A comparison of sea cucumber fishery management plans, and implications for governance in Pacific Island countries

Steven Lee,[1] Hugh Govan,[2] Ian Bertram[3] and Jeff Kinch[4]

Introduction

The main objective of the Pacific Islands Regional Oceanscape Program (PROP) is to strengthen the shared management of selected Pacific Island oceanic and coastal fisheries, and the critical habitats they depend on. Funded by the World Bank, PROP aims to improve environmental and resource quality in the Pacific Islands region in order to increase the economic benefits generated by the sustainable management of the region's oceanic and coastal fisheries, and the critical habitats that sustain them.

One component of PROP is to improve the management of sea cucumber fisheries and the beche-de-mer trade of PROP-recipient Pacific Island countries (PICs), including selected Melanesian Spearhead Group countries. For this paper, sea cucumber fishery management plans for eight PICs were reviewed in order to: 1) understand the various management approaches adopted, 2) identify their strengths and weaknesses, and 3) work towards a minimum standard for national sea cucumber fishery and beche-de-mer fishery trade management throughout the Pacific Islands region.

Sea cucumber management plans were reviewed for the following PICs:

- Fiji (2018) draft
- Kiribati (2013) draft
- Papua New Guinea (2016, 2018)
- Marshall Islands (2012, published in 2014)
- Samoa (2015)
- Solomon Islands (2014)
- Tonga (2007)
- Vanuatu (2017)[5]

Assessment of sea cucumber fishery management plans

After reviewing the sea cucumber fishery management plans for the countries listed above, several "good", "possibly good" and "not-so-good" ideas were identified. This article summarises these ideas, while providing further justification and advice for developing sea cucumber fishery management plans in PICs.

Good ideas

Inclusive committees. Including relevant non-governmental organisations (NGOs) and civil society organisations (CSOs), as well as ensuring fisher representation in management committees, will help to ensure better decision-making and management advice. When selecting representatives for committees, it is important to remember that each person may play different roles and be accountable to different groups or parts of government. One of the purposes of these committees is to achieve accountability, which can be achieved through the inclusion of other government agencies, although more importantly, independent organisations and NGOs. Representatives from national Customs, Finance and Revenue services as well as national conservation agency staff (especially in the context of the Convention on the International Trade in Endangered Species and biodiversity conservation) will be able to ensure the country's best interests – in terms of revenue and biodiversity conservation – are considered. NGOs may represent the interests of conservation, community development, and fisheries management, or represent certain constituencies (e.g. women). Fishers may be represented by resource owner groups or traditional structures, associations or cooperatives. It is important to balance the number of representatives of each organisation, including those from the exporting industry. Involving legal advisors and monitoring, control and surveillance (MCS) officers[6] can also help make

[1] This article is a tribute to Steven Lee who was working on this and other projects at the time of his tragic passing last year. A talented young marine biologist with a passion for the ocean, Steven had so much to offer, and his presence will be missed by the seas and all who knew him.

[2] Consultant, SPC-World Bank PROP/Adjunct Senior Fellow, University of the South Pacific, School of Government, Development and International Affairs (SGDIA). Email: hgovan@gmail.com

[3] SPC Coastal Fisheries Science and Management Adviser. Email: ianb@spc.int

[4] SPC Coastal Fisheries Social Scientist. Email: kinch.jeff@gmail.com

[5] Vanuatu produced a new sea cucumber fishery management plan in 2019 (Vanuatu Fisheries Department 2019), after this study was completed.

[6] MCS officers include fisheries officers, custom officers, export inspectors

policy more sensible, practical and enforceable and, therefore, may help improve compliance and/or conviction rates.

A national management plan acts as a baseline. A local or subnational rule cannot be more permissive than the national one. The vast majority of sea cucumber management plans include this measure, but few state it as clearly as Papua New Guinea's 2016 and 2018 plans, which state that: "The Maritime Provincial Governments will be responsible for implementing the Management Plan at their respective levels; this includes the ability to set a lower Total Allowable Catch (TAC), higher size limits, longer closed seasons, new provincial and Local Level Government management strategies, must not conflict with this Management Plan."[7] However, given the capacity constraints prevalent at the subnational level in most PICs, it is important not to rely on decentralised mechanisms unless provisions are explicitly made for their support.

