

THE PAST AND PRESENT UTILIZATION AND MANAGEMENT OF COASTAL RESOURCES  
IN FIJI

by

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## Abstract

Fish and shellfish caught mainly by women in inshore waters traditionally supplied most of Fijians' protein. Low population densities, the extent of mangrove, lagoon and reef ecosystems, and ownership of fishing grounds by the clan or tribe prevented overfishing of most species (exceptions Tridacna gigas; Hippopus). Turtles were prohibited to commoners; the fishing clan (gonedau) controlled community fishing. Increasing populations, urbanization, increased fishing pressure, mangrove reclamation and changes in land use have placed added pressure on fisheries of the main islands. The government of Fiji claims inshore waters but customary users have fishing rights; their permission is required for commercial fishing, effectively conserving coastal resources but disadvantaging the Indian majority. Fijians now demand the return of traditional waters. Ways in which customary practices can be incorporated into modern fisheries management are suggested.

### Key words

- 1) Fisheries - Fiji Islands    2) Fisheries - Traditional management
- 3) Ethnology - changes in customary fishing practices

Title

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## INTRODUCTION

The islands of the South Pacific range in size from large, fertile continental islands several hundred kilometers in length to small, dry sandy islets a few kilometers long. Their present inhabitants are descendents of several waves of fishing peoples who migrated from Asia along the Malay-Indonesian archipelago several millennia ago. The Melanesians mainly occupy the fertile islands of the southwest, the Polynesians live in the coral islands of the south, and the Micronesians in the coral atolls of the north.

The sea traditionally provided the island peoples with most of their protein. Over many centuries they acquired a wide range of fishing skills and a detailed knowledge of the behaviour and distribution of many marine organisms. Because many islands were small, with limited marine resources, by necessity they evolved a variety of effective systems for their management and conservation.

Western influence, beginning in the late eighteenth century, brought great changes in the cultural, social and economic life of all islands. A succession of beachcombers, whalers and slavers disrupted communities in the early nineteenth century, missionaries later forced the abandonment of many ancient beliefs and customs, introduced diseases decimated populations, colonial powers imposed their own language and culture, and immigrants often took much of their lands. Many islands are now almost entirely dependent on outside sources for all their foodstuffs, including fish. Others, lacking any natural resources to attract colonizers, have been minimally affected by Western influences and remain, as in the past, dependent on their fisheries for subsistence.

It is impossible to even superficially review the traditional conservation practices of this "continent of islands" spread over almost one quarter of this planet. In many cases the practices are long since lost; in others they are of a complexity to defy brief outline. Examples from three newly independent island nations, one large and wealthy, the others amongst the smallest and economically poorest of the nations, are given to illustrate the different ways in which their peoples traditionally made use of marine resources, how they avoided over-exploitation, and the various impacts of outside influences. The primary intentions of this paper are to evaluate customary conservation practices, and to suggest ways in which the traditional and modern might be amalgamated to best advantage.

## FIJI: GEOGRAPHY AND HISTORY

Fiji is an archipelago of almost 400 islands of continental, volcanic and coral origin situated in the South Pacific between 15°S and 21°S and about 180°W (Fig. 1). The largest islands are Viti Levu and Vanua Levu, followed by Taveuni and Kadavu respectively. The total land area is about 18,400 sq. km. Fiji's sea area, under its recently proclaimed 200 mile exclusive economic zone, is about one million sq. km.

The population is about 630,000 (50% Indians, 44% indigenous Melanesians, 1% Rotumans (Polynesians), and the remainder Chinese, part-Europeans, Europeans, and other Pacific islanders. Suva, the capital, is a modern city (pop. 80,000) with many schools, a regional university, light industries, and is a major shipping port for the South Pacific. Fiji

has a relatively buoyant economy based on sugar, tourism, fish, copra, and gold. Major trading partners are Britain and Europe (exports) and Australia, Japan and New Zealand (imports).

Fiji has been inhabited for over 3,000 years by a succession of Melanesian and Polynesian peoples. The pre-contact population was 150,000 to 200,000, of which about 97% lived on the coastline (Williams, 1858). The Fijians, essentially subsistence cultivators and coastal fishermen, have a well developed material culture and complex social organization based on kinship: the vuvale (family)  
matagali (sub-clan or lineage)  
yavusa (clan)  
vanua (tribe)

each with a hereditary chieftain of almost absolute power. Fijians formerly lived in small fortified villages or hamlets as warfare and cannibalism were rife. Land (and adjacent waters) was of paramount importance, held collectively by the matagali or yavusa under a complex tenure which is of major relevance to this report.

