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In-Depth Solution Coverage

Government-supported, Village-based Management of Marine Resources in Vanuatu

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1. Introduction

Effectively monitoring and managing small, multi-species, multi-method nearshore fisheries along conventional western lines has generally failed in developing countries (e.g. Smith, 1991)¹, including those in Oceania. Despite several decades of effort, participants in the 1988 SPC Workshop on Inshore Fisheries Resources concluded that there were "few, if any, Pacific Island inshore fisheries which are currently managed."

It is true that few Pacific Island inshore fisheries were currently being managed *by government personnel*. But it would be wrong to conclude that they are not being managed at all. If management means regulating who may fish, when and where they may fish, what methods they may use, and/or what they may catch, then fisheries management by villagers themselves has been widespread in Oceania for centuries.

It is now quite clear that far more has been going on in terms of local marine resource management in the region than some national authorities or fisheries administrators have been aware of until recently. Moreover, such activities are increasing in at least some countries in the region including Vanuatu, as described below.

However, it would be a mistake to assume that Pacific Island marine resources are necessarily being managed *well*. Management of marine resources by traditional Pacific Islands villagers does not guarantee their sound use. There are several reasons for this. One is that colonial governments, ignorant of traditional management structures and institutions, introduced various types of ineffective centralised natural resource management policies which persist today and often greatly weaken local

authority (e.g. Dashwood, 1991)².

Another important reason is that villagers do not have adequate scientific information on which to base management decisions. Toloa *et al* (1991)³ identify the issue:

"The people of Tokelau feel that the traditional conservation system has served them well over the centuries. They are also aware, however, of the need for modification of the system to reflect recent changes. Although the output from (marine biological research in Tokelau) has been utilised to some extent, a mechanism should be established so that the results are more fully incorporated into the Council of Elders' management plans."

Villagers may not understand the need for certain types of management. Or, if they do, they may not know how to formulate management plans to address those needs effectively. The introduction of commercial fishing, the rise of trochus, giant clams, bêche-de-mer, green snail, rock lobsters and pearl shell as important exportable resources, and the introduction of new fishing gears and faster boats have all brought new management challenges with which traditional arrangements were not designed to cope.

Initiative:

Government-supported, village-based management of marine resources in Vanuatu. Through "cooperative management," in which the government fisheries department provides scientific information and advice, while coastal villages assume the bulk of the responsibility for local management, fisheries are being effectively managed and protected. Vanuatu villagers are widely putting aside opportunities to earn quick cash from their marine resources in exchange for the greater long-term benefits of conserving them.

In common with other Pacific Island fisheries departments today, Vanuatu's Fisheries Department realises that managing most of its coastal fisheries from Port Vila is impossible (Amos, 1993)⁴. The costs of research, monitoring and enforcement in the multitude of small fisheries associated with Vanuatu's several hundred coastal villages would outweigh the benefits by several orders of magnitude. But the Department is beginning to play a vital indirect role in management by working in the villages to help combine local knowledge with modern research-based knowledge to improve village-based management.

This type of management — where a government fisheries department provides scientific information and advice (as well as certain basic conservation laws), while

coastal villages assume the bulk of the responsibility for local management — is a form of what is sometimes referred to as cooperative management (Pinkerton, 1989)⁵.

Cooperative management began modestly in Vanuatu in 1990 when Moses Amos, a trochus specialist with the Fisheries Department, announced over Radio Vanuatu that the Department would provide advice on trochus management to fishing rights owners who requested it. Response was enthusiastic, and Mr Amos and his team began to carry out trochus surveys on village fishing grounds. They also gave the villagers basic information on trochus life history and advice on such things as why minimum size limits on trochus are desirable, where trochus refuges might best be situated, and if, and for how long, their trochus fishery should be closed in order to rebuild stocks.

Amos (1993)⁴ provides a brief description of these activities. A passage from his account (p.16) provides an indication of the deliberate informality of this approach: "Every evening, after each day's diving, the Research Officers arrange for further informal discussions with resource owners and fishermen, about the importance of harvesting only legal size shells. (These discussions are usually held around bowls of kava)."

As of late 1993 these activities have been carried out by the Mr. Amos and his team in a number of villages in each of Erromango, Efate, Emai, Aneityum and in one village in Epi. Coconut crab resource surveys and technical advice had also been carried out in the Torres/Banks region where this species is an important source of income but trochus are not.

Mr Amos ensured that information flows in both directions. For example, learning from villagers about temporal trends in their trochus populations provided information useful in formulating management strategies. Fishermen's information on local nearshore currents helped him decide if and where to suggest setting aside a trochus breeding preserve.

He did not try to force upon villagers rigid management plans based exclusively on biological considerations, but recognised the importance of leaving final decisions to be worked out locally by people who need to balance biological considerations with local social and economic concerns. In choosing the length of a ban on trochus harvesting, for example, villagers may wish to opt for a shorter period than would be ideal biologically in order to obtain cash for a planned community project or to rebuild after a cyclone.

So far the Department's work has been limited mainly, of necessity, to trochus fisheries. But it appeared to me that it might offer a basic general approach to cooperative management that could have application over a much wider range of species, as well as in other parts of Oceania. In this report I describe the results of three weeks of

interviews carried out in Vanuatu in November, 1993 in order to examine the strengths and weaknesses of this approach and its potential for wider application.

A detailed quantitative study of this subject would have taken many times the amount of time and money available. A brief, largely qualitative survey seemed to be a practical alternative. As Mr Amos says, "the reality is that when resources are degrading you can't wait for science" (Amos, 1993, p. 17).⁴

The questions I set out to try to answer during this study are:

1. How widespread is the demand on the part of villagers for technical advice on management of their marine resources?
2. How well has this advice been received and what have been the practical consequences in terms of improved management?
3. What scope is there for expansion of this approach to other marine resources?
4. What are some of the features of customary marine tenure (CMT) that influence the effectiveness with which marine resource management can be carried out in the community?
5. What lessons can be learned from Vanuatu's experience that might be useful to other countries?
6. Do Vanuatu's laws adequately protect customary marine tenure and the rights of villagers to manage their marine resources?

