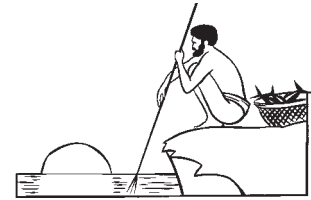




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TRADITIONAL

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NOTE FROM THE CO-ORDINATOR

In this issue we focus on Melanesia, with two contributed articles on traditional marine resource management in Fiji and one on the Papua New Guinean inhabitants of the Torres Strait.

The first on Fiji is by Andrew Cooke and Kolinio Moce who summarize their research findings on the current management status of the Customary Fishing Rights Areas (*qoliqoli*). The second paper is an up-dated review and guide to the literature on traditional community-based fishery management in Fiji, which includes material from the many recent publications on traditional marine resources management there. This is done as part of an agreement with the FAO, to occasionally up-date *A guide to the literature on traditional community-based fishery management in the Asia-Pacific tropics* (FAO Fisheries Circular No. 869. Rome, FAO, 1984), as new publications become available.

A third contributed paper, by Donald M. Schug, is adapted from his recently completed Ph. D. dissertation: *The marine realm and a sense of place among the Papua New Guinean communities of the Torres Strait*, University of Hawaii at Manoa. Dr. Schug demonstrates the importance of the spatial aspects of marine tenure, the traditional role of commercial fisheries, and of including the perceptions and standpoints of all stakeholders in community-based marine resource management schemes.

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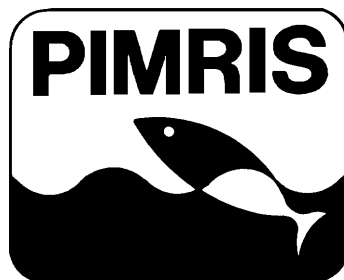
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PIMRIS is a joint project of 4 international organisations concerned with fisheries and marine resource development in the Pacific Islands region. The project is executed by the South Pacific Commission (SPC), the South Pacific Forum Fisheries Agency (FFA), the University of the South Pacific's Pacific Information Centre (USP-PIC), and the South Pacific Applied Geoscience Commission (SOPAC). Funding is provided by the International Centre for Ocean Development (ICOD) and the Government of France. This bulletin is produced by SPC as part of its



Pacific Islands Marine Resources Information System

commitment to PIMRIS. The aim of PIMRIS is to improve the availability of information on marine resources to users in the region, so as to support their rational development and management. PIMRIS activities include: the active collection, cataloguing and archiving of technical documents, especially ephemera ('grey literature'); evaluation, repackaging and dissemination of information; provision of literature searches, question-and-answer services and bibliographic support; and assistance with the development of in-country reference collections and databases on marine resources.

In future editions, we would like to provide comparative information from around the world on traditional resource management and knowledge. To this end we are planning to devote two or three pages in future issues to contributions from outside the usual territory covered by SPC publications, and to establish information exchange linkages with libraries and information departments of fisheries centres in other regions.

In this respect I would like to advise readers in South-east Asia (and elsewhere) that we still ask readers to correspond *directly* with us, as, up to now, nobody has been invited by this Special Interest Group to become Regional Information Coordinator.

Kenneth Ruddle

Current trends in the management of *qoliqoli* in Fiji

by Andrew Cooke and Kolinio Moce

Andrew Cooke is a marine biologist and environmental lawyer who visited Fiji in May–August 1994 to carry out research (for the degree of M.Sc. in Tropical Coastal Management at the University of Newcastle-upon-Tyne, UK) on the management of qoliqoli in Fiji by traditional owners. He lives in London, UK.

Kolinio Moce, who collaborated on the study, is a professional archeologist who has worked for a number of years with the Fiji Museum and as a commercial fisherman. He lives in Naduri village, Vanua Levu.

Introduction

The origins, history and legal nature of the Fijian *qoliqoli* (officially termed 'Customary Fishing Rights Area' or CFRA) have been established by several authors (e.g. Anon., 1979; Anon., 1994; Iwakiri, 1989; Adams, 1993; Pulea, 1993; Fong, 1994; Cooke, 1994), and will not be recited here. Suffice it to say that *qoliqoli* are under the control of clan chiefs whose authority is still strong, and arguably even increasing (see e.g. Crocombe, 1994). Essential points to understand are:

1. National fisheries law and practice require that any commercial fisherman must obtain a permit to fish from the registered owner of at least one *qoliqoli*¹ before the state will issue a licence, and
2. Owners are considered to be entitled to charge a goodwill fee for granting a permit (Anon., 1979) and generally do so. In this article we shall describe some of the trends which we noted in management of *qoliqoli* by traditional owners.

Research methods

The scope of the research was dictated mainly by time constraints. In an eight-week field period it would not have been practicable to visit the far-flung corners of the archipelago. In any case, fishing activities and pressures on managers are most intense around major population centres such as

Lautoka, Suva and Labasa. We decided to focus our attention on the fisheries in the provinces of Ba (Region 1), Tailevu and Ovalau (Region 2) and Macuata (Region 3).

Questionnaires were submitted to *qoliqoli* owners which addressed the principal aspects of fisheries management, including the issue of permits, goodwill payments, management measures, poaching, policing and policy. Questionnaires were also submitted to fishermen to obtain information on fishing methods, patterns and catches. In most cases, the questionnaires were presented personally and respondents generally chose to answer questions orally. In all we obtained completed questionnaires relating to eight CFRAs. Other relevant data, including information relating to fishing effort, were obtained by informal interview, direct personal observations, or from official records.

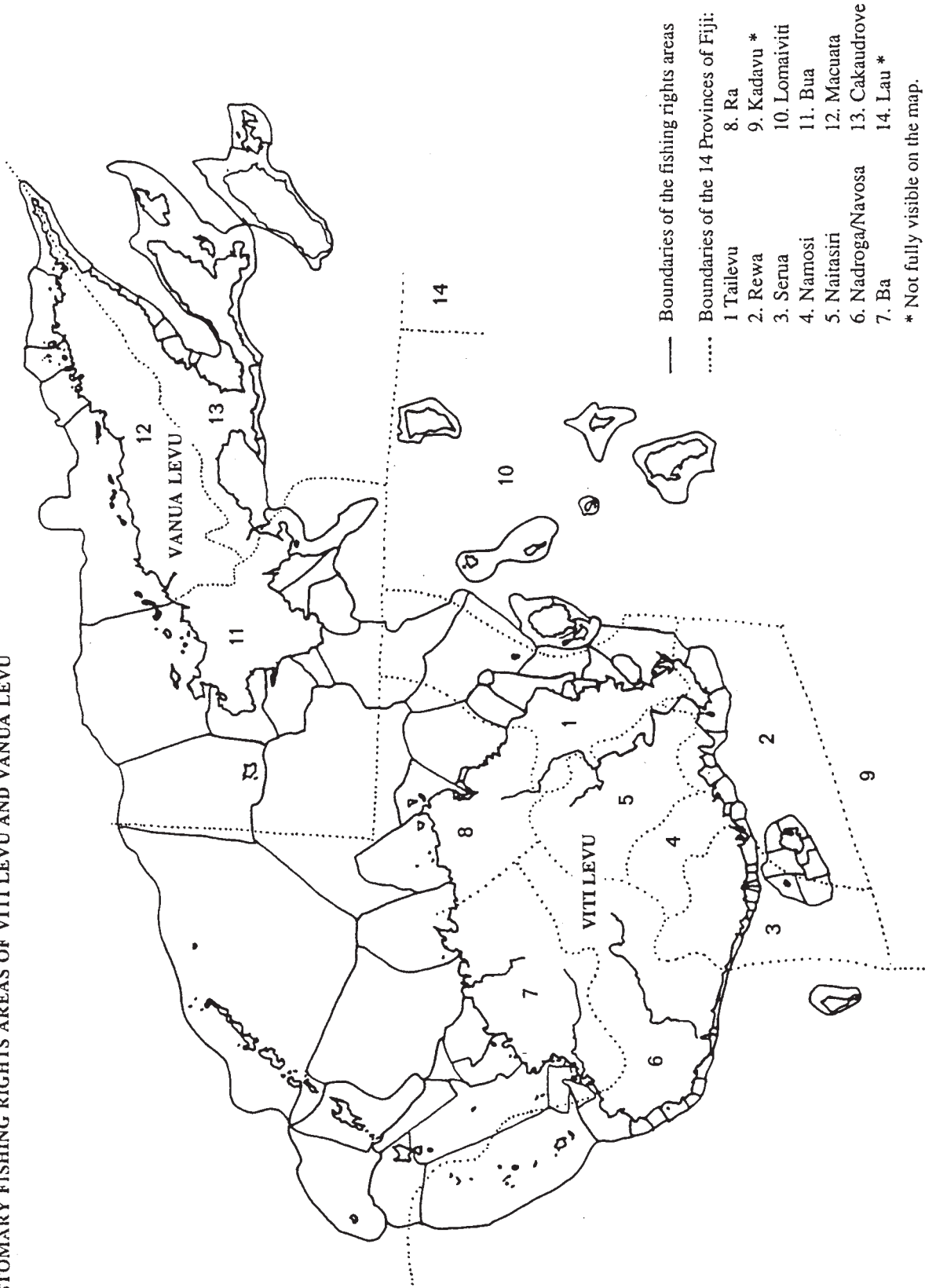
Results

1. Fishing effort

As a background to the management study, we attempted to estimate finfish fishing effort in the different regions studied. Through a combination of official licensing figures, sales of ice from Fisheries Division ice plants, responses of fishermen and managers, independent estimates of the number of active boats and our own observations, we derived estimates of the fishing pressure in each region.

¹ Technically permits may be issued only by the Commissioner for the Division in which the CFRA occurs after 'consulting' the CFRA owners; in practice the Commissioner accepts the wishes of the CFRA owners.

CUSTOMARY FISHING RIGHTS AREAS OF VITI LEVU AND VANUA LEVU

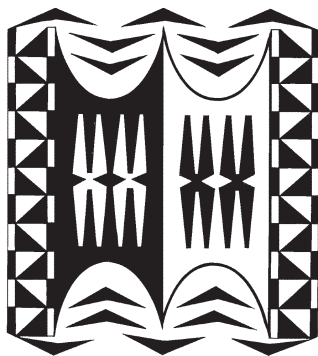


Our estimate of catch per boat (10 t/year) agreed well with Passfield's (1994). Based on an assumed 'readily sustainable yield' (RSY) of 10 t of fish/km² of reef, commercial finfish catches in the regions examined averaged from about 25 per cent of RSY (Region 2) to 50 per cent (Regions 1 and 3). Locally, pressures were outside this range (10–85 per cent).

2. Management by CFRA owners

Authority to make decisions

In most cases, a single chief of the owning clan-group had acknowledged authority to make all decisions regarding the *qoliqoli*. In one exception, the position of chief had passed to another family and no individual had acknowledged authority over the *qoliqoli*, which was still considered the property of the original chiefly family. As a result, no management occurred, despite intense pressure on resources, to the obvious frustration of the displaced chiefly family. In another case, power was shared between three sub-clan chiefs, the ruling clan line having become extinct.



Decision making

Generally the chief alone made management decisions, although some chiefs made a point of consulting resource users and the local Fisheries Officer before doing so.

