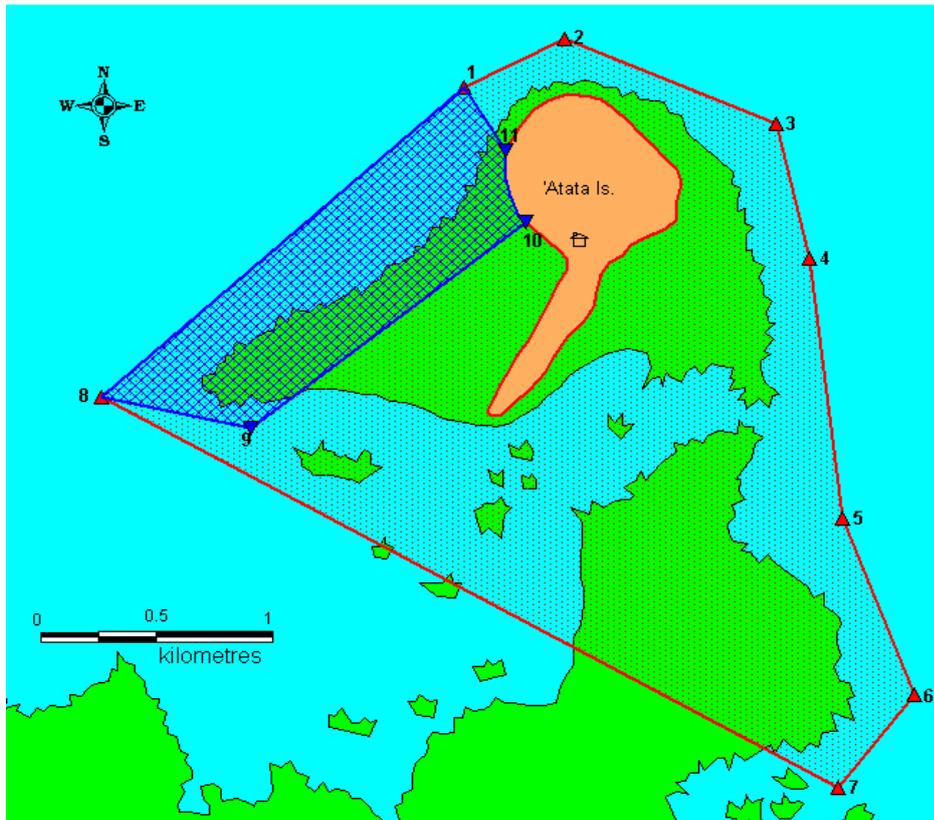




## A REVIEW OF SPECIAL MANAGEMENT AREAS IN TONGA



Cover: The 'Atata Special Management Area in Tongatapu. The SMA boundary is in red and the no-take zone boundary in blue. Drawing courtesy of the Ministry of Fisheries.

## **A REVIEW OF SPECIAL MANAGEMENT AREAS IN TONGA**

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## PREPARATION OF THIS DOCUMENT

The Government of Tonga decided to review the SMA program in 2016 at the ten year mark of the start of the program. A request was made to the Food and Agriculture Organization of the United Nations (FAO) to assess the program and FAO then recruited a consultant with experience in community-based fisheries management and in Tongan fisheries to undertake the review. The program was examined for major issues, especially those dealing with establishment, monitoring, costs, and benefits – and recommendations for improving the program were made.

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### ABSTRACT

During the 20th century all Tongans have had equal access to the coastal fishery resources of the country and a centralised fisheries management approach. In the mid-1990s, the community-based management concept gained momentum and in the early 2000s a change in Tonga's fisheries legislation allowed for fisheries management by local communities, through Special Management Areas (SMAs).

This document contains the review of the SMA program ten years out from initiation. The review includes key recommendations for the improvement of the program based on visits to communities in Vava'u, Ha'apai, and Tongatapu, and discussions with Ministry of Fisheries officials in Nuku'alofa.



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## ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
CCMC	Coastal Community Management Committee
CEO	Chief Executive Officer
CFMDP	Coastal Fisheries Management and Development Project
CPUE	catch per unit of effort
FAD	fish aggregation device
FAO	Food and Agriculture Organization of the United Nations
FFA	Forum Fisheries Agency
FSPI	Foundation for the Peoples of the South Pacific
FSPV	Foundation for the Peoples of the South Pacific Vanuatu
IAS	Institute of Applied Science of the University of the South Pacific
IUCN	International Union for Conservation of Nature
LMMA	locally managed marine area
MACBIO	Marine and Coastal Biodiversity Management in Pacific Island Countries
MPA	marine protected area
R2R	Ridge to Reef Program
SMA	special management area
SPC	Pacific Community
TNC	The Nature Conservancy
VEPA	Vava'u Environment Protection Association
WWF	World Wide Fund for Nature

## **EXECUTIVE SUMMARY**

During the 20<sup>th</sup> century all Tongans have had equal access to the coastal fishery resources of the country. The government's efforts to manage and conserve those resources were based on a centralised approach, in which the Fisheries Division would attempt to regulate fisheries from their head office in Tongatapu and stations in a few parts of the country. In the mid-1990s the idea arose that coastal communities should be given powers to regulate fisheries in their nearby marine areas. That concept gained momentum and in the early 2000s a change in Tonga's fisheries legislation allowed for fisheries management by local communities, through Special Management Areas (SMAs). Since that time the Fisheries Division has worked with coastal communities to establish 11 SMAs.

Given the large amount of effort Tonga is focusing on SMAs, the potential benefits of the scheme, community enthusiasm for participating, and considerable donor interest in funding additional SMAs, the Tonga government decided to review the SMA program. A request was made to the Food and Agriculture Organization of the United Nations (FAO) to assess the program. In mid-2016 FAO recruited a consultant with experience in community-based fisheries management and in Tonga fisheries to undertake the review. The general plan was to examine the major issues of the SMA program, especially those dealing with establishment, monitoring, costs, and benefits – and make recommendations for improving the program.

### **Satisfaction with SMAs of the target communities**

An important feature of the current SMA situation is the satisfaction of the target communities with their respective SMAs. In the establishment of an SMA in Tonga, the government is in effect giving exclusive use rights to a community – which becomes a substantial asset of that community. This process is inherently in the self-interest of the community, hence the large amount of enthusiasm among those participating. Also contributing to the target community interest is that the main fisheries management tool, banning fishing by outsiders, is relatively painless for the SMA community.

### **The Ministry of Fisheries and the SMA program**

It is important to note that the SMA program at the Ministry of Fisheries is largely “home grown” and to a great extent has been developed by Tongans into its current form. The staff of the Ministry of Fisheries are justifiably proud of the system they have created. An important consideration in making suggestions for improving the scheme is to preserve the Tongan content and associated ownership and pride.

The quality of the inputs of the staff of the Ministry of Fisheries into the SMA process is very good. This opinion is derived from direct observation of the staff of the Coastal Fisheries Section, and the Ministry's Vava'u and Ha'apai branches. This includes their organisation, productivity, technical knowledge, and community interaction skills. In terms of facilitating the SMA establishment process, much emphasis is placed by staff on consulting the target communities, as well as nearby communities. From observations during the present review, Ministry staff appear to function well in community meetings.

A major issue in the establishment of SMAs is whether the process should be about improving the management of marine resources or about the much larger process of village development. The SMA concept was originally intended to enable communities to have greater control over fishing activities in nearby waters. It has since expanded to include alternative livelihood activities in the fisheries sector, then alternative livelihood activities outside the fisheries sector (e.g. promotion of pandanus culture), and in some cases has included infrastructure such as community buildings. In some respects, the luxury of these peripheral activities has been at the expense of communities waiting to join the SMA program.

### **The SMA workload**

Most of the SMA work of the Ministry of Fisheries is undertaken by the Coastal Fisheries Section (three staff work on SMAs part-time), supplemented by part-time inputs from a Ministry Deputy CEO, and by part-time inputs of the Ministry staff on Vava'u and Ha'apai. They have a huge workload:

- Servicing the 11 existing SMAs: regular visits, work associated with promoting alternative livelihoods, ordering fishing gear, technical enquiries from communities, quarterly data meetings, etc.
- Undertaking tasks associated with establishing SMAs in the 32 communities on the waiting list: preliminary meetings, drafting management plans, surveying boundaries, presentations to the Fisheries Management Advisory Committee, etc.
- Addressing general SMA-related issues: dealing with potential donors, enquiries from parliament, complaints from non-SMA communities, looking after overseas visitors to the SMAs, etc.
- Also to be considered is the time spent travelling by Ministry staff to the many isolated SMAs all over the country.

### **SMA Monitoring**

The Ministry of Fisheries intended to collect and analyse information on both biological/ecological and socio-economic aspects of the SMAs. In the event, data collection and analysis have been considerably reduced from those anticipated in the SMA management plans, and are probably less than those carried out at the beginning of the SMA period. In short, little useful information is being produced by the monitoring. This is not to imply negligence on the part of the Ministry of Fisheries. Ironically, it may be due to the success of the Ministry's SMA program - the program is now so popular with communities that it has expanded to the point where the workload permits only essential activities.

### **Baseline surveys**

Baseline surveys, as envisaged in the current SMA management plans, often do not give clear direction to community fishery management efforts. This difficulty is aside from any cost considerations. It is suggested that baseline surveys should be eliminated, or at least downgraded in priority.

### **Some basic principles for SMA monitoring**

- Just as communities need to adapt their management efforts to changing conditions, the Ministry of Fisheries needs to periodically modify their SMA monitoring program to take current realities into account.
- The purpose of future SMA monitoring should largely be to assist communities in adjusting their management efforts. The monitoring should not be focused on demonstrating to the outside world the benefits of SMAs, but rather to produce information useful for communities.
- Future SMA monitoring in Tonga should be consistent with the concepts that (a) the priority for monitoring should be for what is being managed, and (b) good simple data that is analysed and is understood by the community is better than more complex data that remains unused.

### **A strategy for SMA monitoring**

The suggested strategy is to:

- Modify the existing catch monitoring on a site-specific basis (i.e. tailored to each community) to obtain the trend of the over-all catch rate, and if possible, trends in rates for important species and gear.

- Collect perception information on trends in catch rates, outsider presence in the SMA, and SMA-related benefits.
- Regularly analyse this information and (importantly) present the results to the communities.

The above strategy suggestion represents a major switch in the goal of SMA monitoring; a change from attempting to collect/use statistically significant quantitative information to the goal of “keeping an eye on general trends”.

### **The costs of establishing SMAs**

The cost of establishing specific SMAs is currently not available. General estimates for the cost of establishing an SMA have been made by the staff of the Coastal Fisheries Section: Vava'u T\$59 934 (US\$26 191); Ha'apai T\$49 728 (US\$21 731); and Tongatapu T\$18 577 (US\$8 118). Costs of establishing community management in nearby countries are examined with the conclusion that the cost of establishing an SMA in Tonga is relatively high, with staff travel allowances and overtime being major factors. It is important to stress that in the view of the present reviewers expenditures on SMAs by the Ministry are especially profligate or wasteful.

### **Expansion of the SMA network**

To expand the SMA program to all coastal communities in Tonga at the present rate of establishment would take about a century and would require about T\$1.7 million (US\$0.74 million) in 2016 dollars.

### **Streamlining the SMA establishment process**

One of the major messages of this review is the need to streamline the process of establishing SMAs, with respect to both costs and time required. Several types of improvement are possible, and eight suggestions for streamlining are given.

### **Additional resources for the SMA program**

A prominent issue to emerge from this review is the very large workload of the Coastal Fisheries Section. That section has three staff who work on SMAs part-time, supplemented by part-time inputs from a Ministry Deputy CEO. Their work load is very large and includes servicing the 11 existing SMAs, establishing SMAs in the 32 communities on the waiting list, and general SMA-related tasks. To properly carry out this work, a much larger budgetary allocation is required.

### **Landlocked communities**

Landlocked communities will have less access to coastal fishing areas as the number of SMAs increases in Tongatapu and Vava'u. Although the benefits to the country from SMAs appear to far outweigh the negative impacts on landlocked communities, the issue should be taken seriously. The effects of SMAs on the food supply and livelihoods of landlocked communities deserve additional attention.

### **Priority recommendations**

The priority recommendations are:

- Streamline the establishment of SMAs
- Enhance the SMA unit in the Ministry of Fisheries
- Improve the SMA establishment process
- Modify current SMA monitoring
- Determine the impacts of SMAs on landlocked communities

**Concluding remarks**

Most SMA communities are very enthusiastic about the benefits they are now receiving from the enhanced management of their fishery resources. Several examples of this were noted during the present review and in other documentation on SMAs. Although it is difficult to substantiate these assertions of success with quantitative data, the enthusiasm is quite real. Similar eagerness over the benefits of fisheries management has been rare or unknown in Tonga in the past century. From that perspective alone, the SMA program could be considered a huge success.

Much of the credit for generating community enthusiasm for improved fisheries management should go to the staff of the Ministry of Fisheries involved in SMA work. The success of the Ministry's SMA work has resulted in the program being so popular with communities that it has expanded to the point where it is "bursting at the seams". Most of the deficiencies noted in this report appear to relate to the tremendous excess in community demand related to SMAs over that which the Ministry could possibly service with its present resources.

## Introduction

During the Twentieth century all Tongans have had equal access to the coastal fishery resources of the country. The government's efforts to manage and conserve those resources were based on a centralised approach in which the Fisheries Division would attempt to regulate fisheries from their head office in Tongatapu and stations in a few parts of the country. In many cases, especially in the outer islands and remote communities, the net result of well-intentioned central management of coastal fisheries in Tonga was the absence of management.

In the mid-1990s the idea arose that coastal communities should be given powers to regulate fisheries in their nearby marine areas. That concept gained momentum and in the early 2000s a change in Tonga's fisheries legislation allowed for fisheries management by local communities, through Special Management Areas (SMAs). Since that time the Fisheries Division<sup>1</sup> has worked with coastal communities to establish 11 SMAs.

Given the large amount of effort Tonga is focusing on SMAs, the potential benefits of the scheme, community enthusiasm for participating, and considerable donor interest in funding additional SMAs, the Tongan government decided to review the SMA program. A request was made to FAO to assess the program.

In mid-2016, FAO recruited a consultant with experience in community-based fisheries management and in Tongan fisheries to undertake the review. That consultant made a preliminary one-week visit to Tongatapu in late August and returned in November for visits to communities in Vava'u (including the Ovaka SMA), Ha'apai (including the Felemea SMA), and Tongatapu (including the proposed Nukuleka SMA), and for discussions with Ministry of Fisheries officials in Nuku'alofa. The general plan was to examine the major issues of the SMA program, especially those dealing with establishment, monitoring, costs, and benefits – and make recommendations for improving the program.

A large number of people were consulted during this SMA review. Appendix 1 gives the 117 individuals interviewed. Senior officials of the Ministry of Fisheries requested that the report of the review contain as much information on Tonga's SMAs as possible. Accordingly, Appendix 2 is a listing of Tongan legislation dealing with SMAs and Appendix 3 is an annotated bibliography of 20 relevant documents.