2. The Interviews

I carried out interviews in most of the coastal villages on the Islands of Efate and Emai as well as in a number of villages in the area of Southeast Malekula. I was assisted in these interviews by Moses Amos on Malekula and Emai and, in most cases, by William Naviti on Efate. Mr. Naviti also carried out interviews for me in two fishing villages on Aneityum. In order to expand the area covered in the limited time available I also interviewed several people in Port Vila whose who were familiar with village marine resource management regulations in their home villages on other islands.

I sought out chiefs, as well as elders who had reputations as being especially knowledgeable about fishing. Chiefs (who were sometimes knowledgeable fishermen as well) were interviewed not only as a sign of respect for their authority, but also because it is they who are usually most centrally involved in making management decisions concerning the villages' marine resources.

I ensured always to include certain basic questions in my interviews. But I made the interviews informal and unstructured rather than adhering to a standardized survey-style format. This was deliberate, and done in order to enable me to pursue unanticipated local issues or local marine knowledge that emerged during the course of the interviews

(Johannes, 1993)[6](#).

In some cases I was asked to explain my interests to the villagers as a group. Since the villages in question were small, I used these opportunities to interview the entire gathering. In other cases as few as one or two people were interviewed.

In Vanuatu each village, through its chief or its constituent clans or families, have for centuries claimed the exclusive right to harvest marine resources from the adjacent shallow waters. Such ownership is often referred to as customary marine tenure (CMT). All reef flats are thus owned and Vanuatu's Constitution upholds these traditional rights (Amos, 1993)[4](#).

Within the framework of CMT I concentrated on determining how and when, recent local fishing regulations or "taboos" had been designed and implemented, the problems encountered, and the attitudes of village leaders toward the continuing use of this approach to marine resource management.

In addition, I tried to determine how villagers looked upon government assistance, both from the Fisheries Division in designing and implementing local management regulations and from the courts in enforcing those regulations.

3. Results

3.1 Village-based Conservation Measures

All but one of the 27 villages surveyed currently employed some form of explicitly conservation-based taboos on their fishing grounds. All villages asserted their right to exclude others from their fishing grounds. This last measure, although it is not always employed with conservation in mind, reduces harvesting pressure and thus serves the purpose of conservation in waters where resources are limited relative to demand.

The interviews revealed that village-based marine conservation has experienced a remarkable upsurge in Vanuatu beginning in 1990. In the majority of the 27 villages surveyed, explicitly conservation-based fishing taboos had been applied for the first time in living memory only within the past four years. In several other villages some such taboos had been employed prior to 1990 (e.g. Analgawat, Mangaliilu, Marae, Ebau, Tongamea), sometimes for as long as anyone could remember. In earlier times these taboos usually focussed on trochus and green snails (although at Marae a 1-2 year ban on taking of octopus was used periodically to rebuild stocks). In most of these villages, however, these controls had been diversified since 1990 to cover other marine resources.

The only published descriptions of customary marine tenure in parts of Vanuatu (Taurokoto, 1984⁷ Fairbairn, 1992⁸) do not prepare the researcher for the exceptional variety of ways in which marine conservation measures have developed recently within its framework. No two villages surveyed in the present study were identical in this regard (Table 1).

Queries concerning the cause of this sudden, widespread flowering of marine conservation revealed that the educational efforts of the Fisheries Department, along with those of the government Conservation Unit played a major role.

Education in the villages by the Fisheries Department has focussed largely on trochus conservation. But since these efforts began, less than four years ago, villagers have perceived that what works to conserve trochus can be adapted to conserve other species. They have, accordingly, introduced regulations controlling the harvest of many other species. In short, the Department's efforts have been favoured by a prodigious multiplier effect.

Table 1. Village-based fishing restrictions

1. Species tabooed

All species — Marae, Lamén, Emua, Ebau, Pelong, Uri, Litslits, Uripi, Tongamea, Tabakoro, Analgawat, Lamap

Trochus or trochus and green snail — Lamén, Erakor, Eton, Mangalililu, Seviri, Pelong, Lutes, Marae, Tabakoro, Utche, Analgawat

Trochus, green snail and bêche-de-mer — Tongamea

Trochus, green snail and lobster — Aneitcho (Port Patrick)

Octopus — Sangava, Marae, Pescarus

Bêche-de-mer — Mangalililu, Emua

All shellfish — Marae

Mangrove crabs — Uri

Shore crabs, limpets, parrotfish and rudderfish - Anawanjei

Rock lobsters — Analgawat

2. Methods tabooed

a. During closures that involve species other than molluscs

All methods — Lamén, Marae, Emua, Ebau, Pelong¹⁰, Uri⁹, Uripí, Litslits, Tabakoro, Tongamea, Pescarus

Night spearfishing — Pelong, Uri

Gillnetting — Pelong, Tabakoro, Utche, Uri

Dropline fishing — Tabakoro

All methods except bow and arrow or throwing spear — Lamap

All methods except line fishing and day spearfishing —Pelong

b. At all times

Breaking coral or not turning rocks back after looking under them while reef-gleaning — Erakor. Marae

Gillnetting — Utche

Commercial gillnetting - Uripí

Spearfishing — Utche

Night spearfishing - Mangaliilu

3. Extent of Areas Affected by Closure

All village fishing grounds— Mangaliilu, Erakor, Lamén, Emua, Paunangisu, Uri, Norsup, Tautu, Tabakoro, Aneitcho (Port Patrick)

Roughly one half of the village's fishing ground — Marae, Ebau, Litslits, Sangava, Burbar,

Smaller portion — Uri , Pelong, Tabakoro, Tongamea

Individual subdivisions of fishing ground owned by different descent groups, i.e. clans or

families — Lamén, Uripí, Pescarus, Pelong, Lamap, Lutes, Tautu, Marae, Analgawat

4. Duration of closures initiated during the past three years

None — Tanialu

One month — Sangava

Three months — Uri

Six months — Uri

Seven months — Uri

One year — Erakor, Mangaliilu, Paunangisu, Ebau, Pelong, Lamap, Norsup, Tautu, Tabakoro, Marae, Pescarus, Analgawat, Anawanjei

