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Towards improved governance, management, and sustainability of the demersal line fishery in Tonga

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Purpose of this paper

1. The purpose of this paper is to debrief Heads of Fisheries on activities conducted under the New Zealand Ministry of Foreign Affairs and Trade (MFAT) funded project 'Improved governance, management, and sustainability of the demersal line fishery in Tonga (hereafter 'the Project').

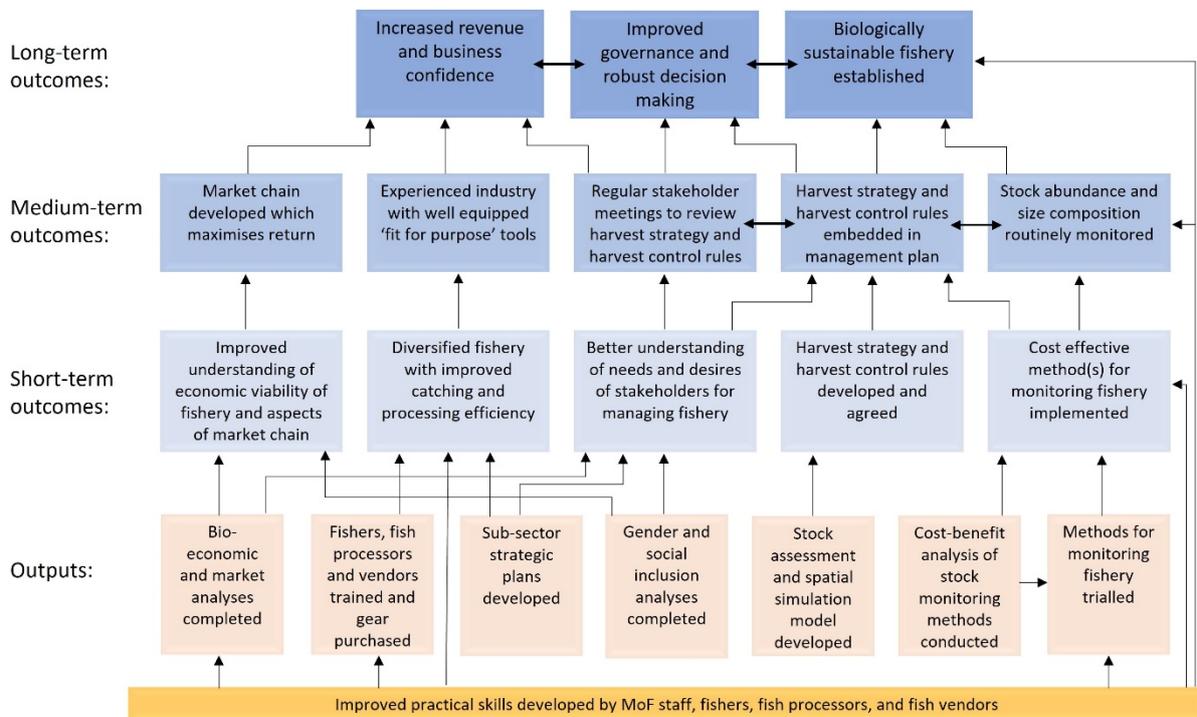
Background

2. A fishery for deepwater demersal fish species has operated in Tonga since the early 1980s, following surveys by FAO and SPC that showed commercial quantities of fish existed in Tongan waters.
3. The fishery exploits a multi-species assemblage of members of the families Lutjanidae (snappers), Lethrinidae (emperors), and Serranidae (groupers) for export and domestic consumption. The fishery expanded rapidly to over 600 tonnes in 1987, but subsequently declined to about 100 tonnes during the 1990s. A second smaller expansion occurred peaking at 250 tonnes in 2002 followed by a steady decline to around 100 tonnes in recent years.
4. The fishery is managed under the Tonga Deepwater Fisheries Management Plan (DFMP).
5. The fishery is a valuable source of income, livelihood, and social well-being to the people of Tonga. However, recent assessments suggest flametail snapper, the main target species for export, is overfished, while there are several indications that the fishery is underperforming with respect to its biological, economic, and social potential.

Project objectives, implementation, and governance

6. The Project has three long-term outcomes designed to facilitate an ongoing, well-managed, and sustainable line fishery for deepwater fish species in the Tonga EEZ:
 - Increased revenue and business confidence.
 - Improved governance and robust decision making.
 - Biologically sustainable fishery established.
7. These outcomes are underpinned by several short- and medium-term outcomes (Figure 1).
8. Capacity building and gender and social inclusion across the sector are cross-cutting themes.
9. The Project is implemented with funding from MFAT. The implementing organisations are New Zealand's National Institute of Water and Atmospheric Research Ltd (NIWA) and the Tongan Ministry of Fisheries (MoF), with the Pacific Community (SPC) and the Tongan National Fisheries Council (NFC) as key partners.
10. The Project was originally implemented in 2015 as a five-year, two-phase activity. Due to impacts associated with the COVID-19 pandemic, the Project has had three, one-year no-cost extensions, and is now scheduled for completion in June 2023.

11. The Project is overseen by the Project Management Group (PMG) which comprises representatives from each of the four partner organisations (MoF, NIWA, NFC, SPC) and key stakeholder groups: New Zealand Ministry of Primary Industries (MPI), deepwater line fishers, and the Fafine 'o Tonga Ngatai Women in Fisheries Group. The PMG meets multiple times (typically four) in each year. MFAT staff based at the New Zealand High Commission, Nuku'alofa, also regularly attend PMG meetings.



