



Supporting fisheries rehabilitation in Tonga's special management areas by promoting alternative fishing methods

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Introduction

In many Pacific Island countries and territories (PICTs), human populations are increasing, creating additional pressure on the coastal fisheries resources that they depend upon (Bell et al. 2009). This problem is also evident in the Kingdom of Tonga (Sun et al. 2011). To address this issue, PICTs need to seek out ways to ensure the sustainability of their coastal fisheries resources. One possible option is through co-management arrangements between government, other stakeholders and communities (Likiliki 2006). Community-based fisheries management (CBFM) is where communities take on the primary responsibility for managing their coastal fisheries resources. In the case of Tonga, a co-management programme is in place that supports CBFM through the Tonga Ministry of Fisheries (MoF) Special Management Area (SMA) programme (Malimali 2013; Gillett 2009, 2017). The use of SMAs allows communities to set their own management rules and take responsibility for enforcing them.

Special management areas

In Tonga, fisheries operate under an open access regime whereby there is no community ownership and all coastal fisheries resources belong to everyone. MoF has the overall responsibility of managing Tonga's fisheries, but understands that communities also have an important role to play, hence the SMA programme. The SMAs give communities a sense of ownership and responsibility for the management and control of coastal resources in the immediate waters of their village area.

In 2002, communities were provided with the legislative mandate – through the Tonga Fisheries Management Act – to manage their coastal fisheries resources by establishing SMAs (Malimali 2013). The first SMA was established in 2006 in the island of 'O'ua in the Ha'apai group and, to date, 42 communities in Tonga now have established SMAs. In May 2019, MoF, together with other partners including SPC, implemented a national SMA lessons learned workshop (Muron 2019). One of the key recommendations from this workshop was the need to assist SMA communities in reducing pressure on coral reef fisheries through alternative fishing practises.

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In support of SMA communities, MoF, with the support of the Pacific Community (SPC), conducted a two-week, small-scale fishing operations (SFO) course in February this year for SMA communities to learn new fishing techniques that target offshore pelagic fisheries resources. The rationale behind this is to move fishing efforts away from coastal fisheries resources to allow them an opportunity to rebuild.

The SFO training was targeted at local fishers from several SMA communities from the islands of Vava'u, Ha'apai, Eua and Tongatapu. MoF fisheries extension officers also participated. In total, 21 participants (16 males and 5 females) attended the SFO training.

Fishing practises

The people of Tonga have a rich fishing tradition. Both women and men target various marine areas using a variety of techniques to catch fish, harvest molluscs, invertebrates and seaweeds (Kronen 2002; Halapua 1982).

To understand current fishing practises, SMA community members who attended the SFO training were asked to identify the current fishing methods they use, target species, who uses those methods and if there are any impacts perceived by fishers in using those methods (Table 1). Apart from trolling, which mainly targets pelagic fish such as tunas, wahoo and mahi mahi, the most common fishing methods used by attendees were spearfishing, handlining, gillnetting and gleaning, which are used to target reef fish and invertebrates.

Small-scale fishing operations

The SFO training raised trainees' awareness on how to fish safer, fish better, fish smarter, fish comfortably, fish economically and fish sustainably. As most attendees fish within their immediate coastal waters, sea safety was a major component of the SFO training, especially as the emphasis is to get fishers to go offshore and target pelagic fish using a variety of horizontal and vertical fishing methods, including single and multiple lure trolling, vertical long line, chum bag *palu abi* (scatter bait) and spreader rod jigging.

Small boat safety at sea included appropriate planning of a fishing trip, noting the weather and sea conditions, ensuring a first aid kit and other emergency equipment was prepared and onboard, managing work space, arranging fishing gear, working with sharp-edged and pointed tools, proper loading conditions, responding to different emergency scenarios (e.g. swamping, grounding, engine breakdown, leak, collision), how to safely board fish, and the type of boats to use (these have to be certified and classed as suitable for offshore fishing).

Training was also provided on developing a set of standard operating procedures for a fishing trip, including the use of appropriate tools and accessories, wearing suitable clothing for different weather conditions (e.g. being protected from the sun with hats and sunglasses, having rain coats handy, using gloves), always having an overhead shelter, choosing the optimum time to go fishing (i.e. there is no point going fishing when you expect rough seas), picking target species to suit market demands, and keeping boat(s) clean and the work area clear at all times.

Financial planning was also part of the SFO training, with simple examples of how to keep financial records, monitor income and expenses, keep catch records, keep up insurance and loan repayments, and other matters.

Finally, fishing sustainably involves an awareness of how to release undersize fish using appropriate release methods, releasing non-target species, changing fishing spots frequently, not fishing for target species during their spawning season, stowing fish on ice or refrigerating to 0°C to keep retain quality, and catching only what you can retain under quality conditions.