Two years — Lamap, Uripí, Pelong, Sangava⁷, Analgawat (1.5 — 2 years)

Three years — Marae, Lamap, Tabakoro (2-3 years)

Five years — Uri⁹, Pelong¹⁰, Seviri, Pescarus (4 — 5 years), Aneitcho (Port Patrick)

"Until it is decided that the area is ready," — Tongamea

Indefinitely — Mangaliilu, Emua

5. Size restrictions

Mangrove crabs - Uri

Bêche-de-mer — Uri, Sangava

6. Villages in which reef taboos were traditionally related to:

a. A chief's death or initiation — Marae, Lamén, Erakor, Mangaliilu, Emua, Ebau, Uripí, Analgawat

b. Any family member's death — Lamén

c. Circumcision ceremony — Uripí

7. Villages where the custom(s) described in item 6 have been abandoned

Marae, Erakor, Mangalilu, Emua, Ebau, Uripi, Analgawat

8. Villages in which conservation-based fishing taboos have recently been, or are soon expected to be abandoned.

Erakor, Uripi, Mele

9. Villages no longer asserting exclusionary rights to their fishing grounds

None of the villages surveyed

Village-based fishery closures can be divided into those that involved the total closure of fishing grounds and those that were species or species-group specific.

3.1.1. Trochus and Green Snail Harvesting Closures

The Fisheries Department usually advises villages to implement trochus closures for a period of two to three years. Three years is the time it takes from larval settling to the attainment of legal harvestable size. Vanuatu regulations stipulate a minimum harvestable size of 90mm across the base of the shell; Bour and Granperrin (1985)⁹ report that trochus in Vanuatu achieve an average size of 94mm three years after settlement. For green snails this period is thought to be similar or only slightly longer (Yamaguchi, 1993)¹⁰. Thus, for the present at least, it thus seems appropriate to combine trochus and green snail harvest closures — which already done in several of the village surveyed here.

Actual closure periods for trochus ranged from one to five years. Where one year periods were chosen, the decision was based at least in part on villagers' unwillingness to be deprived of income for trochus for longer periods. Four and five year closures seemed to be based on reasoning that if two or three year bans are good, then longer bans should be even better.

Adherence to the government size limits on trochus shell was said to be rigorous in some villages, not rigorous in others.

3.1.2 Closures for other individual species or species groups

a. Bêche-de-mer

Only two villages employed bêche-de-mer harvesting closures. One reason for this is that bêche-de-mer stocks in Vanuatu are naturally rather limited (Chambers, 1992)¹¹. Thus their harvesting is not a very important source of income in most villages. In addition, several species of differing sizes are involved, and the biological information necessary for designing optimal management strategies with which the Division could supply villagers is very limited. Leaders in one village attempted to impose a closed season on bêche-de-mer, but it broke down because of understandable arguments over just what constituted an appropriate closure period.

One village had imposed a total taboo on bêche-de-mer harvesting because of a concern over its possible impact on the reef community as a whole. This was based on an apparent misunderstanding concerning the biology of bêche-de-mer, which I attempted to rectify. Two villages had size restrictions on bêche-de-mer but I did not have time to investigate the details.

b. Rock lobsters

Rock lobsters are an important commercial resource in some villages. To complement government size limits for rock lobsters and its prohibition on taking berried females, two villages had imposed closed periods on their lobster fisheries.

c. Others

Octopus were often said to be important components of the village catch. Three of the villages surveyed had specific closure periods for octopus ([Table 1](#)). Other marine animals for which specific closure periods were reported were limpets, parrotfish, shore crabs and rudderfish (all on a single family's fishing grounds at Anawanjei) and mangrove crabs (at Uri).

3.1.3 Restrictions on Specific Methods

Gillnetting was prohibited in some villages. The explanations given were uniform: "it catches too many fish." (Indeed, uncontrolled gillnetting has devastated certain reef fish stocks in a number of other Pacific Islands (e.g. Johannes, 1993)⁶ and villagers elsewhere in Oceania have similarly banned the use of gillnets (Johannes, 1982¹²; Hviding, 1992)¹³.)

Night spearfishing using underwater torches (flashlights) was banned in some villages because it enables fishermen to deplete stocks of certain fish, especially large parrotfish, which sleep in shallow water at night and are then like sitting ducks for

spearfishermen.

I am unclear on the reasons for banning dropline fishing at Tabakoro, and daytime (in addition to nighttime) spearfishing at Utche.

3.2 The Experimental and Rapidly Evolving Nature of Village-Based Marine Conservation

While a basic awareness of the relation between excessive fishing pressure and declining stocks is lacking in villages in some Pacific island areas (e.g. Johannes and MacFarlane, 1991)¹⁴ such awareness was clearly manifest in many of the Vanuatu villages I visited. This awareness appeared to have traditional roots in at least some villages. Some, for example, had employed explicitly conservation-based fishing closures for periods ranging from several decades to as long as anyone could remember. But it was also clear that the recent dramatic upsurge in villagers' interest in marine conservation is due in no small measure to the educational efforts in the villages made by the Fisheries Department.

Many villagers are convinced of the benefits of the recent regulations on fishing, judging not only by their enthusiastic comments, but also by the ways these regulations are evolving. A number of villages decided on the basis of their initial experiences to extend the length of closures. For example, the period of total closure of fishing grounds at Uri, has been successively increased from three months to seven months, then to a year, and in Seviri the trochus closure has been extended from 2 years to 5 years.

In only 3 of the 27 villages for which I obtained information was regulation being abandoned. The basic reason given in each case was lack of community unity. Termination of local management efforts was brought about in one village by complex, long-running, initially land-based disputes among land and reef owners. In none of the three cases was cessation reportedly due to any disillusion concerning the conservation benefits of the regulations.

Two village leaders told of experiences which have caused them to modify the way in which a fishing taboo is formally declared. When fishing taboos were merely announced without fanfare, observance of them was unsatisfactory. Now, in these villages, closures are announced with substantial traditional ceremony. Pigs are killed, a feast is held and church leaders are asked to bless the taboo. By thus impressing villagers with the seriousness of these taboos, their observance, according to these leaders, is now much improved.