## Background

King Taufa'ahau Tupou I united Tonga in the mid-1800s and the result was a consolidation of power greater than in any other Pacific Island country. In 1875 a constitution became effective which declared that all land and sea belonged to the King. Tonga's sea areas were defined by Royal Proclamation in 1887 to be all islands, rocks, reefs, foreshores and water lying between 15 and 23.5 degrees south latitude and between 173 and 177 degrees west longitude. In other words, Tonga was defined as being all that inside a boxed area and that all geographic features are owned by the King. The Land Act of 1927 further reinforced this ownership. With respect to fishing, this has resulted in two consequences: (1) all Tongans have equal fishing access to all Tongan waters and (2) any traditional claim of local control or management authority over fishing areas was abolished.<sup>2</sup>

This open access nature of fisheries in Tonga is in some respects compatible with the sharing nature of Tongan society. Nobody would refuse to give food to a hungry person and to discourage somebody from fishing in an area regardless of the purpose or how close to a village was thought to be equally selfish. This system may have worked reasonably well in the era of subsistence fisheries, but in modern times it has collided with commercial realities and the carrying capacity of inshore resources. By the 1990s there was an increasing amount of concern by residents of outer islands that Tongans from anywhere, especially

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<sup>1</sup> In mid-2016 the Ministry of Fisheries separated from the Ministry of Agriculture, Food, Forests and Fisheries. During another period, from the early 1990s to the mid-2000s, the government fisheries agency was also a separate ministry.

<sup>2</sup> Source: Gillett et al. (1998)

commercial operators from Tongatapu, could harvest the food resources adjacent to villages in outer islands thereby affecting the food security situation. One frequent comment from villagers is that, even if a community conserves and manages its adjacent marine resources, it may be a useless exercise as outsiders can, and have, moved in to over-harvest. Given the limited production of the inshore areas, the benefits from this outside commercial activity appear to be, at least to some extent, at the expense of the subsistence food supply. Another effect of open access and associated lack of community control is that the conditions do not encourage a long-term relationship with the resources: the first-come-first-served regime was an incentive to harvest as much as possible, as fast as possible.

By the late 1990s, the situation had become critical. A World Bank report (World Bank 1999) stated: “The failure of centrally-based management, together with the urgent need for some form of management to prevent further declines in coastal resources indicate that a change from the present open access is required.”

In the early 2000s, the concept of giving local communities the ability to manage their coastal resources gained traction. One of the responsible factors was the enlightened leadership by the then Secretary for Fisheries, who proposed a change in the fisheries legislation. FAO assisted in the preparation of the Fisheries Management Act 2002 which gives the power to the Minister responsible for fisheries to declare any area of the fisheries waters and corresponding subjacent area to be a Special Management Area for purposes of coastal community management.

The Australian-funded Tonga Fisheries Project assisted in developing the SMA program and establishing the first three SMAs. The formal recognition of the first SMA of ‘O’ua Island in the Ha’apai Group occurred in November 2006.

## The current situation of Special Management Areas (SMAs)

### Present SMAs and requests for future SMAs

In the period since 2002 (when the fisheries legislation of Tonga was change to allow for SMAs) a total of 11 SMAs were established in Vava'u, Ha'apai, and Tongatapu. Table 1 gives those SMAs and the year in which they were established<sup>3</sup>.

**Table 1: Established SMAs**

Island Group	Island or Village	Year Established
<b>Vava'u</b>	Ovaka	2008
	Taunga	2013
	‘O’ua	2006
<b>Ha'apai</b>	Felemea	2008
	Ha’afeva	2007
	Nomuka	2011
	Kotu	2015
<b>Tongatapu</b>	‘Atata	2008
	Fafa <sup>4</sup>	2014
	Kolonga	2015
	‘Eueiki	2008

Source: staff of the Coastal Fisheries Section of the Ministry of Fisheries

<sup>3</sup> “Established” is defined by the Coastal Fisheries Section of the Ministry of Fisheries as having had the Minister of Fisheries approve the associated SMA management plan.

<sup>4</sup> This is a resort SMA, rather than a community SMA. An SMA on the unpopulated Minerva Reef (the ownership of which is contested between Tonga and Fiji) was established by Special Management Area Order GS 20 of 2004, but this area has not received much, if any, fisheries management attention from the Ministry of Fisheries.

A number of SMAs are being developed, a process which ranges from receipt of a community request by the Ministry of Fisheries up to ministerial approval of the management plan. According to the staff<sup>5</sup> of the Coastal Fisheries Section of the Ministry of Fisheries, in late 2016 there were 12 SMAs in development in Vava'u, 12 in Ha'apai, and 8 in Tongatapu. The communities that have spent the longest in the development process are Hunga and 'Utungake in Vava'u, which started in 2007 and 2008, respectively. Those communities waiting to be included in the SMA program are generally accommodated in the order that requests have been received, with the provision that those that have managed to obtain outside funding are given preference.

## **The Ministry of Fisheries and SMAs**

Presently, most of the SMA work of the Ministry of Fisheries is undertaken by the Coastal Fisheries Section of the Fisheries Science Division of the Ministry. That section also has other responsibilities, such as market surveys and coastal resource surveys. The section has three staff: (1) the head, (2) an individual who mainly enters data, and (3) a technician primarily for field work. Despite the large workload related to SMAs, each person in the Coastal Fisheries Section spends from 25% to 50% of their time on non-SMA work.

The Deputy CEO of the Ministry of Fisheries responsible for the Fisheries Science Division has worked on SMAs for much of the past decade, including writing his PhD thesis on the subject. He currently spends about half of his time on high-level aspects of the SMA program (e.g. finalisation of management plans, attendance at the Fisheries Management Advisory Committee).

The staff of the Ministry's offices in Vava'u and Ha'apai work part-time on SMAs. This generally involves community visits and is mostly done in conjunction with the Tongatapu-based staff of the Coastal Fisheries Section.

## **Other agencies Involved in working with SMAs**

In addition to the Ministry of Fisheries, below is a list of other local agencies as well as regional and international agencies who were or are currently involved in SMA work and projects.

- The Department of Environment under the Ministry of Meteorology, Energy, Information, Disaster Management, Climate Change and Communications (MEIDECC) collaborates closely with the Ministry of Fisheries in planning, coordinating and/or implementing SMA-related projects and activities.
- The Vava'u Environment Protection Association (VEPA) has helped out with the ADB baseline surveys for that project's SMA sites in Vava'u and has done public awareness work in Vava'u on the benefits of SMAs. It is likely that involvement of VEPA in SMA work will increase substantially with a new grant from the Waitt Foundation, which is understood to include the facilitation of establishing SMAs and supporting the Ovaka and Taunga communities with their established SMAs. Their future SMA work is likely to use expertise from the Bren School of Environment at the University of California, Santa Barbara.
- Seacology is a charitable organization headquartered in California that works to preserve island ecosystems and cultures around the world. It has provided funds for the construction of meeting halls in SMA communities (Ovaka, Felemea) so as to facilitate the SMA process, including meetings and accommodation of visitors. Seacology's website states that "we believe that environmental issues are human issues, too. By providing a benefit – be it a health center, a school, or a water system – in exchange for the creation of a nature reserve, we ensure the reserve works in everyone's interests" "They're not giving money away, they're not making grants, they're making deals".
- Tonga Health, a Tongatapu-based NGO, is assisting in the establishment of SMAs in Ha'apai (Fonoi, Matuku, Mango) and Tongatapu (Ha'atafu, Navutoka).
- Civil Society Forum of Tonga, a Tongatapu-based NGO, is assisting in the establishment of an SMA in Tongatapu ('Atata). In October 2015 they co-sponsored the SMA lessons learned meeting in Ha'apai.
- The Pacific Community (SPC), a Noumea-based regional organisation, assists Tonga in many different areas of the fisheries sector. The SPC assisted with the brochure "Community-Managed Special Management Areas in Tonga".

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<sup>5</sup> In this report "staff" are taken to be employees, whether on permanent or daily paid basis.

- The Climate Resilience Sector Project funded by the Asian Development Bank (ADB) and executed through Ministry of Finance and National Planning is assisting seven communities in Vava'u in the establishment of SMAs. These are 'Utulei, Talihau, 'Utungake, Ofu, Lape, Hunga, and Falevai. The project runs for 35 months and has one staff of the project based in Vava'u and two (including the coordinator) in Tongatapu, all of whom are integrated into the Ministry of Fisheries. International consultants were used in mid-2016 to do biological and socio-economic baseline surveys, and associated training, with the intention of re-surveying two years later.
- The World Bank and the International Fund for Agriculture Development working with Ministry of Fisheries prepared the Tonga Fisheries Sector plan 2016-2024, which features comments on the current SMA system and suggestions for improvements.
- The Pacific Development and Conservation Trust provided NZ\$15,000 for the Kolonga SMA. The trust was established by the New Zealand Government with funding from France in recognition of the events surrounding the destruction of the Greenpeace "Rainbow Warrior" ship in Auckland Harbour.
- The Tonga Ridge to Reef Program (R2R) project is based in the Department of the Environment (MEIDECC) and is taking an integrated approach to the environment of Fanga'uta Lagoon which involves 26 communities. At four of those communities the R2R is assisting communities in the establishment of SMAs.
- The AusAID Tonga Fisheries Project (under Ministry of Fisheries) supported the development of the SMA program and establishment of some of the first SMAs in Tonga. These were in the Ha'apai Group starting with Ou'a in 2006 and a few years later, Ha'afeva and Felemea.
- The IUCN project Marine and Coastal Biodiversity Management in Pacific Island Countries (MACBIO) supported a national meeting of SMA communities in October 2015 in Pangai, Ha'apai. The meeting came up with lessons learned and encouraged the transfer of information to non-SMA communities.
- The UNDP GEF-Small Grants Programme (SGP) projects, were administered through the Civil Society Forum of Tonga, and funded several SMAs (e.g. Átata and Ovaka in 2011) to implement ongoing SMA management and monitoring activities, and promote alternative livelihoods.

### **Some features of the current SMA situation**

A good understanding of the relevant legislation is important for improving fisheries management. Appendix 2 lists and annotates the laws and regulations currently in force that deal with SMAs. Of special importance is the provision in the Fisheries Management Act 2002 that gives the Minister power to declare a Special Management Area and then exclude certain groups from fishing in that area.

An important feature of the current SMA situation is the satisfaction of the target communities. In the establishment of an SMA in Tonga, the government is in effect transferring use rights to a community – which becomes a substantial asset of that community. This process is inherently in the self-interest of the community, hence the large amount of enthusiasm from participating communities. Also contributing to the target community interest is that the main management tool, banning fishing by outsiders, is relatively painless for the SMA community.

The Ministry of Fisheries has a process for establishing SMAs (see the section below). A brochure prepared by the Ministry gives the rules that are presently applicable to all SMAs:

- Only registered persons and fishing vessels listed in the Fishers Register and Fishing Vessels Register of the respective SMA are authorized to fish in that SMA.
- Any other person not listed on the Fishers Register or the Fishing Vessels Register may apply for a fishing permit from the Coastal Community Management Committee (CCMC) of the respective SMA to fish in that SMA.
- No person shall use destructive fishing methods such as using metal bars.
- No person shall harvest any marine organism for the aquarium industry which includes hard coral, soft coral, small invertebrates and aquarium fish.

The current success and challenges of SMAs from the perspective of Tongan stakeholders are nicely summarised in a presentation prepared by the Fisheries Division (Fisheries Division 2015):

- Success and benefits of SMAs: (a) no more trespassing of outside fishers into their fishing areas; (b) no more aquarium people accessing SMAs; and (c) marine resources are sustainably conserved and managed by the SMA communities.
- Challenges: (a) there are very limited resources (funds, staff) for enforcement and conducting resource assessments and monitoring at the national level; (b) at the community level, illegal fishing within SMAs and fish reserves is still being reported as a common problem; (c) issues with data collection include recording errors, inconsistency and missing data; and (d) planning and implementing activities can be delayed due to the process of securing funds.

Although there are numerous documents describing SMAs in Tonga (Appendix 3), there has been little critical review of SMAs to improve their effectiveness, perhaps limited to a statement in the Tonga Fisheries Sector Plan 2016-2024 (Anon 2016):

In order to make the inshore community fisheries sustainable, the SMA regime will require several Improvements: (a) introduction by the community of limits on community harvests, either by limiting effort or the amount of fish harvested, and through effective compliance with the community rules, (b) capacity building through leadership and business development training, through raised awareness of sustainable practises and related climate change resilience challenges, (c) devolution of greater authority to the SMA committees, and (d) institutional mechanisms to foster cooperative arrangements between communities.

It is important to note that the SMA program at the Ministry of Fisheries is largely “home grown” and to a great extent has been developed by Tongans into its current form. The staff of the Ministry of Fisheries are justifiably proud of the system they have created. An important consideration in making suggestions for improving the scheme is to preserve the Tongan content and associated ownership and pride.

## Facilitation and implementation

To eliminate some confusion over terminology, in this review “facilitation and implementation” are taken to mean the work done by the Ministry of Fisheries and communities in consulting and subsequent fully operationalising an SMA management regime<sup>6</sup>. For analysis purposes (and possibly for structuring future activities of the Coastal Fisheries Section) it may be convenient to think of another phase: the period after an SMA becomes functional when it requires only occasional visits from the Ministry of Fisheries.

### The process of establishing SMAs

Box 1 gives the stages in establishing an SMA, as articulated by the staff of the Coastal Fisheries Section.

#### Box 1: Stages in the establishment of an SMA

1. **Request by community.** The Town Officer of a requesting community writes to the CEO of the Ministry of Fisheries. The CEO acknowledges receipt of the letter and indicates the intention to proceed with the establishment of an SMA, subject to (a) prior requests from other communities, and (b) availability of funding. When (a) and (b) have been addressed, implementation moves to Stage 2.
2. **Community visit.** This is usually carried out by two senior staff of the Coastal Fisheries Section during an afternoon visit. The purpose is for the Ministry of Fisheries to confirm the receipt of the community request and for the community to confirm their interest in participating in the SMA program.
3. **Development of a management plan.** This is usually carried out by the community and three staff of the Coastal Fisheries Section during a one-week site visit. The plan has the following components: vision, objectives, status/trends in the fishery, statement/analysis of the problems, management strategies, and monitoring &

<sup>6</sup> Note that in Box 1 the staff of the Coastal Fisheries Section uses “implementation” to mean only the work after SMA ministerial approval (e.g. deploy the boundary markers, training community members, initiating alternative income activities, re-stocking depleted species, and deploying FADs).

evaluation. Common objectives are: improve fish catch, improve livelihoods, increase fish abundance, and decrease environmental degradation. This stage also include a mapping of the fishing area. Objectives are largely established by the community, with the Ministry of Fisheries staff's main role being the pointing out of unrealistic objectives. The management plan (about 20 pages in length) is produced in both Tongan and English. There is the intention to carry out base-line surveys (biological and socio-economic), but this work has received diminished emphasis since the first SMAs were established. There is also the intent to replicate those surveys after five years.

