations and field staff
 - Lack of experienced database manager for most of FLMMA’s history

- Lack of implementation of agreed definitions for key words such as site, tabu, MPA, LMMA
- Poor choice of unique identifier for fields in the database i.e. sites or tabus (instead villages appears to be the best choice)
- Managed area i.e. LMMA is not rigorously and consistently calculated. Some sites may describe or delineate the managed area but in others it may be incorrectly assumed that the qoliqoli adjacent to a village site qualifies as an LMMA.
- The recorded existence of other management rules is not always associated with a defined area.
- A consistent and validated inventory of villages (koro) and customary fishing areas (qoliqoli) has not been used so far in conjunction with site records so far.

Strategies for LMMAs and inshore Marine Spatial Planning

Recent developments of note relating to coastal MPAs and LMMAs in Fiji include:

1. Expansion and consolidation of the decentralised approach – YMST.
2. Implementation of the Provincial Conservation Officer approach by the ministry of I Taukei Affairs and increasing collaboration with FLMMMA.
3. FLMMMA has finalized a strategic plan 2014-2018
4. The development of a FLMMMA policy brief and strategy for government.

These developments provide a series of opportunities for increasing the spread, support and effectiveness of LMMAs in Fiji towards Aichi target 11 as well as providing the backbone of systems of integrated resource management and resilience. Of note is the yet to be launched FLMMMA Policy Brief which proposes concrete steps by the Government to “Provide a suitable enabling environment and procedures at all levels” and “Improve implementation, enforcement and information for decision makers at all levels” (FLMMMA 2015).

The FLMMMA led approach towards achieving wider resource management along with a substantial increment in No-Take Zones fits the national context of customary rights and tenure and the local governance structures. The approach neatly straddles the purview of three sectors - that is Fisheries, Environment and I Taukei (Indigenous) Affairs and therefore needs delicate coordination. The assumption since the outset is that coordinated support of the FLMMMA approach should be able to meet various government policy priorities such as food security and sustainable resource management as well as Aichi target 11 on protected area coverage.

A highly adaptive approach to aligning local strategic realities with international obligations has been pioneered in Fiji and described in Mills et al (2011). In essence Fijian planners should be able to assign effectiveness scores to the various LMMAs and their various management approaches

Figure 2: Number of sites (counted as No-Take Zones/tabus) recorded cumulatively by date in the FLMMMA database as of July 2015.

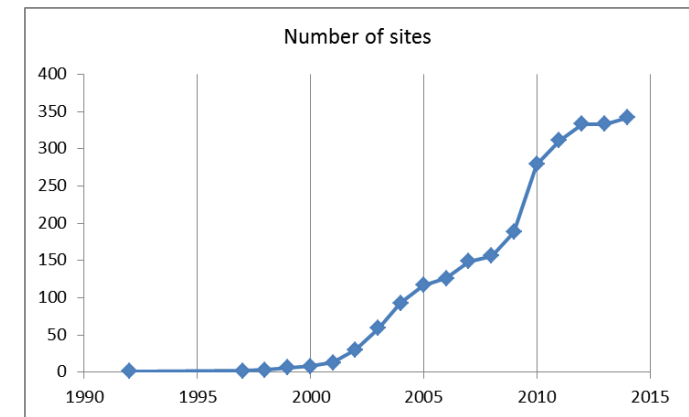
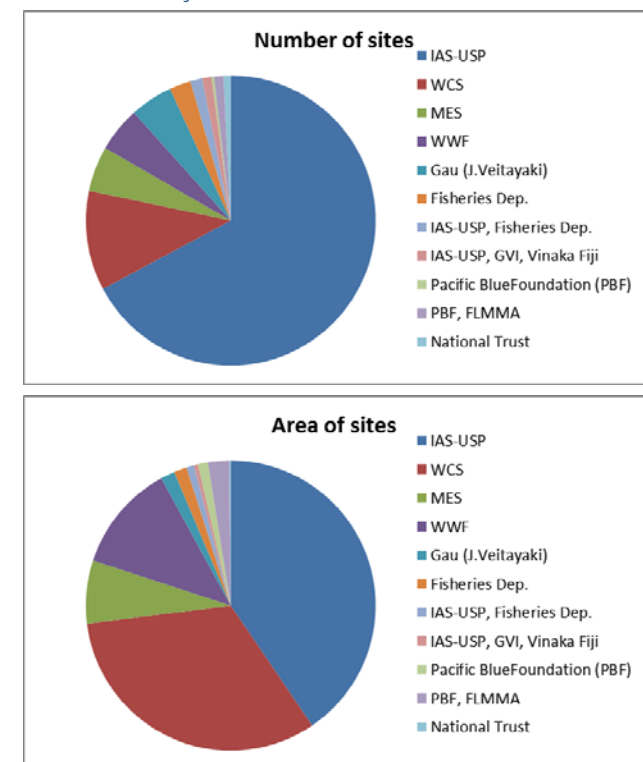