Although Fiji was first sighted by Europeans in 1643, the first impact was not felt until the succession of sandalwood and beche-de-mer traders, whalers, traders and planters of the nineteenth century. After various attempts to establish a national government, the Fijian high chiefs ceded to Great Britain in 1874 on terms which are also particularly relevant to this review.

Indentured Indian labourers, brought in to the sugarcane fields from 1880 to 1920s, have ultimately gained a numerical majority and economic control while Fijians have retained ownership of over 70% of all lands.

Multi-racial Fiji achieved political independence in 1970. Today the nation has a Westminster-style of parliamentary government, but the Fijians have also retained their ancient chiefly system. The Great Council of Chiefs (paramount chieftains) today determines matters relating to Fijian culture and tradition, while a village and provincial system of administration links the customary and political systems.

#### FISHERIES AND MARINE RESOURCES

Fiji has extensive areas of highly productive tidal forests or mangal, estuaries, lagoons, and platform, barrier and fringing reefs. The Great Sea Reef north of Vanua Levu is among the largest barrier reefs in the world. Although the islands are generally separated by deep waters, the surface waters are of moderate productivity and are seasonally rich in tunas.

#### Fish in the diet

Unlike most of the Polynesian and Micronesian in the islands to the north and east, Fijians are exclusively inshore fishermen and gleaners. Although pigs, birds and lizards traditionally provided some protein, fish and shellfish were of major importance and sea foods are still vital in the subsistence of the majority of Fijians. Brown (1979) estimated that the average consumption of whole fish is 100g/capita/day in coastal villages but it is up to 220g/capita/day on the

infertile islands such as Fulaga (Botkin, 1980). Consumption in the capital, Suva, is about 50 to 60g/capita/day and the national average, including canned fish, is about 100g/capita/day (Zann, in prep.). This compares with about 23g/capita/day in islands off New Ireland in Papua New Guinea (Wright, pers. comm.) and 560g/capita/day in atolls of Kiribati and Tuvalu (Zann et al., in prep.). Canned fish consumption is high because both of an inadequate supply and high cost of fresh fish, and for its convenience value. Dietary changes in recent decades have resulted in a recent increase in the incidence of diabetes and heart diseases in Fiji.

### Subsistence fisheries

With the exception of the more spectacular techniques such as turtle fishing and communal fish drives, the pre-contract fisheries were poorly documented. Hornell (1940) described a range of techniques and gear including gleaning, poisoning, spearing, bow and arrows, traps, snares, weirs, fences, many net types, and line fishing with gorges and thorn hooks. Apart from a few examples traded from Tonga, the highly specialized hooks and lures characteristic of Polynesia and Micronesia were absent (Anell, 1955). Seacraft were well developed: dugout outriggers (takias) and rafts (bilibili) were used for fishing in protected waters, decked sailing canoes (camakau) were used for more distant fishing, and a giant double canoe (dura) was used for inter-island travel.

The subsistence catch has not been well documented but probably comprises about equal amounts of invertebrates and fish, and depends on the geographical situation of a village. The shellfish include river clams (Batissa), cockles (Anadara) and other bivalves (Gafrarium, Tridacna, Periglypta), snails (Strombus, Polinices, Nerita etc.), crustaceans (Cardiosoma, Sesarma, Scylla, Penaeus, Macrobrachium) and other invertebrates and algae (Lingula, Siphonosoma, Caulerpa, Gracillaria). Virtually all finned fish over a few centimetres in length are eaten but major ones include the mullets (Mugilidae), striped mackerel (Rastrilliger), small snappers (Lutjanus, Lethrinus) and rock cods (Epinephelus). The catch is probably similar to the artisanal catch (Table I), with an even greater reliance on the inshore species. Various estimates by the Fiji Fisheries Division (1979, 1980) place the subsistence catch at between 4000 and 14000 tonnes p.a. Initial surveys by this author suggest the catch lies about midway between these estimates.

Most of the everyday fishing is conducted by women. Botkin (pers. comm.) estimated that women caught 90% of all fish products on Fulaga in 1979-1980. Men are responsible for providing the large quantities of fish for customary feasts. The fishing clan (gonedau) and the Lavan masterfishermen (dauqoli) traditionally were the specialist fishermen for the chiefs and managed communal fishing activities. Their special role in the management of fisheries is discussed separately.

### Commercial fisheries

The small-scale commercial or artisanal fishery is based on the punt and outboard with a crew of two to four, using gill nets and hand lines in inshore waters. The operations are generally inefficient: few carry ice, the marketed fish is of poor quality, fuel is expensive, trips are short, carrying capacity is limited, fishermen usually have

to sell their own fish, and the potential fishing grounds are limited because of the customary fishing rights.

