

**Combination of different management principles
for *Trochus niloticus* resources in Vanuatu**

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The full title of this article, when presented at the SPC Workshop on the Management of Pacific Island Inshore Fisheries, was: 'Combination of fisheries management regulation, traditionnally-based management and wild stock enhancement using hatchery-reared trochus juveniles as a precautionary management principle for Trochus niloticus resources in Vanuatu'.

1. Background

Country

The Republic of Vanuatu comprises over 80 islands, 67 of which are inhabited. These islands lie between latitudes 13° and 20° South and longitudes 166° and 172° East in the Western Pacific Ocean (Fig. 1). The total land area is 12,200 km², of which 5,500 km² (45%) is considered potential arable land. The areas of inner reefs and lagoons have been estimated to be approximately 448 km² and mangroves 25 km². The Exclusive Economic Zone covers an estimated area of 680,000 km².

People

The people of Vanuatu are Melanesian in origin. The 1979 census indicated that 93 per cent of the total population were Melanesian ni-Vanuatu. In the 1989 census the total population of Vanuatu was recorded at 142,630, an increase of 28 per cent from the 1979 census.

Culture

Traditional values still govern village life, and stress living in harmony with the physical environment.

2. Introduction

Distribution of *Trochus niloticus* in Vanuatu is dependent upon the existence of favourable reef habitats surrounding each individual island within the archipelago. Islands that are surrounded by large areas of hard coral substrates and reef flats harbour more trochus populations than those with small or no reef flats.

Trochus resources in Vanuatu have been harvested for subsistence and commercial purposes since the beginning of the 19th century. It is a small but significant form of cash crop, generating revenues for mainly coastal communities in Vanuatu. Recently trochus resources in Vanuatu have been under tremendous fishing pressure as a result of the increase in demand for the shells by overseas markets.

The consciousness of possible complete depletion of trochus resources in the archipelago resulted in the implementation of the Fisheries Management Act Cap 158 in 1983. Regulation 17 of this Fisheries Act sets a minimum size limit of 9.0 cm for trochus shells. This regulation was and is continually violated regardless of a fine of VT 10,000 for anyone who contravenes it.

The Fisheries Department Research Division, faced with the problem of trochus mismanagement, addressed the need for an holistic management approach towards the trochus resource and the importance of the development of the trochus fisheries within the framework of an integrated management and development strategy that includes the application of the 'precautionary principle'.

The Fisheries Research Division investigated three management options that are available for trochus resource management. These are:

- Existing Fisheries Management Regulation;
- Existing traditionally-based management system; and
- Wild stock enhancement using hatchery-reared juvenile trochus.