Figure 3: Sites (counted as No-Take Zones/tabus) by supporting organizations in the FLMMMA database as of July 2015.



and by using geospatial analysis techniques monitor whether adequate area is being effectively managed to achieve equivalent amounts of protection to meet policy goals including Aichi target 11 and national targets in other sectors (e.g. 100% of inshore waters under fisheries management). Importantly, for such analyses to be feasible it is of utmost importance that the data on the status of management in Fiji be reliable.

- **A database containing all available information on the geographic extent of all coastal management efforts needs to be established and maintained. This could optimally be coordinated through FLMMA but current deficiencies outlined above would need to be addressed with specific regard to the needs of government and planner users.**
- **Sites which are not members of FLMMA need to be inventoried and assessed including resorts and those supported by other NGOs. This could be carried out by FLMMA or an independent body.**
- **Work underway to improve assessment of status of management in sites should also be supported and independently assessed with the possibility of it being extended to sites that are not members of FLMMA or operate under different governance arrangements e.g. resorts.**

The "other" Aichi targets

In line with findings relating to ICCAs elsewhere (ICCA briefing note) it is probably nowhere more evident that enormous potential exists for meeting many of the other Aichi targets through the current strategies adopted by FLMMA in Fiji such as those on mainstreaming biodiversity, sustainable resource use, improving awareness and status of biodiversity and ecosystem approaches. However, the poor resourcing of the Department of the Environment is of grave concern as noted in this study and also by the Director in his statement "Fiji only has about 50% of resources to properly monitor and implement its environmental laws and international conventions¹." This lack of resourcing will affect the achievement of Targets 8-10 with serious consequences to coastal protected areas as well of course to Target 20 itself relating to mobilizing financial resources.

¹ <http://fijivillage.com/news/Department-of-Environment-faces-problems-in-law-enforcement--k2r59s/>