Limiting access. Short open seasons are easier to monitor and enforce than long ones, and can be timed to take into account factors such as the target species' spawning season, which should protect stock replenishment, particularly if the species aggregates in order to breed. Other factors include times when overseas market prices are highest or when cash needs for fisher communities are most pressing. These three factors may not intersect at the same time, but due consideration should be given to each when determining open seasons.

Encourage local participation in the fishery. Priority should be given to local businesses to participate in the fishery, but not if subsidies are required. Solomon Islands' 2014 sea cucumber management plan does this by requiring processors to be citizens, and reserving 10 out of 15 export licences for citizens. Prioritising or reserving licenses for local businesses supports the employment of nationals, and may benefit the local economy if enforceable, as local businesses are more likely to retain and invest any income earned in-country.

Size limits. Wet and dry minimum size limits should be based on biological information, and set well above the size at which 50% of the population can reproduce. Wet sizes will be most useful for fishers in order to avoid catching animals that, upon processing, will be undersized, but live animals' sizes are harder to enforce given the flexibility of the animals. Therefore, dry sizes at the point of purchase or export should be most emphasized. Size limits are an essential component of any sea cucumber fishery management plan, and enforcement of these should be prioritised. The Melanesian Spearhead Group's agreed size limits (Govan 2018) are a good start but should be regularly reviewed.

Nine published or draft sea cucumber fishery management plans were reviewed to understand the management approaches adopted in eight different Pacific Island countries.

[7] Papua New Guinea National Beche-de-mer Fishery Management Plan 2018, Section 6: Joint Management.

Live sea cucumbers' minimum sizes are hard to enforce given the flexibility of the animals; controlling minimum dry sizes at the point of purchase or export will be a lot easier (image: SPC)

List of permissible species. Such a list would make monitoring and enforcement easier, and would help to prevent a previously unknown species from becoming commercialised before there are any relevant management measures pertaining to that species. TACs can also be set to "zero" for permissible species that are deemed to be overharvested.

Restricting harvest methods. All of the previously mentioned PIC sea cucumber fishery management plans prohibit certain harvesting methods, most notably the use of an underwater breathing apparatus (UBA). However, when writing legislation that restricts harvesting methods, how these restrictions will be monitored and enforced should be taken into consideration, especially if a case is taken to court. Ambiguous wording should be avoided.

Tonga's 2007 sea cucumber plan has a good example of clear wording that aids monitoring and enforcement: "Sea cucumbers must be collected only by wading and freediving. The use of artificial breathing apparatus (SCUBA, hookah) to take sea cucumbers is banned. Any person found in possession of sea cucumbers in a boat that carries artificial breathing apparatus will be guilty of an offence."

Export restrictions. Define a limited number of allowed export points (e.g. any sea cucumber products bound for export may only pass through Airport "x" or Port "y". This helps to create bottlenecks where monitoring, control and surveillance can be concentrated, and helps to close loopholes where a product is able to be exported through a port without the capacity to properly monitor and inspect.

Restrict the number of export licences. Have a fixed number of export licences available per year, or per season, with the number of available licences capped at a sensible limit. The total amount of product allowed for export under each licence could be stipulated in an effort to enforce national catch limits. Regardless of how well the fishery may be doing, it is important to not issue more licences than the limit stipulates; instead, licence fees should be increased. Restricting the number of export licences also brings in the possibility of auctioning off licences.[8]

Standardised labelling and packaging. This makes monitoring easier, which is an essential step as beche-de-mer in PICs are almost exclusively for export and may transit through other PICs.

[8] Table 1 of the SPC, 2015. Tonga Sea Cucumber Fishery Advisory Note (March 2015) is a good case for increasing export licence fees rather than the number of export licences issued. While the fishery apparently did well – based on export tonnage alone – from 2009 to 2010 export licence fees increased by 1500%, yet there was still a strong demand for these licences; demand only began to decrease as it became apparent that the fishery had once again been overfished (2011 onwards).