Issue of permits

Most observed the minimum administrative task of issuing written permits which fishermen could present to the Fisheries Division to obtain fishing licences. In all cases permits were valid for one year (although the law allows permits to be given for up to three years). Some owners have streamlined the permit procedure through the use of typed standard form-permits (sometimes carrying restrictions on fishing) authorising Fisheries Division personnel to collect goodwill on their behalf.

Payment of goodwill

A few chiefs required only the traditional gift of *yaqona* before granting permission to fish. Most owners, however, now charge goodwill to commercial fishermen for the issue of a permit. Prices ranged from about \$F 50 to \$F 1000 per annum, at rates of \$F 0.10 to \$F 1.3 per km² of fishing area. Rates have increased significantly over the last five years, and appeared to be determined primarily by the perceived earnings of fishermen or their ability to pay. In most case rates were fixed, some setting higher rates for non-locals or Indo-Fijian fishermen. In one notable exception no goodwill was charged to any fisherman, but entry to the fishery was strictly limited to residents of the same district who were expected to contribute to public funds for social projects. Some owners set a high goodwill payment to keep down the number of fishermen, and statistical analysis showed a strong negative correlation between goodwill payment and permit numbers. Others made a surcharge for the right to use nets. One owner who set a high payment was accepting payment by installments.

A widely perceived problem was that licensed fishermen would fish in CFRAs for which they did not have a permit (the state will issue a fishing licence as long as at least one CFRA permit is presented). This problem was most acute for off-shore CFRAs where policing was difficult. In one case the chief responded by authorising the Fisheries Officer to collect goodwill on his behalf.

Distribution of goodwill

Some chiefs appear to treat goodwill as personal income, while others make a point of distributing goodwill to community projects. The latter cases tend also to be more conscientious managers. Some thought that the Native Lands Trust Board should distribute receipts, while others supported the freedom of chiefs to decide and were against any extra bureaucracy.

Restriction of fishing effort

At one extreme, there was essentially no attempt to regulate fishing effort, whether through controlling the number of permits or imposing fishing rules. At the other, owners operated and policed a range of measures designed to regulate fishing effort within the *qoliqoli*.

Examples of measures used included:

1. Setting a high goodwill payment to reduce the number of fishermen;

2. Applying a surcharge for the use of nets;
3. Setting a limit on the total number of permits;
4. Banning certain fishing methods (e.g. gill nets, spearfishing, night fishing);
5. Banning certain areas from fishing (e.g. reef bans, island bans);
6. Regulating the harvest of certain species (e.g. reserving prawn fishing to the owners; bans on taking corals); and
7. Banning fishing on Sundays².

In addition, owners often expressly prohibited the range of activities already prohibited under national fisheries law (such as dynamiting, use of compressed air, poison, or illegal net mesh sizes; and catching undersize fishes). Subsistence fishing was essentially uncontrolled, owners considering this to be everyone's right. Fishing activities of women tended to be regarded as subsistence, even where they were of a commercial character (e.g. fishing for mangrove crabs). There was some evidence of commercial women fishers obtaining permits in Region 2.

Use of ecological knowledge in management measures

Certain restrictions appeared to have been based on local ecological knowledge, such as a ban on an area of reef to permit recovery of rabbitfish stocks. Some bans extended to the terrestrial environment, including a ban on a small coral island whose vegetation was threatened by fishermen camping. Owners mostly well appreciated the need to maintain the productive functions of the ecosystem, including mangrove areas for spawning and nursery grounds. In one area, a rotational scheme for the harvest of crabs in mangrove was being contemplated.

There was no evidence, however, that a traditional 'lore' of ecological knowledge was involved in management decisions. Rather decisions appeared to be based on modern principles of environmental management which had been acquired by the chiefs. Fishermen interviewed claimed that the knowledge of elder fishermen was not useful as it related only to inshore areas. Today's fishermen in

motorised vessels go for different stocks further out to sea. Nonetheless, management measures tended to relate to nearshore areas where commercial and subsistence fishing converge. Aspects of traditional knowledge may therefore remain important.

Co-operation with the Fisheries Division

In some CFRAs there was a significant level of collaboration between the owner and the Fisheries Division which generally led to more developed management procedures. There was not, however, a uniformity of approach, management strategies being very much the invention of the individual Fisheries Officer and chief involved. The Fisheries Division did not, at the time, have a formal policy of co-management.

Policy strategies

Policing presented the greatest problem for CFRA owners. Only one patrolled regularly, using the boats of the CFRA's own people, and policed effectively through an implied threat of violence. Most had appointed honorary fishing wardens, but these were volunteers who were uncompensated and often afraid to act. Several years ago, in one CFRA, wardens who had reported fishermen using dynamite had their own boats blown up. Wardens have since ceased to be active.

Most owners relied on the support of the navy (which makes regular patrols to check licences and watch for dynamiting). In most areas the Fisheries Division has no boat, but where it does, the CFRA owners rely upon the Fisheries Division to police the fishing ground.

Communication with other CFRA owners

Essentially, no communication takes place between CFRA owners on the subject of management problems. As a corollary to this, several respondents said they had acquired new insights through the questionnaire process.

Conclusion

It may be concluded that CFRA owners, while taking many management initiatives themselves, are not ready to pursue management alone, but would be willing to tighten up their management

² It should be pointed out that Section 13(1)(b) of the Fisheries Act empowers the Divisional Commissioner (who in practice acts on the wishes of the CFRA owners) to impose conditions on the fishing permit, including restrictions on species, fishing methods and areas, in any combination. Sunday bans may technically be outside the powers of the Commissioner.

measures and move towards 'co-management' (see e.g. Pinkerton, 1989) with the state. There were indications that strengthening legal reforms would encourage such a move. There was a need for an exchange of ideas and experience between CFRA owners. Some doubts remained on the treatment of goodwill payments, an issue which needs to be tackled.

Recommendations

Based on the above findings we recommend that:

- The Fijian Fisheries Division and the Fijian Government adopt a formal policy of co-management to ensure the sustainable use of resources within CFRAs;
- The policy focus on areas of moderate to high fishing pressure;
- Special attention be paid to subsistence fishing in areas where this is intensive;
- A comprehensive investigation be carried out of management practices in CFRAs;
- CFRA custodians and interested state agencies exchange information and management expertise, for example in the form of a regular national conference;
- The Fisheries Division develop a programme to provide advice and assistance to CFRA custodians; and
- As part of such a programme certain CFRAs be selected for a management development project as envisaged in the National Environment Strategy (IUCN, 1993).

Acknowledgments

Full acknowledgments to sponsors, advisers and others appear in the M.Sc. thesis on which this article is based. However, we would like to thank particularly the several officers of the Fisheries Division who were most helpful with information, the Fijian chiefs who gave generously of their time to answer questionnaires, numerous other informants, and Dr Dick Watling, for setting things up.

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A guide to the literature on traditional community-based fishery management in Fiji

by Kenneth Ruddle

In agreement with the FAO, this article is an up-date of the information on Fiji published in Ruddle, K. 'A guide to the literature on traditional community-based fishery management in the Asia-Pacific tropics', FAO Fisheries Circular No. 869. Rome, FAO. 1994. The revisions are based on several recent publications either on traditional fisheries in Fiji or including a Fijian content on the subject. Nevertheless, because recent fieldwork has not verified now-old literature items, it is still impossible to avoid a confusion of tenses when writing on the subject.

In the marine realm, Fijians are traditionally in-shore fishers and gleaners. Apart from the more spectacular techniques, pre-European contact fisheries are poorly documented. Most routine fishing activities are done by women, whereas men are responsible for providing large quantities of fish for ceremonial purposes.

Fijian social organisation is based on a hierarchical kinship system consisting of *vanua* (tribe), *yavusa* (clan), *mataqali* (sub-clan or lineage), and *tokatoka* (sub-lineage or extended family) (Ravuvu, 1983). Each is headed by a chief, whose office is usually hereditary, with almost absolute power. Fishing rights to traditional fishing areas (*qoliqoli*) are held by the chief of a *yavusa* or *vanua*.

Each village sub-clan has a specific, hereditary role in the community. In Ucuivanua, on the northeast coast of Viti Levu, for example, villagers are divided into the chiefly sub-clan (*mataqali turaga*), warriors (*bati*), spokespersons (*matanivanua*), carpenters (*matasau* or *matavuvale*), traditional priests (*bete*) and fishers (*gonedau* or *kai wai*) (Vunisea, 1994). Sub-clan functions are complementary. For example, traditionally when fishers were on prolonged fishing trips, their families would be provided with staple foodstuffs by the other clans (Vunisea, 1994).

Since Independence, in 1974, Fiji has adopted a Westminster parliamentary system of government while retaining the traditional chiefly system. The modern and traditional systems are linked by village and provincial administrations. A Council of Chiefs, composed of the paramount chiefs, sets policy for general Fijian affairs.

Nowadays, the traditional owners retain their in-shore exclusive fishing rights, but the actual ownership of all territorial waters is held by the National Government (formerly 'the Crown'). The legal question of rights and ownership is complex and sometimes highly charged, and commonly not

well understood by traditional owners (Lagibalavu, 1994). Information on the topic has been difficult to obtain, and official opinion usually closely guarded.

Fishing rights areas

As elsewhere in Melanesia, fishing rights areas (*qoliqoli*) are an integral part of a tribal land-sea 'estate' (*vanua*) that extends from a central watershed seawards, generally to the outer margin of the seaward slope of the fringing reef¹. Fishing rights areas extended from the high-water mark to the outer reef. Areas beyond the reef were not always traditionally owned by the adjacent right-holding group. These fishing rights areas are worked communally. There are 411 *qoliqoli* in Fiji (Kunatuba, 1993), ranging in size from one to 5,000 km² (Cooke, 1994a).

In most cases fishing territories are in the marine waters directly adjacent to a village or group of villages. Also, in former times, because the continual warfare required people to live in fortified villages, most fishing occurred as near as possible to the settlements.

However, many tribal groups have exclusive use rights to territories located far from their adjacent waters. In some instances rights in distant areas are held in addition to those in adjacent waters. Most such distant fishing rights areas are associated with patch reefs or with island-studded shallows, and many are separated from the rights-holding villages by inshore waters belonging to other social groups.

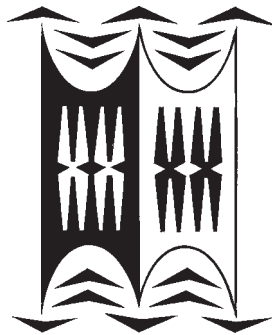
Boundaries

In pre-European contact times, the land and sea territories of Fijian chiefdoms seem not to have been delimited by precise boundaries. Rather they were defined by centres of power (Cooke, 1994a). Nowadays in most cases the lateral boundaries of a sea territory are defined by the projection to the

¹ The comprehensive term *vanua* essentially describes the totality of a Fijian community. Depending on context, it is used to refer both to a social unit and to the territory it occupies, thereby expressing the inseparability of land and people, as well as to the supernatural world and worldview (Ravuvu 1983, 1987).

fringing reef of the lateral watersheds of a group's land holdings. As usual, they are defined by such clearly visible geomorphological features as headlands, islands, river mouth, patch reefs, reef holes or reef channels, and territories of cultural significance (Vunisea, 1994).