4. **Consultations on the plan.** There are three components to this: (a) Consultation with the community itself which normally takes one day and requires three staff of the Coastal Fisheries Section, (b) Consultation with adjacent communities which takes about one day for each adjacent community, and (c) Nation-wide consultation which occurs over a 28-day period and utilises staff of the Coastal Fisheries Section and the media unit of the Ministry of Fisheries.
5. **Approval.** There are four components to this: (a) A meeting for the national Fisheries Management Advisory Committee either accepts or rejects the community's management plan, (b) the Minister responsible for fisheries (and sometimes the Cabinet) either accepts or rejects the plan, (c) Crown Law and the Legal Officer of the Ministry of Fisheries translate the rules in the management plan into legally enforceable regulations, and (d) the regulations are gazetted.<sup>7</sup>
6. **Implementation.** One of the first tasks of this stage is to deploy the boundary markers. Other work depends on the management plan but often includes training community members, initiating alternative income activities, re-stocking depleted species, and deploying FADs.

Source: staff of the Coastal Fisheries Section of the Ministry of Fisheries

The average time spent by Ministry staff in a single community to establish an SMA is difficult to estimate. Each community is different and an accounting of staff time for each community is not documented. Based on an estimate of the cost to establish an SMA (see section on costs below) and the associated travelling allowance for government staff, it can be estimated that establishing an SMA in Vava'u requires about 154 days when travel allowances are paid. This is the number of nights that Tongatapu staff spend anywhere in Vava'u and the number of nights that Vava'u-based staff spend in the concerned community. This 154 days does not include establishment work done at one's duty station.

### Some observations establishing SMAs

The quality of the inputs of the staff of Ministry of Fisheries into the SMA process is very good. This opinion is derived from observing at work the staff of the Coastal Fisheries Section and the Ministry's Vava'u and Ha'apai branches. This includes their organisation, productivity, technical knowledge, and community interaction skills. From an historical perspective, this represents a remarkable improvement in staff performance from that noted during the 1997/1998 Tonga fisheries sector review (Gillett *et al.* 1998). It also should be noted that interviews conducted during village meetings at Ovaka, Felemea, and Nukuleka reinforced this view: a high degree of satisfaction with the performance of the staff, including action that has been promised. As expressed by one villager, "hard to think of ways they could be better".

In terms of facilitating the SMA establishment process, much emphasis is placed on consulting the target communities, as well as nearby communities (i.e. people who may be negatively affected by the SMA). From observations during the present review, Ministry staff appear to function well in community meetings; when they speak, people tend to perk up and listen. The only suggestion that could be made on the facilitation aspect is at the level of the general public in Tonga. Although the Ministry has done some radio and television work, more could and should be done to inform the average person – as judged by enquiries to people in several parts of the country made during the present review.

A major issue in the establishment of SMAs is whether the process should be about improving the management of marine resources or about the much larger process of village development. The SMA concept was originally intended to enable communities to have greater control over fishing activities in

<sup>7</sup> Because steps (c) and (d) can take a long time, the implementation stage (Stage 6) will often begin before the work of Crown Law and gazetting has been completed.

nearby waters. It has since expanded to include alternative livelihood activities in the fisheries sector, then alternative livelihood activities outside the fisheries sector (e.g. promotion of pandanus culture), and in some cases has included infrastructure such as community buildings. While all these activities may be highly appreciated by the target community<sup>8</sup>, they can significantly constrain the process of establishing SMAs, in terms of increasing the cost and perhaps decreasing the speed. In some respects, the luxury of the peripheral activities is at the expense of communities waiting to join the SMA program – bearing in mind that some communities have been waiting almost a decade. There is also the issue of whether the Ministry of Fisheries is the best agency to encourage activities, such as the cultivation of yams or the raising of livestock.<sup>9</sup>

The SMA establishment process as given in Box 1 is generally good, but improvements are possible. From the perspective of the present reviewer, the major difficulties associated with the SMA establishment process are the long time required and the high costs. Other noticeable problems include the growing expectations of the community during the process (“mission creep”), communities that are unaware/unprepared for their required inputs, and changes in the community during the process (e.g. town officer resigning).

The opinions of community members on establishment improvements were obtained during the visits to Ovaka, Felemea, and Nukuleka. Generally, there was a shared sentiment that the process should be speeded up. Other opinions expressed were:

- A need for more community awareness workshops
- The police and judges need to enhance their knowledge of SMAs and associated legislation
- SMA rules: better availability to the community and a clear process for making rule changes
- More robust boundary markers

The above problems were identified at three locations where the SMA establishment process appears to be relatively successful. At Taunga in Vava’u the process, seems to have been much less successful (i.e. SMA process not fully complete after several years). Ministry of Fisheries staff feel this is because of a change in the town officer, turnover of members of the committee managing the SMA, and the fact that many Taunga residents are only in the village on weekends. This may suggest a need for a more careful screening of communities that apply to the SMA program.

The idea that the SMA establishment process should be accelerated clearly emerges from the present review - but this sentiment appears to be somewhat contrary to what is given in the report of the October 2015 SMA lessons-learned conference (Tupou-Taufa 2016) which stated:

- One community with an established SMA reported that it took them several years of village meetings and house-to-house visits to build understanding within their own community of the potential benefits of SMAs
- Lesson 1: Ensure adequate resources and time is applied to the SMA process to allow for sufficient consultation

On reflection, the two different ideas above on the speed of establishment may not be completely opposite. When contemplating establishment speed the present review and the Ministry generally think in terms of the number of SMAs established in, for example, a ten year period, whereas the above document refers to the time required at a specific community. The two contentions could be reconciled in the future by increasing the number of communities being established simultaneously. In other words, adequate time for a specific community, but working on many communities at the same time. This would require more inputs from the Ministry of Fisheries.

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<sup>8</sup> During the review in some cases the peripheral activities were cited as those that produced the most benefits.

<sup>9</sup> Some people have expressed the opinion that the non-fisheries peripheral activities of SMAs (e.g. promotion of yam cultivation) do not require any technical work on the part of the Ministry. If so, some thought should be given to the issue of whether those are simply subsidies that may encourage dependence or are catalytic activities that do not require future inputs.

Another issue relevant to the establishment process is the staff input. In the section “The Ministry of Fisheries and SMAs” above it is stated that most of the SMA work of the Ministry of Fisheries is undertaken by the Coastal Fisheries Section (3 staff who work on SMAs part-time), supplemented by part-time inputs from a Ministry Deputy CEO and by part-time inputs of the Ministry staff on Vava'u and Ha'apai. By contrast, in Samoa (a country of 230 coastal villages (King *et al.* 2001)) there is an on-going program of introduction of community-based management which was started by the Australia-funded Samoa Fisheries Project<sup>10</sup>. During the initial period of that project (which corresponds to the present period of SMA introduction in Tonga) the Samoa team that did the work at the community level had 12 trained officers, supplemented by two expatriate advisors (K.Passfield, per.com.).

The above section is about issues in the SMA establishment process. One of the major messages is the need to streamline the process of establishment. Costs of SMA establishment are covered in a dedicated section (see the section on “Costs” below). Overall issues in the process of SMA streamlining (including both the cost and time aspects) are covered in the discussion section below (Section 8.2).

## Monitoring the SMAs

### General

With respect to monitoring, it is the intention of the Ministry of Fisheries to collect and analyse information on both biological/ecological and socio-economic aspects of the SMAs. Most of the recent SMA management plans include a statement such as that in the draft Holonga management plan (Box 2).

#### **Box 2: Monitoring and Evaluation in the Coastal Community Management Plan for Holonga**

- **The Fisheries Department will conduct a biological baseline survey to assess the current status of marine resources within the Special Management Area and Fish Habitat Reserve boundaries. The Baseline Survey collects key information early in its establishment, so that later judgments can be made about the current resources and development results as it rolled out. It is suggested that the baseline survey is to be conducted in a 5 year basis to assess- any biological or environmental changes within the SMA and FHR boundaries. Results obtained from this survey will be recorded and reported to the community.**
- **The Fisheries Department will also conduct a household (socio-economic) survey to assess the current status of the social and economic wellbeing of the Holonga community before or at the time the Special Management Area was established. This is to monitor the community situation by analysing the trend analysis, socio-economic and household surveys. This survey is suggested to be conducting in a (5 year) basis to asses for any significant change on the status of its socio-economic impacts. Results of this survey will be recorded and reported to the community.**
- **Fish catch monitoring of individual fisher/ fishing vessel catches of the Holonga community will be monitor by the Fisheries Department on a regular basis in order to closely assess any changes in its catches that may relates to their conservation and management activities. Fisheries Department will also conduct training on fish catch data collection with the local community. All fish catch data results are to be collected once or twice a week of every month and submitted to the Fisheries Department. Results of this survey will be recorded and reported to the community.**

The box above specifies two types of baseline surveys (marine resources, household) and the regular monitoring of fish catches. It should be noted that staff of the Ministry of Fisheries also consider some other activities as part of the SMA monitoring: checking on boundary markers, inspection of FADs, counting giant clams in the no-take zone, and keeping track of the level of fishing by outsiders in the SMA.

<sup>10</sup> To some extent the Australia-funded Samoa Fisheries Project provided the model for the Australia-funded Tonga Fisheries Project which carried out much SMA work.

Fisheries (Coastal Communities) Regulations 2009 stipulate a legal requirement for monitoring. Regulation 15 states: “In addition to the relevant requirements for a fishery plan under section 7(2) of the Act and these regulations, a plan shall contain . . . a trend analysis which contains details of the past and present environmental and socio-economic situation of the coastal community and surrounding area...”

Although it is not documented in the available literature on SMAs in Tonga (Appendix 3), it appears as though the monitoring of SMAs was initiated during the period of the Australian-funded Tonga Fisheries Project in the mid/late 2000s when the first SMAs were established – and the system has evolved since then.

Similar to other community fishery management programs in the Pacific Islands, it is likely that the original intention of the SMA monitoring was to support adaptive management, a process where management interventions are modified in response to changes in the managed resources. As expressed by a Fiji-based community fisheries specialist: “Adaptive management starts with the most sensible management actions to address priority issues and re-evaluations are done regularly to see if it is working or a need to change” (H.Govan, per.com.). It is also likely that the initial purpose of monitoring SMAs in Tonga included elements of satisfying donors and generating community enthusiasm.

### **Collection of biological/ecological information**

Originally, there was the intention to carry out base-line surveys (biological/ecological and socio-economic), but this work has received diminished emphasis since the first SMAs were established. The only recent biological/ecological surveys for SMAs have been carried out using international expertise under the ADB’s Climate Resilience Sector Project for seven SMAs in Vava’u: Utulei, Taliuhau, ‘Utungake, Ofu, Lape, Hunga, and Falevai. The report of that survey (Ceccarelli 2016) states:

The effects of fisheries management in SMAs and no-take protection in fish habitat reserves will need to be monitored regularly. After the follow-up survey in 2018, it is recommended that the same sites be surveyed annually. It is advised that the same site coordinates and the same methods be used, so that changes over time can be tracked accurately. It may be possible to train local teams, including community members, to conduct the surveys, but this would involve intensive training programs and a degree of testing to ascertain that the ability of each survey team is appropriate.

In addition to the baseline surveys, there is also regular monitoring of fish catches. According to the head of the Ministry’s Coastal Fisheries Section, this usually consists of recording all fish and invertebrate catches on two days per week by a volunteer from the community. A data collection form is used that records the following: date of fishing trip, name of fisher, sea condition, location inside/outside of SMA, fishing zone, types of fishing area, fishing depth, fishing technique, number of fishers on vessel, number of fishing hours, name of major species caught, average weight of those species, and average length of those species. The collected data are submitted to fishery officers the last week of each month and are entered into a database at the Ministry headquarters in Sopo. Aspects of this data are discussed at the Ministry’s data working group which meets each quarter.

The site-specific analysis by the Ministry of Fisheries from the above catch monitoring appears to be limited to that for the ‘Eueiki SMA. A presentation of that analysis (‘Aisea 2016) shows for the sampled days each month in the period 2011-2014 the following: (a) the partitioning of fishing effort by gear type, (b) for inside the SMA the total catch in numbers of fish, the numbers of fishers, and fishing hours, (c) the same for outside the SMA, and (d) the total catch by taxonomic family.

## **Collection of socio-economic information**

Socio-economic information is collected during the establishment of SMAs, with somewhat more emphasis during the early period of the SMA program. Hard copies of older raw data collected are now located in the office of the Ministry's Coastal Fisheries Section.

Socio-economic surveys have recently been carried out by ADB's Climate Resilience Sector Project for seven SMAs in Vava'u. The stated objectives of that work are:

- To raise community awareness of climate change and SMA process/steps
- To invite local feedback and re-confirm interest as a proposed SMA site
- To rapidly appraise key socio-economic factors in support of the baseline social assessment design
- To gain knowledge of social & logistical characteristics across all seven sites.

Recently, the ADB-type socio-economic surveys have been carried out in non-ADB SMAs (e.g. Ovaka). The Ministry of Fisheries has the intention of abbreviating the ADB questionnaire for use in other parts of Tonga.

The current staff of the Coastal Fisheries Section indicate that they are unaware of any re-surveys of SMAs where baseline socio-economic surveys took place. No analysis of SMA socio-economic information has taken place in recent years, with the exception of that carried out by the ADB SMA project.

A PhD thesis by a current CEO of the Ministry (Malimali 2013) contains considerable data and analysis of the socioeconomic implications of the Special Management Areas in Tonga.

## **Observations on the current collection of information**

The following are a few brief observations on the above collection and analysis of biological/ecological and socio-economic information:

- The data form used for the regular catch monitoring seems to be most appropriate for fishing trips in which fishing occurs at a single location, using a single fishing gear. It appears to be much less suitable for multi-location and multi-gear fishing trips. It is not appropriate for reef gleaning.
- The 'Eueiki SMA catch data analysis described above appears to be the only occasion in recent years that data collected by the community has been prepared for presentation back to the community. It should be noted that SMA communities collect the information on a volunteer basis.
- SMA baseline surveys (biological/ecological and socio-economic) have not been re-done in the Tonga SMA program.
- Probably the most important comment that can be made concerns trends. Because trends over time are very important for fishery management purposes (especially in the context of community fisheries), the Ministry of Fisheries staff should strive to collect, analyse, and present to the community information on trends related to SMAs. Although this is especially important for adaptive management, the collection of data and subsequent elucidation of trends has not yet been done in the history of the Tonga SMA program.

From the above sections it can be seen that data collection and analysis activities have been considerably reduced from that anticipated in the SMA management plans, and they are probably down from that carried out at the beginning of the SMA period. In short, little useful information for anybody is being produced by the current monitoring. This is not to imply negligence on the part of the Ministry of Fisheries. Ironically, it may be due to the success of the Ministry's SMA program - the program is now so popular with communities that it has expanded to the point where the workload permits only essential activities. Consider:

- Currently, there are enormous demands on staff time for servicing the 11 existing SMAs (e.g. regular visits, work associated with promoting alternative livelihoods, gear ordering, technical enquiries from communities, quarterly data meetings, etc.).
- There are many tasks associated with establishing SMAs established in the 32 communities on the waiting list (e.g. preliminary meetings, drafting management plans, surveying boundaries, presentations to Fisheries Management Advisory Committee, etc.).
- There are also general SMA-related tasks (e.g. dealing with potential donors, enquiries from parliament, complaints from non-SMA communities, looking after overseas visitors to the SMAs, etc.).
- Also to be considered is the time spent travelling by Ministry staff to the many isolated SMAs all over the country.

The above very large workload is carried out mostly by the three staff of the Coastal Fisheries Section and a Deputy CEO – all of whom work only part-time on the SMA program.