References

- Abernethy K.E., O . Bodin, P. Olsson, Z. Hilly, A. Schwarz. 2014. Two steps forward, two steps back: The role of innovation in transforming towards community-based marine resource management in Solomon Islands. *Global Environmental Change* 28 (2014) 309–321.
- Adelman, M; Ivaschenko, O; Packard, T; and V. Suri. 2014. *A regional companion to the World development report 2014 : hardship and vulnerability in the Pacific island countries*. Washington DC ; World Bank Group. <http://documents.worldbank.org/curated/en/2014/01/19188485/regional-companion-world-development-report-2014-hardship-vulnerability-pacific-island-countries>
- Aswani S. and K. Ruddle. 2013. Design of Realistic Hybrid Marine Resource Management Programs in Oceania. *Pacific Science*, 67(3):461-476.
- Auriemma G, Byler K, Peterson K, Yurkanin A, Costello C. 2014. A global assessment of Territorial Use Rights in Fisheries to determine variability in success and design. Santa Barbara, California: Bren School of Environmental Science and Management. http://www.bren.ucsb.edu/research/2014Group_Protocols/documents/TURF_GP_Thesis_21March2014.pdf
- AusAID 2008. Making Land Work: Reconciling customary land and development in the Pacific. (2 Vols). AusAID Pacific Land Program, Canberra.
- Bergh PE, Davies SL. 2001. Monitoring, control and surveillance (Chapter 8). In Cochrane KL (ed.) *A Fishery Manager's Guidebook*. FAO Fish Tech Pap. No. 624. Rome: UN Food and Agriculture Organization.
- Berkes, F., R. Mahon, P. McConney, R. Pollnac and R. Pomeroy. 2001. *Managing small-scale fisheries: Alternative directions and methods*. IDRC, Ottawa, Canada, 308pp
- Borrini-Feyerabend, G., A. Kothari and G. Oviedo 2004, *Indigenous and Local Communities and Protected Areas. Towards equity and enhanced conservation*, IUCN/WCPA Best Practice Series, 11, Gland (Switzerland) and Cambridge (United Kingdom)
- CCIF 2013. *Assessment of the Enabling Conditions for Rights-Based Management of Fisheries and Coastal Marine Resources in the Western Pacific: Companion document to the six country assessment reports*. California Environmental Associates and the Community Investment Forum (a project of the Trust for Conservation Innovation) for the David and Lucile Packard Foundation.
- Chuenpagdee R, Liguori L, Palomares MD and Pauly D (2006) *Bottom-up, global estimates of small-scale marine fisheries catches*. Fisheries Centre Research Reports 14(8), Fisheries Centre, University of British Columbia, Vancouver. 112 p.
- Dahl A. L. and I. L. Baumgart. 1983. *The state of the environment in the South Pacific*. UNEP Regional Seas Reports and Studies No. 31.
- DENR/DA-BFAR/DILG. 2001. Department of Environment and Natural Resources, Bureau of Fisheries and Aquatic Resources of the Department of Agriculture, and Department of the Interior and Local Government. *Philippine Coastal Management Guidebook No. 8: Coastal Law Enforcement*. Cebu City, Philippines.
- FAO, 2002. *Recent trends in monitoring, control and surveillance systems for capture fisheries*. FAO Fisheries Technical Paper . No. 415. Rome, FAO. 200p
- FAO. 1981. *Report on an expert consultation on MCS for fisheries management* . Rome, FAO.
- FLMMA 2011. *The way we work together – guidelines for members of the FLMMA Network*. FLMMA Operations guide v1.6. www.lmmanetwork.org
- FLMMA 2015. *Fiji Locally Managed Marine Area Network: Working with government towards a better Fiji - How FLMMA can assist government towards food security, conservation, disaster risk reduction and green growth*. A policy brief and strategy coordinated by H. Govan. June 2015
- Gezelius, S., & Hauck, M. 2011. *Toward a Theory of Compliance in State-Regulated Livelihoods: A Comparative Study of Compliance Motivations in Developed and Developing World Fisheries* *Law & Society Review*, 45 (2), 435-470