Involve customs, central bank and tax authorities in export permitting, inspections, data collection and cross checking: Involving other relevant authorities or organisations in the permitting process increases bureaucracy, but has the added advantage of increased checks and balances, thereby reducing opportunities for corruption. It also provides the opportunity to levy taxes to ensure that a greater proportion of the value of the beche-de-mer trade stays in the nation and can contribute to management costs.

Solomon Islands' Ministry of Fisheries and Marine Resources (MFMR) introduced an additional check in 2017, involving the Central Bank of the Solomon Islands (CBSI). Exporters must declare the freight on board (FOB) cost of the consignment to MFMR (a sales contract is a required document), and MFMR will then provide a Market Price Certificate to the exporter. This Market Price Certificate, along with a letter of credit from a commercial bank, is taken to CBSI in order to apply for Specific Authority approval to export the consignment. If approved, the exporter must then take the approved Specific Authority and a bank guarantee to the Department of Customs. The goal of this system is to prevent exporters from under declaring the value of consignments, which ultimately undercuts government income in the form of duties and taxes; Solomon Islands has a 10% levy on sea cucumber exports.

Annual report and/or evaluation of the state of the sea cucumber fishery. Some countries (e.g. Vanuatu and Solomon Islands) have produced reports on the sea cucumber fishing season. These reports, preferably carried out by an external agency or adviser, give an opportunity to assess the status of the sea cucumber fishery and, in particular, evaluate how well the management plan is functioning and what improvements can be made.

Possibly good ideas

Minimum price guide for fishers, sellers and buyers. This would prevent fishers and sellers from being underpaid, although this may be tough to enforce and would need to take into account the different grades of each species and the specific ways that market and value chains operate in a given PIC. It may not achieve the desired effect to make this a legal provision, although ensuring fishers have information on market prices is important.

Minimum price guide for export declarations and export levies. This would help to determine export value and more accurate export levies. A minimum price guide reduces exporters' understating of the value of their exports, and transparent export values may enhance the ability of fishers to demand fairer prices.

Auctions. Auctioning export licences may increase income from licensing fees. Auctioning the final product is likely to obtain the best possible price from importers (Carleton et al. 2013). An auction of confiscated beche-de-mer in Solomon Islands is thought to have generated between 6 and 10 times the value per tonne as declared in the previous year of export (Anon. 2016). Vanuatu's draft 2017–2022 sea cucumber fishery management plan is the only one in the region that requires the final product (i.e. "dried products") to be sold by way of auction, and it rightly requires that "minimum export grades, standards and prices shall be set for all products". What raises concern is that before auctioning can become feasible, appropriate legislative support and procedures for auctions are needed.

Compliance bond. Papua New Guinea utilised these for exporters in their 2016 and 2018 management plans. It is a bond (PGK 50,000 = USD 15,000) that is held as a security by the fisheries authority in case the exporter violates a law. If a law is violated, the compliance bond is forfeited to the management authority. If the licensee commits no infringements during the season, the compliance bond rolls over to the next season, and if the licensee operates throughout the entire licence period with no infringements, the bond is refunded to them. The compliance bond is a good way of ensuring that fines are paid without the burden of extensive judicial processes. It is possible, however, that not all PICs are able to legally support this mechanism.

Not-so-good ideas

Unclear structure of management and committees. If there is delegated authority for the management of the sea cucumber fishery and beche-de-mer trade between national (e.g. management committees or governing boards) and lower-level authorities (e.g. provincial or island management committees or councils), then clear lines of communication need to be established and adhered to in order to avoid confusion over management decisions at the different levels (e.g. who determines the number of export licenses to be issued). All management decisions made by lower-level authorities must not contradict or contravene the respective national legislation regarding the sea cucumber fishery and beche-de-mer trade. Finally, for the sake of transparency and accountability, the affiliation of all committee members within national and lower-level authorities should also be stated, along with the number and type of representatives that are allowed to be on these committees. Provision should be made for public disclosure of documentation, decisions and licencing procedures, as well as mechanisms for addressing complaints.