In this situation of the workload for a small staff being much larger than what can possibly be handled, it is logical that the tasks be prioritized, at least until the budget/staff is commensurate with the amount of work. This appears to be what the Ministry did – in this case reduced emphasis on baseline work, and to a lesser degree on data analysis and dissemination. From the perspective of the present review, this appears to have been a reasonable course of action. There is also a more technical reason that justifies a reduced emphasis on baseline surveys and associated follow up (Section 5.5 below).

### **Baseline surveys**

Some additional discussion of baseline surveys is warranted. This is primarily applicable to the biological/ecological baseline surveys but to some extent is also relevant to socio-economic baseline work.

In several Pacific Island countries there is the concept of using information from an underwater census baseline survey and associated follow-up to adjust community fisheries management. The general idea is that when setting up a community fisheries management scheme, donors and government fishery agencies often insist that there be a baseline survey, which is supposed to be repeated after a few years – giving some valuable insight for fisheries management purposes. The problem is that these baseline surveys are quite expensive and they rarely get repeated in the future by communities unless some outside entity steps in and sponsors the survey. In addition to these practical problems, there are some other questions: (1) does the comparison between the baseline and a similar survey in the future provide much information on real changes in the concerned stocks of fishery resources (especially for finfish)? (2) Is the comparison information obtained useful to communities for modifying fisheries management? Box 3 gives an example of where a baseline survey did not give clear answers for management.

#### **Box 3: Baseline survey work at Majuro**

**SPC did several years of well-funded baseline survey work all over the Pacific Islands region under a program known as PROCFish/C. There is an example in Majuro where years later another SPC team (well-funded, with good expertise) carefully re-surveyed the baseline location (Moore *et al.* 2012). The results showed some differences, but the associated caveats negated, to some degree, the value of the information generated for fisheries management. The report of the follow-up survey stated: “It should be noted that these surveys were not conducted at exactly the same locations, thus these results may be at least partially influenced by spatial differences in habitat cover or depth among surveys. Further monitoring is required to determine whether these differences are consistent over time.”**

**If these surveys that were very well-funded and well-implemented are not able to produce much information that is useful for fisheries management, there appears to be little promise for baseline survey work carried out solely by communities and fisheries departments of developing countries.**

In Fiji where there is substantial experience with monitoring community-based fisheries management activities, there is considerable scepticism of the value of baseline surveys for community management. The Locally Managed Marine Area Network has never supported baseline surveys (H.Goven, per.com.). The Fiji Fisheries Department has spent over 10 years collecting baseline information at about 200 traditional fishing areas. There is much doubt that the results of those surveys are of any value for the type of management likely to be carried out by the communities (Gillett *et al.* 2014). Another Fiji example (from an FAO study) is given in Box 4.

#### **Box 4: Biological monitoring at Navakavu**

**Biological monitoring of the Navakavu fishing area to the west of Suva by outside agencies/individuals has been undertaken on numerous occasions. By far the most extensive was the work carried out in 2003 and 2009, focusing on three topics: finfish, invertebrates and socio-economics. The goal of that work was to “provide baseline information on the status of reef fisheries, and to help fill the massive information gap that hinders the effective management of reef fisheries” (Friedman 2010). Although that work was well-planned, carried out by highly experienced scientists, and extensively documented, it is interesting that, according to interviews with Navakavu residents, the mostly qualitative monitoring by locals has had a much greater impact on management processes at Navakavu.**

Source: Gillett (2015)

A recent project in the Solomon Islands on the social dimensions of local fisheries co-management gives some insight into baseline surveys:

To help determine management success, or the need for management to adapt, partner agencies had supported both communities to conduct underwater counts of trochus and sea cucumber. However, there was no evidence that these data had been used to guide decisions about the timing of openings, quantities harvested or duration of harvests. Decisions to harvest were largely based on socially related reasons rather than environmental management or conservation rationale, or the management plan in place. (Cohen and Steenbergen, 2015)

On the socio-economic side, there is a Socio-economic Advisor for the ADB project establishing SMAs in Vava'u, an individual with substantial experience in community management in many countries. He has indicated that he is unaware of a single case anywhere in the Pacific Islands in which socio-economic baseline data and the follow-up has been used to modify community management actions (J.Parks, per.com.).

The above suggest that baseline surveys, as envisaged in the current SMA management plans, often do not give clear direction to community fishery management efforts. This difficulty is aside from any cost considerations.

#### **Monitoring: establishing the basics**

Box 5 gives some sensible advice on community monitoring based on experience at many sites in several Pacific Island countries.

#### **Box 5: Advice on monitoring**

**The Locally Managed Marine Area (LMMA) Network has been supporting practitioners and communities across Southeast Asia and the Pacific for ten years and now encompasses 420 sites in eight countries practicing "Community-based Adaptive Management" to manage over 12 000 km<sup>2</sup> of coastal marine area. We offer recommendations to anyone considering investing in, designing and implementing a large-scale monitoring programme involving communities, projects, and larger initiatives. By 2010, some 16 reports had been commissioned based on reviews specifically looking at the way monitoring was being conducted and used across the LMMA Network and the quality of the resulting data and information that was being generated. Recommendations:**

- **Our experience highlights the vital importance of first investing in thoughtful consideration of what information is really needed to support management, what are the simplest ways of addressing these needs effectively and what the resource implications are over the long term.**
- **Programmes, projects and communities need to design monitoring from basic principles - what is the purpose and audience for monitoring and what information is really needed in each case. This suggests that simply adopting existing methodologies or “packages” can result in generation of information not suited to purpose. Also, attempting monitoring for multiple levels of needs is highly challenging.**
- **Recognize that for improved learning and management, quantitative monitoring systems may not be the most appropriate approach. Other potentially more appropriate, cost effective and sustainable approaches to generating information should be considered, including perception-based approaches, less formal opportunities for learning (e.g., cross-site visits) as well as quantitative monitoring.**
- **Explore and evaluate methods that are closely aligned to management objectives and that provide information to decision-makers in more inclusive or accessible ways, for example perception-based techniques and locally designed approaches.**
- **Keep monitoring as simple as possible - to minimize opportunities for mistakes, vulnerability to erosion or loss of skills and personnel turnover and misunderstandings on purpose of monitoring that can emerge over time.**

Source: Govan *et al.* (2011)

The above advice, together with observations during the present review and discussions with some of the specialists listed in Appendix 1 lead to some principles and conclusions on Tonga SMA monitoring. These are:

- Just as communities need to adapt their management efforts to changing conditions, the Ministry of Fisheries needs to periodically modify their SMA monitoring program to take account of current realities.
- The purpose of future SMA monitoring should largely be to assist communities in adjusting their management efforts. The monitoring should not be focused on demonstrating to the outside world the benefits of SMAs but rather to produce information useful for communities.
- Future SMA monitoring in Tonga should be consistent with the concepts that (a) the priority for monitoring should be for what is being managed, and (b) good simple data that is analysed and is understood by the community is better than more complex data that remains unused.

### **A suggested monitoring strategy**

This section is intended to provide a strategy, rather than detailed instructions for monitoring SMAs. The strategy has the following features:

- The regular catch sampling should be modified in the following ways: (a) Simplified, in that appropriate site-specific sampling schemes are formulated, rather than attempting to record all catches, and (b) Enhanced, in that the information collected is oriented to show the important trends.
- The use of baseline surveys should be discontinued except in cases where there is clear justification and ample donor funding, the use of which does not detract from essential SMA tasks.
- Excluding fishing activity by outsiders is very new to Tonga and is a crucial element of the SMA scheme. Following from this, at least some monitoring of outside fishing within an SMA should be done.

Because monitoring needs to be geared to the management objectives, the priorities for monitoring are likely to differ between communities. For the three communities visited during the present review it seems that the priorities for monitoring should be to collect information that shows:

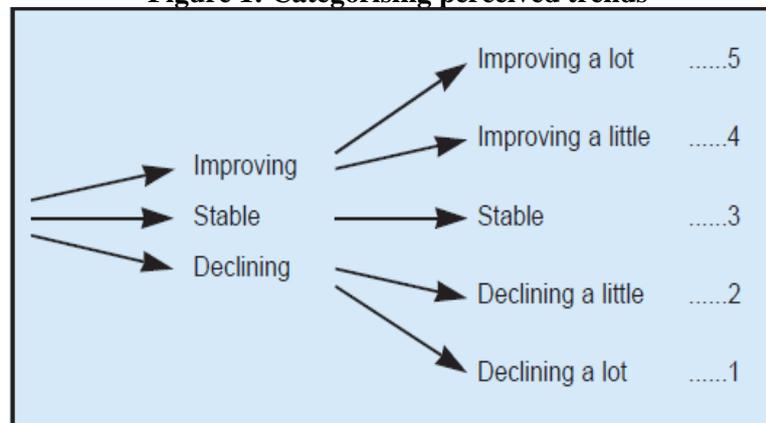
1. Trends in overall catch rates, broken down by inside SMA and outside SMA
2. If practical, trends in catch rates by species and by gear type
3. Trends in outsiders fishing in the SMA (both legitimate and illegitimate)
4. Trends in over-all benefits from the SMA

To show the above trends, the ideal way would be to correctly collect quantitative data at SMA communities and properly analyse them. However, the reality is that it is difficult and expensive to do so - and there is a good chance it may not get done (as is the case at present). A next best option to obtain trends would be to collect community perceptions on a regular and formal basis. For the four types of trends cited above, the first two can be obtained by a modification of the present regular catch monitoring program. All four types of trends could be obtained by regularly/formally collecting perception information.<sup>11</sup>

The term “perception information” is very broad, ranging from a recall of yesterday’s catch to what conditions were like in past decades. Here the suggested gathering of “perception information” consists of the impressions of focus groups of the changes in certain features during the past three months. Specifically, what changes have occurred in over-all catch rates (e.g. catch per day inside and outside the SMA), catch rates of important groups of fish or invertebrates (e.g. catch per hour of acanthurids), catch rates by gear (e.g. catch per hour by spearfishing), trends in sighting outsiders (e.g. the number of sightings of outsiders in the SMA per week), and changes in over-all benefits of the SMA (e.g. the change in benefits from SMA fishing and SMA-promoted alternative livelihood activities in the past three months).

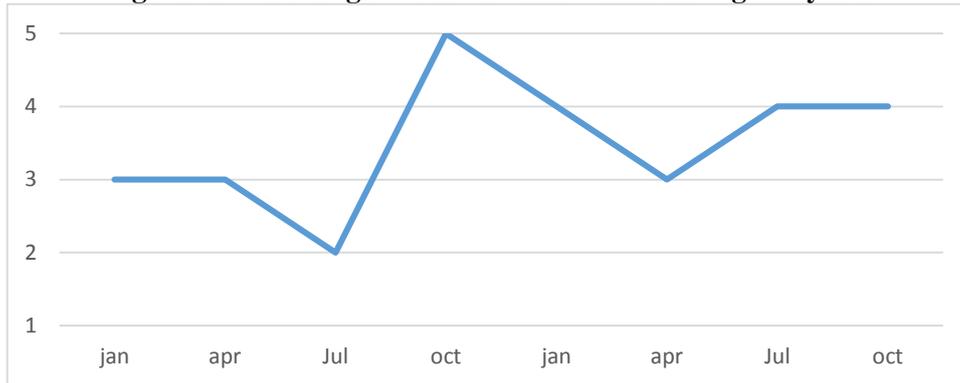
As an example, three focus groups (adult male fishers, adult female fishers, and youth) could be asked independently what changes they have noticed in the overall catch rate during the past three months. The response could be categorized as in Figure 1. If this were to be carried out on a quarterly basis for two years, there would be eight data points that could be graphed to show the trend over the two year period (Figure 2).

**Figure 1: Categorising perceived trends**



Source: World Bank (1999)

<sup>11</sup> There is a recent paper on the use of perception information for monitoring an SMA in Tonga (Webster et al. 2016). It is important to note that the way in which perception information was collected in that study was quite different from that suggested here in the present report. In the earlier study questions were asked on a single occasion for what happened in the previous five-year period.

**Figure 2: The change in over-all catch rates during two years**

To summarise the suggested strategy for SMA monitoring:

- Modify the existing catch monitoring on a site-specific basis (i.e. tailored to each community) to obtain the trend of the over-all catch rate, and if possible, trends in rates for important species and gear.
- Collect perception information on trends in catch rates, outsider presence in the SMA, and SMA-related benefits.
- Regularly analyse this information and (importantly) present the results to the community.
- Agree to more detailed quantitative monitoring only where there are exceptional circumstances, such as a donor with a long-term commitment that will be responsible for all extra costs and work.

An important point is that the above strategy suggestion represents a major switch in the goal of SMA monitoring; a change from attempting to collect/use statistically significant quantitative information to the goal of “keeping an eye on general trends”. What is described above is an alternative to data-hungry and analysis-heavy monitoring that has been promoted for years in the Pacific Islands (including in the Tonga SMA program) without much success. The proposed scheme is not inconsistent with what is recommended for SMA monitoring in the Tonga Fisheries Sector Plan 2016-2024. That plan states: “the programme would enhance the current monitoring and review of SMA performance, using metrics developed in association with communities, measurable by the communities and directly linked to community decisions on SMAs”.

In monitoring changes associated with SMAs, there is the persistent (and perhaps slightly inappropriate) idea that something must be done to show to the outside world that the SMA is working. Box 6 below shows something simple that happened in Fiji which eventually catered to that concern.

#### **Box 6: Re-appearance as an indicator of success in managed areas**

Navakavu consists of three villages and two settlements located near Suva on the south coast of Fiji’s main island, Viti Levu. The most important measure for managing the resources of the Navakavu fisheries is the marine protected area (MPA). Originally established to the west of Muavuso Village in the late 1990s, in 2003 the MPA was shifted to the south of the Navakavu peninsula. Navakavu residents today feel that fishing is more productive in the area and species not seen for many years have returned.

The latter feature was the subject of a study. That work used older residents of Navakavu to identify species that were found in the area of the MPA many years ago but disappeared and subsequently re-appeared a few years after the establishment of the MPA. The results were remarkable. For example, 43 species of bony fish, 6 species of echinoderms, and 14 species of crustaceans were among the organisms sighted for the first time in the last 10 to 20 years. This impressed both local residents and the donors that support the MPA.

Source: Thaman *et al.* (2012), Thaman (per.com.)

There are also two minor suggestions that deal with monitoring:

- Changes in the prosperity of villages can often be obtained through the regular national census. To do so requires appropriate questions on the census questionnaire, which could be facilitated by Ministry of Fisheries staff participating in the census planning process of the Statistics Department (A.Finau, per.com.).
- In the office of the Coastal Fisheries Section there are hard copies of the raw data from many baseline socio-economic SMA surveys. It is likely that other un-analyzed data exist in the Ministry's computer system. To avoid this data from being lost (and losing the chance to analyze them opportunistically in the future), there should be an inventory and cataloging of that data.

## Costs

### Institutional costs of setting up an SMA

There are several reasons to examine the costs of establishing and maintaining SMAs. Good governance principles dictate that such an examination should be done regularly with any large project. Donors are likely to feel more comfortable if there has been an external scrutiny of project expenses. This need is recognised by the Tonga Fisheries Sector Plan which encourages an examination of costs of SMA establishment as SMA knowledge accumulates.