In recent years disputes over boundaries have increased. There are several reasons for this. In Verata villages, for example, this has largely been the result of an inaccurately transmitted oral history of the boundaries of rights areas, coupled with the increasing value of the now commercial fisheries using them (Vunisea, 1994). Both natural and man-made changes in the morphology of natural boundary markers are another source of inaccurate recall of historical information. Also, the elders who provided information for the original mapping of boundaries are no longer alive. Thus there is also a perception among villagers that the official maps of their fishing areas are inaccurate, since they do not coincide exactly with the areas that they have historically used.



Acquisition of rights

All Fijians inherit fishing rights as a birthright to the collectively-owned kinship land. The chief of the *yavusa* is usually the rights owner, and he/she has the powers of distribution. Chiefs generally consider themselves to be sole and absolute rights owners (Cooke, 1994a; Cooke, 1994b).

Transfer of rights

Historically, full rights could be granted to immigrants, refugees, military allies, or in-marrying persons of rank. For example, Mago Island, near Vanuabalavu, Lau, was sold in 1861 by the High Chief of Cakaudrove Province to the European who had married his niece. At the same time he made a gift of the inshore waters and turtles to his niece, to ensure her food supply. This gift was entered into the document as an integral part of the sales transaction (Waqairatu, 1994).

Shared rights

The sharing of rights areas by mutual access agreements between or among different *yavusa* is common, especially those in distant areas, as well as by villages linked by close ties of kinship. Thus on the south-eastern coast of Viti Levu, just north of the Rewa Delta, a large area is shared by five groups (Kubuna, Batikasivi, Natodua, Mataisau, and Batiki), and three fishing rights areas on the north coast of Vanua Levu island have been combined (Fong, 1994).

Sometimes a *vanua* will share rights in one area and maintain exclusive rights in another. Thus in the Macuata–Mali–Sasa–Dreketi shared area of northern Vanua Levu, each village maintains an exclusive right to work immediately adjacent waters, whereas all other areas are open to fishers from all four villages, on a secondary rights basis.

Such sharing has deep historical roots. For example Native Lands Commission records of 1899 demonstrate that the *yavusa* Vusaratu, Serua, located on the southern coast of Viti Levu, shared its inshore rights area equally with the people of Tomasi, Serua, Manggumanggua and Korovisilou (Hornell, 1940).

Rights of outsiders

Secondary rights can be granted to neighbouring kinship units to fish at specified times and locations. Today such entry rights are granted, with the applicant making a formal request via the traditional *sevusevu* ceremony, that involves presentation of *yagona* (kava: *Piper methysticum*) root, *tabua* (whale's teeth) and mats. Further, a portion of the catch has to be offered to the rights-owners as compensation.

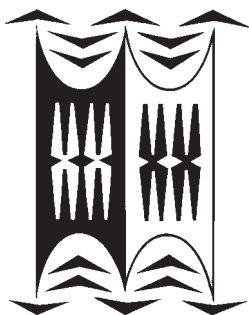
However, nowadays the cash economy has had a major impact on secondary rights formerly granted to neighbours. These have often been revoked, since the fish were being caught for the market and not for subsistence. For that reason the customary rights holder at Dravuni and Bulia, on the northern Great Astrolabe Reef, revoked the ancient agreement whereby Ono Islanders were allowed access, for example (Zann, 1983). As a reaction, groups with historical secondary rights have been pressing for legal recognition of them, although such disputes are still resolved traditionally, through chiefs or at provincial meetings (Zann, 1983).

Qoma Island fishers jealously guard their fishing rights area against outsiders. They are particularly wary of ethnic Indians, since they use gill nets,

which on Qoma can be used but rarely, and only if permission has been granted by the chief (Veitayaki, 1990).

This has led to difficulties. Villagers at Votua, which has the rights at the mouth of the Ba River, have demanded of ethnically Indian fishermen up to F\$500 per annum for entry rights (Kunatuba, n.d.; Zann, 1983).

The law requires that outsiders fishing in customary rights areas must first approach the Native Fisheries Commission, which then instructs the District Officer, of the Ministry of Rural Development, to obtain permission for the fisher from the appropriate *mataqali*. This is the official procedure. But because of the time it requires, it is considered acceptable for the fisher to approach the *mataqali* directly, to obtain the letter of consent, which is then endorsed by the District Commissioner. The Native Fisheries Commission then issues a permit. On payment of an annual licence fee to the Fisheries Division, permission for the outsider to operate is given. It is an open secret that money changes hands during this process, although this is a sensitive topic.



Nested rights

Smaller social groups sometimes have rights to specific areas within the larger communal rights area of a *vanua*. Although these specific areas can be fished by all members of a *vanua* as a primary right, the smaller group has the right to impose temporal closures by taboo, as well as to restrict entry.

For example, in Ucunivanua village, in north-eastern Viti Levu, the three family groups that compose the chiefly clan have three nested rights areas within the communal fishing territory. Only members of those families have the right to impose a temporal closure by taboo in these specific areas on the death of a chief (Vunisea, 1994).

Entry restriction as a conservation measure is practised on the Rewa River fishery at Nadali, Nausori, near Suva. Whereas fishing in the river is open to all members of the *vanua*, lakes and ponds bordering

the river are owned by the neighboring *mataqali*. Persons not members of the *mataqali* are required to seek permission before fishing in them (Vunisea, 1994).

Nested rights seem to have been more widespread in former times. For example, it is likely that gear and species rights were awarded to different families (Hornell, 1940). However, these have not been recorded in official surveys of overall fishing rights areas.

Traditional fisheries management

In pre-European contact times the *yavusa* or *vanua* land-holding unit usually held tenure over adjacent mangroves, lagoons and reefs, together with exclusive ownership of sea-floor, water, marine life and rights of passage. This is unlike land, the rights to which are held by the *mataqali* (Ravuvu, 1983; Fonmanu, 1991). There has been some confusion on this matter in the literature. For example, Iwakiri (1983) erroneously assumed that marine area rights follow land rights in being based on the *mataqali*.

Sea territories were defended to the death against outsiders operating without permission. In pre-European contact times boundaries were in a state of flux owing to conquest and changing alliances, population pressures, marriage and adoption.

Traditional authority

Authority over the fishing rights area is vested in the chief of the *vanua*. Whereas the status is hereditary, succession is not automatic, since chiefs must be elected by the people and installed in office. When the line of succession is broken, chiefly property, like the *qoliqoli*, remains with the original family. Causes of change in the line of succession include preference for candidates with superior education, or the absenteeism of the former chief (Cooke, 1994a).

This can lead to a change in the locus of authority over fisheries area management from the former chiefly line to persons responsible for routine management. For example, at Vitogo when a member of the Vidilo *yavusa* became chief, the fishing rights area remained the acknowledged property of the chiefly family of *vanua* Vitogo. However, the power shift prevented the Vitogo family from exercising their authority over the management of the *qoliqoli* (Cooke, 1994a).

Although in Fiji as a whole the political and economic power of chiefs appears to be increasing, in contrast the traditional respect accorded to them

seems to be declining (Cooke, 1994a). Thus traditional authority might be declining among those chiefs who have not shared in the overall increase in chiefly power and economic benefits, as in remote areas, or among those who have neglected both education and modernisation (Cooke, 1994a).



Traditional authority is also being eroded by urbanisation. Chiefs now often live in town and control their fishing territories from a distance. Where this occurs, villagers increasingly exert their own authority to control fishing, as in Ucuivanua, north-east Viti Levu (Vunisea, 1994). Similarly, new social institutions based on gender, education, religion, or age, for example, have gradually supplanted the role of traditional institutions (Vunisea, 1994).

Throughout most of Fiji, a specialised fishing clan (*gonedau*), also known as *kai wai* in north-eastern Viti Levu (Vunisea, 1994), or *dauqoli* in the Lau Islands, the master fishermen or 'marine resource managers' (Thompson, 1940) were specialist fishermen for the chiefs. They were members of the upper class who managed the fishing grounds, communal fishing activities and turtle fishing, and controlled organised, long-distance fishing trips. Communal fishing by women was managed by the wife or daughter of the master fisherman (Thompson, 1949). The *gonedau* remain responsible for imposing the 100-day fishing taboo following the death of a chief (Zann, 1983). Routine daily management is conducted by each household.

At present, the protection of customary fishing rights and management of fisheries in rights areas is done via a complex arrangement. Responsibility is essentially shared by traditional authorities and various branches of the national government.

Fishing in rights areas is mainly for subsistence, although there is some small-scale commercial fishing to supply urban markets. Subsistence is controlled by the local chief. Both members of the rights-holding group and outsiders may engage in commercial fishing within a rights area provided they obtain an IDA (Inside Demarcated Area) licence. However, members of the rights-holding group are exempted if fishing commercially from the shore with either a spear or a line.

IDA licences are issued by the Fisheries Division. However, before applying, a fisherman must first obtain a permit from the social unit in whose rights area he intends to operate. This is issued by the District Commissioner, if the tribal group consents. Thus the principal authority determining whether commercial fishing can occur is still the traditional authority of the rights-holding group, which both consents or not to commercial fishing and can set such conditions on the licensee as target species, permitted gear, areas exclusion, and conservation rules. However, no legal provision exists for compensating the rights-holding group for harvesting in its area, although it is common knowledge that *sevusevu* or 'goodwill' payments are made.

But this seemingly straightforward modern management of traditional rights areas is, in reality, confused and emotionally charged. A major confusion stems from the convoluted legal framework governing inshore fisheries. Further problems are introduced by the several institutions and agencies that are involved in fisheries management in Fiji. Among these are the Native Land and Fisheries Commission, District Commissioners and Fish Wardens.

The Native Land and Fisheries Commission is under the Ministry of Fijian Affairs and Rural Development. It is responsible for identifying, surveying and registering the traditional fishing rights territories; conflict resolution; and protecting ancestral Fijian rights. Prior to registration of these territories, the boundaries established through the survey must be approved by each social group.

Fish Wardens, honorary officials appointed under the provision of the *Fisheries Act (1978)*, are appointed by the Minister of Primary Industry, usually following a request from a social group. Their task is to enforce the provisions of the *Fisheries Act* and ensure compliance with conditions attached to fishing licences in their community's traditional fishing rights areas.

Sanctions

Traditionally, trespassers were subject to physical violence and their catches were confiscated by the rights-holding villagers (Kunatuba, n.d.). Boats and gear are also destroyed (Zann, 1983).

As is widespread in the Asia-Pacific Region, in Fiji infringement of fishing rights is thought to incur supernatural punishment. According to Vunisea (1994), in Ucuivanua village, northern Viti Levu, supernatural punishment is feared much more than sanctions imposed under modern law.

Nowadays the question of sanction is sensitive, owing to the legal uncertainty of owners' rights. For example, Zann (1983) reports that politically and traditionally important high chiefs have been taken to court and charged with the illegal confiscation of a poacher's gear.

Traditional conservation

Traditional attitudes and behaviour toward land and sea have assisted in resource conservation, based on the spiritual affinity with the natural environment, as expressed in the terms *na qau vanua* (lit. 'the land which supports me and to which I belong'), or *na vanua na tamata* (lit. 'the men are the land').

Certain taboos protected marine animals and reefs. Of these probably the most important was the taboo on the consumption of turtles by commoners. But social factors, and particularly the need for large quantities for ceremonial feasts, may have contributed to the former over-exploitation of turtles (Zann, 1983; Kunatuba, n.d.).