In the old days curses were put on the reef so that anyone breaking the taboo was threatened with supernatural retribution as well as fines. Such curses remain in use in certain villages today and are reportedly taken seriously. One man in a village on Emai collapsed and died while poaching on such a reef and this 'lesson' has reportedly

been taken to heart by the rest of the community.

Another chief said that the fine associated with breaking the taboo on trochus harvesting in his village was specified at the outset, but for poaching in waters closed to harvesting of all species, village leaders had simply mentioned an unspecified fine. The former taboo was well observed, the latter was not. The lesson taken from this, he said, is to announce specific fines firmly at the beginning of any closure period.

(Fines are typically stipulated in pigs, cattle or cash, or both livestock and cash. We also heard of fines being levied in terms of labour on community projects or kava. Fines ranged from 5,000 to 13,000 vatu and/or up to 3 pigs depending upon the village and the perceived seriousness of the transgression. (When this was written 100 vatu were roughly equivalent to one US dollar). Since a full-size pig may be worth more than 10,000 vatu, and since, according to Fairbairn (1993)⁸ the Gross National Product is less than ten times that amount per capita, it can be seen that these fines are stiff.)

The relinquishing of village sub-groups over their sections of village fishing grounds was a trend commented upon favorably by village leaders. Commented on unfavorably was the opposite trend, that is, where subgroups are increasingly assertive concerning their individual rights, and uncooperative with other fishing rights owners in the village. One or other of these opposing trends was reported from each of several villages during this survey.

Villagers were asked how they adapted to the temporary loss of animal protein from their fishing grounds during total closures. There were six main responses:

- greater reliance on land-based sources of animal protein
- fishing with negotiated permission, and often some form of payment, in nearby waters of other villages
- purchasing more local seafood from a nearby market or village
- purchasing more tinned fish or meat
- greater reliance on fish caught outside the reef in untenured waters
- cutting back on consumption

3.3 Customary Marine Tenure (CMT)

There is no single body of custom in relation to marine tenure in Vanuatu; there are over

100 different village language groups with differing resource tenure customs. In many places land and sea tenure rights are inherited through men, but in some it passes down through women. This survey revealed that even within single language groups marine tenure systems may differ somewhat from village to neighbouring village.

Customary marine tenure not only survives throughout Vanuatu, but is going through a period where exercising the right to exclude outsiders and regulate one's own groups' activities on the fishing grounds is intensifying.

Ownership of marine resources creates opportunities not only for resource management, but also for dispute. Considerable population movement in Vanuatu over the past century was associated with coastal land alienation for plantations etc. and by churches for their settlements. Since custom laws were never written down, this resulted in poorly-remembered histories of traditional ownership of land and associated fishing grounds in some areas. And when ni-Vanuatu reclaimed these alienated areas after independence, disputes developed. As Nalo *et al* (1988, p.84)¹⁵ state: "Sometimes a request for identification of custom owners can stir up old disputes that have been sleeping for many years, or the desire for money can lead to claims which have little foundation in true custom."

(One such claim, said to be made by a number of villages, is that their traditional fishing rights extended well beyond the outer reef edge and sometimes all the way to the horizon. Such claims are often viewed with skepticism, especially in cases where neighbouring villages make no such claims. Ni-Vanuatu refer with conscious irony to such apparently spurious claims as "new history.")

There are typically six levels of dispute-resolution available a fishing rights owner within a clan. Dispute-resolution between clans or between villages also begins at the appropriate level in the following sequence:

First the dispute is referred to the heads of families within the clan. If this fails it can be taken to the council of the subchiefs of the village, next to the head chief, and then it may be referred to the council of chiefs of the area.

In the event that this still proves unsatisfactory, a dispute can be taken to an Island Court (Island Courts Act {Cap. 167}). These are local courts staffed by justices who are local chiefs knowledgeable in custom. Decisions in Island Courts, while judged in accordance with custom, are nevertheless enforceable by law. (Not all of the 11 rural regions had established operational Island Courts in late 1993).

Appeals from an Island Court decision on customary tenure go to the Supreme Court (cf. Island Courts Act). There, the chief justice sits with assessors knowledgeable concerning the traditions of the area where the dispute has arisen. The Supreme Court's

decision on custom tenure questions is final. Although the Supreme Court has heard hundreds of land disputes, so far very few fishing rights disputes have reached it. I learned of only two.

According to villagers, however, sea rights disputes have been increasing in the past several years. This was said to be due to the increasing economic value of trochus and the growing significance of the cash economy in village life, and because of disagreements over traditional boundaries and the nature and allocation of rights within those boundaries.

3.3.1 CMT and the Law

In Vanuatu, as in many Pacific island countries, land tenure is the most contentious and widespread legal issue (e.g. Weisbrot, 1989).¹⁶ In formally identifying custom owners and determining their traditional rights the government gives priority to land that is the subject of dealings under law (for example, leases, logging contracts, declarations of public land). The legal framework for dealing with these problems remains inadequate, according to Weisbrot (1989)¹⁵. And since nearshore marine resources have seldom been subject to such dealings, the development of formal government procedures for dealing with customary marine tenure has lagged behind those dealing with land tenure.

Chapter 12, Article 71 of the Constitution establishes that "all land in the Republic belongs to the indigenous custom owners and their descendants." And "land" includes "land extending to the seaside of any foreshore reef but no further" under the Land Reform Act (Cap.123).

Thus government laws concerning land in Vanuatu often pertain to tenured marine areas. According to Nalo *et al* (1988)¹⁵, however, the Land Leases Act stipulates that customary owners cannot lease their reefs as they can their land. The confusion this produces is illustrated by a current dispute which involves fishing grounds contiguous to a piece of land owned by a chief but leased to another individual on Emae. The fishing grounds in question are part of those belonging to the chief's village and controlled in the village's behalf by the chief. The latter placed a taboo on fishing on the village fishing grounds. The lessee complained that since the accepted tradition is that coastal land owners also own the fishing rights to contiguous shallow waters, he should have the right to use the fishing grounds associated with his lease as he sees fit and not be subject to the taboo. But the accepted tradition that the lessee speaks of may only be relevant to land *ownership*. As mentioned above, the law says that land *leases* may extend only as far as the high tide mark.