According to the Ministry's financial officer, the budget for the Coastal Fisheries Section for the financial year 2015/2016 was T\$254 300 (US\$111 348)<sup>12</sup>, of which T\$143 100 (US\$62 535) was for coastal resources assessment and T\$111 200 (US\$48 594) was for community fisheries (i.e. for SMAs). Actual expenses incurred for the establishment of a specific SMA are not available. According to the staff of the Coastal Fisheries Section, expenditure requests and receipts are associated with a specific SMA, however the Ministry's financial officer indicates it is not possible to determine the amount of money actually spent on a specific SMA<sup>13</sup>. In any case, the cost of establishing a particular SMA was not available to the present review.

Estimates for the cost of establishing SMAs have been made by the staff of the Coastal Fisheries Section. The Excel worksheet "Draft Budgets for One SMA in Vv, Hp, Tbu" shows the estimated establishment costs per SMA are: Vava'u T\$59 934 (US\$26 191); Ha'apai T\$49 728 (US\$21,731); and Tongatapu T\$18 577 (US\$8 118). The costs do not include the salary of Ministry staff but do include staff travel allowances<sup>14</sup> and staff overtime.

In examining the details of the budget several features emerge:

- For a Vava'u SMA the travel allowance (which does not include airfares/seafares) is T\$24 600, or 41% of the above estimated cost of establishing an SMA in that area.
- For a Ha'apai SMA the travel allowance (which does not include airfares/seafares) is T\$16 500, or 33% of the above estimated cost of establishing an SMA in that area.
- For a Tongatapu SMA there is no travel allowance, presumably because Tongatapu-based Ministry staff are not required to spend nights away from home. However, overtime is paid, which amounts to T\$4 600, or 57% of the above estimated cost of establishing an SMA in that area.

<sup>12</sup> The exchange rate used in this report is T\$1 = US\$0.437, the average during the month of November 2017.

<sup>13</sup> This contention may require confirmation.

<sup>14</sup> As an example, the daily travel allowances for Vava'u are T\$170 for senior staff and T\$150 for junior staff. This is presumably to cover the food and lodging expenses when staff are required to spend nights away from their established residences on work duties.

- The estimated costs for SMA establishment in all three areas as given above include baseline biological socio-economic surveys, however these have not been carried out in recently-established SMAs.

Some other points that arose during the present review that are relevant to SMA costs are:

- An estimate was made for the cost of a short trip to an SMA. The cost for fuel, and travel allowances for three Ministry staff (two officers, one boatman), not including their regular salaries, is about T\$700 for a two-day one-night trip to an island community.
- The Vava'u Environment Protection Association (VEPA) has made an independent estimate of how much it would cost that association to establish an SMA in Vava'u. They indicate it may be possible to do so for T\$8 000 (K.Stone, per.com.). During the review it was not possible to determine the elements of a VEPA SMA, nor verify the accuracy of the cost estimate.

The costs of establishing community managed marine areas in other Pacific Island countries have received considerable attention. It is important to note that what is being established in Tonga could be considerably different than that of neighbouring countries and that costs increase with increasing site isolation. Table 2 gives costs of establishing community managed areas in several Pacific Island countries.

**Table 2: Costs of community managed areas**

Country	Site or Project <sup>15</sup>	Cost/Site (US\$)
Samoa	Village Fisheries Management Programme	1,344
Samoa	Aleipata MPA	6 500 - 16 000
Samoa	Safata MPA	6 500 - 19 000
Solomon Islands	WorldFish, Isabel and Western Province	3 000
Solomon Islands	WWF, Western Province	16 000 for MPA 5 000 for no-take zone
Solomon Islands	FSPI, Malaita, Gela, Guadalcanal	1 851 - 2 569
Solomon Islands	TNC, Arnavon Islands	20 000
Vanuatu	FSPV	5 537
Cook Islands	WWF	5 000-10 000
Fiji	Daku	478
Fiji	Nasau	938
Fiji	Navakavu	725
Fiji	170 IAS FLMMA sites	800
Fiji	Waitabu	3 000
PNG	CFMDP, Morobe and Kavieng	3 800

Source: Govan *et al.* (2009)

The costs given in the table are not strictly comparable to SMAs in Tonga for several reasons: these are taken from a 2009 report, some of the areas are very small (e.g. in Samoa), some are very large (e.g. Arnavon), staff costs vary remarkably across the region, and the work required for boundary delimitation in other countries could be very small, especially in Melanesia. Nevertheless, it is possible to use the table and other information in this section to infer that the cost of establishing an SMA in Tonga is relatively high.

Another conclusion that can be drawn from the cost information given in this section is that much of the costs of an SMA in Tonga is due to staff travel allowances and over time. It is not the suggestion of

<sup>15</sup> WWF = World Wide Fund for Nature; FSPI = Foundation for the Peoples of the South Pacific; FSPV = Foundation for the Peoples of the South Pacific Vanuatu; TNC = The Nature Conservancy; IAS = Institute of Applied Science of the University of the South Pacific; CFMDP = Coastal Fisheries Management and Development Project.

the present review that those payments be reduced or eliminated (they are government-wide entitlements) but there appears to be scope for modifying the SMA program so that less travel away from staff duty stations is required.

It is important to stress that the present review does not consider that expenditures on SMAs by the Ministry are especially profligate or wasteful. On the contrary, it was noted that Ministry officers in Vava'u and Ha'apai used measures opportunistically to economize. For example, those officers took advantage of the review-funded boat transportation to SMA communities to conduct their quarterly SMA business.

Most of the expense of establishing SMAs is not covered by the regular budget of the Ministry of Fisheries, but rather by a large number of multilateral development institutions, bilateral donors, philanthropic foundations, NGOs, and others (Section 3.3). Although there is considerable enthusiasm at present from those funding sources, donor fatigue may occur in the future – especially as regards ongoing SMA costs.

The above section is about issues related to SMA costs. Section 4.2 contains information about the time required to establish an SMA. One of the major messages of this review is the need to streamline the establishment of SMAs, with respect to both costs and time required. SMA streamlining is elaborated in the discussion section below (Section 8.2).

### **Costs/benefits for communities**

The SMA communities do not pay money for SMA establishment. They do, however, incur non-monetary costs during the establishment period and after the SMAs are operational.

In the three SMAs visited during the review, there was general agreement that the most laborious community input was the surveillance of the SMA, especially for that of the no-take zone. Another significant non-monetary cost is the time spent in meetings of the SMA management committee. Somewhat surprising is that the catch monitoring was not perceived as being very demanding in terms of inputs of time – probably because of the small number of people involved in the activity.

In terms of benefits, during the review, members of those SMA communities visited expressed opinions similar to those stated in three studies:

- Among the benefits perceived by SMA communities, the security of access to more fish in the future, exclusion of fishers from other communities, and increasing fishing catches were considered important. The SMA communities also felt that the SMA regimes conveyed a sense of ownership of the fishing grounds and therefore empowered them to manage the fisheries resources. (Malimali 2013)
- Ninety percent of the fishers interviewed perceived that catches had improved across all taxonomic groups since the inception of management. Fishers also reported less time spent fishing and reduced travelling times to fishing grounds. (Webster *et al.* 2016)
- The introduction of Special Management Areas (SMAs) was seen, by [national SMA] conference participants, to be an effective tool to help sustain and manage marine resources in coastal areas.... There are now nine SMAs established throughout the Kingdom, and the adjacent communities have all testified to the benefits they've acquired from their SMAs. Benefits include, but are not limited to, an improvement of their marine stocks, and the relative ease of harvesting. Fishers reported that they could catch more in short periods of time and without the higher risks to safety of more distant travel. (Tupou-Taufa 2016)

It is difficult to substantiate the above perceived success and anecdotes with quantitative data. The baseline surveys have not been redone, and should they be redone, there are unlikely to be clear unambiguous before/after differences (Section 5.5 above). An SPC sea cucumber survey in November 2016 did not detect significant differences in densities at Ovaka or Felemea between inside the SMAs

and no-take zones and the outside (B.Moore, P.Bosserelle, per.com.), despite community assertions of improvement.

At the three SMAs visited during the review, the people interviewed felt that after SMA establishment fishing pressure was reduced due to exclusion of outsiders; the reduction ranged from 20 percent to 40 percent. Another interesting finding is that, when asked about which activities related to SMAs produced the most benefits, several indicated that the livelihood activities outside the fisheries sector (e.g. pandanus cultivation/weaving) were quite important.

The communities visited seem to have several donor-support projects not related to the SMAs, such as solar lights and water tanks. The staff of the Coastal Fisheries Section have also noticed this, and use this fact in initial discussions with communities applying to the SMA program – in which they refer to this as “SMA being a door to donors for other purposes”.

## **Administration of the SMA program**

The present administration of the SMA program seems reasonably good. This opinion is based on:

- Good records are kept of community meetings and copies are dispatched promptly to the Ministry in Sopo for action on those items requiring follow-up.
- E-mail correspondence is answered quickly, as judged by experience in this review.
- The Coastal Fisheries staff was able to retrieve historical correspondence, such as older requests from communities to join the SMA program.
- There is adequate information on SMA work in the annual reports.
- Staff report no problems in handling the large amount of money required to establish an SMA.
- Communities appear reasonably satisfied with responses to their SMA-related requests to the Ministry. As put by one town officer “they are doing their best”.

On the other hand, there are some complaints from communities that have spent years on the SMA waiting list – but this is understandable (i.e. budget constraints) and not really a reflection on the administration of the SMA program.

Administration of any project can be improved. The present review indicates that:

- The expenses incurred for the establishment of a specific SMA are currently not available (Section 6.2). The Ministry should therefore set up a system so the exact cost of establishing each SMA is available.
- Some modification of the present Ministry nomenclature could be useful, so that expenses for each SMA can be partitioned into the categories of (1) establishment, and (2) on-going. This is an alternative to the naming of the present phases in which “implementation” includes deploying the boundary markers and alternative income activities, but appears to fade into long-term on-going expenses of the SMA.
- Large amounts of raw data are held in the office of the Coastal Fisheries Section (e.g. old socio-economic data sheets). Much of the catch data has been computerised. Given the large amount of valuable information held by the section, there should be a cataloguing of the data.
- Following from the above, staff of the Coastal Fisheries Section should review the practices for information back-up so that data will not be lost – and possibly do some upgrading. It should be noted that the office of the Coastal Fisheries Section has been destroyed by a fire in the past and that in Fiji many years of coastal fisheries survey data has been lost in a computer crash.

## Discussion of additional issues

### Expansion of the SMA network

The Minister of Fisheries has expressed a desire to have an SMA in each coastal community in Tonga (S.Fakahau, per.com.). If the start of the SMA program is taken to be 2005, then the program has been running for 11 years during which time 11 SMAs have been established, or one per year. As there are about 111 coastal communities in the country (R.Thaman, per.com.), at the current rate it would take a century to cover the country. The Deputy CEO of the Ministry of Fisheries indicates that it would conceivably be possible to establish five community SMAs per year (S.Malimali, per.com.). Although that rate seems optimistic, it would still take 20 years to cover the country.

From the Costs section above the establishment costs per SMA are: Vava'u T\$59 934 (US\$26 191); Ha'apai T\$49 728 (US\$21 731); and Tongatapu T\$18 577 (US\$8 118). The average cost per SMA in the three island groups is T\$39 000 (US\$17 043). To establish 100 more SMAs at that cost would require about T\$1.7 million (US\$0.74 million) in 2016 dollars. That does not include the regular salaries of the Ministry staff working on SMAs.

### Streamlining the process

The present process at the Ministry of Fisheries for establishing an SMA is quite long and expensive. In order to increase the possibility that most coastal communities in Tonga will have an SMA, changes need to be made. One of the major messages of this review is the need to streamline the process of establishing SMAs, with respect to both costs and time required. Several types of improvement are possible, many of which are better known to the staff of the Ministry than to the present reviewer. The following is a non-exhaustive list of contributions to the streamlining process:

- As much of the costs and time are related to the fact that essential SMA staff are based in Tongatapu, consideration should be given to establishing dedicated SMA teams in Vava'u and Ha'apai, occasionally supported by expertise from Tongatapu. This concept is consistent with the Tonga Fisheries Sector plan 2016-2024, which envisages “placement of community fisheries staff and operating funds in the outer islands groups”.
- A commonly heard complaint related to the speed of the SMA process at the Ministry is “Too many staff with academic qualifications sitting in Tongatapu; not enough qualified field staff with technical skills”. The Ministry should strive to recruit technically qualified field staff for the Vava'u and Ha'apai SMA teams.
- One of the NGOs involved with SMAs in Tonga has indicated a desire to help streamline the SMA process. The Ministry should support this effort.
- Section 4.2 above deals with the alternative livelihood aspects of SMAs, and suggests that involvement with livelihood activities outside the fisheries sector (e.g. promotion of pandanus) may slow down the establishment process. There is considerable merit in the Ministry doing an effective job transferring fisheries management authority to the community, rather than getting bogged down in non-fisheries activities. Bearing in mind that a long process to some extent is at the expense of communities waiting to join the SMA program, the Ministry should give consideration to shedding the non-fisheries livelihood activities, at least those that are time consuming.
- The growing expectations of communities during SMA establishment (“mission creep”) can add considerably to the Ministry’s work load and slow the process. This difficulty can be mitigated to some extent by formulating during the initial community approach a memorandum of understanding, specifying precisely the responsibilities of the Ministry and those of the community.
- The travel allowances account for a substantial portion of the cost of establishing an SMA in Vava'u and Ha'apai. While the allowance rate cannot be changed (it is a government wide entitlement), the days spent in community visits can be scrutinized for distortions due to personal incentives.

- Section 5.5 above is on baseline surveys and carries the suggestion that baseline surveys (both socio-economic and biological/economic) should not be a high priority in SMA work. If those surveys were to be eliminated, there would be considerable savings in terms of both cost and time.
- The present very large workload of the Coastal Fisheries Section (and likely increase in an accelerated SMA program) justifies an increase in financial resources (next section).

### **Additional resources for the SMA program**

As mentioned above, a prominent issue to emerge from this review is the very large workload of the Coastal Fisheries Section. That section has three staff who work on SMAs part-time, supplemented by part-time inputs from a Ministry Deputy CEO. Their workload is huge and includes servicing the 11 existing SMAs, establishing SMAs in the 32 communities on the waiting list, and general SMA-related tasks. To properly carry out this work, not to mention expanding the SMA program with teams in Vava'u and Ha'apai, requires a much larger budgetary allocation.

Obviously, the best solution would be for the budget of the Ministry of Fisheries to expand to cater for the workload of the SMA program. This does not seem unreasonable for an initiative that is likely to change in a very positive way the relationship between Tongan coastal communities and their fishery resources.

If an expansion of the Ministry's budget is not possible, another option is for the Ministry to internally re-allocate more resources to the SMA work from other sections of the Ministry in which investments may give less return, such as aquaculture<sup>16</sup>. This is not to suggest that aquaculture work at the Ministry should be discontinued, but rather some of those resources be transferred to SMA. Although the re-allocation process may have been difficult in the past, the Minister of Fisheries believes it will be much simpler now that there is a dedicated ministry for the fisheries sector (S.Fakahau, per.com.).