The total artisanal catch is about 3500 tonnes p.a., half of which is shellfish. The domestic supply of fresh fish is inadequate, for about 2,000 tonnes of frozen fish and 7,000 tonnes of canned fish are imported each year.

About 10,000 tonnes of skipjack and yellowfin tuna worth about US\$20 million are exported each year by the large-scale tuna fishery. Japanese-type pole-and-line vessels of the government IKA Corporation land their catch at the PAFCO Cannery (a Fijian-Japanese joint venture) on Ovalau Island.

#### CHANGES IN TECHNOLOGY AND EXPLOITATION

The introduction of new gear and techniques, the trebling of the former population, and urbanization have greatly changed the pattern of exploitation, and had a great impact on coastal fisheries.

Imported steel hooks (cuku) and synthetic twines have increased line fishing and gill netting while the introduction of steel spears, goggles and rubber have enabled spearfishing to develop. The adoption of the easily constructed, roomy Indian punt and the compact, powerful outboard motor have increased the range and carrying capacity of the fisherman. Fiji's fleet of small craft now comprises of 1000 registered commercial fishing punts and 300 launches, together with 3000 to 4000 punts in the transport and subsistence sectors. Between 120 to 140 traditional outrigger canoes are in use today, virtually all in the southern Lau islands (Zann, 1980). Finally, the advent of the cash economy, the high demand for fresh fish from urban and agricultural communities, the increased range and capacity of vessels, the convenience of refrigeration, and efficient air, road and sea transport have changed the nature of the subsistence fishery. Part of the fish catch is often marketed by those living near urban areas. Trochus and pearl oysters are collected by outer-islanders for sale. Beche-de-mer are fished on an increasing scale. Total exports of these invertebrates are valued at about F\$330,000 p.a. (Fisheries Division Annual Report, 1981).

However with the changes in technology the subsistence fisherman has lost his self-sufficiency. Today he is reliant on outside sources for fishing gear, boats, motors and fuel. A certain amount of money is now needed to go fishing; this may come from the sale of copra or fish, hire of boats, or a remittance from a relative in salaried employment. A place on a fishing punt may cost F\$2 or more for the day. Although motorized transport has aided communications between islands, cash is now required, with the result that social visits have declined. People on Vanua Balavu have complained that because of the high cost of fuel they now visit relatives on neighbouring islands less frequently.

Mechanization has also been costly to the nation. Fiji imports about 1000 outboards p.a.; breakdowns are frequent, spare parts are difficult to obtain, and fishermen have a low level of mechanical skills. Fuel imports exceed F\$150 million p.a. (Zann, 1980).

## PRESSURE ON COASTAL RESOURCES

### Overfishing: past and present

While the fish and shellfish immediately adjacent <sup>to</sup> villages are often overfished, there is divergent opinion on overfishing elsewhere. Baines (1981) considered that the marine resources of Vanua Balavu by far exceeded the subsistence requirements and it was improbable that a ~~sufficient~~ awareness of conservation principles could develop.

However populations of a number of the more vulnerable organisms have in fact declined since human occupation. The tridacnid clam Hippopus hippopus, common as a subfossil and in some middens, is virtually extinct on the more populous islands. Likewise the giant clam Tridacna gigas is now rare, confined to the more remote reefs. Turtles (Chelonia and Eretmochelys), formerly relatively common, have now become uncommon to rare, the latter because of the trade in tortoise shell last century broke down the traditional constraints.

A number of cases of overfishing have been reported in recent years. The catch of mullet in Laucala Bay near Suva declined in the 1930's (Hornell, 1940); stocks increased following a period of closure, but have rapidly declined since the re-opening in 1975. In Fulaga in Lau mullet have also declined following the establishment of a modest gill net fishery for export of salted fish to Suva (Botkin, pers. comm). Considerable conjecture also surrounds baiting by the IKA Corporation, with many complaints from local fishermen of declines of bait, and of adults of species such as Rastrillegger. Visiting sports divers and marine scientists almost invariably comment on the lack of large fish in the region of a Fijian village, and the timidity of those even in more remote waters.

Thus even large reefs and lagoons under a relatively light fishing pressure may be overfished of certain highly valued, biologically vulnerable organisms such as turtles and clams. Larger fish may become "catch-shy" or leave accessible areas. Although the total standing crop of a reef may not be significantly altered, such changes in behaviour might increase fishing effort sufficiently to create hardship, and thereby provide a motivation for conservation.

~~Studies indicate~~ that despite an increasing fishing effort, the subsistence catches are declining. Of 63 villages surveyed, 68% reported an increase in fishing effort and 75% reported declining catches. Reasons cited include: overfishing, increased gear efficiency, use of dems and dynamite, competition from commercial fisheries and poachers (Fisheries Division Annual Report, 1980).