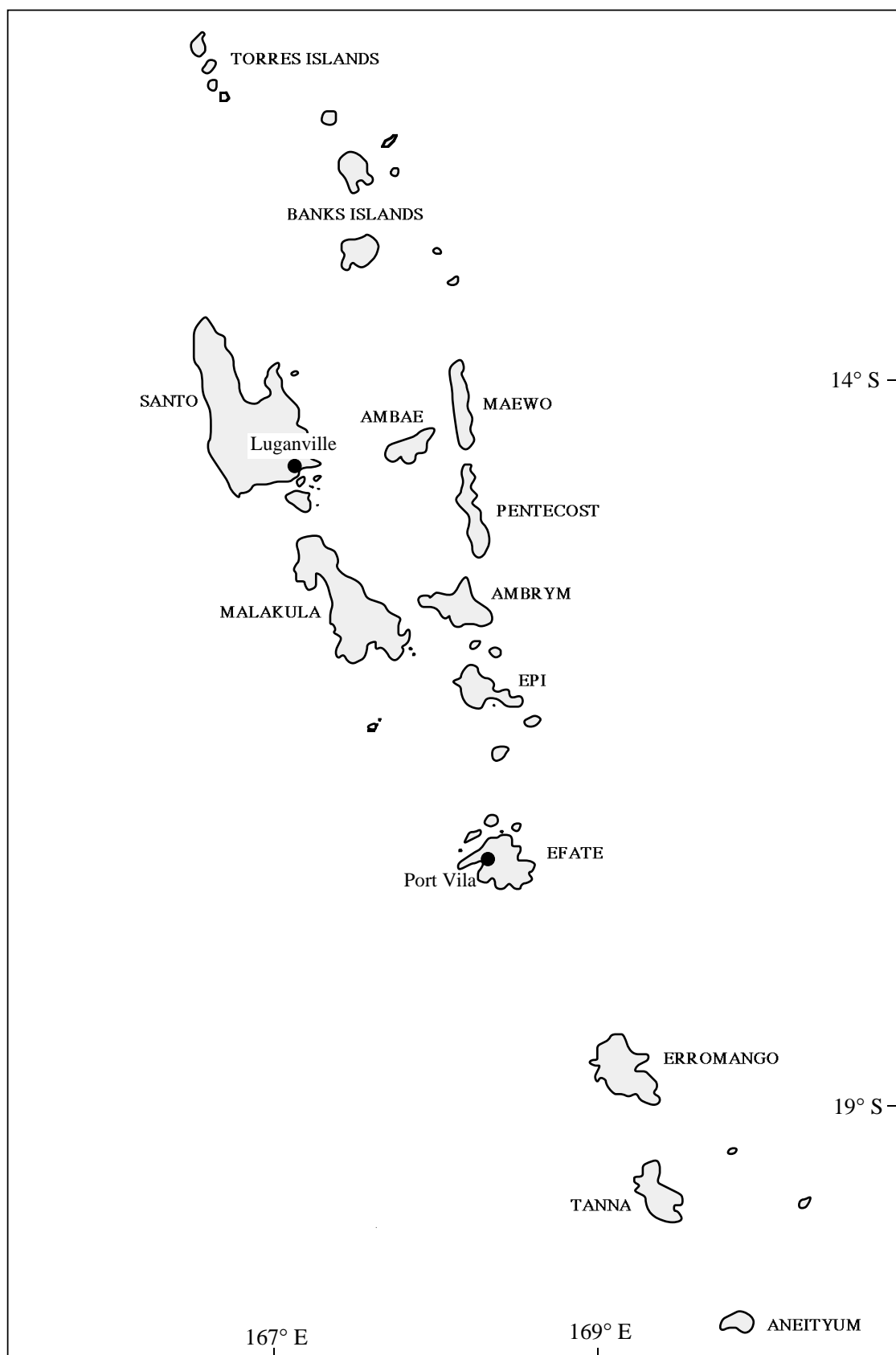


Figure 1 : Vanuatu

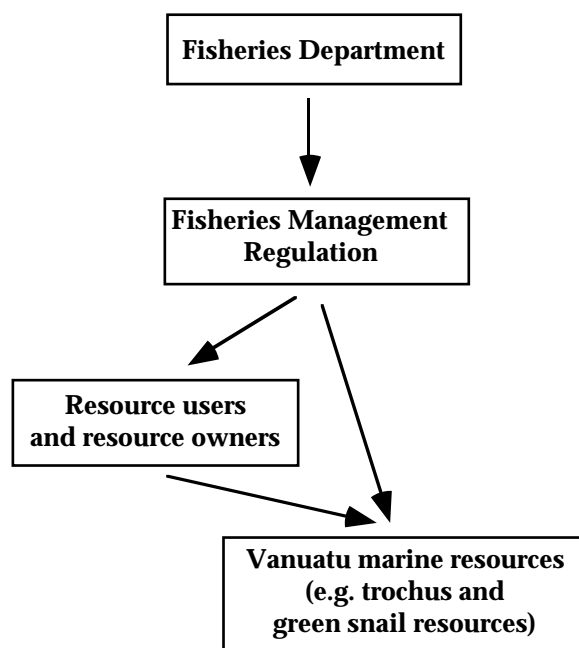
This report will endeavour to throw light on the precautionary management principle for trochus resources in Vanuatu.

3. Fisheries Management Regulation

The purpose of implementing the Fisheries Management Regulation is to impose some form of control of the trochus resource so that it will continue to yield benefits to the community and the country as a whole. The primary aim of this regulation is:

- to provide trochus fishing at both economically and biologically sustainable levels;
- to conserve trochus resources for future generations; and
- to provide a means for better utilisation for trochus resources.

Fisheries Management Regulation



The minimum size limit (9.0 cm) for *Trochus niloticus* instigated by the Fisheries Act provides an adequate protection of the trochus stocks. It allows the trochus to breed a sufficient number of times to maintain the population before being harvested.