- Gillett, R. 2009. Fisheries in the economies of the Pacific island countries and territories. Mandaluyong City, Philippines: Asian Development Bank.
www.adb.org/documents/studies/pacific-fisheries/pacific-fisheries.pdf
- Gillett, R. and I. Cartwright. 2010. The Future of Pacific Fisheries. SPC, Noumea. http://www.spc.int/fame/doc/corporate_docs/Future_of_PI_fisheries_Report.pdf
- Govan, H. 2012. Solomon Islands: Summary results and recommendations on the Local Compliance and Community-supported Enforcement Project. Project of the Coral Triangle Support Project.
- Govan, H. 2013. Strategic Review of Inshore Fisheries Policies and Strategies in Melanesia: Fiji, New Caledonia, Papua New Guinea, Solomon Islands, and Vanuatu. Part I: General Overview. Part II: Country reports and data (with Jeff Kinch and Alexandre Brjosniovski). Reports to the Secretariat of the Pacific Community for the Melanesian Spearhead Group, Noumea, New Caledonia. <http://bit.ly/1dhlxv4>
- Govan, H. 2013a. Review of Guadalcanal and Central Islands Provincial Governments capacity for implementation of the NPOA: Strengthening the role of provincial level governments in Community Based Resource Management Part 1: Review. Report for SIG and PSLP under the Coral Triangle Initiative. <http://bit.ly/161Excp>
- Govan, H. 2013b. Strategy for Provincial Government implementation of the NPOA: Progressively building capacity for Community Based Resource Management +. Report for SIG and PSLP under the Coral Triangle Initiative. <http://bit.ly/161Excp>
- Govan, H. 2013c. Implementation Plan for The National Plan of Action of the Coral Triangle Initiative On Coral Reefs, Fisheries And Food Security In Solomon Islands 2013-2016. MECM / MFMR of Solomon Islands Government. <http://bit.ly/161Excp>
- Govan, H., Aalbersberg, W., Tawake, A., and Parks, J. 2008a. Locally-Managed Marine Areas: A guide to supporting Community-Based Adaptive Management. The Locally-Managed Marine Area Network.
- Govan, H., A. Tawake, K. Tabunakawai, A. Jenkins, A. Lasgorceix, A. Schwarz, W. Aalbersberg, B. Manele, C. Vieux, D. Notere, D. Afzal, E. Techera, E. Tulala, H. Sykes, H. Walton, H. Tafea, I. Korovulavula, J. Comley, J. Kinch, J. Feehely, J. Petit, L. Heaps, P. Anderson, P. Cohen, P. Ifopo, R. Vave, R. Hills, S. Tawakelevu, S. Alefaio, S. Meo, S. Troniak, S. Malimali, S. Kukuian, S. George, T. Tauaefa, T. Obed. 2009a. Status and potential of locally-managed marine areas in the South Pacific: meeting nature conservation and sustainable livelihood targets through wide-spread implementation of LMMAs. SPREP/WWF/WorldFish-Reefbase/CRISP.
http://www.sprep.org/att/publication/000646_LMMA_report.pdf
- Govan, H., Alifereti Tawake, Kesaia Tabunakawai, Aaron Jenkins, Antoine Lasgorceix, Erika Techera, Hugo Tafea, Jeff Kinch, Jess Feehely, Pulea Ifopo, Roy Hills, Semese Alefaio, Semisi Meo, Shauna Troniak, Siola'a Malimali, Sylvia George, Talavou Tauaefa, Tevi Obed. 2009b. Community Conserved Areas: A review of status & needs in Melanesia and Polynesia. ICCA regional review for CENESTA /TILCEPA /TGER /IUCN/ GEF-SGP. <http://bit.ly/H7oqQn>
- Govan, H. 2014. Monitoring, Control and Surveillance of Coastal fisheries in Kiribati and Vanuatu. Part I: Priorities for action. Part II: Reviews. Report for Secretariat of the Pacific Community, FAME Division. Noumea. <http://bit.ly/1vOvcSR>
- Govan, H. in prep. Preliminary review of public expenditure of the Fisheries Agencies of Pacific Island Countries and Territories: Policy, operational budget and staffing support for coastal fisheries. Draft report to the SPC Division of Fisheries, Aquaculture and Marine Ecosystems.
- Hauck, M. 2011. Small-scale Fisheries Compliance: Integrating Social Justice, Legitimacy and Deterrence. Small-scale fisheries management: frameworks and approaches for the developing world, 196 in Pomeroy and Andrew 2011.
- Huber M, K. McGregor, 2002. A synopsis of information relating to marine protected areas. IWP Technical Report 2002/01. The International Waters Programme, Apia: Secretariat of the Pacific Regional Environment Programme; 2002. 132pp.
- Johannes, R. E. 1994a. Design of tropical nearshore fisheries extension work beyond the 1990s, pp. 162-174. In: R. South, D. Goulet, S. Tuquiri and M. Church (eds.) Traditional Marine Tenure and Sustainable Management of Marine Resources in Asia and the Pacific. International Ocean Institute - South Pacific, Suva.