### Changes in land use

Although other aspects of coastal zone use and management (e.g. from urbanization, ports development, construction of roads, hotels, tourist development) cannot be discussed here, the effects of changes of land use should be briefly mentioned.

About 6000 ha. of mangrove forest has been cleared on the two main islands (Lal, 1983) leaving approximately 18,400 ha. (Vodonaivalu, 1982). Much of the coastal forest in the west of these islands was cleared by Fijians in pre-contact times, resulting in the development



of dry, unproductive grasslands (talasiga). Clearing has accelerated in the past century; almost 20% (the amount of land under freehold and leasehold) of coastal lands have been cleared.

### Pollution

Effects have included shoaling of the major rivers (Rewa, Navua, Ba) and localized damage by siltation to coral reefs (Squires, 1962), contributing to the declines in fish yields around urban areas.

Moderate heavy-metal contamination has been detected in inshore bivalves and certain fish in the Suva area (Naqasima, pers. comm.), while extremely high levels of coliform bacteria have been found in the river mussel or kai (Batissa violacea) and high levels have been found in the shore cockle or kaikoso (Anadara maculata) on Suva shores (Brody, pers. comm.). Toxic chemicals were probably responsible for a large fish kill in Suva Harbour in December, 1983.

The traditional inhabitants of villages now engulfed by the urban spread have been particularly affected by overfishing of their traditional fishing grounds by outsiders, and by pollution. Their interests are rarely considered in town plans and health aspects have been ignored.

## TRADITIONAL CONSERVATION AND MANAGEMENT

### Conservation "ethic"

Fijian attitudes to land and sea have traditionally assisted in their conservation.

The Fijians have a characteristically Melanesian affinity with the land, na qau vanua ("the land which supports me and to which I belong") and na vanua na tamata ("the men are the land"). Formerly an area of land and sea was "owned" (an inadequate translation) or held collectively by a clan (matagali or yavusa). Sharing is obligatory among kin; a man has to be given what he asks from (kerekere) a kin. Acquisitiveness and waste were discouraged; production did not exceed immediate demand in former times.

Those from aid agencies involved in development in Fiji often fail to appreciate the spiritual significance of the land, the communal society of Fijians and their low esteem of Western consumerism.

Foreigners are frequently critical of the large tracts of "idle" land and sea, and the slow economic progress of the Fijians compared with the Indians. All too frequently the primary objective of aid workers appears to be the imposition of their own societies' values (particularly the work ethic and Western materialism) onto the recipients of the aid.

### Fisheries management

Although day to day subsistence fishing in nearshore areas was conducted by each household, the responsibility of the fishing expeditions to more distant waters and the communal fish drives belonged with the chief's fishing clan, the gonedau (in most of Fiji) and the master fishermen, the daugoli (in Lau).

The gonedau are possibly the descendants of a more recent group to reach Fiji. Originally they were seafarers without land or sea rights who acquired a store of fisheries knowledge in their travels. Many were given small areas of land by the chiefs in return for their services as fishermen (and "fishers of men", for they also provided food for cannibal feasts) while some even constructed artificial islands (Clune, pers. comm.).

Thompson (1940) classified the daugoli of Lau as "marine resources managers" who decided when and where and what could be fished with an objective of sustained yield, an idea which Baines (1982) considered as attractive, but of questionable validity.

The gonedau's importance has declined although they are still responsible for communal fishing activities and the declaration of 100 day fishing taboo following the death of a chief. The gonedau have been disadvantaged by change; lacking lands for cash crops many cannot afford to purchase punts and outboards for artisanal fishing (Baines, 1982).

### Food and fishing taboos

Several socio-religious prohibitions or taboos (tabu in Fijian) directly or indirectly protected certain marine animals. The most important was the already mentioned taboo on the consumption of turtle by commoners, a practice common elsewhere in the Pacific. Certain groups were given the control of the manufacture of tangle nets and in the fishing for turtles (Tippett, 1968) which are still required in large numbers for chiefly feasts. Early visitors to Fiji reported a punitive expedition sent from the chiefly island of Bay to kill commoners who had taken turtles (Clune, pers. comm.). Thompson (1940) considered the taboo represented an ecologically sound system of resource allocation. The rapid decline of turtle numbers since its breakdown late last century, is evidence of its former efficiency.

Various other food taboos also exist (e.g. Ravuvu, 1983) but have little relevance to conservation. Clan totems, a few of which are marine animals, are not eaten. In Kadavu consumption of octopus and sharks, representing ancient dieties (vu), are avoided. In much of Vanua Levu sharks are similarly sacred. Dolphins were taboo "because of their resemblance to men" (who were eaten). Cowries (Cypraea) could not be eaten by children as they "prevented hair growth" (Clune pers. comm.). A similar taboo is found in Kiribati (~~following paper~~).