However, the minimum size limit is new to the resource users and resource owners. They in-

terpret the Management Regulation as unfair play by the Government. In their view, the Government is putting up a barrier to prevent the people from making money. The people fail to see the importance of the Regulation and thus refuse to respect it. This results in continuous violation of the Regulation. The Fisheries Department retaliates by arresting the culprits and criticising them for their ignorance and lack of concern for the trochus resources. Who is to be blamed for this negligence and ignorance: the people, the Fisheries Department or both the Fisheries Department and the people?

Failures of the Fisheries Department

The primary role of the Fisheries Department is to ensure that the marine resources are sustainably exploited through implementation of management systems that are cost-effective and will produce results that are commensurate with the value of the resources, both in economic terms and in the eyes of the people.

The minimum size limit of 9.0 cm allows the trochus to breed a sufficient number of times to maintain the population before being harvested. From the viewpoint of sustainable management, the management system protects the trochus resource. However, in the eyes of the 'grass-root' people who depend on marine resources to generate their income, this view of sustainable management is non-existent.

The people do not understand the relationship between the minimum size limit of 9.0 cm and sustainable management. What has a size limit of 9.0 cm to do with sustainable management; and why a size limit of 9.0 cm and not 8.0 cm or 7.5 cm? The people do not understand the biological concepts linking the minimum size limit of 9.0 cm and sustainable management.

Failure 1

The Fisheries Department concentrated only on enforcing the Fisheries Regulation and overlooked one very important aspect of sustainable management, that is, going out to the people in rural areas and explaining to them in simple language the importance of respecting the minimum size limit of 9.0 cm and why it is important to promote trochus fishing at both

economically and biologically sustainable levels.

Failure 2

Attempts to raise public awareness through the media (radio and newspapers) are not very helpful. This is because the information is given out through a monologue and not a dialogue system. The people cannot voice their questions through a monologue information dissemination system. The person who is giving out the information is speaking to a microphone and looking at his/her reflection in the studio mirror glass and not speaking and looking directly at the people who will be indirectly affected by the information.

Failure 3

The Fisheries Department concentrated on enforcing the Management Regulation and failed to discuss management alternatives that would help those who depend mainly on marine resources as their main source of income.

Legislation will always be necessary as a basis for legal action to curb wilful resource destruction and environmental damage. However, education is the ultimate key to a general appreciation of how each person relates to environment and resources and what that person's obligations are. More knowledge and understanding is needed if the constitutional obligation is to be met. Among the fundamental duties which the Constitution of Vanuatu (Section 7) lays upon 'every person . . . to himself and his descendants and to others' is the duty:

'to protect Vanuatu and to safeguard the national wealth, resources and environment in the interests of the present generation and of future generations'.

The best way to disseminate information is to go out and meet with the people. This is very important because in the eyes of the people, the Fisheries Officer has some concern over their marine resources and thus has lowered himself/herself to their level, is willing to eat and sleep with the people and to sit with the people in their Nakamal (meeting house) to discuss sustainable management. This is how

a Fisheries Officer can gain respect from the people, especially the Chief (which is very important) and establish a working cooperation with the people.

4. Traditional management practices

Traditional practices in Vanuatu have a long history. These practices were established in prehistoric times and they are still used today. Traditional ownership of nearshore areas, particularly coral reefs, is hereditary. The ownership is handed down from generation to generation. Customary Law in Vanuatu dictates that most nearshore areas, especially coral reef flats owned by clans or larger communal groups, are not subjected to open-access fisheries.

In prehistoric days, our ancestors lived in harmony with the physical environment. Our ancestors had a determination to use the resources wisely. Thus the primary aim of traditional practices is to conserve marine resources for future generations. This is achieved through restrictions instigated by the resource owners. These restrictions include limited entry, closed seasons and restricted harvests.

The major feature of customary rights is that controls are expected at a local level, not from outside. Controls exerted at local levels are much more effective than controls exerted from the outside, such as the Vanuatu Government Fisheries Management Regulations. Controls exerted at local levels are set and implemented by the people directly affected by the controls. This promotes self-confidence amongst members of the community and can create a good working partnership for trochus resource management between the Fisheries Department and the community.