### **Landlocked communities**

Landlocked communities will have less access to coastal fishing areas as the number of SMAs increases in Tongatapu and Vava'u. Several reports and individuals have expressed the view that issues that landlocked communities<sup>17</sup> face in the era of SMAs be examined. An EU-sponsored review of the Tonga Fisheries Sector Plan 2016-2024 (Dredge 2016) goes further and makes a specific recommendation: "The short and medium term impact of wide-spread implementation of Special Management Areas on fish supplies to local markets and communities without immediate access to marine resources should be examined".

The communities visited during the present review are all coastal. In each of those locations community members were asked their views on how the grievances of landlocked communities should be addressed. The following are typical of the ideas expressed:

- "They do not share their (relatively good) land with us, so we do not need to share our fishing area with them."
- "Fishing is not very important in landlocked communities."

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<sup>16</sup> An example of an opportunity to re-allocate is the budget for the Ministry's aquaculture section. The FAO/AusAID Tonga Fisheries Sector Review stated: "Aquaculture research and development work has taken place in Tonga for more than 40 years. During that time numerous projects, some of which have been very substantial, have been carried out, but so far very little of this work has been translated into commercial or production aquaculture" (Preston 1998). Sixteen years later (and after 56 years attempting to develop aquaculture in Tonga) the situation has not improved. An SPC report (Gillett 2016) states that the value of all aquaculture production in Tonga during the calendar year 2014 was T\$28 000 and estimated that actual benefits from that production (i.e. value added or contribution to GDP) was estimated to be T\$14 000. According to the Ministry's finance officer, the Aquaculture Division's budget for the financial year 2014/2015 was T\$283 452. This indicates that the Ministry of Fisheries spends over T\$20 on aquaculture to get T\$1 of benefit. It is much more than T\$20 if the foreign aid expended on aquaculture is considered.

<sup>17</sup> To some extent the comments in this section apply to the residents of urban areas.

- “Coastal areas that adjoin lands of the King should remain open-access so landlocked communities have a place to fish.”

To some extent the Fisheries Act can be interpreted as being sensitive to the interests of landlocked communities. The Act states: “The Minister shall, in designating a community to be a coastal community, take into account the concerns of communities living adjacent to the Special Management Area”.

Although resolving the SMA-related problems of landlocked communities is beyond the terms of reference of the present review, several ways of dealing with the issue were either expressed by stakeholders or emerged during the analysis phase of the review. These were:

- SMAs should be established and negative impacts on landlocked communities could be mitigated to some extent by discussion between the concerned communities.
- At the Felemea SMA, outsiders can be allowed to fish in the SMA, but they are charged for the privilege.
- Neighbouring countries offer some options. In the traditional fishing areas of Fiji, outsiders can carry out subsistence fishing but not commercial fishing. In the traditional fishing areas of Samoa, coastal communities cannot exclude outsiders but they can make rules that are applicable to both residents and outsiders.
- There is the possibility of having a “district SMA” in which several communities (perhaps including those that are landlocked) have access to an extended SMA.
- Certain areas (e.g. land adjacent to the King’s land and urban areas) could remain open access.

Although the benefits to the country from SMAs appear to far outweigh the negative impacts on landlocked communities (and there appear to be several options for mitigation), the issue should be taken seriously. The effects of SMAs on the food supply and livelihoods of landlocked communities deserve additional attention, and a survey of the impacts should be carried out.

## **The management plan**

An important aspect of an SMA is the Coastal Community Management Plan. In fact, some staff of the Ministry of Fisheries indicate it is by far the most essential element – an assertion that seems reasonable. Accordingly, some additional attention should be given to the plans.

The typical plan contains the following elements:

1. Introduction and background
2. Coastal Community Management Committee
3. Summary of the existing situation
4. Community vision
5. Community objectives
6. Problem analysis of the Coastal Community and Surrounding Area
7. The boundaries of the Special Management Area and fish habitat reserves
8. Fishing conditions within the Special Management Area
9. Conditions for the fish habitat reserves
10. Community capacity-building and public awareness
11. Monitoring and Evaluation

The plans are not short. The Ovaka plan (combined English/Tongan version) is 33 pages. That for Felemea is 34 pages.

The most substantial comment that can be made is that a summary of the “rules of the game” should be included in each plan. This is because, to some extent, the rules are the essence of the plan. As it is now, several readings of a plan may be required to identify the rules and during the review, few community residents of Ovaka and Felemea seemed to be fully aware of the rules. If there were to be a short

summary of rules in the plan, it could easily be extracted for posting in the community. Such a summary would also facilitate periodic revisions of the rules.

The final point above leads to the need for a clear revision process in the plans, other than a simple statement such as “Assess and where necessary, revise the coastal community management plan every twelve months”. As an example, in Ovaka currently an important SMA issue is the periodic opening of the no-take zone, but in the Ovaka plan the subject does not appear. If the original plan requires approval of the Minister, it would seem logical that the Minister should have some control over revisions.

## **Other issues**

Two types of SMA workshops deserve some attention:

- In Section 6.2 it is stated that the most laborious community input into the SMA process is the surveillance of the SMA. In the communities visited during the present review there was a general feeling that, although the surveillance detected numerous cases of illicit outsider fishing, only a few of the incidents have been successfully prosecuted, with the inexperience of the police and judges of the SMA legal situation cited as being an important factor. It is commendable that in January 2017 the Ministry of Fisheries will be holding a workshop for police and judges in Vava'u.
- In October 2015, the MACBIO project together with the Department of Fisheries and the Civil Society Forum of Tonga convened a nation-wide “lessons learned” conference on SMAs (Tupou-Taufa *et al.* 2016). The 65 participants came from several areas of Tonga and included residents of SMA communities, as well as those from communities interested in joining the SMA program. In all communities visited during the present review, there was mention that the workshop was quite valuable in terms of capacity development and generating enthusiasm for SMAs.

Following from the two points above, the Ministry of Fisheries should consider promoting similar workshops in the future.

Some thought should be given to succession planning in the Coastal Fisheries Section. The work of this small unit is critical for the success of the SMA program, but is reliant on special skills that appear to be in short supply at the Ministry of Fisheries. A related aspect is the need for some type of incentive to encourage staff retention in the Coastal Fisheries Section. Also to be considered is the need for university-level training to enlarge the pool of individuals with skills needed by the SMA program.

The terms of reference for the present review contain a provision “To the degree possible, provide observations and suggestions on monitoring external donor assistance at the communities visited.” This issue was pursued in the communities visited, as well as with senior staff of the Ministry of Fisheries stations in Vava'u and Ha'apai and a Deputy CEO at the Ministry headquarters in Tongatapu. In short, none of the Ministry officers consulted perceived the issue to be very significant. Both Vava'u and Ha'apai are small enough that any work being done by outsiders affecting the fisheries sector becomes general public knowledge. Probably the most important aspect of external donors working at the community level is sending conflicting messages to villagers. This suggests a role for the Ministry as a coordinator of work at the community level by overseas groups that is related to fisheries.

## **Priority recommendations**

Suggestions for improvements appear in various sections of this report. The priority recommendations are given here, grouped into a few themes.

### **Streamline the Establishment of SMAs**

The current process is long and expensive, especially considering the plan to extend SMAs to all coastal communities in Tonga. Section 8.2 of this report gives eight suggestions for trimming the costs and time. Of those, probably the most important are: (a) enhancement of the SMA unit in the Ministry of Fisheries (more details below), (b) placement of staff dedicated to SMA work in Vava'u and Ha'apai, (c) support the efforts of NGOs to create streamlined SMAs, (d) reduce or eliminate baseline surveys, and (e) study the various considerations relating to the shedding of non-fisheries livelihood work associated with SMA.

### **Enhance the SMA Unit in the Ministry of Fisheries**

SMAs have the potential to have a huge positive effect on the entire country. As the quality of the Ministry's SMA work can have a large impact on future SMA-related benefits, the institutional unit handling SMA work should be enhanced:

- The responsible entity for SMA at the Ministry should be elevated from its current position as an informal part of the Coastal Fisheries Section with three part-time staff to a body commensurate with the importance of SMAs in the country.
- To cater for establishing a large number of SMAs in all areas of the country, the dedicated SMA unit should have more staff, some of whom are based in Vava'u and Ha'apai. The staff should have adequate technical skills (including statistical expertise) and a better gender balance than at present.
- Such a dedicated SMA unit would require a budget that is expanded from the present, either as an additional allocation to the Ministry of Fisheries or by the Ministry internally re-allocating resources.

### **Improve the SMA establishment process**

The priority suggestion for improving the SMA establishment process are:

- At present the SMA establishment process has several phases (Box 1), including an "implementation" phase which includes such activities as deploying the boundary markers and alternative income activities - but which appears to fade into long-term ongoing SMA tasks. For several reasons (e.g. providing an exit strategy for donors), that phase should be broken into two components. In other words, having a seventh step in Box 1 above.
- The expenses of establishing an SMA should be handled in such a way that it is possible to determine the costs of establishing each SMA.
- The template for the Coastal Community Management Plan should be modified so that (a) there is a summary of the rules of the SMA, and (b) details are provided on plan modification.
- One of the conditions for a potential SMA community to join the waiting list should be agreement of that community to a standard letter specifying the obligations of that community and those of the Ministry in the SMA process.

### **Modify the current SMA monitoring**

It is suggested that the current nebulous objectives of SMA monitoring be modified to simply "keeping an eye on general trends in the SMAs". The baseline surveys should be reduced or eliminated. It is recommended that the future SMA monitoring strategy have the theme of simplicity and consist of:

- Modify the existing catch monitoring on a site-specific basis (i.e. tailored to each community) to obtain the trend of the over-catch rate, and if possible, trends in rates for important species and gear.
- Collect perception information on trends in catch rates, outsider presence in the SMA, and SMA-related benefits.
- Regularly analyse this information and present the results back to the community.

### **Determine the impacts on landlocked communities**

Although the benefits to Tonga from SMAs appear to far outweigh the negative impacts on landlocked communities, the Ministry of Fisheries should gain a greater understanding of the situation. The effects of SMAs on the food supply and livelihoods of landlocked communities should be studied.

There is some possibility that the recommendations of this review will not get implemented due to the current demanding work schedule of the Coastal Fisheries Section. Alternatively, if much attention is paid to implementing the review's recommendations, the establishment and servicing of SMAs may be significantly hampered. In this situation there are advantages of focusing donor funding on assisting in the implementation of the above recommendations.

## **Concluding remarks**

Most SMA communities are very enthusiastic about the benefits they are now receiving from the enhanced management of their fishery resources. Several examples of this were noted during the present review and in other documentation on SMAs (e.g. “Webster *et al.* (2016), Malimali (2013), Tupou-Taufa *et al.* (2016)). Although it is difficult to substantiate these assertions of success with quantitative data, the enthusiasm is quite real. Similar eagerness concerning the benefits of fisheries management has been rare or unknown in Tonga in the past century. From that perspective alone, the SMA program could be considered a huge success.

Much of the credit for generating community enthusiasm for improved fisheries management should go to the staff of the Ministry of Fisheries involved in SMA work. This includes their organisation, productivity, technical knowledge, and especially community interaction skills. The success of the Ministry's SMA work has resulted in the program being so popular with communities that it has expanded to the point where it is “bursting at the seams”. Most of the deficiencies noted in this report appear to relate to the tremendous excess in community demand related to SMAs over that which the Ministry could possibly service with its present resources.

The transformation that SMAs are creating is arguably the biggest change in Tonga's fisheries sector since the Royal Proclamation of 1887. SMAs will probably affect many more Tongan lives than other fisheries events in the country, such as the surge in deep bottom fishing of the 1980s, the tuna longline boom of the late 1990s, or spurts of interest in various forms of aquaculture.

The recommendations in this report should improve the benefits to Tonga from SMAs but some of them will require considerable political will to implement, especially those related to enhancement of the SMA unit in the Ministry of Fisheries. In contemplating this issue, it should be noted that the amount of political will that was required in the early 2000s to change the Fisheries Act to allow for SMAs dwarfs the present situation. The persistence of the Secretary for Fisheries at that time and his willingness to expend political capital on the SMA concept - at even the highest level - is now allowing the potential of SMAs to come to fruition.

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## Appendix 1: People consulted during the review

### FAO:

- Jessica Sanders
- Frank Chopin
- Pau Molevuka Likiliki

### Ministry of Fisheries

- Semisi Fakahau
- Tu'ikolongahau Halafihi,
- Siola'a Malimali
- Latu 'Aisea
- Sione Mailau
- Viliame Fatongiatau
- Salote Kolomatagi
- Tevita Talakai
- Silika Ngahe
- Akosita Leakona
- Sosefina Vili

### Ovaka Community

- Ulaisi Vaisima, District Officer
- 32 members of the Ovaka community

### Felemea Community

- Sione Masima, Town Officer
- 23 members of the Felemea community

### Nukuleka Community

- Sitiveni Fe'ao, Town Officer
- 17 members of the Nukuleka Community

### Pacific Community

- Ian Bertram
- Brad Moore
- Pauline Bosserelle
- Paul Mead (retired)

### Forum Fisheries Agency

- Mike Batty
- Tim Adams

### ADB Climate Resilience Project

- Sione Vailalala Matoto
- Saulesi Kauvaka
- John Parks

### Environment Department

- Tahirih Hokafonu

### University of the South Pacific

- Randy Thaman

- Elizabeth Holland
- Salome Tupou Taufu

University of California at Santa Barbara, Sustainable Fisheries Group

- Michaela Clemence
- Lennon Thomas

Vava'u Environment Protection Association

- Karen Stone

Waitt Institute

- Kathryn Mengerink

Locally-Managed Marine Areas

- Hugh Govan

Vava'u Environment Protection Association

- Karen Stone

Seacology

- Mary Randolph

WorldFish

- Joelle Albert
- Pip Cohen

Wildlife Conservation Society

- Stacy Jupiter

Australia Samoa Fisheries Project

- Kelvin Passfield (former staff)

Matangi Tonga Magazine

- Pesi Fonua

Tuvalu Fisheries Department

- Garry Preston
- Ursula Kaly

## Appendix 2: Laws and regulations relevant to SMAs

**Tonga's Fisheries Management Act 2002** gives the power to the Minister responsible for fisheries to declare any area of the fisheries waters and corresponding subjacent area to be a Special Management Area for purposes of coastal community management, application of certain conservation and management measures, subsistence fishing operations or other specified purpose. That declaration specifies:

- The persons or groups of persons or types or classes of vessels that may be allowed to fish or carry out a related activity;
- The methods of fishing that may be used;
- The terms and conditions of fishing or a related activity;
- Any activity that may be prohibited, regulated, exempted from regulation, subject to specified terms and conditions;
- Any other necessary conservation or management measure that apply;
- Any other matter that may be prescribed;

Other provision of the Act state:

- The Minister shall, in designating a community to be a coastal community, take into account the concerns of communities living adjacent to the Special Management Area;
- Any person who fishes or carries out a related activity in any Special Management Area in contravention of any Order made under this section shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$50,000.
- The Secretary of the ministry is to maintain a record of Special Management Areas and any coastal community responsible for such Special Management Area or parts thereof.