On Naigani Island herrings and sardines (daniva) are taboo because they are food for sacred jacks or carangids (saga). Bones of the saga eaten are always returned to the sea for rebirth. On Ogea in Lau spawning aggregations of rock cods (serranids) are also reputed to be taboo (Kunatuba, 1982). On Beqa a certain clan known as "the fish eaters" is prohibited from selling fish (Bigay et al., 1980). Certain other clans are forbidden from eating fish (Ravuvu, 1983).

### Ranching and live-storage of sea foods

Turtles are ranched in natural salt water ponds on certain islands. Hatchlings or small individuals caught in nets are held until of an edible size. More widespread is the holding of adult turtles in pens at the water's edge for several months before a feast. Bivalves are likewise live-stored in baskets intertidally some days before marketing.

## SEA TENURE

### Traditional sea tenure

To Fijians the vanua ("the land") includes not only the terrestrial lands and all that grows upon them, but also the adjacent waters of the lagoon, the seafloor, reefs and marine plants and animals. Fishing ground (qoliqoli) borders, like those of the land, were defended from any trespassers, and the Fijian men were in a constant state of preparedness for battle to defend them (e.g. Williams, 1858).

The sea boundaries usually ran from the terrestrial limits towards conspicuous sea-marks such as large boulders, patch reefs and small islands to some distance from the seaward edge of barrier reefs. In some cases they extended further to encompass off-shore reefs many kilometres offshore. Unlike the terrestrial boundaries which followed the meandering of streams or hill crests, the sea boundaries extended as straight lines between reference points.

The former system of sea tenure varied somewhat according to geographic, social and political factors, and the boundaries were apparently in a state of flux according to changing alliances, conquest, population changes and other factors. Like the forests, the fishing grounds tended to be vested with the community, the vanua or its component yavusa (Ravuvu, 1983), and overall control was in the hands of the chiefs.

Often the founding or original settlement of a coastline, or the politically most important one, held general tenure to a district's coastal and nearshore resources, but full land and sea rights might be accorded to immigrants, refugees and military allies, while secondary or subsidiary rights to catch fish at a specific place or time could be given to other communities.

By tradition in many parts of Fiji today those wishing to fish for subsistence or commerce, still make their request to fish in another's waters at a sacred sevusevu ceremony which involves presentation of kava (yagona) root and gifts such as whale's teeth (tabua). A proportion of the subsistence catch often has to be given to the owners. Baines (1982) noted that this practice has fallen into disuse amongst the peoples of the Vanua Balavu group.

As Baines (1982) has described, the pattern of marine resource allocation in an island group such as in Vanua Balavu is most complicated. One village may have exclusive fishing rights to an area far in excess of its actual requirements while a nearby one with a much larger population may have a comparatively small area. In many such cases, the latter may have been granted permanent exclusive rights to fish in delineated parts of the former's territory, and subsidiary rights to other parts. Such transactions and the status of the tenure have been carefully recorded in tradition over the centuries.

### Modern sea tenure: Customary Fishing Rights

Today, the national government of Fiji, in the British tradition, has (or claims) ownership of unutilized foreshores, banks, waters, water bottoms etc. while the rights to use the fishery resources in the coastal waters belong, where existence of traditional rights could be proven, to the customary fishing right owners and which can be withdrawn by the

Crown (Lal, 1983).

### Historical and legal background

The former variable and fluid tenure system, completely alien to Western principles of tenure, had to be codified by the British colonial administrators after Cession, in 1884. In their efforts to formalize tenure the British froze the 1874 boundaries, adopted rather arbitrarily the matagali as the land-owning group, and established the Native Land Commission to begin to register land and settle disputes. While effectively preventing alienation of Fijians (who have since become a minority in their own land) by vesting ownership of nearly 80% of lands with the matagali, subsequent social, political and economic changes have often made the 1874 boundaries inequable amongst Fijians themselves, as well as the landless Indian majority.

The origin of the present clash between the former sea "owners" (the present fishing "rights" holders) and the national government lies in the unclear terms of Cession. The British negotiator on Cession, Sir Hercules Robinson (Governor of New South Wales) had assured the Fijian high chiefs in 1874 that "they must also trust her (Queen Victoria) to govern them righteously and in accordance with native usages and customs", implying that the traditional systems would be retained. However Article 1 of the Deed of Cession refers to possession of waters, reefs and foreshores by the Crown, and Article 7 only acknowledges those rights of chiefs "consistent with British Sovereignty".