To build attendees' capacity and ensure they understood the methods, gear construction was an interesting aspect of the training. Attendees were provided the opportunity to learn about different hook sizes and target species, the various breaking strengths of monofilament line, appropriate sinker weights, and working depth for the floats needed. Attendees were also taken on two fishing trips to trial fishing gear that they had constructed and test new fishing methods.

Conclusion

While the SFO training provided fishers from several SMA communities with the ability to target offshore pelagic species, this cannot be a one-off activity. Further support to SMA communities is required by MoF, with the support of SPC, to ensure that the benefits of the SMA programme are realised for each SMA community. The future of Tonga's coastal fisheries resources is at stake as well as the people that depend on these resources. An important activity that is required is future monitoring to determine if the skills and techniques imparted by the SFO training have been taken up by fishers in the SMA communities. Monitoring of SMAs is complicated, but simple methods based on perceptions and complemented by more rigorous assessments (see Gillett 2017; Webster et al. 2017) can contribute to highlighting the important relationship between MoF and SMA communities as they continue to manage their coastal fisheries resources in a partnership of co-management and CBFM.

Table 1. Small-scale Fishing Operations training attendees' perceptions of the fisheries in their area.

Place	Spearfishing	Handlining	Trolling	Gleaning	Gillnetting	Fish traps
Ha'apai	Who uses?	Who uses?	Who uses?	Who uses?	Who uses?	Who uses?
	Everyone	Everyone	Everyone	Everyone	Everyone	
	Target species?	Target species?	Target species?	Target species?	Target species?	Target species?
	Parrotfish Unicornfish Surgeonfish Rabbitfish	Snapper species	Wahoo Mahi mahi Tuna	Shellfish Invertebrates	Scads Mulletts Emperor	
	Issues?	Issues?	Issues?	Issues?	Issues?	Issues?
	Difficult to fish in inclement weather	Difficult to fish in inclement weather	Difficult to fish in inclement weather as well as having to travel farther to find fish	Reef damage due to cyclones as well as human activity	Difficult to fish in inclement weather	
Vava'u	Who uses?	Who uses?	Who uses?	Who uses?	Who uses?	Who uses?
	Men mostly	Everyone	Men mostly	Women mostly	Everyone	
	Target species?	Target species?	Target species?	Target species?	Target species?	Target species?
	Parrotfish Groupers Rabbitfish	Groupers Emperors	Tuna species	Shellfish, notably giant clams	Goatfish Mulletts Grouper	
	Issues?	Issues?	Issues?	Issues?	Issues?	Issues?
	Reef damage due to cyclones as well as human activities	Nothing specific	Nothing specific	Damage to seagrass beds as well as a notable reduction in size of shellfish and giant clams harvested	Reef damage due to cyclones as well as human activities	
Eua	Who uses?	Who uses?	Who uses?	Who uses?	Who uses?	Who uses?
	Mostly men	Mostly men	Mostly men	Everyone	Men mostly	
	Target species?	Target species?	Target species?	Target species?	Target species?	Target species?
	Octopus Lobster Various fish species	Snapper Groupers	Tuna species Mackerel Marlin	Octopus	Scads Parrotfish Various fish species	
	Issues?	Issues?	Issues?	Issues?	Issues?	Issues?
	Difficult to fish in inclement weather	Difficult to fish in inclement weather as well as high costs of fuel and fishing equipment	Difficult to fish in inclement weather as well as high costs of fuel and fishing equipment	Difficult to fish in inclement weather	Difficult to fish in inclement weather	
Tongatapu	Who uses?	Who uses?	Who uses?	Who uses?	Who uses?	Who uses?
	Men mostly	Everyone	Mostly men	Everyone	Everyone	Everyone
	Target species?	Target species?	Target species?	Target species?	Target species?	Target species?
	Wahoo	Snapper Groupers	Tuna species Mackerel Marlin	Sea urchins Shellfish	Mullet Emperors	Mulletts Emperors Rabbitfish
	Issues?	Issues?	Issues?	Issues?	Issues?	Issues?
	Safety	Reef damage due to cyclones as well as human activity	Difficult to fish in inclement weather as well as high costs of fuel and fishing equipment	Reef damage due to cyclones as well as a notable reduction in size of sea urchins harvested	Reef damage due to cyclones as well as a notable reduction in size of fish caught	Damage to seagrass beds as well as being a navigation issue

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Page 5 image and images below: Participants to the training learned how to make a mini tuna longline, set it from a small craft and retrieve it by hand. (images: William Sokimi and Watisoni Lalavanua)

