Vanuatu sea cucumber fishery opens under a strengthened quota management system

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Background

The sustainable management of sea cucumber fisheries is a challenge due to the high value and highly lucrative price offered for sea cucumber products. The aggressiveness and demand from the Asian market continues to be the key catalyst in the increase in fishing pressure on these resources (Kinch et al. 2008), and the reality in the Pacific Islands region as a whole is that countries struggle to keep up with the demand. The result is evident through the boom-and-bust characteristics of this fishery.

Sea cucumber harvesting in Vanuatu began in the early 19th century but no form of management was in effect until after independence in 1980. Management practices since then have continued to evolve. Figure 1 documents the phases of harvest since the 1980s, and the management measures applied during those phases as revised and updated from Léopold (2016).

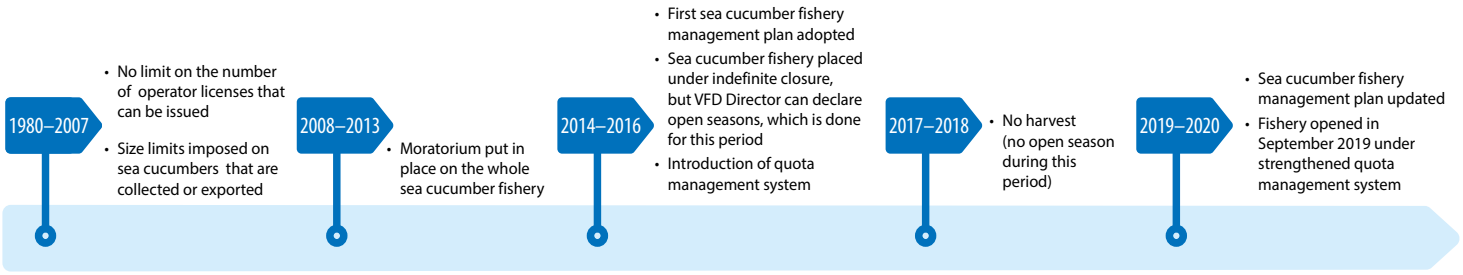

Figure 1. Harvesting phases, and the management measures and approaches applied.

In 2014, there was a notable change in management, from imposing a simple regulatory measure of size limits, to a more complicated quota system of spatial total allowable catch (TAC) and a short nationwide fishery opening that was guided by a fishery management plan and regulated by comprehensive fisheries regulations. This is a clear demonstration on the part of the Vanuatu government to come up with effective and efficient management controls for its sea cucumber resources. However, despite that, exploitation and overfishing continued, mainly due to ineffective control and monitoring of the quota management system, which was developed in collaboration with the Institute of Research for Development (IRD) and the Northern Province of New Caledonia. The Pacific Community (SPC) provided technical assistance with reviewing and updating the fishery management plan.

In 2019, Vanuatu again declared an open season after the fishery had been closed for two years. This time, through the recommendation by Léopold (2016) and through an independent review, Vanuatu decided to review the 2014 sea cucumber fishery management plan with a view to incorporating new and innovative ways of strengthening the measures in the quota management approach.

Purpose

In this article, we discuss the new strengthened measures, how these are different from the previous management approaches, and outline the operationalisation of this strengthened management approach. These are discussed in the context of the current open season 2019–2020. The current season was declared open in late September of 2019 and will be closed when declared TACs from all declared areas are harvested. The data presented in this article refer to the first six months of the current open season.

The framework of the strengthened management approach

Three key documents provide the framework of the strengthened management approach: the Fisheries (Amendment) Act No. 38 of 2019, Fisheries (Amendment) Regulations Order No. 98 of 2019, and the Vanuatu National Sea Cucumber Fishery Management Plan 2019–2024.

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Four key management principles underpin the strengthened management approach:

1. limited number of licensed operators,[4]
2. indefinite closures and rotational open seasons for harvest by area,
3. a quota system, and
4. effective monitoring.

These principles have their basis under the newly approved Vanuatu National Sea Cucumber Fishery Management Plan, 2019–2024 (referred in this article as "the plan") and regulated under Fisheries (Amendment) Order No. 98 of 2019.

Limited number of operators

Since the quota system was adopted in 2014, one of the biggest challenges to ensuring effective monitoring of the total allowable catch (TAC) has been the fact that there are too many operators, thus stretching and draining the financial and human resources of the Vanuatu Fisheries Department (VFD) (Léopold 2016).

The new plan limits the number of operators to no more than two companies for purchasing, processing and exporting sea cucumber products during an open season. The intent of this is directly in response to the capacity of VFD to ensure effective monitoring.