Live storage of excess catches was practised (Kunatuba n.d.). There are also 100-day taboos imposed after the death of a chief, as well as those associated with birth and marriage (Ravuvu, 1983).

At Ucuivanua, in north-east Viti Levu, the wives of members of the fisher clan were forbidden by taboo to fish while their husbands were away on an organised fishing expedition (Vunisea, 1994). Since expeditions could last for up to three months, this would function as a conservation device on the species fished by women. However, that seems not to have been the intent of the taboo, since it is believed that fish are naturally replenished every year, so there is no need for conservation management (Vunisea, 1994).

Temporary closures of a year or more are sometimes imposed by taboo to allow overfished stocks to recover. In the Ba area this is done particularly

for rabbitfish, baitfish and *bêche-de-mer* stocks. Such closed areas are demarcated by poles or leaves on the reef. Taboos are also used to reduce blast fishing, as well as to protect mangroves from being burned (Cooke, 1994b).



Commercial demand more than subsistence is now driving inshore fisheries. This has been reinforced by modernisation of fishing boats and gear, and recurrent costs of marketing, all of which reinforce the demand for cash and so the fishing effort. In addition, market forces weaken the conservation ethic by encouraging deleterious fishing methods (e.g. night diving) and encouraging fishing for under-sized fish for home consumption (Vunisea, 1994).

The dual system of fisheries management

As in many other formerly colonised nations, the inshore waters of Fiji are subject to a dual system of ownership, under both customary law and statutory law, that reflects the legal system introduced by the former colonial administration. Thus in Fiji tribal units own their traditional fishing rights, whereas the state owns the land beneath the sea from the foreshore below high watermark to the limit of the Exclusive Economic Zone (EEZ).

This dual arrangement has been a source of often great confusion. That they are limited to owning just fishing rights in their rights areas seems not to have been fully understood by Fijians (Waqairatu, 1994). Misunderstanding over the question of legal ownership of marine resources has persisted for 120 years, since the Deed of Cession was signed by many Fijian chiefs.

The case of Fiji is interesting because there exists a documented record of a clash of legal traditions. It also demonstrates attempts by local colonial officers to undermine traditional management in favor of expatriate entrepreneurs and in defiance of the expressed wishes of the British Crown and the unambiguous orders of the metropolitan government (Ruddle, 1994).

In 1874, when Fiji was ceded to the British Crown, the question of customary resource rights was of major concern to the High Chiefs, most of whom wanted to attach conditions regarding their land and fishing grounds before agreeing to the cession of the country. However, Robinson, the British representative, reassured them by explaining that Queen Victoria '... was willing to accept the offer of cession . . . but that conditions attached to it would hamper, and might even prevent, the good government of the country' (Derrick, 1946: 248). The High Chiefs agreed, but it was apparent that they expected to have their lands and waters returned, in accordance with Victoria's 'generosity and good faith' (Derrick, 1946: 248).

Detailed instructions regarding the verification and simplification of Fijian land titles of lands to be held in trust for the Fijians were given to the British Governor of Fiji by the Secretary of State for the Colonies.² No similar clear statement was made respecting their reefs, so the chiefs sent two letters to Queen Victoria expressing anxiety over their apparent loss of reef ownership.

In response, Kimberley, then Secretary of State for the Colonies, wrote to Des Voeux, Governor of Fiji, instructing him that he (Kimberley) had been commanded by Queen Victoria to inform the chiefs that Des Voeux was to investigate the entire matter, '... and that it is Her Majesty's desire that neither they nor their people should be deprived of any rights which they have enjoyed under their own laws and custom'.³ In another dispatch Kimberley further instructed Des Voeux to:

'... examine into the statements now advanced by the chiefs, and if you are satisfied that these reefs are the recognized property of native communities . . . , or that they are required for the use and occupation of some Chiefs or tribe, you will take such measures as may be necessary to secure to the rightful owners the possession of their respective reefs and to effect the registration of them under the Ordinance relating to native lands; in the same way as other lands (not covered by water) which are the property of the different mataqali. . . .'⁴

'If there are any reefs not claimed as the property of any Native Chiefs or Community they will continue to be the property of the Crown together with the other lands which became vested in Her Majesty under the terms of the Deed of Cession'.

Thus clearly it was both the policy and the intention of both Queen Victoria and the British Government that, according to customary law, the reefs and fishing grounds would be owned by Fijians, just like the land. In November 1881, Des Voeux conveyed equally unambiguously the contents of those two dispatches during his opening address to the Council of Chiefs. He added that the *mataqali* would obtain the reefs that belonged to them.⁵ This reassured the chiefs.⁶

However, neither royal command nor the official British Government policy was ever implemented. Apparently nothing was ever done to follow up Des Voeux's statement of November 1881.



² Despatch No. 1, March 4, 1875.

³ Despatch No. 69, June 2, 1881.

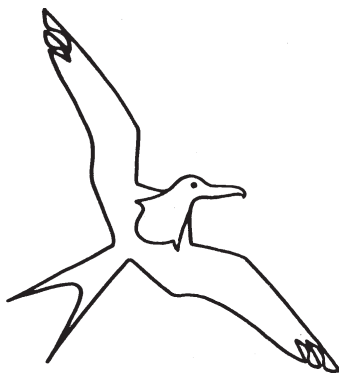
⁴ Despatch No. 71, June 2, 1881.

⁵ A *mataqali* is 'an agnatically related social unit—usually a lineage of the larger clan' (*yavusa*) (Ravuvu, 1983:119).

⁶ Proceedings of the Council of Chiefs held at Nailaga, Ba, November 1881, p. 32.

The Native Lands Commission was unable to devote time and personnel to marine matters. This renegeing on royal wishes and official policy is exemplified by the behavior of Thurston, Acting-Governor, who in 1886 wrote to the Secretary of State for the Colonies that:

'It has been the habit of natives of this Colony to claim as absolute and exclusive, a proprietary right in the reefs . . . and in some cases this has led to pretensions that could not be recognised It is however inconsistent with the altered conditions of the country that any exclusive rights of the nature indicated can be enjoyed by one class only of Her Majesty's subjects'.⁷



Further, in 1886 Thurston also opened the bêche-de-mer fishery to non-Fijians, in the interests of the export economy and under strong pressure from the colonists. This was accepted by the chiefs as a temporary measure applying to only the outer reefs. But in 1887 the new Governor, Mitchell, opened all reefs to bêche-de-mer fishing, in the interests of the economy.⁸

Further, the *Rivers and Streams Ordinance* (1882) was interpreted to mean that the private fishing rights of Fijians in all rivers and streams had been abolished and that these rights belonged to the Crown.⁹ Colonial officials were of the opinion that there were no longer exclusive tribal fishing grounds.¹⁰

In 1958, 77 years after Des Vouex's pledge of 1881, a Native Fisheries Commission was formed! By the *Fisheries Act 1942* (Cap 158) it was charged with:

1. Ascertaining the customary fishing rights in each province of the country and identifying the hereditary and rightful owners of the rights; and
2. Making a written record of the boundaries and situation of the rights areas and the names of the communities claiming ownership rights to them (Waqairatu, 1994).

Between 1958 and 1967 staff of the Native Lands Commission conducted the requisite investigations and recording of information.

The Native Fisheries Commission was also charged with preparing a *Register of Native Customary Fishing Rights*, and of transmitting these for title registration. Although registers were prepared in 1960 for the provinces of Rewa, Serua and Namosi, the titles were not registered, owing largely to boundary disputes. There was a clear need for precise boundary definition (Waqairatu, 1994).

From 1986 the Hydrographic Unit of the Marine Department became involved in a pilot survey of fishing rights area boundaries in seven fishing rights areas on the islands of Beqa and Yanuca. Based on this survey, in 1990 cabinet approval was received to recruit technical staff to the Native Fisheries Commission to complete the survey and registration nationwide. It was planned to complete the fieldwork by the end of 1994 (Waqairatu, 1994).

The procedure followed (Waqairatu, 1994) is:

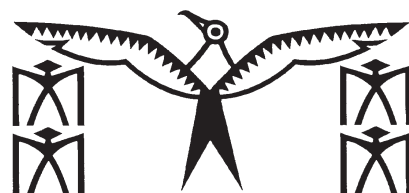
1. Base maps are constructed from hydrographic marine charts and 1:50,000 topographic maps;
2. To supplement earlier written descriptions, in the field rights owners indicate the landmarks used traditionally to delimit their boundaries;
3. Marine Department hydrographers then survey these points;
4. The hydrographers' survey calculations are then drafted on a map and submitted for approval to the Chief Hydrographer and the Chairman of the Native Lands Fisheries Commission;

⁷ Despatch No. 24, February 17, 1886.

⁸ Despatch No. 87, June 13, 1887.

⁹ Colonial Secretary's Office 3114/1891.

¹⁰ Colonial Secretary's Office 1304/1893.



5. Based on the approved plans, areas are described, and the documents sent to the Registrar of Titles for registration;
6. Duplicates of the registered titles are forwarded to the respective rights owners; and
7. Rights owners have a 90-day appeal period, after which the registration is final and can no longer be appealed.



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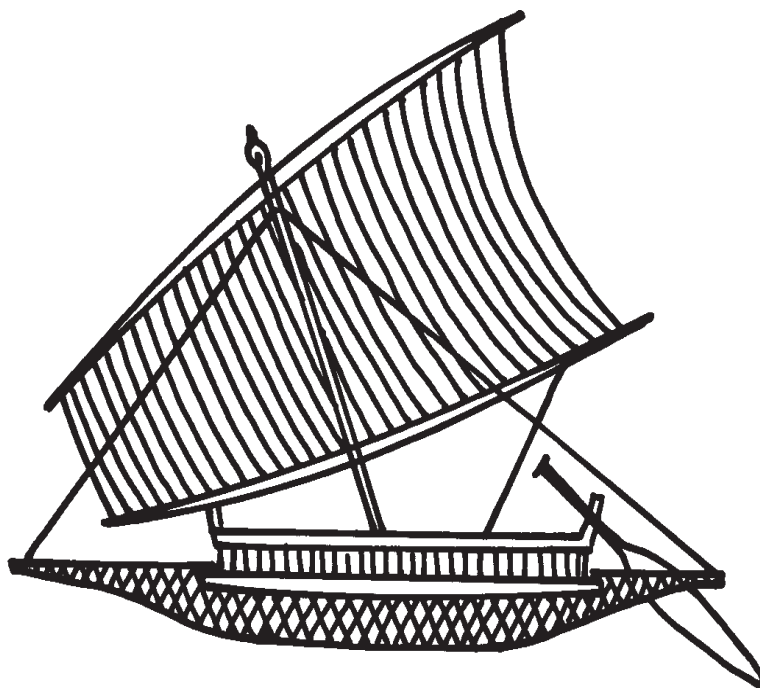
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The marine realm and the Papua New Guinean inhabitants of the Torres Strait

by Donald M. Schug

This article is adapted by the author from his recently completed Ph. D. dissertation: 'The marine realm and a sense of place amongst the Papua New Guinean Communities of the Torres Strait,' University of Hawaii at Manoa.