5. Trochus enhancement using hatchery-reared juveniles

Enhancement of wild trochus stocks using hatchery-produced trochus juveniles is an alternative form of trochus resource management. The Fisheries Department Research Division has been carrying out experimental studies to determine the viability of this management approach. Even though it is still too early

at this stage to speculate, experimental results of released hatchery-reared trochus juveniles were very good. For example, on 17 August 1992, a total of 1,000 trochus juveniles with an average basal length of 2.5 cm were released on a reef flat where intensive pre-assessment surveys indicated no wild trochus. (This reef flat has had no trochus for the last three years, the trochus were completely fished out in 1988). In February 1994, the site was re-surveyed. A total of 3,200 trochus shells (size range 4.5–9.5 cm) was counted.

This management option can only work if working cooperation is established between the Fisheries Department and the resource owners. This is because the Fisheries Legislation provides no protection against people damaging the reseeded sites. The Fisheries Research Division therefore relies on the cooperation of the resource users and resource owners for the protection of the sites. This working cooperation can only be achieved through negotiations with the people, which involves talking, listening to, and learning from them.

6. The 'precautionary management principle' for trochus resource

Without basic scientific knowledge of trochus resources and environment and without natural resource planners and managers being aware of the traditional environment and resource management skills and knowledge of ni-Vanuatu, it will not be possible to make the best use of the country's trochus resources, in a way which sustains societies and cultures and protects the environment.

Marine tenure systems in Vanuatu are not, as is widely suggested, necessarily hindrances or problems in themselves. The problem is the apparently irreconcilable gap between these systems and modern concepts of natural resource development and of financial security; and the difficulty which some foreigners have in understanding the true nature and cultural significance of communal tenure.

The difficulties and complexities of incorporating a cost-effective management system that will produce results that are commensurate

with the value of the resources, both in economic terms and in the eyes of the people, have meant that efforts to develop procedures for accommodating customary tenure systems have had to be put aside. The difficulty, however, is not only local.

The pervasive influence of bilateral and multi-lateral aid agencies is such that the Fisheries Department inevitably becomes geared to the needs of these external agencies and of their criteria for trochus and other marine resource management. And the criteria of funding agencies are overwhelmingly economic, despite recent efforts by some to make allowance for the more conspicuous environmental and social dis-benefit of the management options.

Traditional environment and resource management knowledge is particularly important for long-term (sustainable) resource management, especially trochus resource management. There is a need to tap custom knowledge for development. In Vanuatu many traditional ways of using the resources of land and sea had the effect of conserving these resources so that they were not wasted and could be used indefinitely.

Some farmers, for instance, used techniques of clearance and cultivation which made it possible to grow crops on steep slopes, the soil from which would otherwise be washed downhill. Seasonal taboos on coastal waters where certain fish were known to gather for breeding ensured that harvests elsewhere could be sustained.

Introduced, modern, forms of resource development tend to overwhelm custom environmental knowledge and practices. This process of extinction of custom knowledge is reinforced to some extent by a mistaken belief that custom knowledge is not relevant to modern development needs.

The 'precautionary management principle' is a management development procedure for trochus resources which incorporates the best of the modern management systems and customary systems. It allows those who retain custom environmental practice and who are skilled in custom conservation practice to con

tribute to a form of marine environmental management of trochus resources which is appropriate for a modern Vanuatu. Such people are assured by the Fisheries Department Research Division that their knowledge is respected. They are encouraged to share this knowledge with the Division so that it can be applied to modern development practice. The application of custom knowledge through the precautionary management principle also provides a form of support for Vanuatu cultures, boosting pride in their value and relevance.

Combining the modern and customary management systems is a straightforward process. The two management systems have the same objectives, even though methods of implementation may be different.

For example:

The primary aim of the Fisheries Management Regulation is to:

- provide fishing at both economically and biologically sustainable levels;
- conserve resources for future generations; and
- provide means for better utilisation of resources.