Currently, only one company has been issued a license and it is actively operating in the current open season, which began in late September 2019. This company was set up as a public–private partnership arrangement between the Vanuatu Government and a private company that was selected through a tender process.

Indefinite closure and limited duration of declared open seasons

The plan states that the sea cucumber fishery will be managed by an indefinite closure, with occasional open seasons of limited duration. An open season is declared by the Director of VFD by area[5] and by species, but only after 1) VFD has conducted a survey to assess the stock biomass, and 2) the results of the assessment indicate that stock estimates allow for sustainable harvesting. Once an area is declared open, harvesting is done on a rotational basis, meaning no two areas can be open for harvesting at the same time. This allows for the coordinated mobilisation of the VFD monitoring team to ensure effectiveness.

Quota system

The quota system is based on the total allowable catch (TAC). TAC is based on three reference indicators: biomass, abundance and density estimates for all species. The biomass figure is limited to the biomass of legal-size individuals, and is estimated after a stock assessment has been carried out by VFD. However, only 21–25% of the estimated legal-size biomass can be declared for harvesting during an open season, depending on the health of the stock.

Effective monitoring

Given that areas are opened on a rotational basis, the VFD team monitoring the TACs of each open area will be under less pressure and be more effective. The plan states that monitoring can be carried out in collaboration with other partners – such as provincial governments, community-based fisheries authorised officers and communities – thus allowing for better resource mobilisation on the ground and subsequently ensuring effective control and monitoring of the fishery.

How does this strengthened approach differ from past approaches?

Past approaches were market-driven, with more than one operator allowed to enter the fishery, and multiple areas opened simultaneously during an open season, resulting in limited control and overexploitation, which eventually led to the permanent closure of the fishery.

Key differences between the current strengthened management approach and past approaches are: 1) the restriction on the number of operators allowed to participate in an open season, and 2) rotational harvesting. Monitoring TACs among several buyers and exporters, and with multiple areas opened at the same time were the greatest challenges confronted by VFD during past open seasons.

In addition to the limitation on the number of operators, one of the main differences is that the current operator is a joint venture between the Government of Vanuatu and a private operator. This arrangement allows the government to be involved in the operations of the company, and to ensure that the sustainability of the sea cucumber fishery is fully taken into account.

[4] The term "operators" refers to company(ies) licensed to purchase, process and export sea cucumbers.

[5] According to the plan, and area is declared by the national government or provincial government as a place where certain fishing activities can be undertaken. For the current open season, an area can be a provincial jurisdiction, an island or part of an island