Progress

12. To increase revenue and business confidence the Project has:

- Undertaken a preliminary bio-economic analysis of the deepwater snapper fishery to provide baseline information on the fishery at the start of the Project.
- Undertaken a revised bio-economic analysis to update the preliminary model with new cost information, and to evaluate the effect of diversifying the fishery. The models showed that the current number of vessels (22) at the time could be marginally supported by the size and productivity of the fish stock, but that it would be more economically profitable to have some individual vessels focus on deepwater snapper while other vessels focussed on alternative target species such as deepwater squid or small pelagic species for bait fish supply.
- Increased diversity of catches through training fishers in deepwater squid, loligo squid, small pelagic, and mini longline fishing gears, and provided sets of these gears to fishers.

These diversification options were initially implemented to reduce operating costs (in the case of squid and small pelagics), and latterly to increase domestic food security.

- Provided a once-off payment to licensed deepwater fishers for vessel repairs / improvements to improve the efficiency of their business operations and maintain product supply for markets.
 - Provided training to fish processors and vendors in fish handling and processing to improve marketability of catch, and in business practices to increase revenue and business confidence.
 - Invested in the development of a local market for deepwater squid, through marketing campaigns, promotions, and public tastings.
13. An initial objective of the Project was to develop alternative export markets for deepwater snapper species. Markets canvassed included Australia and New Zealand. However, with the onset of the COVID-19 pandemic, MoF prioritised maintaining domestic food security, and thus this objective was not pursued further.
14. To improve governance and robust decision making the Project has:
- Facilitated regular meetings between stakeholders to facilitate collegiality among groups, and to facilitate an improved understanding of the needs and desires of the different groups for managing the fishery.
 - Supported the development of the NFC Strategic Plan, 2021–2025.
 - Developed harvest control rules and embedded these within the DFMP to ensure transparent decision making.
 - Provided scientific and bio-economic advice as far as possible to all aspects of the DFMP.
 - Assisted with the development of monitoring and evaluation criteria for the DFMP.
 - Developed automated reports for regular monitoring of fishery performance against the DFMP objectives.
 - Supported mid- and full-term reviews of the DFMP.
15. To improve biological sustainability, the Project has:
- Supported continued catch monitoring, including of catch volumes and the size of landed fish.
 - Undertaken regular stock assessments of flametail snapper, and characterisation analyses of the fishery.
 - Increased diversity of catches through training in deepwater squid, loligo squid, small pelagic and mini longline fishing gears and the provision of sets of these gears to fishers, and invested in the development of a local market for deepwater squid.
 - Developed and provided training in the *tongafish* R package, which enables the production of standardised analyses and reports regarding fishery performance.

16. The Project also explored diversifying the fishery to fish for bluenose, *Hyperoglyphe antarctica*, following the observation of good catches in the south of Tonga's Exclusive Economic Zone (EEZ) during surveys conducted under the AusAID-funded, SPC-implemented 'Pacific Fisheries for Food Security' program. Fisheries-dependent surveys recorded low catch rates around Tongatapu and Ha'apai, suggesting the majority of fish biomass was in the south, and thus only accessible to the largest vessels. Work on this activity therefore stopped as bluenose were not considered to be an equitable diversification option.

Capacity building

17. Capacity building activities conducted to date include:

- Regular in-country and online training for MoF staff in the R statistical environment, including the *tongafish* R package, since the inception of the Project.
- Attachments of MoF staff to SPC for training in economic analyses.
- Supporting travel costs for MoF staff to attend an international deepwater snapper ageing workshop in Hawaii.
- Supporting travel costs for MoF staff to attend an R training course held at NIWA Auckland and run jointly by NIWA and SPC.
- Secondment of a MoF staff member to NIWA Wellington for a ten-week internship to learn R coding, fisheries analysis, and stock assessment.
- A combined data analysis and fish age estimation workshop with MoF staff held in NIWA Wellington.
- Training of fishers in master/engineer class 6 courses as well as three at-sea safety training modules from an accredited training provider giving them valuable skills increasing their employability and at-sea safety.
- Training of fishers in various fishery diversification options, including fishing for deepwater squid (specifically diamondback squid and neon flying squid), loligo squid small pelagics, and nearshore pelagics (e.g., tunas and mahi mahi). Gear was also provided to fishers to support adoption of these diversification strategies.
- Training of members of the Fafine 'o Tonga Ngatai Women in Fisheries Group in fish handling and processing to improve marketability of catch, and in business practices to increase revenue and business confidence.

Gender and social inclusion

18. To inform activities in this area, a report on social inclusion and gender equality analysis of Tonga's deepwater fishery was commissioned by the Project in 2015 and completed in 2016.
19. The Fafine 'o Tonga Ngatai Women in Fisheries Group is a key component of the Project and were integrated into the PMG early in the Project to ensure their needs are understood in decision making. Regular meetings, separate from PMG meetings, are held with the group.

20. Training in fish hygiene, handling and processing, and new equipment (bins, boards, knives, aprons, gloves etc) were provided to the group to improve work conditions and marketability of the catch.
21. The group is instrumental to the developing squid fishery and the associated marketing plan. They are organising squid processing infrastructure including labelling, fish processing, packaging, and distribution. In addition, they are organising public tastings and distribution of marketing materials in collaboration with MoF.
22. Significant investment has been made into the diversification options, particularly deepwater squid, to provide an additional source of income for all along the value chain.

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