Abstract

Field research reveals that the sense of place the Papua New Guinean communities of the Torres Strait hold with respect to the offshore seas and reefs has many spatial, temporal and social facets. The feeling of connectedness that people have toward the marine realm is not limited to village-or clan-held marine territories; it encompasses the entire Torres Strait and all within it. Local communities perceive a continuity from the past to the present. Their concept of tradition incorporates their long involvement in commercial fishing, both as contract laborers and independent producers, as well as local perceptions of pre-colonial patterns of marine use. The marine environment represents a multiple reality for the various island, coastal and inland social groups that comprise the indigenous population of the Torres Strait region. Community-based marine resource management will succeed only after opportunities are created for communities to communicate to each other their different values, goals and aspirations with regard to the Strait and its resources.

Introduction

The Torres Strait is a gap approximately 150 km wide between the Australian Continent and the island of New Guinea through which the Coral and Arafura Seas meet. The Strait is home to several thousand people residing on both sides of the international border separating Australia and Papua New Guinea.

While the close relationship of the Torres Strait Islanders, the Australian indigenous inhabitants of the Strait, to the region's islands, cays, reefs and seagrass meadows is well documented (e.g., Johannes & MacFarlane, 1992; Nietschmann, 1989), much less has been written about the ways in which the various Papua New Guinean communities along the northern shore of the Strait relate to their marine environment.

In 1993, field research was conducted to try to capture the subjective understandings and emotional attachments the Papua New Guineans of the Torres Strait region possess with regard to the marine realm. This paper provides an overview of the study findings and places them in broader debates among social scientists in Oceania regarding the spatial aspects of customary marine tenure, conceptions of tradition and representations



of the indigenous viewpoint. Specifically, the discussion centres on the advantages of adopting a broad spatial, temporal and social perspective when defining and clarifying a people's relations to the natural environment.

Defining a people's relations to the sea

Through an examination of local accounts of key historical events and experiences, the study revealed that the sense of place that the inhabitants of the northern coast of the Torres Strait hold with respect to the offshore seas and reefs has many spatial, temporal and social facets.

For the majority of communities a sense of place is ultimately rooted in shared notions about the origins of distant ancestors and their deeds. Oral histories, songs and place names preserve and celebrate the memory of these forebears and maintain the bond between people and their ancestral domains from generation to generation.

The reefs and other natural features of the Strait represent for some social groups the handwork of their earliest ancestors. They stand as a testament to the great power and knowledge possessed by these individuals.

Today, the sea and its life forms continue to play an essential role in the spiritual lives of local residents. Although many ceremonies and rituals associated with the sea were abandoned following the arrival of

Christian missionaries and colonial officials, the marine realm remains an important medium through which people connect with the metaphysical.

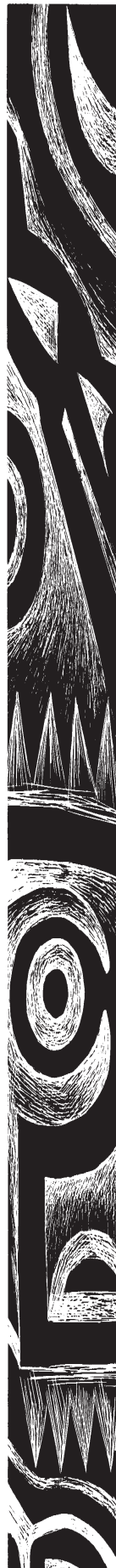
The traditional ceremonies and rituals conducted by island and coastal communities during the hunting of dugong and turtle have been recorded in detail by Haddon (1935), Landtman (1927), Parer-Cook & Parer (1990) and others.

The present field study revealed that the sea also holds much spiritual and symbolic meaning for members of inland villages within the Torres Strait region. The oral histories of inland groups are replete with tales of extensive sea journeys made by distant ancestors. Moreover, inland groups have long used particular marine products such as dried dugong skin in agricultural ceremonies and healing rituals. The residents of villages more than 50 km inland regularly obtain pieces of dugong skin through trade links with coastal villages.

For both inland and coastal communities the reefs and shoals of the Torres Strait are also a tangible memorial to the deeds and travails of more recent ancestors, including those who were involved in the early pearl-shell and bêche-de-mer fisheries.

The many local young men who worked as contract labourers aboard luggers owned by Anglo-Australians, beginning in the late-nineteenth century, are revered for their courage and the hardships they endured. As with more distant ancestors, the memory of these individuals and their experiences is embodied in songs, place names and spoken narratives as well as in the landscape itself.

From an economic perspective, the marine resources of the Strait are viewed by local residents as a vital source of sustenance. In pre-European contact times the sea provided items for personal use and for trade within and between communities. After the arrival of Europeans the sea assumed



an added economic dimension. It provided the means of acquiring a totally new array of goods including iron tools, cloth and tobacco. The cash-earning activities involved in procuring these goods were integrated into pre-colonial social relations and patterns of resource use.

For more than a century local residents have been involved in commercial fishing, and the act of earning a livelihood in the marine industry is regarded today as an integral part of their heritage; it is the trade of their ancestors. Today, many communities remain almost completely dependent on the harvest of marine products for cash income and long-term economic security.

The assertion of customary rights over marine areas and resources continues to take place within a particular, localised cultural framework. In some cases, groups claim customary rights on the premise that their ancestors were the original inhabitants and/or users of particular land and sea areas. They reaffirm their relationship to these areas by invoking myths and songs that tell of journeys made by ancestors across the landscape and by routinely visiting the areas for economic and ceremonial purposes.

The matrix of social relations among island, coastal and inland communities in the region and a mutual sense of reciprocity and sharing also continue to be important factors underlying access to and use of marine resources. The collections of meanings that clans and communities attach to the Torres Strait landscape define the distinctive historical relationships that various social groups have to the marine realm and thereby contribute to the separate identities of these groups. At the same time, however, a network of social ties binds groups together and creates a web of obligations to share territories and resources.

The spatial character of customary marine tenure

Since the late 1970s, there has been a growing literature describing various systems of customary marine tenure in Oceania (e.g., Ruddle, 1994). Much of the literature concerns cases in which a social group exercises a set of exclusive rights to harvest the resources contained within defined marine boundaries (see, for example, the review by

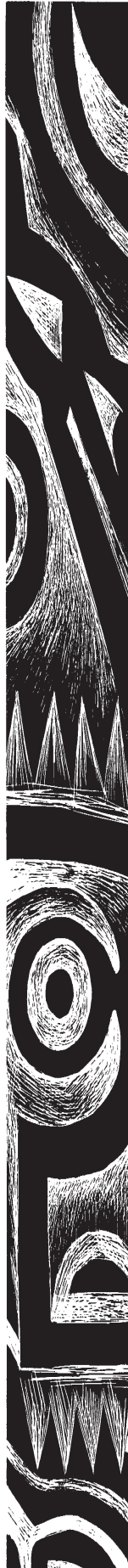
Ruddle, 1988). The lateral boundaries of marine territories claimed by individuals, families, clans or villages are often seaward extensions of the borders of land holdings, but in some instances marine boundaries are influenced by the location of physical marine features, such as patch reefs, reef holes and reef passages, that could be used for demarcation purposes (Iwakiri, 1983; Ruddle, 1988).

The spatial aspect of customary marine tenure is of specific interest to researchers because of the important role well-defined boundaries are reported to play in the creation or maintenance of local property institutions that encourage sustainable resource use (Ostrom, 1990). Pomeroy (1994), for example, states that boundaries enhance fishers' sense of control over a shared resource and the likelihood that they will work to sustain its use over the long term.

While this may be true, the present study found that the relationship between communities and the marine environment may not necessarily be confined to clearly demarcated areas over which groups attempt to exercise exclusive fishing rights.

To be sure, the residents of several coastal communities within the study area have long claimed exclusive use rights over specific reef areas, and the rights holders regard their marine territories as a fundamental element of their relationship to the sea. But the feeling of connectedness that people have toward the marine realm is not limited to these seaward extensions of village or clan estates; one could argue that it encompasses the entire Torres Strait and all within it.

This sense of holistic attachment to the sea may be neglected if researchers concentrate solely on the importance to local residents of marine territories with clearly demarcated boundaries. In short, the study find-



ings suggest that customary marine tenure should be defined in broader spatial terms.

Among the examples uncovered in the field study of attachments to the Torres Strait which extend beyond clan or village-held marine territories is the sacred quality with which social groups imbue the marine landscape. Particular marine sites in the Strait have special religious significance, but local oral histories suggest that the spiritual essence of ancestral figures is diffused over a much broader area that has indefinite boundaries. In effect, the power and personality of distant ancestors pervades the entire Torres Strait as a result of their acts of creation and maritime odysseys.

The study also demonstrates that residents' feelings of connectedness to the Torres Strait are related to the complex network of social ties that link members of widely-dispersed coastal, inland and island communities. This geographically and socially broad web of interpersonal relations fosters a feeling of identity with the entire region. The sense of social unity and regional identity has been reinforced by centuries of trade exchange, intermarriage, sharing of land and marine territories and other forms of social interaction among communities.

Today, some of these interactions exist mainly as nostalgic memories, but they continue to exert an important influence over the way in which the inhabitants of the northern border of the Torres Strait perceive their relation to the Strait as a whole. An informant from one coastal village, for example, remarked that he had become a Papua New Guinean by an act of international politics, but he still considered himself first and foremost to be a 'Torres Strait man'.

A third facet of local residents' relations to the Torres Strait that encompasses an area greater than exclusively-held marine areas is centered on the assortment of marine-related activities residents pursue. Particularly significant is the long tradition of extended voyages to outlying areas for fishing, both commercial and subsistence, and for trade.

These voyages have always had an importance apart from their utilitarian value. They present an opportunity for individuals to demonstrate their skill, courage and endurance as they earn a livelihood in what at times is a

dangerous environment. While much fishing activity is confined to particular marine territories, an important part of the allure of 'wresting a living' from the sea is the freedom to range over the length and breadth of the Torres Strait. This attraction is apparent in reminiscences of trips aboard large double-outrigger canoes and pearling luggers prior to the Second World War and to some extent in anecdotes of contemporary fishing and voyaging activities.

Finally, a fourth dimension of the relationship between people and the Torres Strait that is not limited to territories with well-defined borders concerns local perceptions of certain marine species indigenous to the Strait.

Many social groups regard animals such as dugong and turtle not just as economic resources, but as beings to whom they are spiritually related. These far-ranging animals are viewed as an integral and inseparable part of the marine landscape and a fundamental element of local culture. As symbols of the region the indigenous fauna extends and deepens the emotional attachment local residents feel toward the entire marine sphere of the Torres Strait.

In summary, the interests of maritime communities in their marine environment may extend far beyond the boundaries of 'home reefs' or even distant fishing grounds. These aspects of cultural connections to the sea may be overlooked or under-emphasised by researchers, as they cannot be easily delimited, mapped and displayed. Yet, these connections may be essential elements of a people's relations to the marine realm, and their inclusion in field studies can enrich investigations of customary marine tenure.

As competition for the Torres Strait's commercially valuable marine resources increases, it is likely that individuals and groups will invoke various spatially-broad connections to the region to justify and legitimise their claims of marine resource use rights



in distant areas. Catch data indicate that most of the harvesting effort in the crayfish fishery already occurs outside village-held marine territories. This trend suggests that a marine resource management regime that endeavours to provide for the full and direct participation of local communities must encompass an equally broad geographical area.