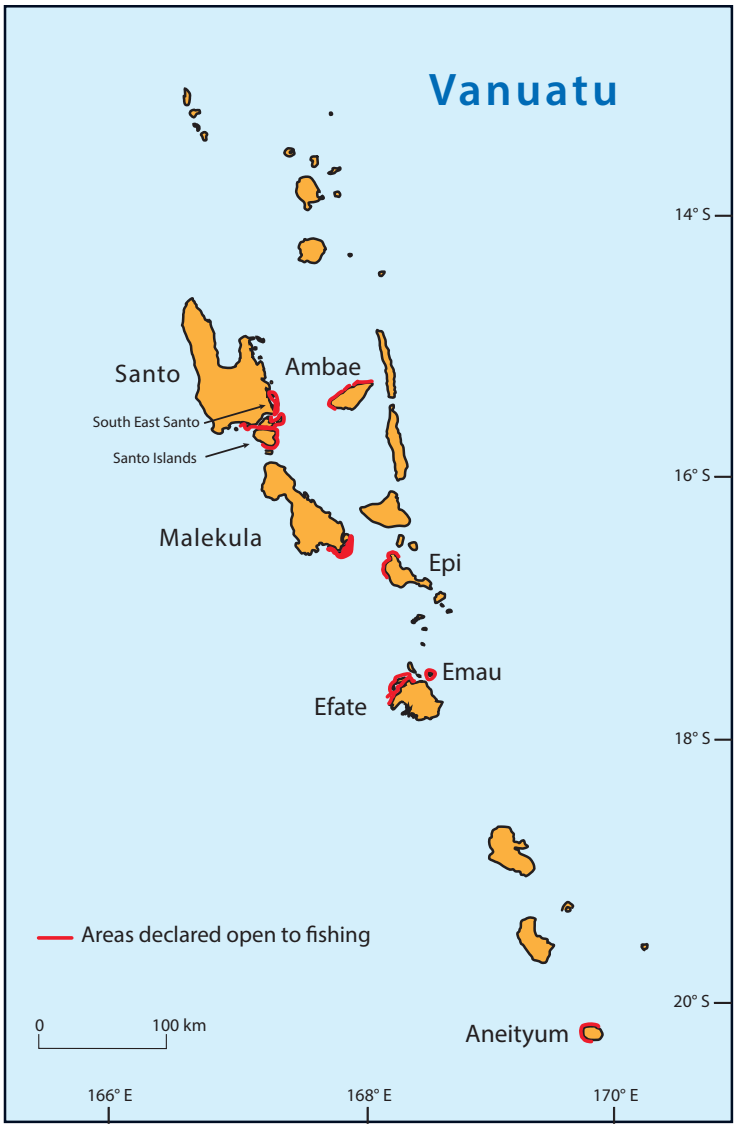

Figure 2. Vanuatu showing the declared open areas identified in red.

Operationalisation

The section that follows outlines the operationalisation of the strengthened approach.

Declaration of open season

Section 62E of Fisheries (Amendment) Regulation Order No. 98 of 2019 states: "The Director of VFD may from time to time and in accordance with the Fishery Management Plan declare an open season for the harvesting of sea cucumber in certain areas of Vanuatu". The current open season was declared in September of 2019, and harvesting began immediately after that. The open season will be closed when the declared TACs for all areas are harvested

Eight areas throughout the country were declared open to fishing for the current open season only after stock assessments were carried out in those areas and the results showed that certain species met the healthy stock indicator of more than 2 tonnes (wet weight) of legal-size individuals. Only those species are declared accessible for harvesting in those areas. Figure 2 shows the areas declared open to fishing.

Stock assessment and quota declaration

The stock assessment methodology involves three steps: habitat mapping, an underwater survey and data analysis.

Habitat mapping focuses on the area of interest using high resolution satellite imagery. This assists with determining categories of habitats, such as seagrass beds, inner reef flats, outer reef slopes, reef crest and lagoons. The delineation of habitat categories and sampling points are then generated using a geographic information system tool. From this, sampling points are then uploaded into portable global position system device to assist with actual field work.

The underwater survey is carried out using a 100-m transect. Each sea cucumber found within one meter from each side of the transect is counted and measured (body length and width). This allows individual weights to be calculated and sea cucumber abundance and biomass (wet weight) to be estimated in order to determine the TAC for an area.[6] The survey is carried out by walking or wading, snorkelling or scuba diving, depending on the depths and habitat of the sample station.

The final step is data analysis. Data collected from the field survey are then entered into BDMER, a predefined VFD database, which is designed to integrate and process data for estimating invertebrate stocks (sea cucumber, trochus and green snail).

The BDMER database calculates the TACs. For each area, TACs are only provided and declared for species that have stocks of legal-size individuals that exceed 2 tonnes in wet weight. The dry weight of each TAC is also estimated for verification during export operations (hence, the exported volume of dried sea cucumbers cannot exceed the corresponding wet weight TAC allocated).

The allocated TAC by species and area is then sent to the Director of VFD for approval and public declaration.

Following stock assessments, TACs are declared for each open area. For the current open season, eight areas were declared open with a total of 10 species allowed for harvesting. Table 1 shows the declared TACs by area and species. However, the final decision to utilise the TAC for a specific area must be made in consultation with the communities concerned, which is part of the TAC declaration process.

Because the collection of sea cucumbers is done by the community of the authorised open area, and because the quota is a collective quota, communities must agree on how the quota will be shared among them.

[6] The formula used for the calculations of individual weight is found in Purcell et al. 2009.

Table 1. The declared total allowable catch (TAC) by area and species for the current open season.