Undefined time frames. One of the management plans we reviewed stated that quotas and size limits should be reviewed "from time to time as deemed necessary". This is in contrast to PNG's National Beche-de-Mer Fishery Management Plan, which is reviewed by the National Fisheries Authority every two years (PNG 2016). PNG's plan was updated in 2018, with roughly six notable changes; the other PIC did not update its management plan for more

If sea cucumbers can only be collected by wading or freediving, they remain accessible to most coastal community members, as these techniques only require very basic fishing gear.
Woman gleaning sea cucumbers in Palau. (image: Mecki Kronen, SPC)

than 10 years, despite the fishery continuing to operate and new information that could aid the fishery's management becoming available. Undefined timeframes risk prolonged delays without reasonable justification.

Quotas, cut-off points and triggers. The use of quotas has proven challenging to enforce effectively. In almost all cases where they have been set, quotas have been dramatically exceeded. Given the effort required to establish biologically meaningful figures, and in particular, the logistics (communications, data-handling, coordination) required to implement them, they should be avoided as a primary management tool.

Export quotas. Export quotas might be worth considering as part of a licencing system but they may incentivise discards of lower-value specimens. Careful consideration is required before implementing these.

Lack of definitions for terms used in the management plan. For example, "sea cucumber ranching" is permitted in all of the nine management plans reviewed, although the term is only defined in two: Kiribati's 2013 draft plan and PNG's 2018 plan. Not defining terms used in a plan leaves things up to interpretation. In the case of ranching, the big question is whether grow-out stock are wild caught or hatchery raised. Using wild-caught animals and then growing them out to legal size undermines the effectiveness of minimum legal size limits.

Promotion of unproven and or over-complex approaches. The national fisheries agencies of most PICs are underfunded, understaffed and overstretched. As such, management measures that are resource intensive – including quotas and measures that are simply unproven such as aquaculture for "restocking" reefs – should be avoided in favour of robustly practical and locally and/or nationally enforceable approaches based on evidence.

Advice

Get the basics right. Given the capacity constraints of many national fisheries agencies, simple and achievable approaches to monitoring, control, surveillance, data collection, reporting, size limits, limited open seasons, licensing and enforcement are required Overall, it may be best to enforce one or two critical management tools effectively before adding others. It is suggested that national fisheries agencies consider the following two measures as priorities:

1. Strong enforcement of minimum size limits: A minimum size length should be set at sizes that allow a sufficient number of animals to breed. This, along with intensive and wide-coverage information campaigns, will ensure that fishers and exporters are aware of the rules and their rationale (as well as the penalties for not complying with them). In addition, systematic MCS should be carried out, focusing on exporters.

2. Control of exporters: Ensure that all exporters abide by all licensing conditions and comply with rules on pain of forfeiture the licence and/or accruing heavy fines. Conditions should only include exporting through certain points of export, only purchasing beche-de-mer at the right size limits, complying with all reporting requirements, and paying equitable prices to fishers.

Do not interfere with management and enforcement. Perhaps two of the main reasons for the failure of sea cucumber fishery management is interference with management plans and measures, and the lack of enforcement (e.g. lifting moratoria before stocks have recovered, lifting moratoria before regulations and management systems are operational, interfering with enforcement, avoiding the enforcement or implementation of management measures). Improved governance and support for fisheries agency enforcement functions is likely to go a long way towards increasing both the sustainability and profitability of the sea cucumber fishery (Baker-Médard and Ohl 2019; Carleton et al. 2013; CFWG 2019; Purcell et al. 2014; Steenbergen et al. 2019).

References

Anon. 2013. Draft Kiribati sea cucumber regulations. Draft document prepared by the Ministry of Fisheries and Marine Resources, Bairiki, Tarawa, Republic of Kiribati.

Anon. 2016. Insights from the state auctioning of beche-de-mer in Solomon Islands. Report prepared for the Ministry of Fisheries and Marine Resources, Honiara, Solomon Islands.