The intentions of the first governor of Fiji, Sir George des Voeux, were quite clear in his address to the Native Council of Chiefs at Ba in 1881... "and that it is Her Majesty's desire that neither you (the Chiefs) nor your people should be deprived of any rights in those reefs which you have enjoyed under your own laws and customs, ... that measures will be taken for securing for each matagali the reef that properly belong to it in the same way that the rest of their land will be secured to them". This was never acted upon.

When fishing rights were finally codified in 1923 in the Birds, Game and Fisheries Protection Ordinance, Clause 16, Protection of Natives Customary Fishing Rights it stated: "it shall be illegal for any person to fish (commercially) on any reef or on any kai (cockle) or other shellfish bed in any water forming part of the ancient customary fishing ground of any matagali". The stipulation of "rights" rather than "tenure" or "ownership" has subtle but far-reaching consequences. This clause, incorporated in the 1942 "Ordinance to Make Provision for the Regulation of Fishing Chapter 135, Protection of Native 12" is still in effect.

The Native Fisheries Commission, established in 1923, began registering boundaries (e.g. see Figure 1 for the boundaries and rights holders for the Suva area). However this did little to address the legal problems of ownership. For half a century the traditional owners have been uncertain of the implications of the Act, while the colonial administration actively sought to avoid a clash with custom.

Finally, with the pressures of the growing cash economy, the development of artisanal and company fishing, prospects of offshore mineral potential, and a widening racial imbalance, the Fijian chiefs sought a clarification of the situation.

In 1974 the Great Council of Chiefs appointed a subcommittee to draft terms of references in respect of customary fishing rights and discussed compensation, royalties and the inclusion of mangroves into fishing rights areas (Anon., 1974). A full committee was then appointed in 1977 to report on the status of customary fishing rights and produced its confidential findings to the Great Council of Chiefs in 1978 (Anon., 1978). Elements of the report, leaked after a 1982 meeting of the chiefs, were harsh in their criticism of the British policy on sea tenure. It restated "Queen Victoria's" original intent to honour customary practices and condemned the subsequent British governors who had ignored this and adopted the policy of Crown ownership of the seas. Stating that the existing laws were unclear, it requested that the government define the inland and territorial waters which belong to Fijians (Anon., 1982).

The issue of sea tenure dominated the subsequent meeting of the Council of Chiefs and finally, on November 8, 1983, it was announced that they would formally ask the Fijian government to make laws giving Fijians actual proprietary ownership of reefs and foreshores as well as streams and rivers fronting their lands. "By ignoring the background discussion leading to Cession they (the colonial government) had deprived the Fijians of the proprietorship of reefs and foreshores ... We are now an independent nation and are masters of our own destiny" (Anon., 1973).

The issue had meanwhile become a controversial one in Fiji. Foreign tuna fishing vessels ceased fishing for bait because of Fijian hostility and the IKA Corporation, the government tuna fleet, encountered much resentment. A legal opinion given on the IKA Corporation baitfish controversy found that the customary fishing rights holders had no case (Southwick, pers. comm.). Unlike Papua New Guinea and the Solomon Islands, where customary owners have been given fees for bait, the Fijians were requested by the government to waive them in the national interests.

The intrusion of the cash economy into customary fishing rights has been also affected long-standing traditional fishing agreements between neighbours. Subsidiary fishing rights given by the traditional "owner" to a neighbour without adequate marine resources have been revoked after a century or more of operation because the fish was being caught for sale and not for subsistence. In 1983 Dravuni and Bulia Islands, customary rights holders of the northern Great Astrolabe Reef, revoked Ono Island's ancient agreement for this reason. Conversely, some villages which have centuries-old subsidiary rights have now been pressing for legal rights to the fisheries. Such disputes are still settled through traditional channels (i.e. between chiefs directly, or at provincial meetings) rather than legal ones.

According to the Act however, it is legally permissible for anyone to fish anywhere in Fiji for subsistence or recreation. Here the law conflicts with customary practice which generally demands that permission should be obtained from the customary fishing rights holders, usually through a sevusevu. Custom has compromised around urban and tourist areas, although in the latter the resort managements would normally make appropriate arrangements with the neighbouring land owners and customary fishing rights holders to allow for tourist access. In the former the traditional owners have been greatly disadvantaged by the overfishing, foreshore development and general pollution which accompany urbanization.