Conceptions of tradition

The concept of tradition in contemporary Pacific island societies has lately been the subject of much scholarly interest and discussion. In a recent issue of *Oceania* devoted to the topic, Linnekin (1992: 251) states that the view that tradition is a 'passively and unreflectively inherited legacy' is being challenged by scholars who define tradition as a 'selective representation of the past, fashioned in the present, responsive to contemporary priorities and agendas, and politically instrumental.'

In a discussion of the relationship of Torres Strait Islanders to the marine environment, Nietschmann (1989: 91) argues in favor of defining tradition in relativistic terms by quoting the Samoan author Albert Wendt (1978: 1):

Is there such a creature as '*traditional culture*'? If there is, what period in the growth of a culture is to be called 'traditional'? If 'traditional cultures' do exist in Oceania, to what extent are they colonial creations? What is authentic culture? ... Should there be *one* sanctified/official/sacred interpretation of one's culture? And who should do the interpreting?

Tradition, concludes Nietschmann (1989: 91), should be taken 'to mean what is self-referentially identifying, not necessarily just what once was.'

As stated earlier, members of the Papua New Guinean communities of the Torres Strait regard their long and continuous involvement in commercial fishing, both as wage labourers and as independent producers, as part of their cultural heritage.

To substantiate their claim that commercial fishing is a traditional activity, local residents point to the fact that for more than five generations they have used introduced vessel

types and fishing gear to harvest marine products for international and local markets. Indeed, historical documentary material suggests that these communities were involved in commercial fishing prior to the annexation of the fishing grounds of the northern Torres Strait by Queensland in 1879.

The local belief that fishing for cash income may be traditional conflicts with the way in which the 1976 Torres Strait Treaty defining the border between Australia and Papua New Guinea chose to define what is and is not traditional.

Under Article 11(1) of the Treaty, the Strait's Australian and Papua New Guinean indigenous inhabitants are allowed to continue to exercise customary rights of access to and usage of land and marine areas in the region for the purpose of pursuing traditional activities.

The Treaty stipulates that 'traditional' is to be interpreted broadly and in accordance with prevailing custom *except* in relation to activities of a commercial nature (Article 1(k)). In effect, the Treaty employs the word 'traditional' as a synonym for non-commercial and suggests that an economic state that existed in the pre-colonial past has been sustained by the indigenous inhabitants of the Strait.

For the Papua New Guinean communities of the Torres Strait, acceptance of the term 'traditional' as it has been defined by the Torres Strait Treaty would mean forfeiting their claim to rights to fish commercially in the Strait south of the fisheries jurisdiction line.¹

The line was not conceived through consultation with the indigenous inhabitants of the Torres Strait and has no basis in customary demarcations of marine territory. Given the economic dependency of local communities on commercial fishing, it is likely that this aspect of the Treaty will remain a contentious issue.



By stopping short of considering even the sale of marine products between customary exchange partners as 'traditional' the Treaty has created an unstable situation. As Mfodwo and Tsamenyi (1993: 25) note:

The tendency of separating traditional fishing in the core sense from commercial fishing under the *Torres Strait Treaty* framework is unsatisfactory. Whilst for purposes of analysis traditional fishing may be separated from commercial fishing, in practice, there is no such easy separation. It is increasingly difficult to identify what is traditional in some pure sense as opposed to what is non-traditional or commercial. The whole project of protecting traditional interests in some pure sense will thus probably become more and more difficult to achieve.

In other situations, members of local communities have also made selective use of the term 'traditional' to further their own economic and political agendas. For example, in the mid-1970s the Papua New Guinea government declared dugong a 'national animal', which meant that they could be hunted and used in traditional ways but could neither be sold nor hunted by modern methods.

Some residents of coastal villages in the Strait objected to the ban on commercial hunting of dugong on the grounds that they had been selling dugong meat in local markets for decades and they now regarded it as a traditional practice.

Hudson (1986) notes that most of the individuals who were involved in the lucrative netting of dugong were comparatively wealthy and of high social status. At a time when money earned from selling dugong was a particularly important source of income, these politically influential individuals argued successfully that the government should grant the coastal villages an exemption from the ban.

One of the merits of applying a historical approach to the study of human-environment relations is that it provides for a

¹ Under the elaborate catch-sharing arrangements provided for in Article 23 of the Torres Strait Treaty, Papua New Guineans may fish commercially in the part of the Strait under Australian jurisdiction provided they have an Australian endorsement of their commercial fishing licences and *vice versa*. To date, the catch-sharing arrangements have conferred direct economic benefits only on the few indigenous inhabitants with sufficient capital and management expertise to operate large-scale fishing enterprises.

clearer understanding of the basis for present-day patterns of resource use in communities. The Papua New Guineans of the Torres Strait perceive a continuity from the past to the present. Their sense of tradition is flexible and dynamic and achieves a blend of indigenous and European ways of life.

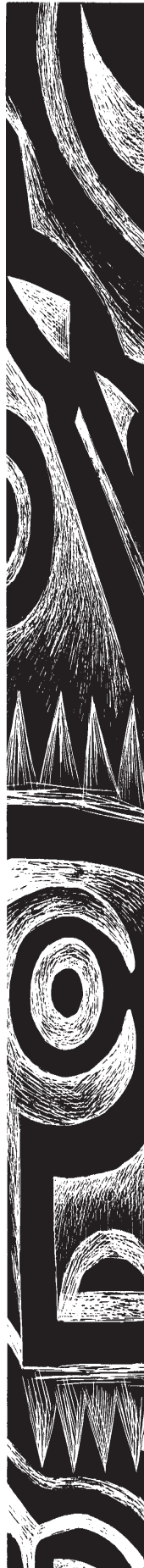
These findings suggest that any effort to fashion a community-based marine resource management program for the Torres Strait must proceed on the premise that local residents are fully integrated into a monetary economy. The harvesting pressure on marine resources is likely to continue to intensify as demands for cash for local infrastructure, customary exchange, church, education and commodities increase.

The indigenous viewpoint

Since the late 1960s, the plight of self-proclaimed indigenous people has developed into a major international human rights issue (Bodley, 1990). Among the key concerns of indigenous populations in the post-colonial era is the recovery of the subjective meanings that geographical areas hold for them. As Jacobs (1993: 104) notes: 'For the colonized, loss of local place is a consequence of imperialism and part of the insurgent act of reclaiming rights is the search and restoration of place lost.'

Efforts to 'return control over the meanings of place to the rightful producers', to use Rodman's (1992: 644) phrase, often presume that the indigenous inhabitants of a particular region share a common set of perspectives and values regarding their environment. But as Rodman (1992) herself notes, a single physical landscape may shape and express different meanings for different users. Linnekin (1992: 258) states that the fact that 'indigenous' may not be an undifferentiated category poses a dilemma for researchers:

... 'native advocacy' is a problematic strategy when scholars may have to choose which indigenous group or faction to champion By assuming 'a' single indigenous perspective and voice the native



advocacy position risks lapsing into a patronizing and unthinking brand of Orientalism that simply replicates colonial categories ...

The 1976 Torres Strait Treaty reflects a concern for the rights of indigenous people by recognising 'the importance of protecting the traditional way of life and livelihood' of the Torres Strait's indigenous inhabitants (Preamble).

Article 12 of the Treaty explicitly requires the parties to preserve the traditional customary rights of access to and usage of land and marine areas held by the various communities in the Strait, provided that those rights are acknowledged by other communities within the region to be in accordance with local tradition.

However, at the time the Treaty was drafted there was no reliable account of what such rights, if any, might exist (Anderson 1981: 67). More, little attention was paid to the differences in the way separate island, coastal and inland communities relate to the Torres Strait and its resources and the various economic and political circumstances that have created conflict among these communities.

Despite the long-standing cultural and kinship affiliations among the different social groups in the Torres Strait region, it is likely that communities have been engaged in disputes over the ownership of territory and resources for centuries.

Recent regional events, such as the political sovereignty movement of the Torres Strait Islanders and the migration of people from the Fly River estuary to the Provincial capital of Daru in search of employment, have brought these conflicts into sharper focus. Ethnic differences, intensified by decades of exposure to different levels and types of external social forces, have come to the forefront as various groups attempt to extend their economic and political control over a limited resource base.

While the Torres Strait Treaty goes a long way toward protecting the rights of indigenous inhabitants as a whole, it does not go far enough in providing for the

resolution of disputes between different segments of the indigenous population (Rentin, 1991).²

Commentary by outside scholars, acting as indigenous rights advocates, may, in some cases, have had the unintended effect of exacerbating the divisions between the indigenous inhabitants of the Torres Strait. For example, a recent study of the customary sea rights of Torres Strait Islanders by Smyth (1993) neglects to mention the points of view of the Papua New Guinean indigenous inhabitants of the Strait.

Discussions (e.g., Lawrence, 1991) which have dealt with the concerns of Papua New Guineans in the context of the 1976 Torres Strait Treaty and other regional issues have tended to centre on the interests of the coastal villages. Yet, as shown in the present field study, various inland groups also claim a relationship to the Torres Strait that is complex and extensive.

By championing the causes of only certain segments of the indigenous population, researchers may inadvertently perpetuate economic and political inequalities in the region.

The findings of the field study suggest that policy makers and scholars should exercise caution in treating the indigenous population of the Torres Strait as a homogeneous entity. A more effective and equitable course is to actively seek out multiple perspectives on the use, value and meaning of the landscape (see Rocheleau et al., 1995).

The finding of the field study that the marine environment represents a multiple reality for the diverse social groups that comprise the region's indigenous inhabitants demonstrates the importance of reinforcing a level of mutual understanding and trust among groups.

Unless avenues for transcending local rivalries and disputes are established it is



unlikely that a community-based marine resource management strategy could succeed. As Hough (1988: 132) notes with specific regard to reconciling the divergent interests that are often represented in the management of a conservation area:

In order to resolve conflicts effectively, it is normally necessary to bring all the stakeholders, or their representatives, together with a view of promoting a joint understanding of the various perspectives and positions of each. If some involved parties are inadvertently left out of consideration or otherwise excluded from this process, their later actions may destroy the accords that have been reached.

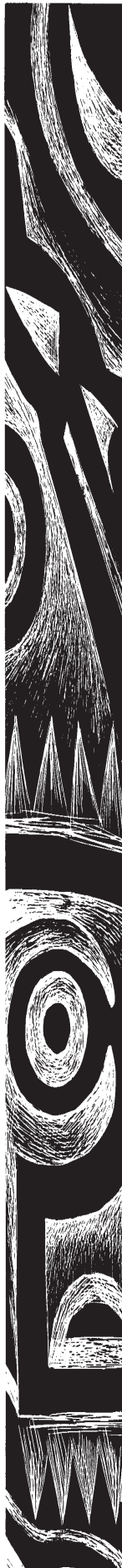
In short, conservation on a regional scale can begin in the Torres Strait only after opportunities are created for communities to communicate to each other their different values, goals and aspirations with regard to the Strait and its resources.