Anon. 2018. Draft Fiji sea cucumber management plan 2015: A plan for the management, development and sustainable use of sea cucumber fishery resources of the Republic of Fiji Islands. Draft document prepared by the Ministry of Fisheries, Suva, Fiji.

Baker-Médard M. and Ohl K.N. 2019. Sea cucumber management strategies: Challenges and opportunities in a developing country context. Environmental Conservation 46(4):267–277. Available at: https//doi.org/10.1017/S0376892919000183

Carleton C., Hambrey J., Govan H. and Medley P. 2013. Effective management of sea cucumber fisheries and the beche-de-mer trade in Melanesia: Brining the industry under rational control. Prepared by Nautilus Consultants for the Secretariat of the Pacific Community. 56 p. Available at: http://purl.org/spc/digilib/doc/3e9e2

CFWG (Coastal Fisheries Working Group). 2019. A call to leaders: Most urgent actions required for sustaining or increasing the contribution of coastal fisheries to our communities. 4 p. Available at: http://purl.org/spc/digilib/doc/t6zjq

Govan H. 2018. A review of sea cucumber fisheries and management in Melanesia. SPC Fisheries Newsletter 154:31–42. Available at: http://purl.org/spc/digilib/doc/fjzhm

Marshall Islands Marine Resources Authority. 2014. Republic of the Marshall Islands National Sea Cucumber Fishery Management Plan 2012. Noumea, New Caledonia: Secretariat of the Pacific Community. 18 p. Available at: https://www.spc.int/CoastalFisheries/Legislation/legaltext/3eab27c7-196a-4e87-b233-f3ffa46e5350

PNG (Papua New Guinea) Government. 2016. National Beche-Mer Fishery Management Plan. National Gazette, G657. 20 p. Available at: https://www.spc.int/CoastalFisheries/Legislation/legaltext/4ecebef0-8788-4b3a-90e1-1e98afca5ad6f

PNG (Papua New Guinea) Government. 2018. National Beche-de-Mer Fishery Management Plan. National Gazette, G368. Available at: https://www.spc.int/CoastalFisheries/Legislation/legaltext/d9c2ad5b-d9aa-4305-a664-2b3d5a49709b

Purcell S., Lovatelli A. and Pakoa K. 2014. Constraints and solutions for managing Pacific Island sea cucumber fisheries with an ecosystem approach. Marine Policy 45(2014):240–250.

Samoa Fisheries Division, Ministry of Agriculture and Fisheries. 2015. Samoa sea cucumber fisheries management and development plan. Noumea, New Caledonia: Secretariat of the Pacific Community. 37 p. Available at: https://www.spc.int/CoastalFisheries/Legislation/legaltext/14f24727-ee5f-4c9d-84bf-a75d2a99e184

Solomon Islands Government. 2014. Solomon Islands national sea cucumber fishery management and development plan. Solomon Islands Gazette, No 125. Available at: https://www.spc.int/CoastalFisheries/Legislation/legaltext/0e160555-8635-4dbb-a084-e3612412e83c

Steenbergen D.J., Fabinyi M., Barclay M., Song A.M., Cohen P.H., Eriksson H. and Mills D.J. 2019. Governance interactions in small-scale fisheries market chains: Examples from the Asia-Pacific. Fish and Fisheries (00):1–18. Available at https://doi.org/10.1111/faf.12370

Tonga Fisheries Division. 2007. Tonga national sea cucumber fishery management and development plan. 40 p. Available at: https://www.spc.int/CoastalFisheries/Legislation/legaltext/43465d4b-3ce2-421a-a714-14edfe27dc01

Vanuatu Fisheries Department. 2017. Draft Vanuatu National Sea Cucumber Management Plan 2017–2022. A national policy for the management of Vanuatu's sea cucumber fisheries.

Vanuatu Fisheries Department. 2019. Vanuatu National Sea Cucumber Fishery Management Plan 2019–2024: a national policy for the management and development of Vanuatu's sea cucumber fishery. Noumea, New Caledonia: Pacific Community. 30 p. Available at: https://www.spc.int/CoastalFisheries/Legislation/legaltext/654da72a-a834-4465-a5ee-ad08e3514171