In the more remote and traditional areas, Customary fishing

rights holders often (illegally) prevent outsiders from fishing, or from even visiting their shores and reefs. The peoples of Beqa island frequently attempt to prevent yachtsmen and tourists from fishing and diving around their island. Likewise, those in Dravuni and Bulia Islands, which controlled the Astrolabe Reefs in northern Kadavu, have (illegally) banned yachtsmen, recreation-fishing groups, shell collectors and divers from their waters. Paradoxically, they have entered an agreement to allow the passenger liner "Fairstar" to land its 1,500 passengers once a month. The advantages of a regular income to the island is considered by its leaders to outweigh the harmful social and ecological effects of the periodic invasion.

Exploration for offshore petroleum and alluvial gold has prompted claims of customary ownership of the sea bed and non-living resources. On Fiji's declaration of the 200 mile exclusive economic zone in 1982, some traditional owners threatened to extend their claims offshore. But the greatest impact of the customary fishing rights issue has been to retard the developing artisanal fishery which supplies the urban and rural centres with fresh fish. Because indiscriminate commercial fishing in coastal waters is illegal, few commercial fishermen have been willing to capitalize on vessels with freezers needed for economic fishing. Artisanal fishermen (usually Indians) have been forced to pay large "fees" to customary holders for permission to fish and in some cases, merely for passage across certain waters (e.g. the village of Votua which has rights over the entrance of the Ba river charges Indian fishermen up to \$500 p.a. for access to the sea).

The apprehension of illegal fishermen by the customary controllers is relatively frequent, though seldom reported. Cases of physical violence, destruction and confiscation of the poacher's gear and boats do occur. The gravity - and the sensitivity - of the situation existing at this time is illustrated by a relatively recent case in which one of the most important (politically and traditionally) high chiefs was taken to court for illegal confiscation of a poacher's equipment.

#### Commercial fishing

The protection of customary fishing rights is the responsibility of the Crown. Several full-time inspectors, together with about one hundred honorary wardens from fishing villages, have the responsibility of enforcing the fisheries ordinances. Infringements by illegal commercial fishermen are probably frequent but prosecutions are seldom. To fish in "demarked" waters (that is, where customary fishing rights exist) a prospective fisherman must approach the Native Fisheries Commission which instructs the District Officer from the Ministry of Rural Development to obtain permission from that matagali (actually the yavusa or vanua) holding the rights. Because of "time delays" in this action, it is considered acceptable for the fishermen to directly approach the matagali and obtain their letter of consent which is then endorsed by the District Officer. The Commission then issues a permit and upon payment of an annual licence fee to the Fisheries Division, permission to fish is granted. Invariably money is exchanged in the agreement, although the amount and identity of the recipient are again sensitive subjects.

## Offshore reclamation

The reclamation of mangrove shores has been less controversial but ecologically more important. Since 1974 all foreshore lands have been administered by the Ministry of Lands. Those wishing to reclaim lands presented their application to the relevant departments, the customary fishing rights holders and the Fisheries Division. Most proposals were approved. In 1980 the cutting of mangrove timber was prohibited in light of "recent awareness on the value of preserving the mangrove forests" but this was later amended to allow domestic use. Foreshore developers were exempt.

To arbitrate on reclamation proposals, a system was instigated in which an Independent Arbitrator considered submissions from the developer, the Native Fisheries Commission and the Fisheries Division, and awarded a recompensation value to the customary fishing rights holders if appropriate. Awards were initially of a small, token, amount but after detailed submissions by the Fisheries Division in 1982, these became realistic. Finally, in late 1983 an enlightened Ministerial decision was made to suspend mangrove development projects because of the importance of this ecosystem to fisheries and coastal protection.

## Conclusion

The national government and Council of Chiefs have so far avoided confrontation over the customary rights issue and public debate has been discouraged in the interest of inter-racial harmony. Almost all material pertaining to customary fishing rights is therefore classified, and a comprehensive academic work on the subject has been prohibited from publication (Crocombe, pers. comm.). As those within the Native Fisheries Commission declined to interview this author, certain statements contained in this present review could not be confirmed. The divergent opinions obtained from Fijian fishing rights holders, government officers and others clearly indicate that few Fijians have a clear understanding of the traditional system and its present legality.

To conclude, although the present system of customary fishing rights may be of uncertain legality, it has been most effective in protecting the traditional owners, primarily subsistence dwellers, from outside commercial influences as well as protecting the inshore waters from over-exploitation. Conversely, it may be claimed, it is an inequable system as it discriminates against some Fijians and the Indian majority. It has also hindered the development of the commercial fishing sector, economically and nutritionally disadvantaging the nation. The issue of actual proprietary ownership is potentially divisive (between Fijian neighbours, and inter-racially) and if granted will radically affect all coastal and offshore development in the future, and create enormous problems in compensation for previous development.