Declared open areas	Declared allowed species	Scientific name	Declared TAC (wet weight in tonnes)
Mangaliliu (Efate West)	Lollyfish	*Holothuria atra*	4
	Greenfish	*Stichopus choloronotus*	4
	Surf redfish	*Actinopyga mauritiana*	2
	Tigerfish	*Bohadschia argus*	3.5
Ambae Island	Black teatfish	*H. whitmaei*	4
	Surf redfish	*A. mauritiana*	19
	Tigerfish	*B. argus*	2
Aneityum Island	Lollyfish	*H. atra*	101
	Greenfish	*S. choloronotus*	20
	Black teatfish	*H. whitmaei*	4
	Surf redfish	*A. mauritiana*	4.5
Epi Island	Lollyfish	*H. atra*	6
	Greenfish	*S. choloronotus*	2
	Tigerfish	*B. argus*	2
	Black teatfish	*H. whitmaei*	2
South Malekula Island	Lollyfish	*H. atra*	24
	Brown sandfish	*B. marmorata*	2
	Curryfish	*S. herrmanni*	2
Emau Island	Tigerfish	*B. argus*	2
	Prickly redfish	*Thelenota ananas*	2.3
Santo Island	Tigerfish	*B. argus*	5.5
	Prickly redfish	*T. ananas*	5
South East Santo	Curryfish	*S. herrmanni*	4
	Elephant trunkfish	*H. fuscopunctata*	3
	Prickly redfish	*T. ananas*	4
	Surf redfish	*A. mauritiana*	4
	Tigerfish	*B. argus*	4
	White teatfish	*H. fuscogilva*	0.5
	Stonefish	*A. lecanora*	0.5
	Black teatfish	*H. whitmaei*	0.5

Rotational harvest

The rotational harvested principle is stipulated in section 62E (4) of the of the Fisheries (Amendment) Regulation Order No. 98 of 2019, and states that, "Sea cucumber must only be harvested at one declared area at a time".

Monitoring the TAC

Harvesting is carried out by the community of the authorised open area. Prior to harvesting, VFD observers and community-based authorised officers are deployed to the authorised harvest area and station at allocated landing sites. Landing sites are chosen by the communities in collaboration with VFD. This is where the wet product is purchased by the processor and where the TAC is monitored and updated daily. Whenever a quota for an individual species is reached, collectors and the community are notified accordingly, and this information is relayed back to VFD headquarters for update. When the TAC for all species is reached, the Director of VFD declares the area closed in accordance with the regulations. During this open season, the average number of days spent harvesting in each open area was about 26 days. To assist with an effective monitoring, a standard operating procedure was developed as a guide.

Figure 3 details the declared TAC for each species in each declared open area for the current open season, and the catches made after six months.

Exports

There are two exports in the value chain: domestic exports of semi-processed sea cucumber products from the islands to the main processing base in Port Vila or Luganville, and overseas exports of final dried products to overseas markets.

Domestic exports are monitored through a shipment form filled out by the operator, and which must be attached to the shipment to Port Vila or Luganville and checked and verified by VFD upon arrival.

Overseas exports are monitored through an export permit. Out of 11.69 tonnes (dry weight) that were declared authorised for export, over 4.4 tonnes have been exported so far. Figure 4 shows the export composition by species.

Summary

Although the current open season is still underway, it seems that, so far, the strengthened management approach is holding up well. The management frameworks are clear and the mechanisms for operationalising the approach under the three legislative and policy frameworks have helped with