### **Special Management Area Order GS 20 of 2004**

- Declares that the following shall be Special Management Areas: (1) Teleki Tokelau (North Minerva Reef), and (2) Teleki Tonga (South Minerva Reef).

**Fisheries Management (Conservation) Regulations 2008** have one regulation concerning SMAs, specifically the SMA boundaries:

- The boundary of a special management area is to be measured seaward from the high-water mark of a coastal community; and not exceed a distance of 2500 metres from the high-water mark or a depth of 50 metres.
- Where the boundaries of any two coastal communities will overlap, the boundary is to be the equidistance between such communities.
- The Minister may, in consultation with that community's Coastal Community Management Committee and the Fisheries Management may alter the boundary for the purposes of ensuring habitat, conservation, management, sustainable utilisation and development of fisheries resources

**The Fisheries (Coastal Communities) Regulations 2009** includes provisions for:

- Establishing SMA boundaries
- The SMA-related responsibilities of the Ministry
- Functions of the Coastal Community Management Committee
- The requirement that the Committee prepare a plan for the conservation, management, sustainable utilisation and development of fisheries resources for the SMA
- Fish habitat reserves within the SMA
- The establishment and maintenance of a Fishing Vessels Register and a Fishers Register, the latter containing the names and details of persons authorised by the Committee to fish in the SMA
- Authorisations to fish in the SMA (subsistence fishing permit, small scale fishing permit, *cladosiphon* seaweed harvesting permit, yacht fishing permit)

- Fish Habitat Reserve
- Giant clam and Lobster Protective Zone
- Conditions of fishing in the SMA

**The Special Management Area Order of 2013**

- Contains provisions for the SMAs of Nomuka, Taunga, and Fafa

### **Appendix 3: Annotated bibliography of the history and status of Special Management Areas in Tonga**

Thaman, R., R. Gillett, and N. Prescott (1995). **The Ha'apai Conservation Area**. South Pacific Regional Environment Programme and the University of the South Pacific, 181 pages.

- The almost complete lack of any marine resource management, traditional or modern, is considered as one of the most critical issues in the Ha'apai Conservation Area (HCA). If inshore fisheries resources are to be sustainably utilized in Ha'apai, some form of community-based fisheries management is urgently required. This would require empowering local communities with some degree of management control over nearby resources.
- Without the management participation of local communities, efforts to conserve turtles and seabirds, establish effective marine reserves, reduce fishing pressure on over-exploited species, apply measures to protect endangered species, and promote clam circles will probably not be effective. It is therefore thought that community-based fisheries management is a fundamental issue upon which the success of many other endeavors depends. The HCA, due to its community orientation, could be an ideal mechanism to at least initiate the process of community-based management.

Petelo, 'A., S. Matoto, and R. Gillett (1995). **The Case for Community-Based Fisheries Management in Tonga**. Background Paper 61, Workshop on the Management of Pacific Island Inshore Fisheries, South Pacific Commission, Noumea.

- In practical terms, it is difficult to visualize that major improvements could be made in the effectiveness of management of inshore resources unless the villages are given at least some management authority.
- Some types of fisheries management (e.g. offshore tuna fishery, deepwater snapper, and those inshore resources near the capital) are best done at the national level. Conversely, there needs to be recognition that some management functions cannot be effectively carried out centrally. Although limited government funds and geographically dispersed fishing areas can be cited as reasons why central management cannot function in some areas, the fundamental difficulty is the nature of the system; quite simply, central management is not part of the community.
- In many cases, especially the outer islands and remote communities, the net result of well-intentioned central management of fisheries in Tonga is the absence of management.
- The prevailing system of totally open access does not foster a long-term relationship with the resource and therefore inshore fishery conditions are likely to degenerate in the future. Some form of community management and differential access is urgently required.

Gillett, R., R.Thaman, and T.Latu (1996). **Consideration on the Introduction of Community-Based Management in Ha'apai**. Ha'apai Area Conservation Project, 19 pages.

- One of the serious concerns of villagers in Ha'apai is that, even if a community attempts to conserve and manage adjacent marine resources, it may be a useless exercise because outsiders can move in and over-harvest. Consequently, a major development/management priority identified by the communities is that some form of increased control over local marine resources is urgently needed.
- There are numerous indications that the incidence of conflict between local and outside fishermen are increasing.
- Views were obtained of the Ha'apai communities on increased community control over adjacent marine resources by limiting access.
- The paper concludes that there is clear consensus among the Ha'apai communities surveyed of the necessity limiting access to inshore fishing areas. There are numerous issues to resolve prior to implementing a fisheries management scheme in Tonga based on limiting access, each of which requires careful consideration. It is suggested that the Ha'apai area would be an appropriate location to begin implementation due to the consensus of the community, the severity of the fisheries management problems, the government commitment to the Ha'apai Conservation Area Project, and

the resources within that project to assist the Ministry of Fisheries in promoting community-based management.

Fakahau, S. (1996). **A Human Resource Development Programme**. Commonwealth Secretariat, London, 175 pages.

- The fishermen that have come from outside the group [Ha'apai] to fish the inshore waters of Ha'apai often have a comparative advantage over those that actually live on the islands - the locals. In most cases the outsiders have the capital and more advanced fishing equipment. They fish indiscriminately for preferred species of fish, shellfish, invertebrates, and live coral, and when these resources are fished out or when the operation is no longer viable economically they move somewhere else.
- Although the locals favour rational exploitation of the resources in the group, as they always have done in the past, they know that they do not have the power to influence the fishing activities of outsiders. They are also aware that it is the Government that has the power to impose control on the outsiders' activities, but it does not have the means to do so.

Gillett, R., P.Cusack, W.Pintz, G.Preston, B. Kuemlangan, C.Lightfoot, H.Walton, and D.James (1998). **Tonga Fisheries Sector Review, Volume I: Main Report of the Consultants**. Food and Agriculture Organization of the United Nations and Australian Agency for International Development, 132 pages.

- The failure of centrally-based management, together with the urgent need for some form of management to prevent further declines in inshore resources, and the non-conservative nature of Tonga's open access regime, all indicate that a change from the present open access is required. Giving communities the ability to restrict outsiders from fishing in adjacent inshore areas would provide an incentive to conserve resources for the future. It would also serve to safeguard the food supplies of the more isolated villages in Tonga.
- Discussions with many key Tongan policy makers indicate that the introduction of the concept of limited access, although quite ambitious, is both desirable and achievable.

Kuemlangan, B. (1998). **Some Legal Considerations for Fisheries Co-Management in Tonga**. In: FAO (1998). **Tonga Fisheries Sector Review, Volume II: Issue Papers**. Food and Agriculture Organization of the United Nations and Australian Agency for International Development, 155 pages.

- The concern addressed in this paper is to determine how best the co-management concept can be formally recognised and utilized should the decision be made to adopt it in fisheries management.
- It seems that if any arrangement or operation initiated by government in Tonga is to have some respect and a chance of being implemented, it must not only be appreciated but also formally recognised.
- Some form of co-management had been proposed by the Ha'apai Conservation Area project. The plan for introducing co-management under that project included the drafting of a cabinet paper to request authorization to proceed with the process of implementing such management in Ha'apai.
- The whole scheme of the Fisheries Act 1989 is to provide for the management and development of fisheries through a central authority and does not envisage that decision making and enforcement functions are exercised otherwise. The areas where stakeholder participation is provided for are few and the participation is restricted to the soliciting of views and advice.
- It was concluded that the existing legislation does not explicitly provide for co-management. Owing to the perceived nature of co-management and serious legal implications of the exercise of certain functions such as rule-making and enforcement, there should be a clear legal foundation for adoption and implementation of co-management.

World Bank (1999). **Voices from the Village: A comparative study of coastal resource management in the Pacific Islands**. Site Visits and National Summaries. The World Bank, Washington DC.

- The conclusion from studying six villages around the country: "One recommendation overshadows all others: The failure of centrally-based management, together with the urgent need

for some form of management to prevent further declines in coastal resources indicate that a change from the present open access is required. Giving communities the ability to restrict outsiders from fishing in adjacent inshore areas would provide an incentive to conserve resources for the future”

Government of Tonga (2002). **Tonga’s Fisheries Management Act 2002.**

- B. Kuemlangan (the author of the above paper) did much of the legislative drafting for the Fisheries Management Bill.
- The approved Fisheries Management Act gives the power to the Minister responsible for fisheries to declare any area of the fisheries waters and corresponding subjacent area to be a Special Management Area for purposes of coastal community management, application of certain conservation and management measures, subsistence fishing operations or other specified purpose.

Department of Fisheries (2006). **Tongan Community Takes the Lead in Sustainable Development.** Government of Tonga website.

- The small, volcanic island of ‘O’ua in the Ha’apai Group will go down in history for having the very first Community Special Management Area in the Kingdom. This historical event was marked and officially opened by the Minister for Agriculture and Food, Forests and Fisheries, Hon. Sione Peauafi Haukinima on 1 November, 2006.
- The ‘O’ua community made a request of the Department of Fisheries in March 2005 to assist them in establishing a Special Management Area as a means to help ensure that there will be enough fish for their families today and for their children in the future. A number of awareness raising activities were conducted in the community, a representative did a study visit to Samoa facilitated by the Tonga Fisheries Project to provide the community with ideas and options of how to manage their coastal area sustainably.
- A Coastal Community Management Plan was prepared that describes the past and current status of the resources and habitat of the area and the management measures the community intends to take through the ‘O’ua Coastal Community Management Committee (CCMC) to ensure the sustainable use of the area.

Likiliki, P. (2006). **Fisheries Co-Management and the Evolution Towards Community Fisheries Management in Tonga.** Fisheries Training Programme, United Nations University, 52 pages.

- The study seeks to (a) outline the importance of establishing stakeholder consultation and participation in fisheries management in Tonga, (b) illustrate the problem of the commons by analysing Tonga’s experience in coastal resource use in Tonga’s coastal waters, (c) strategically analyse the best way to establish the fisheries stakeholders’ participation approach for Tonga from a Tongan’s perspective, (d) to justify why and how Tonga’s social, cultural and traditional values and system should be integrated into any fisheries management regime for Tonga, and (e) to explain property rights and their merits in their application to community fisheries management in Tonga.
- The evolution to community fisheries management in Tonga has been slowly driven by the continuing poor results experienced by fishers. Those poor results are reflected in their low catches and the poor economic benefits the fishing activity generates. The fundamental idea behind community fisheries management is the strengthening of their rights to its adjacent and surrounding waters.
- Studies of co-management and its use have been beneficial in gaining further insight into the fisheries management problem. But there are challenges to be tackled. Those challenges revolve around the willingness of government to let go of its management efforts, the capacity of the users to accept responsibilities and identify who are considered relevant stakeholders, and how it is possible to resolve conflicts.

Gillett, M. (2010). **Success of Special Management Areas for Inshore Fisheries Management in Tonga.** Marine Studies Programme, University of the South Pacific.

- In 2002, a new fisheries law was enacted which has a provision for Special Management Areas (SMAs). A main feature of an advisory council of the Fisheries Management Act 2002, is that the Minister may, in consultation with the Committee, designate any local community in Tonga to be a coastal community for the purposes of community based fisheries management and may prescribe the rights and responsibilities of such coastal community in respect of the Special Management Areas.
- An SMA grants community management control of its inshore resources. In effect, providing community with the basic tools and skills for better management initiatives. The main objectives of a management plan is to enforce the authority to exclude outsiders from entering an SMA, the establishment of marine parks, and/or putting other restrictions on harvested resources, including, size, limits, and catch amount.
- Given the major decline of Tonga's inshore resources, it is believed the most successful aspect of the SMA program is how SMAs are promoting sustainable growth of resources in hopes for sustaining fish stocks for the future. They do it by inviting a community to participate in something that is inherently in their self-interest. It now seems there is light at the end of the tunnel for both Tongan Fisheries Division and SMA communities in terms of maintaining and sustaining a healthy fisheries environment.
- Other positive aspects of SMA governance include: (a) Protects the future of fisheries giving local communities the essential tools for inshore resources, (b) Unlike open access fisheries, there is no pressure to take as much as possible as fast as possible, and (c) Bonds between the community and inshore resources are stronger than ever.

Fisheries Division and SPC (2010). **Community-Managed Special Management Areas in Tonga**. Secretariat of the Pacific Community, Noumea [brochure]

- Provides maps of six SMAs.
- Gives the general fishing conditions for SMAs and fish habitat reserves
- Gives additional fishing conditions for the 'Atata and 'Eueiki SMAs

Malimali, S. (2013). **Socioeconomic and Ecological Implications of Special Management Areas (SMAs) Regime in the Kingdom of Tonga**. A thesis presented to the Bangor University for the degree of Doctor of Philosophy, School of Ocean Sciences, Bangor University. 235 pages.

- There are three main areas of study: (a) Socioeconomic implication of the SMAs, (b) Biological assessment of reef community's assemblages in response to SMAs, and (c) Evidence of shifting baseline in fisher's perceptions of reef fisheries.
- The study indicates that the establishment of the SMAs in Tonga has had some impact on fishing activities and patterns of food use.
- There have been variable responses in terms of the restoration of fish and invertebrates.
- The study suggests a shifting baseline syndrome evident in spear-fishers' memories and perceptions in regards to those fish species that were depleted in the multi-species and multi-gear coral reef fishery in Tonga.
- The document concludes an SMA can provide win-win solutions to many of the problems of inshore fisheries resources facing fisheries managers in Tonga. These solutions include limiting coral reef degradation caused by fishing, ensuring equitable access to fisheries resources, and maximising opportunities for those who fish responsibly.

Anon (2015). **Coastal Fisheries in Tonga: Lessons from Tonga in BDM management including use of Special Management Areas (SMAs)**. Fisheries Division. 18 sheet Power Point presentation.

- Success and Benefits of SMAs: (a) No more trespassing of outside fishers into their fishing areas illegally, (b) No more aquarium people accessing SMAs, (c) Marine resources are sustainably conserved and managed by the SMA communities.
- Challenges: (a) There are very limited resources (funds, staff) for enforcement and conducting resource assessments and monitoring at the national level, (b) At the community level, illegal fishing within SMAs and fish reserves is still being reported as a common problem, (c) Issues

with data collection include recording errors, inconsistency and missing data, and (d) Planning and implementing activities can be delayed due to the delayed process of securing funds.

Govan, H. (2015). **Status of Locally Managed Marine Areas in Fiji, Kiribati, Solomon Islands, Tonga and Vanuatu.** Volume 2: Country reports. MacBio programme, GIZ.

- This presents the current status of locally managed marine areas in the individual countries and specific details of the institutional and policy situations as well as some key issues and priorities.
- 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.
- The SMAs each have a management plan and, different to Fiji but similar to Samoa, these assume regular visits from Fisheries staff. These visits do not occur and this demoralises communities at best.
- 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, and key roles and activities and support from other potential stakeholders.
- 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.

Tupou-Taufa S., Kara P., Aisea L., Koloi, F., Matoto V. and Fernandes L. (2016). **Feitu'u Pule'i Makehe (Special Management Areas, SMAs) – lessons learned.** Draft report to the Government of Tonga and to MACBIO, IUCN, GIZ, SPREP: Suva.