Judgement in the dispute was pending in the Supreme Court in late 1993. The case highlights the confusion that exists because of a failure of the law to deal clearly with

customary marine tenure. The decision in this case appears to have considerable potential influence on the operation of future leases in Vanuatu's coastal zone.

In another case on Malekula, the local police chief was reportedly told by a member of the National Government to instruct a village chief to desist in his attempts to impose a taboo on fishing against the wishes of a subordinate chief. Here people are perplexed as to who is really in charge in this situation — the village chief, as indicated in the Constitution, or the government official?

Many custom reef owners we talked to told us that their disputes should and would be settled in due course by customary procedures and that government involvement would accomplish little other than further complicating the issues. If serious crimes, such as acts of violence, were committed as a result of such disputes, then the government should act to punish the offending individuals. Even then, however, it should not get involved in the dispute that occasioned the violence, they stressed. That should be handled locally and according to traditional dispute resolution procedures.

This feeling was not universal, however. At Port Patrick on Aneityum, local reef owners, unsatisfied with local dispute-resolution procedures, successfully petitioned the Minister of Fisheries to pass a regulation (Fisheries [Management and Conservation Measures] Regulation No. 35, of 1993) specifically recognizing their rights to close their fishing grounds to the harvesting of trochus, green snails and rock lobsters for five years.

4. Discussion

Lindley (1993, p. 18, 25)¹⁷ in a generally very useful report, states, "there is no great pressure on shallow reef resources anywhere in the country outside of areas with commercial access to Vila and Luganville." and that, "It is unlikely that overfishing of the shallow reef will occur in most rural areas for a long time to come." It would be interesting to know how he arrived at these conclusions since there are no data for such areas. Moreover, fishermen in most villages I visited said they had imposed fishing closures because their reef resources were seriously depleted. Some said catches were insufficient to supply the needs of the village, let alone products for sale outside the village.

Around some islands there are long stretches of uninhabited coastline, and it may well be that these are underfished. But this is of little practical consequence to village fishermen who lack the mobility (or, often, the traditional right) to exploit these resources and must rely on dwindling local stocks.

The rapid expansion of village-based marine resource management in Vanuatu has

occurred at a time when villagers' already-limited incomes have been further reduced since the mid-1980s by a prolonged drop in the price of copra (once villagers' most important source of income, but now reduced to about one-quarter of its post WWII value), and cacao. The problem was made worse by cyclones that had badly damaged many plantations in the past several years. The need for money was thus reportedly acute in many villages. Yet ni-Vanuatu villagers are widely putting aside opportunities to earn quick cash from their marine resources in exchange for the greater long-term benefits of conserving them. Trochus sales are reportedly declining this year compared with 1992, in part, apparently, because of the increased number of villages that have tabooed their harvest (Amos, pers. comm.).

It is too early to evaluate the quantitative significance of these new management strategies. The importance of making such evaluations will be discussed below. In the absence of quantitative data, the enthusiasm of villagers concerning the perceived benefits of their new management strategies is encouraging — not only in terms of the apparent improvement in resource productivity, but also in terms of the likelihood that the recent flurry of such initiatives will not prove to be short-lived.

4.1 Improving government support for village-based management.

At present villagers are exploring controls over a wide variety of marine resources in the absence of technical advice. Trochus management through periodic closures is now taking place in many villages without the direct involvement of the Fisheries Department, encouraged by the results they have heard about from villages that have been motivated by the Department's team. For similar reasons, closures are being implemented in connection with other species, species-groups, or entire sections of shallow water fishing grounds.

This is not a bad thing; village fishermen are well-placed and highly-motivated to evaluate the effects of their closures, and quite capable, as our interviews revealed, of modifying management as their knowledge of its effects improve.

Some of the relevant aspects of the life histories of target organisms are unknown to fishermen, however. For example, before Mr Amos advised them that trochus took three years to grow from settlement to commercial size, villagers had little idea of how fast this species grew and thus had rather hazy notions of how long a closure would be effective as a conservation measure. In addition, some principles of fisheries management cannot easily be learned simply through experience on the fishing grounds. For example, unless it is explained to them, fishermen are unlikely to be aware that decreases in catch per unit effort or the mean size of individuals in the catch are not necessarily signs of overfishing.

Clearly, villagers could benefit from much more advice on a much wider range of

subjects than is presently available. How can the government lend further support to efforts that are clearly in the best interests not only of villagers, but also the Vanuatu's economy as a whole?

Expanded Fisheries Department support for village- based marine resource management appears to have great potential. It seems likely that it would be widely welcomed in the villages I visited. Such support can be divided into two categories — research and extension services.

4.1.1 Expanded Research

The value of research on the effects of experimental management on marine resources is widely recognized (e.g. Sainsbury, 1982¹⁸; Alcala and Russ, 1990¹⁹; Hilborn and Walters, 1992²⁰). But opportunities for such research are very limited in most tropical areas (as well as much of the rest of the world) because of the general lack of suitable controls. During my study Vanuatu's village marine resource management systems appeared to provide opportunities for research to quantify the benefits of such management unparalleled in number and variety.

Villagers already seem convinced of the benefits of such management. But politicians and aid agencies may only be convinced — and thus persuaded to support expanded activities in this area — if they see hard data. Such data would also be of great interest to marine resource managers and researchers in other tropical coastal regions.

Research on the effects of closures of varying lengths on finfishes, trochus, rock lobsters, mangrove crabs, green snails, giant clams, various species of bêche-de-mer and other species that are important economically in large areas of the tropical Indo-Pacific would also be of great interest and value. Management systems in certain villages even offer researchers useful spatial as well as temporal controls; that is, when one half the village's fishing ground is closed, the other half is open.

Monitoring the impact of closures on some trochus populations deserves highest priority for both economic and historical reasons. Mr. Amos and his group have already gathered systematic quantitative data on trochus size distribution and abundance on several hundred transects on various village fishing grounds prior to their closure.