- Johannes, R.E. 1994b. Cooperative Fisheries Management : Major changes in training required for government fisheries personnel. SPC Traditional Marine Resource Management and Knowledge Information Bulletin #4. SPC, Noumea.
- Johannes, R.E. 1978. Traditional marine conservation methods in Oceania and their demise. *Annual Review of Ecology and Systematics* 9:349-64.
- Johannes, R.E. 1982. Traditional conservation methods and protected marine areas in Oceania. *Ambio* 11(5): 258-261.
- Johannes R. E. and F. R. Hickey. 2004. Evolution of village-based marine resource management in Vanuatu between 1993 and 2001. Coastal region and small island papers 15, UNESCO, Paris, 48 pp.
- Kaufmann D., Aart Kraay and Massimo Mastruzzi. 2010. "The Worldwide Governance Indicators: A Summary of Methodology, Data and Analytical Issues". World Bank Policy Research Working Paper No. 5430. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1682130. Full interactive access to the aggregate indicators, and the underlying source data, is available at www.govindicators.org.
- Kothari A, Camill P, Brown J. Conservation as if People Also Mattered: Policy and Practice of Community-based Conservation. *Conservat Soc* 2013;11:1-15
- LMMA 2014. Social Contract: Our Promises To Each Other: Our Commitment To Communities. www.lmmanetwork.org
- MECM/MFMR 2009. Solomon Islands National Plan of Action - Coral Triangle Initiative on coral reefs, fisheries and food security. SIG, Honiara, Solomon Islands. Compiler and facilitator: H. Govan.
- Morin, S. C. Marlessy, D Steenbergen. 2011. Impacts on our Reefs: Case study of Meos Mangguandi & Auki Islands in the Padaido Islands, Biak, Papua, Indonesia. Report Prepared for 'Asia Pacific LMMA Network Meeting' in Fiji, 8th-21st of May 2011, Indonesia LMMA Network.
- Parks, J. E. and Salafsky, N., 2001. Fish for the future? A collaborative test of locally-managed marine areas as a biodiversity conservation and fisheries management tool in the Indo-Pacific region: Report on the initiation of a learning portfolio. The World Resources Institute. Washington DC.
- Pomeroy, B., J. Parks, K. Flower, M. Guidote, H. Govan, and S. Atkinson. Submitted. Status and priority capacity needs for local compliance and community-supported enforcement of marine resource rules and regulations in the Coral Triangle region. *Marine Policy*.
- Pomeroy, R. S., & Andrew, N. (Eds.). 2011. Small-scale fisheries management: frameworks and approaches for the developing world. Cabi.
- Rocliffe, S., Peabody, S., Samoily, M., & Hawkins, J. P. (2014). Towards A Network of Locally Managed Marine Areas (LMMAs) in the Western Indian Ocean. *PLoS one*, 9(7).
- Spalding MD, Ravilious C, Green EP (2001) World Atlas of Coral Reefs. University of California Press, London
- SPC. 2011. Demographic indicators. PRISM project. <http://www.spc.int/prism/>
- Taholo, Ana. 2013. Presentation to UNDAOLOS / PIFS 2013.
- UNEP 1999. Pacific Islands Environment Outlook. United Nations Environment Programme, Mexico.
- Zann, L.P. 1999. A new (old) approach to inshore resources management in Samoa. *Ocean & Coastal Management* 42: 569-590.

Appendix 1: Characteristics of marine Community Conservation Areas in different islands of Vanuatu: summary of a survey by George Petro and Wan Smol Bag

George Petro and Nicolas Pascal (data and survey), Hugh Govan (analysis)

July 2015

In 2012, George Petro in collaboration with Nicolas Pascal performed a survey through the Wan Smol Bag network of the presence and main characteristics of community conservation areas in the main islands of Vanuatu. The methods were based on direct interviews (both physical and phone) with the representatives of each coastal community of the network. The questionnaire cover aspects of socio-economic context (e.g. fishing effort, tourism development, distance to market, etc.), MMA features (e.g. age, size, management plan, enforcement, NGO support, etc.).

Data was collected for 67 communities in 17 islands from March 2012 to October 2012. When possible, data was checked in the field.

The survey is not exhaustive and represents sites that were brought to the attention of the survey team. Estimates of the total number of coastal communities vary between 550 and 1400 (Govan 2013, 2015) and other communities may be implementing local or traditional management measures.

The tragic passing of George has delayed the release of this most comprehensive study to date but the following tables summarise the findings of the survey and provides important insights into community conservation in Vanuatu.