- On the 13-15 October 2015, the Marine and Coastal Biodiversity Management in Pacific Island Countries project (MACBIO) together with the Department of Fisheries and the Civil Society Forum of Tonga convened a nation-wide “lessons learned” conference on marine Special Management Areas in Ha'apai, Tonga. There were 65 participants including community representatives from across all the island groups.
- When the Fisheries Department started their work to establish SMAs in Tonga, it met with many challenges. This was mainly due to a lack of understanding and appreciation of what an SMA was. In order to successfully establish SMAs, close cooperation and communication between coastal communities and the Fisheries Department is critical.
- In 2006, the first SMA in Tonga was successfully established. There are now nine SMAs established throughout the Kingdom, and the adjacent communities have all testified to the benefits they have acquired from their SMAs. Benefits include, but are not limited to, an improvement of their marine stocks and the relative ease of harvesting. Fishers reported that they could catch more in short periods of time and without the higher risks to safety of more distant travel. Other benefits of SMAs to their communities included tourism, handicraft and other funded development projects, leading to alternative sources of income and improved livelihood. It also provides these communities with an opportunity to farm marine products such as giant clams and seaweed. SMA also encourages members of these communities including their neighbours to collaboratively work together not only to protect and manage, but to share the benefits of their marine resources.
- There are major issues to address at critical milestones in setting up an SMA. One community with an established SMA reported that it took them several years of village meetings and house-to-house visits to build understanding within their own community of the potential benefits of SMAs. Once the majority accepted the concept, they had to work with neighbouring communities to inform them of their SMA plans.

- The report identifies 12 lessons learned in the establishment of SMAs in Tonga.

Anon (undated, 2016?). **Tonga Fisheries Sector Plan 2016-2024**. Government of Tonga, the World Bank, and the International Fund for Agriculture Development.

- While the community approach and the SMA plans are based on sound principles, preliminary analyses suggest that the measures taken under the SMA plans are insufficient to prevent further deterioration of the communities' fisheries resources. Overfishing is prevalent within SMAs on all species groups: finfish, invertebrates and particularly with regard to high value sessile invertebrates such as beche-de-mer and giant clams (two species already depleted). In some cases the SMA 'fishing rules' are simply inadequate for rebuilding fish stocks as communities market increasing proportions of their catches to generate cash income. In other cases, the SMA's ability to control illegal fishing both by community members or outsiders is weak and needs strengthening.
- Given the relatively small size of the SMAs and the subsistence requirements of the communities, the SMAs appear capable of stabilising and sustaining the subsistence harvests. However, the SMA communities generally have no limits on the commercial harvests and gifting which leads to overfishing and resource depletion. Even where harvests are restricted under the fisheries regulations (e.g. minimum sizes), these controls are difficult to enforce. Nevertheless, the SMAs provide a sound foundation for building an effective community co-management regime. The SMA network would ideally be extended to cover most of the coastal communities, become fully integrated with and complementary to the marine parks network and facilitate implementation of management plans for the inshore commercial fisheries.
- In order to make the inshore community fisheries sustainable, the SMA regime will require several Improvements: (a) introduction by the community of limits on community harvests, either by limiting effort or the amount of fish harvested, and through effective compliance with the community rules, (b) capacity building through leadership and business development training, through raised awareness of sustainable practises and related climate change resilience challenges (c) devolution of greater authority to the SMA committees (d) institutional mechanisms to foster cooperative arrangements between communities.
- Establishment of SMAs to date focuses only on isolated single village communities. It has not been trialled on multiple-village communities that are adjacent to one another with a range of multi-resource users. The current SMA model and approach will require adjustments to accommodate such situation. The main principles of fisheries resource management will remain the same with further additional strategies to accommodate larger communities, including inland villages that have traditionally fished in the coastal areas for food, with the occasional selling in the local markets to meet other obligations. These type of communities are mainly located on the main island of each island group in Tonga, where most of the fishermen are concentrated, with the highest impact on the coastal resources. There is an urgent need to expand such co-management systems, as the SMAs, with the appropriate adjustment to tackle the issue of sustainability and conservation in places where most of the problems occurs.
- This Tonga Fisheries Sector Plan is divided into four main components and several sub-components with the intention that some of these units could be further developed as specific programmes or projects eligible for support or co-financing from development partners. The implementation, timescale and cost estimates for such initiatives would require discussion with development partners. The components are:
  - Component 1. Sustainable community fisheries
  - Component 2. Profitable commercial fisheries and aquaculture
  - Component 3. Public and private investment
  - Component 4. Governance and capacity building
- Component 1: Sustainable Community Fisheries. This involves three sub-component: (a) Enhancement of the Special Management Area (SMA) programme, (b) Expansion of the SMA network, and (c) Management of community fisheries
- **Enhancement of the SMA programme:** The outcome for the sub-component would be to ensure effective operation of SMAs. Sub-component 1 would secure the foundation of the SMA

framework to enable replication and expansion in Sub-component 2. The sub-component would have the following activities: (a) an on-going adaptive management programme for SMAs to develop and implement best practices. In association with the communities, the programme would enhance the current monitoring and review of SMA performance, using metrics developed in association with communities, measurable by the communities and directly linked to community decisions on SMAs, (b) improvement of the SMA regulatory framework to allow progressive delegation of authority to communities over SMAs and facilitate changes in SMA by-laws and community enforcement measures (closely linked to the Component 4. Governance) (c) grant assistance to SMA's for mapping, marking, enforcement and community development (d) leadership training for community leaders, for youth and women's group leaders and leaders of local commercial fisheries (closely linked to Component 4. Capacity building) (e) awareness raising at all levels, including in schools, in neighbouring communities, among commercial fishers, in local authorities and among local political leaders (f) progressive valuation of SMA environmental and social impacts of SMAs and costs of SMA establishment and operation as knowledge of SMAs accumulates.

- The inputs required for the sub-component would include the following, provided through a combination of prioritised public resource allocation and development assistance: a) establishment of a multi-disciplinary community fisheries team including environmental and social science professionals supported by an advisory group which includes civil society and other agencies at national and island group levels. The teams would be suitably equipped on each island group (transport, including seaworthy vessels with adequate safety equipment; communications; dry storage for computer, audio-visual, or scientific equipment; diving gear; survey and measuring devices; GPS) and provided with adequate operating expenses to support and adaptive SMA programme. b) placement of community fisheries staff and operating funds in the outer islands groups, assisted where possible by volunteers secured through by development partners, and /or universities and NGOs engaged in coral reef studies and conservation. c) social and legal studies on emerging issues, including relationships with neighbouring SMAs and communities, legal aspects of community enforcement and establishment of bye-laws, use rights in the SMA (e.g. for clam gardens, seaweed culture, access), conflict resolution and governance (e.g. application of environmental (non-fisheries) regulations through the SMA instrument), d) technical services on community development and development of school curriculum modules, radio programs and other media required to raise awareness at all levels e) workshops for SMA leaders to exchange knowledge and experiences f) high-level national seminars on SMAs and community fisheries leadership g) SMA small grants programme to assist SMA. Grants would be linked to preparation of community plans for maintenance and replacement of assets. Where appropriate, the SMA framework could be used to channel available grants, or support for adaptation to climate change and disaster preparedness.
- **Expansion of the SMA network** The long-term outcome would be to create an effective SMA network covering the majority of Tonga's coastal fisheries and take appropriate SMA approach to multi-villages and multi-resource users (including inland villages) and pilot at least two communities of this type. This sub-component would be based on successes and experiences from sub-component 1.1. and would have the following activities: a) identification of the most vulnerable communities and areas of special environmental value in order to prioritise and target communities and areas b) preparation and submission of medium/long-term programme for SMA development and Management, including a schedule of priority SMAs, financing plans and sourcing of the required human and financial resources from internal and external sources c) implementation of the programme, which would involve activities and steps identified as best practices under Sub-component 1.1. and include the following (1) consultations with the identified communities to initiate dialogue on establishment of SMAs, (2) inclusion of communities in the SMA development programme subject to political willingness and contributions and commitments from the communities, (3) support for community initiatives on sustainable use of marine resources, diversification of livelihoods and businesses, including development of handicrafts, aquaculture, tourism, marine leisure and tourism (4) mainstreaming SMA principles and practices into community development

programmes, climate change adaptation, disaster risk management, school curricula and cultural events.

- The inputs required for the Sub-component would include: a) establishment of an expanded SMA unit to manage the programme b) medium/ long-term financing in accordance with a realistic schedule of SMA establishment and development c) measures to raise political commitment for resolution of key tenure and empowerment issues d) engagement with other (non-fisheries) stakeholders through advisory groups and civil society e) partnerships with organisations that have experience and skills in community co-management and MPA design, management and financing; with partners who can provide skilled volunteer services; and with local NGO partners.
- **Sub-component 1.3. Management and development of coastal fisheries** This sub-component would develop the framework for overall management and development of the coastal fisheries both within and outside of SMAs and fisheries not covered by specific management plans. The SMA programme is considered as a part of this overall framework. The outcomes would be: (i) effective management of coastal fisheries, particularly those outside the scope of the SMAs and not covered by specific management plans; (ii) pro-active and responsible coastal fisheries organisations; (iii) improved access to services by coastal fishing communities, particularly to markets, finance and business development (there would be some overlap with activities under component 2, commercial fisheries).
- The activities would include: a) periodic (every five years) frame surveys of coastal fisheries to establish numbers of fishers, vessels and gears, estimate catches and use of catches and provide a basis for improved sector planning and service delivery. The Fisheries Division would draw on expertise available through SPC and FAO to establish the methodology, train enumerators and analyse the data b) organisation of small-scale commercial fishers into groups and associations with registers, codes of practice and reporting obligations, including boat owners, gleaners (collectors) and women fishers, owners of fish fences, divers and fish buyers c) development of rules for management of discrete manageable fishery units (on access, effort and co-management modalities). The units would be variously defined in terms target species, area or communities, groups of fishers, i.e. whatever constitutes the most ‘manageable’ arrangements and units in the combined views of the stakeholders. d) assistance in developing programs where small scale fishermen can acquire necessary tools and equipment such as fishing boat, fishing gear and related supplies which will enable them to fully participate in the fishery while complying harvest rules and management plan e) assistance in developing group or community initiatives, including to access small grants, credit, climate change adaption and disaster preparedness finance and develop market and business opportunities.

Dredge, M. (2016). **Tonga Fisheries Sector Plan Review**. European Union Pacific Agriculture Policy Project and the Pacific Community, Ecoconsult, Suva.

- This is a review of the above “Tonga Fisheries Sector Plan 2016-2024”. It contains three recommendations dealing with SMAs.
- Recommendation 2: The short and medium term impact of wide-spread implementation of Special Management Areas on fish supplies to local markets and communities without immediate access to marine resources should be examined.
- Recommendation 3: The TFSP acknowledges that overfishing of coastal and inshore resources is a key issue in the context of the country’s fisheries. A process by which a national dialogue and political commitment to a change in culture that leads to reduction of exploitation levels and effort directed at inshore and coastal resources in areas outside SMAs is needed. Clarification about the distinction between local subsistence fishing and coastal and inshore commercial fishing may be required.
- Recommendation 4: Debate and clarification is needed for national guidance or control over management of critically overfished species and species groups. Mechanisms by which such co-management is carried out could be considered as part of the evolution of SMAs.

Ministry of Fisheries (2016). **Response to recommendations of the SPC June 2016 independent review of the Tonga Fisheries Sector Plan (TFSP).**

- This report is the Ministry of Fisheries response to the above Tonga Fisheries Sector Plan Review. The above three recommendations dealing with SMS are commented on.
- Recommendation 2: The short and medium term impact of wide-spread implementation of Self Managed Areas on fish supplies to local markets and communities without immediate access to marine resources should be examined. Response: This recommendation is supported. A review of Special Management Area (SMA) implementation is already underway under a FAO funded project. The consultant has agreed to consider this issue as a part of that review. Recommended action: Revise report to include: “The Ministry supports this recommendation and advises it has secured technical support from UN FAO the review of SMAs proposed under the sector plan. The FAO consultant has agreed to consider this issue as a part of that review”.
- Recommendation 3: The TFSP acknowledges that overfishing of coastal and inshore resources is a key issue in the context of the country’s fisheries. A process by which a national dialogue and political commitment to a change in culture that leads to reduction of exploitation levels and effort directed at inshore and coastal resources in areas outside SMAs is needed. Clarification about the distinction between local subsistence fishing and coastal and inshore commercial fishing may be required. Response: This recommendation is supported. This will be addressed through the development of the Tonga National Fisheries Policy. Recommended action: Revise report to include: “The Ministry supports this recommendation and will address the distinction during the development of the Tonga National Fisheries Policy”.
- Recommendation 4: Debate and clarification is needed for national guidance or control over management of critically overfished species and species groups. Mechanisms by which such co-management is carried out could be considered as part of the evolution of SMAs. Response: This recommendation is supported. The Tonga National Fisheries Policy will consider the mechanisms proposed under the TFSP, and Cabinet has endorsed a review of stakeholder engagement. The FFA has been approached to assist with this review. Options for co-management and the level of delegated decision making to community groups for SMAs will also be considered as a part of the development of the Tonga National Fisheries Policy. Recommended action: Revise report to include: “The Ministry supports this recommendation and will address this during the development of the Tonga National Fisheries Policy, and in the review of stakeholder engagement”.

Webster, F., P.Cohen, S.Malimali, M.Tautai, K.Vidler, S.Mailau, L.Vaipuna, and V. Fatongiatau (2016). **Detecting Fisheries Trends in a Co-Managed Area in the Kingdom of Tonga.** Fisheries Research 186 (2017) 168–176.

- This is a study of the first community-based, co-managed area in the Kingdom of Tonga, the small island of ‘O’ua. Perception-based data from interviews and catch landings data are examined and compared.
- The trade-offs are examined between the catch landings and perception data in terms of accuracy, precision, participation and cost for the purpose of guiding adjustments to co-management.
- Typically, data were collected from only one fisher per day, and from 9 to 85 catch landings were recorded during the period 2007 to 2011.
- Changes in catch trends since the inception of co-management were analysed using the catch data from spearing only as there was insufficient data from hand lines and gillnetting for statistical analysis.
- ‘O’ua experiences periods of elevated catches when middlemen visit the island and data from these periods were unlikely to be recorded as catches were sold immediately.
- The perception data indicated that the total annual yield was almost double estimates of sustainability, which could indicate that ‘O’ua’s reef fisheries are overexploited, or conceivably that perceptions of catches are too large. [seems to imply quantitative perception data, rather than trends]

- Ninety percent of the fishers interviewed perceived that catches had improved across all taxonomic groups since the inception of co-management. Fishers also reported less time spent fishing and reduced travelling times to fishing grounds. In contrast, landings data showed no significant trends in total catch per fisher per trip over the five year period
- Community members were initially provided with thorough training by fisheries officers. Additionally, fisheries officers visited the island periodically since the establishment of co-management; typically once per year to collect the data sheets and ensure that the data continued to be recorded correctly.
- While fishers perceived that catches had improved since the inception of co-management, landings data suggested that catches were either stable or declining. These differences are important as they would suggest very different management responses.
- In summary the landings and perception catch data for 'O'ua demonstrate distinct differences in the estimates of total catch, CPUE, total annual yield and catch trends.
- There is clearly still scope for more research to further understand the use of community perceptions as a monitoring tool.

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