Nash (1993, p. 482)²¹ observes that, because of the short pelagic stage and consequently limited dispersal capacity of trochus larvae, "the unit of stock is probably of the order of 10 km in linear dimension" a circumstance, he points out, that makes the species well adapted to experimental management. Since tenured fishing grounds in Vanuatu are often of similar dimension, the opportunity of using them in experimental management research on trochus seems particularly promising.

These management systems appear to offer so many opportunities for valuable research that overseas as well as local researchers should be made aware of them. Indeed, such overseas research would have to be encouraged if full use is to be made of the opportunities afforded by these systems to help design optimal management strategies for tropical marine resources. Foreign-based research would, of course, have to be designed and carried out with the best interests of Vanuatu in mind, and with the approval of appropriate authorities at both national and village levels. Direct personal contact between village authorities and prospective overseas researchers would be more desirable in this connection than trying to arrange village-based research projects through intermediaries. (See Hviding (1996, p. 359-60 and elsewhere)¹³ for an excellent discussion of why dealing with village fisheries through intermediaries works badly in another Melanesian fishing culture).

As described above, management in the villages is evolving rapidly. This is another reason that visits to prospective sites would be desirable before final research plans were made by overseas researchers. Another reason is that Vanuatu's shallow-water marine resources are legally owned and controlled by villagers and any research to be done on them depends upon their understanding and support. Their active participation, as well as some training, especially in appropriate monitoring methodology would also be highly desirable.

One way of identifying good sites for particular research projects relatively quickly would be to solicit the interest of villages with appropriate management plans, as the Fisheries Division has done in the past.

4.1.2 Expanded Fisheries Extension Support

In Vanuatu, as elsewhere throughout the developing world, fisheries extension work has focussed largely on fisheries development. But where cooperative management is operating in artisanal fisheries, supportive extension program needs to incorporate a new set of skills and knowledge. Extension workers must obtain information on village marine management strategies and on practical local knowledge concerning marine resources. They must also provide the complementary scientific knowledge and education that villagers need in order to manage their resources better.

Villagers do not want to be *told* how to manage their fisheries. What they do want is education concerning practical management alternatives — answers to questions such as "what management measures are there for us to choose from, and where, when and for how long should they be applied?"

Learning how to carry out the appropriate interviews, discussions and other activities with fishermen requires training that is not normally a part of a fisheries biologist's

curriculum, and lies partly in the realm of social science research methodology. Such training should be made available to those supervising extension officers in the Fisheries Department and, through them, the extension officers themselves. (Note added in 1997: this has since happened - Frances Hickey, pers. comm.)

4.2 Features of Customary Marine Tenure Systems that Influence their Value in Supporting Fisheries Management

Social indices of the potential effectiveness of a CMT system in relation to fisheries conservation include, 1. the degree of the owners' commitment to management, 2. the degree of community cohesiveness, and 3. the degree of respect for village authority. Where one or more of these is low, as in villages near Port Vila, and, reportedly on Aneityum, village-based management may be beset with problems.

It appears that villages are likely to be more successful in designing effective marine conservation programs where individual reef-owning descent-groups (clans or families) are willing to subordinate their rights to those of the community as a whole. One example of this is where individual owning groups stagger their closures systematically and allow other units from the same village to use their fishing area when it is open in exchange for the reciprocal rights when their area is closed. This means that some fishing area is always accessible to the entire village.

Another approach in some villages is for families and clans to relinquish entirely their special rights over fishing grounds, entrusting them to the community as a whole, and participating in a community-wide management plan in which everyone's grounds are managed collectively as a single unit.

Geographically, Vanuatu's shallow waters areas favor the efficient operation of customary marine tenure because the reefs and lagoons are typically rather narrow. This makes surveillance relatively easy compared with conditions in some other countries.

4.3 Management Options

Village fishermen need to know what options are available to them to improve their management systems. For example, regulations in some villages might be more specifically targeted than they are at present so as to protect vulnerable stocks without completely closing the fishing grounds. This would undoubtedly appeal to villagers for whom total closure means hardship. This, of course is already being done in the case of bans on harvesting of trochus, green snail, lobster etc. that do not prevent fishing for other species. But the principle could be extended. Local knowledge could help provide the basic information required to decide upon appropriate strategies.

One such strategy is the banning of fishing on seasonal migrations or seasonal spawning aggregations. This approach to management was seldom mentioned in Vanuatu villages. Nevertheless, fishermen were often familiar with the location and seasonal timing of migrations and spawning aggregations of a number of species that are important in their fisheries. These are the times when such fish are usually at their most vulnerable to overfishing because of their dense concentrations and, frequently, their spawning stupor (Johannes, 1981)²² which makes them unusually easy to catch in large numbers.

Elsewhere in the tropics local stocks have been completely eliminated from some areas through overexploitation of such migrations/spawning aggregations (e.g. Johannes, 1989²³, 1991²⁴, 1993⁶). Fishermen in several Vanuatu villages said they believed that overfishing at such times was responsible for the observed decline or disappearance of mullet, rabbitfish or mackerel in migrations or spawning aggregations in their areas.

4.4 Justification for Expanded Support for Fisheries Work in Aid of Village-based Management.

The Fisheries Department's achievements in providing relevant advice and motivation for village-based fisheries management, is something of which they can be proud. Vanuatu villagers deserve great credit for this achievement too, but it is unlikely that they would have carried it out with such energy and speed without the encouragement and advice of Fisheries Department.

Throughout much of the developing world, however, politicians and foreign aid donors alike have focussed on conventional development so single-mindedly that they have perceived only dimly, or not at all, the economic benefits of increasing domestic production through conservation. And in Vanuatu, according to David and Cillauren (1992, p. 44)²⁵, "in the opinion of the authorities, small-scale unstructured village fishing is incapable of generating a reliable increase in seafood production."

In the light of Vanuatu's past emphasis on fisheries development over fisheries management, it is instructive to contrast the accomplishments of the Fisheries Department's shoestring cooperative management efforts described above, with those of Vanuatu's lavishly funded Village Fisheries Development Programme (VFDP) focussed on fishing in deeper water.