	TOTAL	Percent	N. Efate	Erromango	Ambrym	Malekula	Pentecost	Malo	Emae	Motolava	Avok Island	Makira	Tanna	Tongoa	Maskelyne	Epi	Buniga	Santo	Aneityum
Numbers reported	67	100%	2	4	4	6	10	3	6	7	2	2	2	2	2	6	2	3	4
Tabus or No-Take Zones	67	100%	2	4	4	6	10	3	6	7	2	2	2	2	2	6	2	3	4
NTZs permanently closed	40	60%	2	4	4	4	9	1	5	6	1	0	0	0	1	1	0	1	1
Existence of species restrictions ¹	20	30%	3	0	0	0	0	0	0	1	1	0	1	1	6	0	3	4	0
Existence of habitat restrictions ¹	31	46%	3	0	2	2	0	0	0	2	1	2	2	2	6	2	3	4	0
Existence of gear restrictions ¹	19	28%	2	0	1	0	0	0	0	1	0	1	0	2	5	0	3	4	0
Sites with buoyage or signs	13	19%	1	4	0	1	0	0	0	0	0	0	0	2	2	3	0	0	0
Existence of management plan	20	30%	1	0	1	1	7	0	0	4	0	0	0	0	0	4	0	1	1
Include terrestrial component	22	33%	2	3	0	2	2	1	1	1	0	1	0	0	2	4	0	3	0
Empowerment rated better than 50% ²	54	81%	2	4	4	4	10	3	5	7	1	0	2	0	2	6	2	0	2
Adherence to rules rated above 50% ³	53	79%	2	4	4	5	10	0	5	7	1	1	2	0	2	6	2	0	2
Existence of management committee	30	45%	1	0	0	2	8	0	1	6	0	1	0	0	2	4	0	1	4
Poaching incidents reported in 2012 ⁴	16	24%	0	0	0	1	0	1	0	4	1	0	0	1	1	2	0	3	2
Poaching by non-community members	9	13%	0	0	0	1	2	1	1	0	1	0	0	0	0	0	0	3	0
Receive NGO visits or support	14	21%	2	4	0	0	0	0	0	0	2	0	0	2	2	0	0	1	1
Receive financial support	5	7%	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	1

	#NTZs	Total size NTZ (Km ²)	Avg. size NTZ (Km ²)	Total size CMT (Km ²)	Avg. size CMT (Km ²)
N. Efate	2	0.11	0.06 (2)	4.00	2.00 (2)
Erromango	4	0.88	0.22 (4)	37.60	12.53 (3)
Ambrym	4	0.01	0.00 (4)		
Malekula	6	3.10	0.62 (5)	6.00	3.00 (2)
Pentecost	10	0.01	0.00 (8)		
Malo	3	0.00	0.00 (3)	3.50	1.75 (2)
Emae	6	0.31	0.05 (6)		
Motolava	7	0.00	0.00 (7)		
Avok Island	2	1.10	0.55 (2)	13.00	6.50 (2)
Makira	2	0.12	0.06 (2)	1.50	1.50 (1)
Tanna	2	1.00	0.50 (2)	2.00	1.00 (2)
Tongoa	2	0.01	0.01 (2)	0.03	0.01 (2)
Maskelyne	2	0.01	0.01 (1)	4.00	4.00 (1)
Epi	6	3.14	0.52 (6)	9.00	1.50 (6)
Buniga	2	0.70	0.35 (2)	3.85	3.85 (1)
Santo	3	4.10	1.37 (3)	16.00	5.33 (3)
Aneityum	4	0.05	0.05 (1)	8.00	2.67 (3)
TOTAL	67	14.65	0.24 (60)	108.48	3.62 (30)

1 Other rules different from NTZ (species restriction, size limits, mangrove cutting taboo,...)

2 Expert opinion about the strength of chief and customary processes inside the community rated on 4 point scale

3 Expert opinion on 4 point scale considering number of poaching events, strength of enforcement, respect of chief's decision, fines

4 Includes events in which poachers were warned, fined, or reported to police

Notable features include:

- **More than half of the NTZs are considered to be permanently closed.** It may be important to further investigate whether those permanently closed are relatively younger. If so, this might reflect either outside influences towards permanent closure as a more effective management tool or alternatively that younger sites have just not yet experienced pressure or inclination to open the closed areas for food.
- **Around half of sites have other management rules**
- **Relatively few sites receive NGO support and less still receive financial support**
- **The average size of NTZ for each island group ranges from 0.0001 to 1.37 Km²** with an average of 0.24 Km², the largest NTZ recorded was 3 Km². For the 30 sites for which data were provided on the size of customary area (marine) this amounts to a total of over 100 Km² which may be significant given that between 28%-46% of sites may exercise other management rules aside from NTZs.