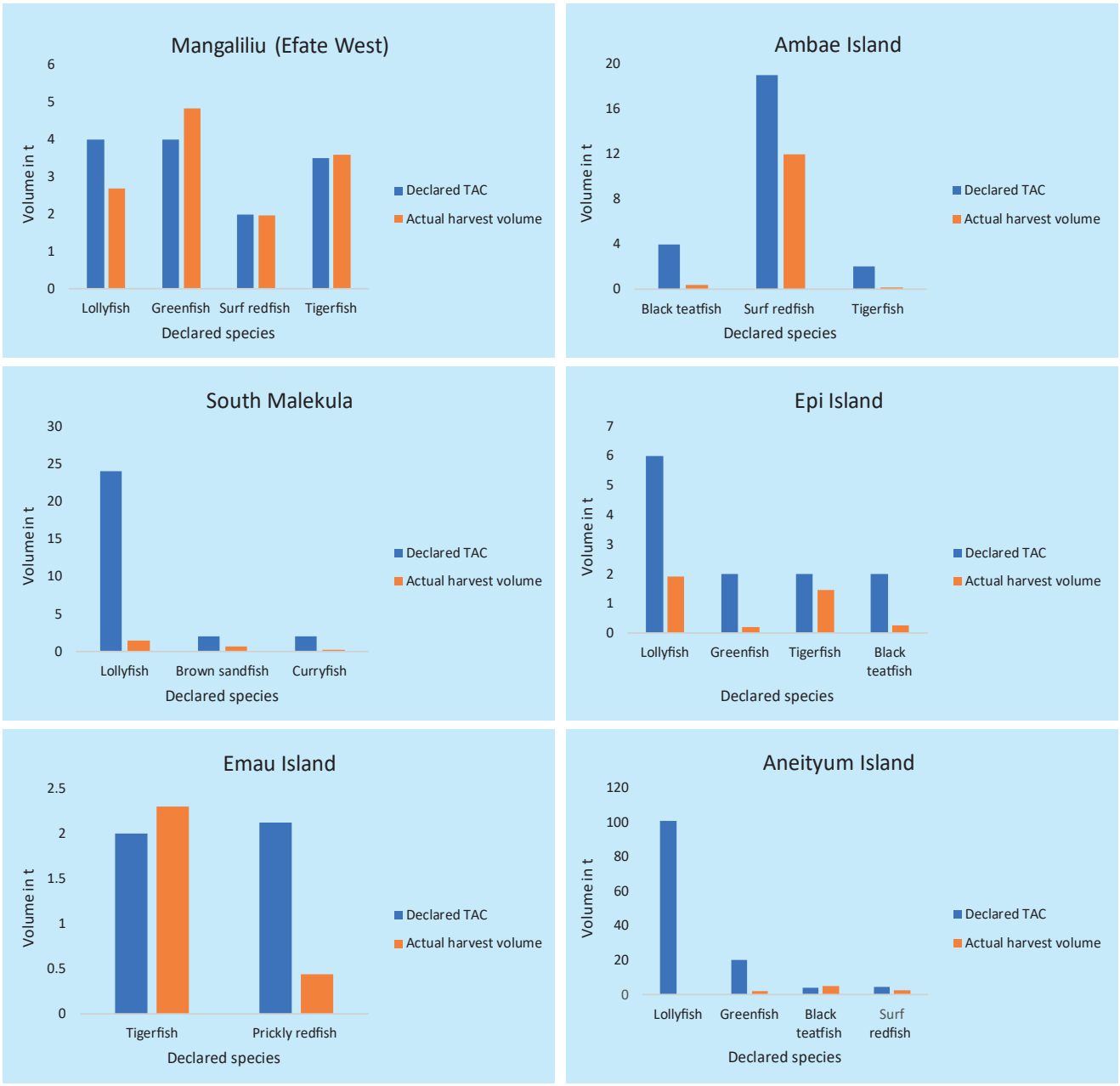

Figure 3. Volume harvested after six months of operation in six of the eight areas declared open to fishing and total allowable catch by area and species in each of these areas for the 2019–2020 open season.

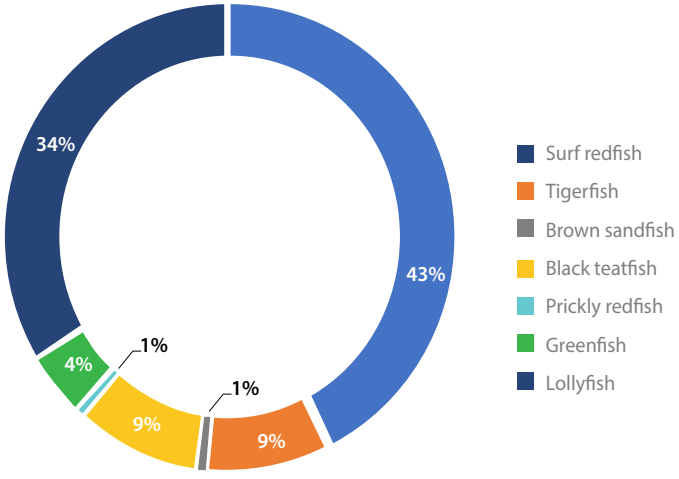

Figure 4: Overseas export composition by species after six months of operation.

implementation. For example, the process, guidelines and standard operating procedures for the stock assessment, declaration of open and closed seasons, declaration of TACs, and monitoring of the TACs help in the smooth implementation of the approach.

The company operating in the joint venture arrangement has complied well with government laws and policies in the purchasing, processing and exporting of sea cucumber products.

Despite that, the human and financial resources dedicated to monitoring the fishery will need to be increased in order for monitory to be more effective. Other challenges include the absence of a clear process or guideline to address what happens when the actual harvest goes above the declared TAC, and monitoring TACs when there is more than one landing site per open area. Figure 2 shows that the actual harvest for some species in the two areas overshot the declared TAC. VFD will need to put in place a mechanism that addresses this issue. In addition, Figure 2 shows that many TACs were not fully utilised in areas already covered for harvest, and VFD will need to understand the reason why, and think of ways to address this issue. This is critical in a business sense because a declared TAC equates to a monetary value and could put VFD under considerable pressure to ensure declared TACs are meaningful.

VFD will continue to learn and strengthen its management approach to ensure the sea cucumber fishery continues to benefit the people of Vanuatu, especially those in rural coastal communities, while still remaining sustainable.

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