The primary aim of the traditional management system is to:

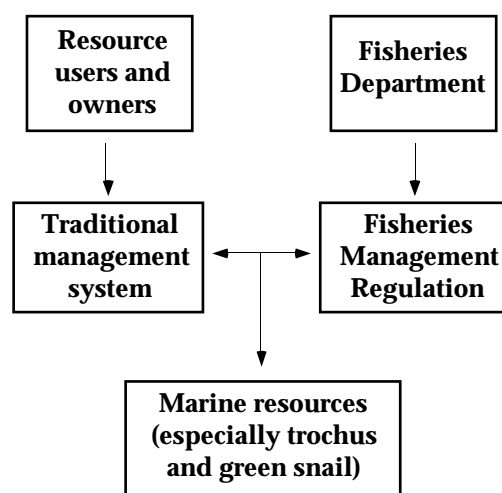
- conserve resources for future generations;
- provide fishing at both subsistence and biologically sustainable levels;
- provide a means of harmonised living with the environment; and
- ensure a more socially desirable distribution of the economic benefits obtained from the marine environment.

The difficult part of the combined management system is establishing a working relationship between the Fisheries Department and the resource users and resource owners. The management procedure is purposefully

termed: 'precautionary management principle', because precaution is required when discussing and addressing appropriate sustainable management systems and establishing a form of working partnership with the people. The people get very defensive and apprehensive if their views concerning the management of their resource are overlooked or considered not relevant for modern development needs.

The purpose of the 'precautionary management principle' is to encourage the resource users and resource owners to manage their marine resources, especially trochus and green snail (*Turbo marmoratus*), resources using whatever traditionally-based management system they see fit. They are encouraged not to overlook or violate the Fisheries Management Regulations which are purposefully implemented by the Government purely for biologically sustainable and recruitment purposes.

Precautionary management principle



The 'precautionary management principle' is a perfect management system for hatchery-reared juvenile trochus reseeding trials. Juvenile trochus reseeding experiments in Vanuatu are proving to be a viable means of trochus management. However, this alternative cannot work without the cooperation of the resource owners and resource users. This cooperation can only be achieved through the precautionary management principle. Once the juveniles are reseeded, the people take up the responsibility of protecting the release sites

and the shells, making sure that no one disturbs or collect the shells for subsistence purposes. This is achieved through the instigation of taboos (bans) on the reefs by the resource owners, which may last for up to three years.

Advice on the period for which a reef should be closed is provided by the Fisheries Department, depending on the type of marine resource involved. For example, for *Trochus niloticus*, the resource users and owners are advised to place a taboo of three years. Some resource owners have gone a step further by instigating a taboo on all marine resources on their reefs for periods up to five years. Some resource owners divide their reef into two halves, with fishing allowed on one half and prohibited on the other. Through the 'precautionary management principle', the resource users and resource owners can either:

- (i) place a no-fishing taboo on all marine resources on their reefs for a certain number of years;
- (ii) place a no-fishing taboo for trochus and green snails only on their reefs for a period of time;
- (iii) divide their reef into two parts, where
 - (a) fishing is allowed on one part and not allowed on the other part; or
 - (b) fishing trochus and green snails is not allowed, but fishing for other resources is allowed, on one half of the reef, while on the other half of the reef fishing of all marine resources is prohibited; or
 - (c) fishing for trochus and green snails, but not for other resources, is allowed on one half of the reef, while on the other half of the reef fishing of all marine resources is prohibited.

The precautionary management principle aims at providing management alternatives to suit the subsistence and financial needs of the people. It provides measures by which marine resources can be managed at local level, thereby ruling out the risk of overlooking the subsistence needs of the people. If this system works effectively, the costs of enforcement of management measures are minimised, as are social and political conflicts between the government and the community. However, the main advantage of the precautionary management principle is that the fishing communities are likely to have a better understanding and appreciation of management principles if they are discussed at a local level.

7. General remarks

A failure to recognise subsistence needs

It is tempting for fisheries officers and environment groups which have concerns over marine resources to instigate strict management controls that do not take into account the subsistence needs of the people, but rather management controls that are confusing and complicated for the resource owners and resource users. Management controls that are confusing and complicated for the people satisfy only the desires of the fisheries officers and environmentalists, not the people whose subsistence needs will be affected by controls.

It is a pure waste of time and money to concentrate on producing awareness programmes and implementing strict management controls, and at the same time fail to devise income-generating alternatives for the people who depend heavily on the resources concerned. If the people are not provided with alternatives that will ensure that their subsistence and financial needs are met, they will continue to do whatever they were doing to the resource, regardless of the management controls.