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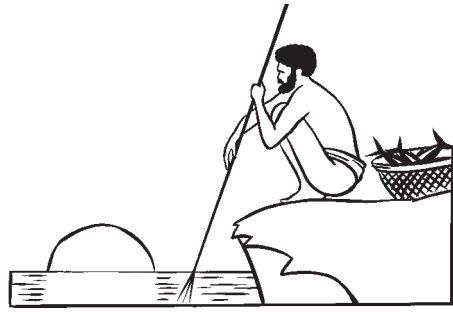
² The administrative apparatus of the Torres Strait Treaty provides for periodic consultations with the indigenous inhabitants, but as Mfodwo and Tsamenyi (1993) note, the approach to protection of traditional rights taken by Australia and Papua New Guinea requires that Treaty objectives be achieved through the two national governments rather than through the local communities themselves. The authors conclude that 'the traditional inhabitants have a subordinate if not marginal position within the Treaty regime' (Mfodwo and Tsamenyi, 1993: 3).

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TRADITIONAL MARINE RESOURCE MANAGEMENT AND KNOWLEDGE

RECENT PUBLICATIONS



Collaborative and community-based management of coral reefs: lessons from experience

Collaborative and community-based management of coral reefs: lessons from experience. A.T. White, L.Z. Hale, Y. Renard and L. Cortesi (eds.) 1994. Published by Kumarian Press Inc., 630 Oakwood Avenue, Suite 119, West Hartford, Connecticut 06110-1529, U.S.A. xiv, 130 pp. US\$21.95. Paperback.

An outgrowth of the *7th International Coral Reef Symposium*, held in Guam in June 1992, this book examines the role of community responsibility and authority in the management of coral reef ecosystems.

It presents cases of local communities and other stakeholders who interact with coral reefs in a manner consistent with the ecological and physical requirements of reef ecosystems. The processes by which a balanced ecological relationship was achieved between the human users of reef resources and the reef ecosystem are highlighted.

The case studies were selected to demonstrate a range of management problems to which creative solutions based on community involvement were sought.

Although none have a Pacific Island content, nevertheless the cases provide useful insights for the region into how the efforts of communities, local and national governments, and non-government organisations (NGOs) can achieve sustainable management of coral reefs.

This volume is organised into four parts. In the first the general problems of coral reef management are examined, as are the reasons for the failure of past approaches. In Part 2, six detailed case studies are presented. Examples of other coral reef management and conservation projects are presented in Part 3. Part 4 is a practical guide to establishing management systems. It also distils the general lessons learned from the case studies and experiences presented in Part 2.

The six case studies are:

1. 'Tracking *Sasi*: the transformations of a Central Moluccan reef management institution in Indonesia' (C. Zerner);
2. 'Community-based coral reef and fisheries management, San Salvador Island, Philippines' (D.Y. Buhat);
3. 'Using education to stop destructive fishing practises: a partial success in several communities' (M.C. Pajaro);
4. 'Community involvement in coral reef monitoring for management in the insular Caribbean' (A.H. Smith);
5. 'Coral reef protection in Phuket, Thailand: a step toward integrated coastal management' (L.Z. Hale & M.H. Lemay); and
6. 'Reef mooring buoys and reef conservation in the Florida Keys: a community and NGO approach' (D. Quirolo).



The *Qoliqoli* of Fiji: management of resources in traditional fishing grounds

The Qoliqoli of Fiji: management of resources in traditional fishing grounds. Andrew Cooke. 1994. M.Sc. thesis, Department of Marine Sciences and Coastal Management, University of Newcastle-upon-Tyne, U.K. 166pp. maps.

The study was undertaken to examine the nature and functioning of Customary Fishing Rights Areas (CFRAs) in areas of moderate to high fishing pressure, near population centres in the three regions of Ba–Lautoka (north-western Viti Levu), Kubuna–Verata (south-eastern Viti Levu) and Labasa (northern Vanua Levu). The case for co-management was also examined and a technique for the preliminary appraisal of CFRA management developed.

The historical, political and legal context of CFRAs in contemporary Fiji is described and the level of commercial and subsistence fishing pressures assessed for the three regions. The main body of the thesis deals with management systems and the technique used in their appraisal. (Detailed

appendices present the results of the questionnaire survey conducted.) The final section makes policy recommendations.

For further information please contact Mr Andrew Cooke, 19, Darville Road, London N16 7PT, UK. (Fax: (44) 71 2498127).



Traditional marine tenure and sustainable management of marine resources in Asia and the Pacific

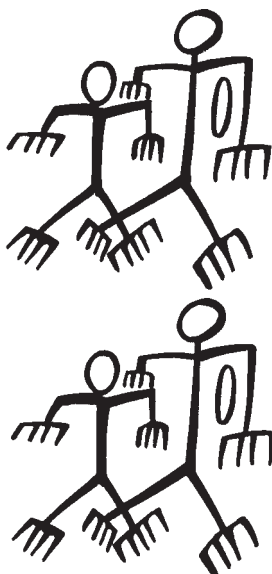
Traditional marine tenure and sustainable management of marine resources in Asia and the Pacific. Edited by G. Robin South, Denis Goulet, Seremaia Tuqiri and Marguerite Church, ISBN 982-01-0241-3. International Ocean Institute—South Pacific, Suva, Fiji. viii + 318 pages.

This idea for this workshop arose during the course of a 1992 study tour of ASEAN countries organised by the Western Pacific Fisheries Consultative Committee and the South Pacific Commission, and sponsored by the Canadian International Development Agency and the Government of France (H. Walton & G.R. South 1992: *Report of the Study Tour of ASEAN Fisheries Education and Training Institutes for Pacific Island Nation (PIN) Officers*. Western Pacific Fisheries Consultative Committee, Manila).

It was realised that there had been little if any exchange between ASEAN and Pacific Island countries concerning traditional marine tenure (TMT) and, furthermore, that the extensive knowledge base was barely if at all incorporated in training and educational programmes.

Traditional marine tenure systems are well developed in the Pacific Islands, and the extensive knowledge about them has been the subject of intensive study in some countries, as the papers presented in this workshop reveal.

The importance of incorporating knowledge of traditional marine tenure into integrated coastal and fisheries management systems is now well recognised: what this workshop also attempted to do is to provide overviews of TMT that can be usefully incorporated into the curriculum at secondary and tertiary levels. The presentations are arranged as full papers; in addition, participants provide commentaries and there are case studies from Fiji drawn from on-going research projects.



Discussions are found throughout the report, and an overview of the workshop is provided by Professor Ron Crocombe. A series of recommendations is included, resulting from a drafting committee chaired by Dr Robert Johannes.

Major papers includes :

Kenneth Ruddle:
Traditional marine tenure in the 90s;

Maria Mangahas:
Traditional marine tenure and management in ASEAN;

Leon Zann & Veikila Vuki:
Marine environment management and the status of customary marine tenure in the Pacific Islands;

Saro Waqairu:
The delimitation of traditional fishing grounds—the Fiji experiences;

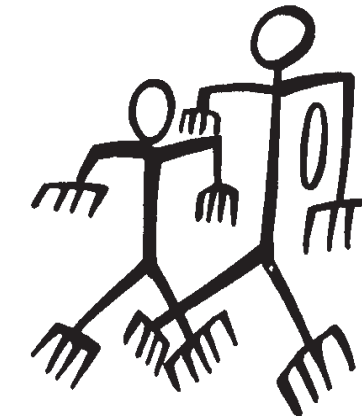
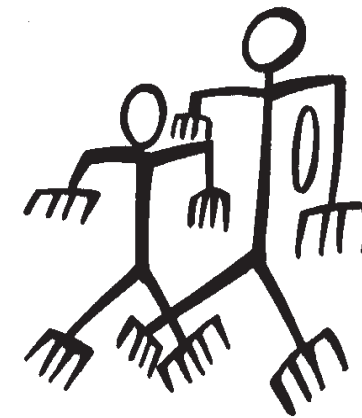
Edvard Hviding.:
Customary marine tenure and fisheries management: some challenges, prospects and experiences;

Marie-Hélène Teulières:
The law of the sea of Kanak fishermen: property and usage rights;

Paul Dalzell & Andrew Smith:
Something old, something new: an approach to obtaining fisheries management information from a remote atoll;

James W. Turner:
Sea changes: adapting customary marine tenure to commercial fishing. The case of Papua New Guinea;

Robert Johannes:
Design of tropical nearshore fisheries extension work beyond the 1990s;



Nicolas Peterson:
Traditional marine tenure and government policy: an Australian perspective;

Robert S. Pomeroy:
Traditional base for fisheries development revitalising traditional community and resource management systems in South-east Asia;

Andrew Smith:
Strategies for acquiring and using traditional marine knowledge;

Maciu Lagibalavu:
Traditional marine tenure and policy recommendations: the Fijian experience; and

Tom Graham:
Examining traditional marine resources management in the context of today's objectives.

Prices include postage and packaging. Only those orders accompanied by full payment by bank draft in US dollars (outside Fiji) or Fiji dollars (within Fiji) will be processed.

Orders should be sent to the Coordinator, IOI-South Pacific, Marine Studies Programme, the University of the South Pacific, P.O. Box 1168, Suva, Republic of Fiji. Tel: (679) 605446, Fax: (679) 605559.

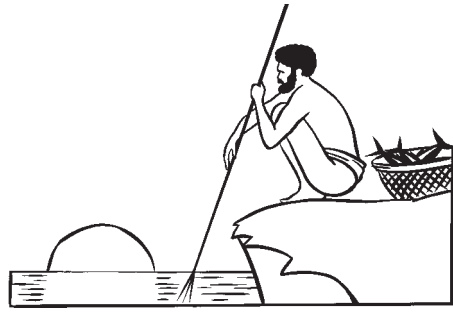
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TRADITIONAL MARINE RESOURCE MANAGEMENT AND KNOWLEDGE

INFORMATION ON PROGRAMMES AND PROJECTS IN THE REGION



Notification and invitation Workshop on the management of South Pacific inshore fisheries

Organised jointly by the South Pacific Forum Fisheries Agency and the South Pacific Commission at South Pacific Commission headquarters, Noumea, New Caledonia from 26 June to 7 July 1995

The South Pacific Commission (SPC) will be hosting a 10-day workshop on the management of coastal fisheries in the Pacific Islands, in collaboration with the Forum Fisheries Agency (FFA), from 26 June to 7 July 1995. The workshop will be attended by fisheries managers from each of the SPC/FFA member countries and other invited keynote speakers, under financial sponsorship from the United Nations Development Programme South Pacific Regional Fisheries Capacity Building Project, the Australian Centre for International Agricultural Research and the Governments of France and the United Kingdom.

This is an invitation to all individuals and organisations who would be interested in attending this workshop, and who are able to support their own travel costs or to obtain financial sponsorship from other sources. Registration is free, and a set of meeting papers will be provided to all participants.

For those who cannot attend the workshop in person, we also invite the submission of papers and case-studies relevant to the management of coral reef/lagoon/slope artisanal fisheries in small tropical islands, for discussion and inclusion in the proceedings.

Background

The sustainable management of marine resources is an item very high on the agenda of island governments. The United Nations Conference on the Law of the Sea (UNCLOS), the United Nations Conference on Environment and Development (UNCED), the Agenda 21 blueprint that resulted from UNCED, the 1994 Forum Leaders Meeting in Brisbane and

several other international agreements, have greatly increased the resource management responsibilities of SPC member governments and administrations in recent years.