The VFDP concentrated on developing deep dropline fishing for high-value species. By 1987 it had received aid - from Australia, Canada, France, Japan, New Zealand, West Germany, FAO, the UK and the EEC - totalling in excess of 15 million US\$ (Schaan et al, 1987)²⁶. Later figures suggest much higher amounts have been spent since the latter report was published (e.g. David and Cillauren, 1992)²⁵.

The program failed signally to fulfil its stated goals. The mean total annual catch from this fishery has amounted to a mere 5 to 8 per cent of the catch from small-scale unstructured village fisheries. In addition, the bulk of the fish caught in VFDP-generated fisheries are too expensive for the poorer Melanesian families who need them most. In rural areas, "consumption of fish from village (VFDP-supported) fishing associations remains marginal, and can in no way be seen as a viable substitute for imported tinned fish" (David and Cillauren, 1992, p. 52)[25](#).

Moreover, because of the costs of importing the requisite equipment and supplies, VFDP-stimulated fishing for urban markets in Vanuatu is actually increasing the balance of trade deficit in those islands of Vanuatu which had VFDP fishing associations (David and Cillauren, 1992). The reasons for the failure of the VFDP are discussed by Rodman (1989)[27](#) and David and Cillauren (1992)[25](#).

While tens of millions of dollars of foreign aid money have been spent on the VFDP and the subsequent Extension Program evolving from it, orders of magnitude less support has been given to those fisheries that are the target of the Fisheries Department's conservation efforts — what David and Cillauren (1992)[25](#) refer to as "small-scale, unstructured fisheries." Yet these fisheries are of far greater sustainable value to Vanuatu, both in economic and nutritional terms, than the VFDP fisheries.

David and Cillauren (1992)[25](#) calculated that in 1984 "the added imports of tinned fish that would have been required without the existence of the small-scale unstructured fisheries. . . . would have driven the cost of food imports up by 13.5 to 15.5 per cent." Using these 1984 figures (the most recent available) it can be calculated that a 25 per cent increase of village fish production for consumption by the local population, as might be achieved by conservation measures, would have saved the country about 0.5 million A\$ annually. In February 1994 prices for tinned fish were roughly 45 per cent higher than the 1984 prices given by David and Cillauren (1992)[25](#). Thus the savings today provided by a 25 per cent increase over 1984 catch levels would amount to about 0.7 million A\$ (about 0.5 million US\$) annually.

The potential direct foreign exchange earnings of village-based management are not trivial either. For example, if village-based conservation of trochus stocks were to result in a sustained 25 per cent increase in trochus production, this would mean additional foreign exchange earnings of about 1 million A\$ based on Vanuatu's 1992 trochus export figures of 193 tonnes (Bell and Amos, 1993)[28](#). Added to this would be the foreign exchange earnings from increased production of green snail and bêche-de-mer.

Compared with the cost in foreign exchange of deep water fishing, costs in these shallow water fisheries are tiny. Most such fishing is done on foot or in unmotorized dugout canoes using implements of local manufacture or of minimal cost. Surveillance

and enforcement is being carried out at almost no cost to the government, performed willingly and without pay by the villagers themselves. And their efforts are, of course, much more effective than those of any government fisheries department could be.

After acknowledging the failure of the VFDP Lindley (1993, p. 34)¹⁷ states, "The major problem now facing the department is in which direction future development efforts in the coastal fishery in rural areas must be directed. . . . The only way forward seems to be diversifying the fishery so as to create more surplus...."

A promising alternative does exist, however — greater emphasis on increased production of nearshore marine resources by means of village-based management. Increasing production through better management is, in the long run, the most sustainable form of development of natural resources there is.

Moreover, it does not require the extravagant infusions of foreign aid that characterized the VFDP. This might appear to be a virtue. Inevitably, however, it will be judged as quite the opposite by many politicians and some aid donors.

4.5 Fishing Rights Disputes

That only a few disputes over tenured fishing grounds have reached the courts, while the rest have been settled or are being settled at the grass roots level, attests to one of the enduring values of the traditional system. But Vanuatu's shallow water marine resources will almost certainly be subject to increasing dispute as economic development and the country's population continue to expand and place additional pressure on them. It seems likely, therefore, that the number of nearshore fishery disputes reaching the courts will increase.

In other parts of Oceania the biggest problems in this connection typically arise in and near district centers. Here, rapid population increase and the influx of outsiders and imported ideas have weakened local traditional authority and the ability to achieve the community consensus needed to agree upon and enforce effective management regulations. The present study indicates that the same things are happening in Vanuatu.

The significance of these problems for village fisheries management should be understood but not exaggerated. Fisheries disputes make news in Vanuatu, as elsewhere. Lack of dispute attracts no attention. The areas of reef and lagoon in the vicinity of Vanuatu's two urban centres, Port Vila and Luganville, that are affected by such disputes account for a few percent of Vanuatu's coastal waters.

Nevertheless, if the power of local authority is allowed to continue to erode, this problem is liable to spread gradually, eventually reaching even remote areas judging

by trends in other Pacific island countries (e.g. Johannes 1991²⁴; Hviding 1996¹³; Graham and Idechong, this volume). Indeed, respect for village authority is already diminishing in certain remoter villages we visited, according to village leaders, although not generally to the extent it is around Port Vila. It seems vital that Vanuatu devise means to keep traditional authority strong. Where it weakens, the regulatory capacity of the traditional system also weakens, and no government can expect to replace it effectively.

One element of the problem is that educated young people returning to their villages sometimes show little respect for village elders because of the latter's frequent lack of formal education or sophistication in outside matters. But it is the young people who are often uneducated when it comes to the importance of maintaining local systems of natural resource management. Aneityum, although not close to any urban center, is said to be especially troubled by this problem.

I do not know the answers. But I do know that the situation is made worse if the public is confused as to whether or not national law has superseded traditional authority in this area. And recent government actions, as described above, have tended to generate such uncertainty.

4.6 The coordination of national law and customary marine tenure

One of the virtues of customary tenure is its flexibility. Allowances are made, for example, for circumstances such as adoption, or the settlement in the community of people from elsewhere. This flexibility is also apparent today in the changes in village marine resource management practices that are occurring as these resources take on increasing monetary significance.