Resources which were formerly considered to be unencumbered natural assets and a source of disposable national income, may now, or in the near future, start to assume greater liabilities both in financial terms, through the cash and manpower that is needed to manage them for maximum long-term yield, and in diplomatic terms, if the dwindling of these natural resources leads to a failure of compliance with international agreements or if it provides an excuse for additional conditions to be imposed alongside international or bilateral financial obligations.

The practical management of tropical small-island coastal fisheries (such as trochus shell, coral reef fish, sea-cucumber, ornamental coral, etc.) is still a very young and unexplored field. Most of these fisheries are small in scale and, while they affect a considerable proportion of the population in small island states, they do not generate large enough cash revenues to facilitate specific national research programmes. Regional programmes thus play an important role in this area, allowing research resources to be pooled, and the results of national experiences to be shared more easily around the region.

Both the Forum Fisheries Agency Research Coordination Unit and the South Pacific Commission Coastal Fisheries Resource Assessment Section have been working since 1988 on various aspects of coastal fisheries resource management. A major workshop in March 1988 bench-marked the cur-

rent state of the art in Pacific Islands coastal fisheries resource research and identified the most appropriate directions for future work.

The workshop proposed here will assess progress six years down the track but, more significantly, will provide the first comparative overview of the most effective and appropriate management methods for the most important inshore fisheries resources of the Pacific Islands region. The workshop will be attended both by practical fisheries managers from Pacific Island governments and administrations, and by recognised experts on different resources and management strategies from both within and without the region.

The main output of the workshop will be an integrated volume on management strategies for different resources, discussing the pros and cons of different methods, and their appropriateness to Pacific Island lifestyles, traditional tenure systems, legislative systems and development plans, as well as their biological effectiveness—a volume that is expected to be an essential reference to Pacific Island fisheries managers for many years to come. It is also planned to discuss a draft Pacific Islands Regional Fisheries Research Review at the workshop and, hopefully, to arrive at a consensus regional coastal fisheries research strategy.

Working papers

Each country representative will prepare a country statement summarising the main coastal fisheries management problems and the priorities for action in their respective country.

All participants will be encouraged to submit working papers consisting of case studies or experience papers giving details of fisheries management problems and approaches to solutions in their respective member countries. These papers will then be addressed during the plenary sessions.

Background and information papers containing experiences and results of management initiatives will also be welcome. Although there may not be time for discussion of these documents in the plenary session, they will be distributed to all participants and may be included in the published workshop proceedings.

We ask everyone submitting papers to provide 100 copies for distribution during the workshop.

Contributions should focus on the management of coastal fisheries and papers that deal solely with

biological aspects of a given resource are not encouraged. This is in contrast to the 1988 Workshop on Pacific Inshore Fishery Resources, where it was necessary to determine how much was known about the biology of the target species of coastal fisheries in the region. A much clearer picture of this has emerged following the contributions to the 1988 Workshop and the publication of the FFA-ICOD book, *Nearshore marine resources of the South Pacific*.



Language

The workshop will be conducted in English and French, with simultaneous interpretation between the two languages. Every attempt will be made to translate key working papers and country statements received before 1 May 1995. It will probably not be possible to translate papers received after that date.

The Workshop will be organised 'horizontally' on the basis of the components of fisheries management, rather than 'vertically' by specific resources like the 1988 Inshore Fisheries Resources Workshop. A provisional agenda for the workshop is attached, based on the likely interest in the various topic headings. However, the timing of sessions is not yet fixed, and needs to be flexible, depending on the interest expressed in each topic. Suggestions concerning the subjects to be discussed and the time allocated to the various topic headings are most welcome.

Sessions which attract a lot of contributions will be allocated more time than others and this final allocation will be made shortly before the meeting. There will also be additional sessions on topics that do not fit neatly into this categorisation, such as updates on new stock assessment methodologies, as well as social, economic, post-harvest, legal and enforcement issues. The intention is not to run a workshop for biological researchers, but for the

benefit of practical fishery managers, and, as stated earlier, it will not be possible to accept papers or presentations that describe purely biological research which does not have a clear and tested application to the practical management of a fishery.

Each topic will be introduced in a keynote paper delivered by an invited specialist, who will also moderate the session. This keynote paper, taking into account subsequent discussion and any other presentations on the topic, will form the basis of chapters in the resultant book on 'Nearshore Marine Resource Management in the South Pacific'.

Other contributions under each topic heading might include, for example, the results of experiments in management of specific resources, descriptions of the pros and cons of applying a management measure under particular conditions, or case-studies on the management of a Pacific Island fishery or resource. Reviews of management topics or of information necessary for management are particularly welcomed.

As well as an overview of those management measures that would be useful and appropriate to the region, it is also hoped to benchmark the current status of nearshore fisheries management activities and policy at the national level.

It would be most helpful if each country delegation were able to table a statement on local initiatives, policy, and future plans in inshore fisheries management.

As well as being of great value in guiding the future of certain SPC fisheries projects, if it were submitted early enough by each country, this information could be summarised in time for a regional overview to be discussed at the meeting.

Comments, expressions of interest, or submissions from potential contributors are welcomed, and should be addressed to:

Tim Adams
Fisheries Resource Adviser
South Pacific Commission
B.P. D5
98848 Noumea Cedex, New Caledonia
Fax: (687) 263818
E-mail: tbap@bix.com
(for the attention of Tim Adams).

I would also be most grateful if copies of this notification could be sent to other individuals or institutions who might be able to take part in this workshop.

Visa requirements

A visa to enter New Caledonia (which is a French Territory) is compulsory, except for citizens from Canada, Japan, New Zealand, USA, and European Union countries.

WORKSHOP AGENDA

1. Management information needs and sources
 1. Stock assessment and biological information
 2. Economic, trade and processing information
 3. Feedback to and from the fishing community
 4. Deciding financial and human resource needs for management
2. Potential management measures (pros and cons, case-studies)
 1. Protected areas, sanctuaries and reserves
 2. Closed seasons
 3. Restricted entry and quotas
 4. Resource ownership (including customary marine tenure (CMT) and individual transferable quota (ITQ))
 5. Artificial enhancement/reseeding and introduced species management
 6. Size limits and gear restrictions
 7. Economic management/trade restrictions
 8. Laissez-faire, free-market, boom-bust and miscellaneous/novel measures
3. Management policies and regulation
 1. Summary of country statements on national management policy and problems, and any broad national case-studies
 2. Mitigating adverse short-term economic effects of management
 3. Legal measures, compliance and enforcement

4. Crisis management (emergency measures and prioritisation of response)
5. Integrating fisheries management into coastal zone management
6. Roles of community, national, regional and global institutions in fisheries management advice and research: 'who should do what'?

4. Conclusion

1. Discussion of reports of relevant special sessions
2. Clearing of record of discussion

Special sessions (evening or weekend)

1. Problem fisheries. What are currently the main coastal fisheries management problems in the region, and what crises are most likely to break in the near future?

2. Computer programs in fisheries stock assessment and management. Demonstrations and discussion.
3. Drafting committee for an action plan for regional fisheries research, taking into account the SPC/FFA regional overview of fisheries research to be finalised in May 1995, and the summary of country statements tabled at this workshop. This committee also to draw up a list of regional needs and suggest ways of addressing them; the prioritisation of these needs to be addressed later in the plenary session.
4. Identification of appropriate specific country sub-projects for implementation in future by the SPC Integrated Coastal Fisheries Management Project.



REEFBASE—A global database of coral reef systems and their resources

A project to develop a global database on coral reefs, to be called REEFBASE, was initiated at the Manila-based International Center for Living Aquatic Resources Management (ICLARM)¹, in November 1993. The Commission of the European Communities (EC) has provided funding for the first two years, and the database will be developed in collaboration with the World Conservation Monitoring Centre (WCMC)² in Cambridge, UK, as well as other national, regional and international institutions.

Coral reefs, the marine equivalents of tropical rain forests, are under threat in many parts of the world as a result of habitat degradation, over-exploitation and, possibly, global climate change. Although fragile, coral reefs are highly productive and can support high levels of sustained fishing if the fishing is sensibly regulated. If they are in good condition, they also have great value as tourist attractions. In many parts of the world these economic benefits

are being eroded by siltation from poor land management, nutrient enrichment from sewage, other forms of pollution, destructive fishing practices and intensive use by tourists. However, the magnitudes of these impacts are largely undetermined and undocumented. Basic questions such as 'What is the total area of coral reefs in the world?' and 'What is the contribution of reefs to the world's fisheries?' are still unanswered.

¹ ICLARM is a non-profit, non-governmental research centre and is a member of the Consultative Group on International Agricultural Research (CGIAR), a worldwide network of research centres supported by international donors. It carries out research and disseminates information on all aspects of aquatic resource management, with the aim of improving sustainable production and management of fisheries resources for present and future generations of low-income users in tropical developing countries.

² WCMC is an independent charity established by IUCN—The World Conservation Union, the World Wide Fund for Nature and the United Nations Environment Programme. It collates and disseminates information on biodiversity at the global level and runs a number of large databases including a major Geographic Information System.

As currently envisaged, REEFBASE users, through a global map on their computer screen, will be able to focus on any country, reef system or individual reef to obtain details of reef area, species composition, coral cover, catch rates and composition of reef fish and invertebrates, recreation and other forms of resource use, human impacts, management efforts and indigenous knowledge. Current discussions among reef scientists on common methodologies and terminology are being used as a starting point for designing the data entry fields.

The preliminary focus will be on obtaining estimates for reef areas, which in many cases will necessitate literature searches and correspondence with a wide range of individuals. Initial figures may well be approximate but will be replaced with more reliable data as the project progresses. Information on other aspects will initially be collection programmes, rather than collecting and inputting raw data. Each data entry will be flagged according to its reliability, and will be referenced and acknowledged.

REEFBASE will provide data from which it should be possible to quantify changes in reef health at national and global levels, thus providing conservation organisations, governments and the media with the statistics and information that are needed to implement policy changes.

REEFBASE will also be useful in identifying future research priorities and could serve as a framework for the development of analytical tools. This has been done on a small scale in Australia, where data compiled for the Great Barrier Reef are being used to identify patterns of ecology and structure and as a management tool.

REEFBASE will draw on the experience gained from FISHBASE, a large database on fish biology, also developed at ICLARM with EC funding. It will link with this database as well as national and

regional databases (such as the ASEAN–Australia Living Coastal Resources Project, a regional reef monitoring programme in South-East Asia, and CORALBASE, a coral taxonomic database being developed at the Australian Institute of Marine Science) and other data-gathering programmes as they are developed.

In order to accomplish these objectives, ICLARM will develop a global network of collaborating scientists and institutions. In developing countries, where coral reefs are most extensive and most threatened, means will also be sought to provide technical assistance in data acquisition.

Developing country scientists will be enabled to fully develop their skills by further training or appropriate linkages with advanced research laboratories and universities. It should be possible for researchers who can obtain appropriate funding to work on particular areas of REEFBASE, benefitting from the global context that the database will provide and augmenting and contributing themselves to the information that is stored, an activity for which they will be fully credited.

The first version of REEFBASE will be distributed at cost in about 1996. The software will run on IBM-compatible microcomputers, which are now available in most offices and laboratories. Subsequent revised and updated versions will be distributed at nominal cost to all relevant national and international research and management institutions and individuals.

Further information available from:

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