Many observers believe that when such local customs and laws are precisely defined and fixed legally they tend to freeze tradition, leaving villagers less flexible in their responses to demographic changes, changes in technology, or other developments that require adjustments in local resource use patterns and controls (e.g. Johannes, 1982¹²; Hviding 1996¹³, but see Graham {1993}²⁹ for a differing view). Some Pacific Island countries have addressed this problem through legislation that guarantees the protection of traditional customs without specifying exactly what those customs are. Legal definition of the latter are arrived at on a case-by-case basis and only as a last resort when the need arises for detailed, locale-specific information during court-mediated disputes. Local leaders have generally tried to prevent this from happening by resolving disputes whenever possible at the local level.

In the time available I was unable to obtain detailed information on the local fishing rights disputes described above in which the government has involved itself. But it seems to me to be superfluous and confusing to enact a government regulation

asserting a traditional right which is already guaranteed by the Constitution (as in the Aneityum case mentioned above) or for a member of the national government to try to direct a chief's decision in what appears to be local matter under the latter's jurisdiction according to the Constitution (as in the Malekula case) .

Moreover, these interventions set precedents that appear to offer an implicit invitation to all traditional fishing rights owners to petition the government directly to get similarly involved in their dispute. This may create endless and largely unnecessary headaches for the courts.

Such government actions will tend in the long run not to strengthen traditional authority, as was apparently intended in the Aneityum case, but rather to weaken it by creating confusion among villagers concerning just who is in control in these matters — traditional village leaders or the national government? Such uncertainty inevitably undermines local authority because of the ammunition it gives those who disagree with it. And the less secure the property rights villagers or their leaders perceive they hold over their fishing grounds, the less incentive they have to invest time and energy in managing them.

5. Summary and Conclusions

The introduction of traditional controls on fishing for the purpose of marine resource management had occurred between 1990 and late 1993 in all but one of 27 coastal Vanuatu villages surveyed. The Fisheries Department set this trend in motion by assisting villages with their trochus management. The efforts of the Department and the benefits of closures are now widely appreciated by villagers, who have extended such controls to other species.

Vanuatu's example suggests some strategies and conditions that would favor the success of government-supported, village-based management of tropical small scale fisheries elsewhere. These include:

1. Publicize in fishing communities the government's willingness to collaborate with villagers on management issues, and invite requests for assistance from interested villages.
2. Start small, not with a comprehensive plan to address many types of fisheries or many villages.
3. Concentrate initially on villages where local marine tenure and local authority are strong and the community is cohesive.
4. Concentrate initially on villages where fishing ground geography facilitates effective village surveillance.
5. Focus initially on a single type or limited number of fisheries - preferably ones that have the following characteristics:

- a. They are commercially important.
- b. They are relatively easy for which to obtain useful management information, for example, benthic invertebrate species that are comparatively simple to census and monitor, such as molluscs (e.g. trochus, green snail, clams, pearl shell), or echinoderms (e.g. bêche-de-mer, sea urchins).

Trochus (as well as green snails - see Yamaguchi, 1993)¹¹ seem especially attractive in this connection because of their limited pelagic dispersal capacities (in striking contrast to rock lobsters) and the consequent likelihood of the existence of more or less discrete local stocks.

Studies of effects of experimental management on bêche-de-mer stocks are badly needed in Oceania (e.g. Preston, 1993)³⁰. Although bêche-de-mer are less important as a source of income in Vanuatu than in most other parts of Melanesia (Preston, 1993)³⁰, Vanuatu, appears to offer excellent opportunities for the study of the effects of fishing ground closures on their stocks. As discussed above, bêche-de-mer fishing *per se* was not managed in the villages surveyed, but many villages employ total fishing ground closures which constitute *de facto* bans on bêche-de-mer harvesting.

6. Work toward ensuring that national law supports local authorities in their regulation of fishing by means of village-based prohibitions and enforcement mechanisms, but does not define these procedures too narrowly.

7. Provide formal legal assistance in disputes only where local dispute resolution or enforcement has clearly failed.

8. Train fisheries extension personnel in the skills necessary to help the community effectively combine local customs and knowledge with technical knowledge for the purpose of marine resource management, by:

a. studying local management procedures and relevant local knowledge concerning marine resources

b. obtaining relevant literature and research-based management information and disseminating it in forms that can be readily understood by the community.

9. Leave the final management decisions and enforcement up to village authorities.

An additional factor favoring effective CMT-based enforcement of village regulations in Vanuatu is the fact that only about 13 per cent of the country's boats are motorized (David and Cillauren, 1992)²⁵. This makes abuse of regulations more difficult than in some other Pacific Island countries where poachers in high-powered boats can more

easily evade apprehension (e.g. Johannes, 1991)[24](#).

Finally, given the lofty objectives of fisheries management as portrayed in most textbooks (see Hilborn and Walters [1992][20](#) for a refreshing antidote), it seems appropriate to conclude by providing those who still have faith in these technonostroms with some justification for management measures that have little quantitative foundation, such as many of those being used in Vanuatu villages today.

As noted earlier, the data necessary to provide such a foundation are quite beyond reach in small-scale, multi-species tropical fisheries, except, occasionally, for a few high-value benthic invertebrates whose populations are relatively easy to monitor. The consequent reluctance among fisheries biologists to impose regulations is one of the reasons for the dearth of effective government management initiatives in Oceania, despite decades of fisheries research. Marine resources, meanwhile, have been very seriously depleted in many areas.

In such circumstances a fisheries manager should not aim for some management ideal like optimum or maximum sustained yield, but neither should he or she give up. More realistic, but still invaluable objectives are simply to prevent serious overfishing, to ensure reasonably satisfactory allocation of resources and to minimise conflict. To achieve even two out of three of these objectives can be looked upon as a major accomplishment in any fishery.

In the opinion of fishermen I interviewed in some Vanuatu villages they seem to be accomplishing all three with the assistance of the Fisheries Department. It seems appropriate then, to ask the sceptics, when was the last time *you* met fishers who were that satisfied with the management of their fisheries?

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