## FUTURE MANAGEMENT STRATEGIES

The failure of many, otherwise sound, fisheries development plans because basic social factors had not been considered, and the clashes between the subsistence and commercial fishing sectors, particularly regarding fishing rights, would suggest that traditional practices and

cultural aspects should be better considered in future management strategies. Ideally the best, or most appropriate, elements of traditional and modern management might be incorporated, to mutual advantage, in such strategies.

The following elements would be important in any planning.

#### Documentation of traditional fisheries knowledge

The work of Johannes (e.g. 1981a and 1981b) and others in recent years have indicated the scientific importance of much of the Pacific island fishing lore, the accumulated knowledge of many centuries of observation, island life and trial and often of error attempts at management.

Although some of this sea lore has been irrevocably lost, a considerable amount is still practised, or retained in the oral tradition of the elders, particularly of the gonedau (fishing) clans. Because much of the oral tradition will be lost with the passing of the present elders, it is imperative, for cultural and scientific reasons, that it should be documented as soon as possible.

The Prime Minister of Fiji, Ratu Sir Kamisese Mara, considered the documentation of Fijian traditional fishing knowledge, in particular that relating to seasonalities in fishing, a priority in the research programme of the University of the South Pacific's Institute of Marine Resources.

Ideally this information should be collected by Fijians (a number of whom are currently engaged in cultural studies) rather than outside anthropologists. Allied studies have been undertaken by Fijians through the University's Institute of Pacific Studies (e.g. in Bigay et al. 1981; Ravuvu, 1983) and should increase when the University begins post-graduate studies in the near future. This author has extensively used the services of fisheries and marine science students from fishing communities for various fisheries surveys (e.g. Zann, 1980 and 1983; Zann et al. in preparation), including the present study. The students taking part invariably commented that the surveys had increased their own cultural awareness as their prolonged absences from their villages for education purposes had tended to alienate them from their communities and culture.

The documentation of oral tradition might also be encouraged through schools. Curricula might include more cultural studies, and, for example, children might be encouraged to record their families' oral history. This would no doubt strengthen their culture, and perhaps inspire some of the elders themselves to record their own oral traditions; although many are literate in both their native Fijian and English, few rural Fijians use these skills after leaving school.

The documentation, interpretation and application of traditional fishing knowledge might be a future objective of extension programmes. Fisheries Officers can learn from, as well as teach, subsistence fishermen. A more detailed and widespread knowledge of the feeding and reproductive habits of fish would increase catches as well as aid in management.



## Estimation and monitoring of the subsistence catch

Fiji Fisheries Division has an extensive data-gathering service which might serve as a model to other Pacific islands. Market sales, imports and exports of fish product are carefully monitored. However, the subsistence catch, possibly four times that of the marketed fish products, is poorly documented. Although the author, in conjunction with the Fisheries Division, is attempting to more accurately estimate landings (by establishing household consumption of fish), more detailed studies and continuous monitoring are required to determine whether the present catch can be sustained. The protection of the subsistence fishery must be paramount in any fisheries management proposals.

## Development of yield models

As the concept of "maximum sustainable yield" as an objective in fisheries management has been disputed, and as present multi-species management models have proven unworkable in the ecologically complex and very high species diversity of coral reefs, the only practical solution for the present is to permit very gradual increases in fishing pressure while closely monitoring catches to detect any change in species composition and yield. The various estimates of fish yields from reefs in the Caribbean, Philippines, Samoa and elsewhere (from 0.5 to 24 tonnes/sq. km/year, reviewed by Stevenson and Marshall, 1974 and Russ, in press) might serve as guides to potential yields. Estimation of catches and yields from intensively fished reefs in the South Pacific islands (e.g. Tarawa atoll, Zann et al., in prep.) will provide more relevant information on fishing strategies and sustainable yields in the region.

## Resolution of sea tenure

The resolution of the looming fishing rights dispute is a priority, but need not be racially divisive. It is possible that a compromise might be reached in which Fijians regain their culturally and spiritually important ownership of the seas without disrupting fisheries, transport and coastal development.

While the traditional users might be granted legal ownership of streams, rivers and coastal waters, their non-living components (water and river and sea beds) might be retained by, or given in trust to, the nation on condition that native interests be favoured. The non-migratory plants and animals might be owned, and the coast owners might be given exclusive rights to subsistence fishing of migratory species while in their territories. Commercial fishing rights might still be "leased" to artisanal fishermen under the present workable (if not completely satisfactory) system. The control of commercial fishing licences by the subsistence fishermen would continue to provide the limited entry which has been vital in protecting the coastal fisheries.

## Consideration of social factors

### (a) Women in fisheries

Although women dominate certain artisanal fisheries and are responsible for the bulk of the subsistence catch, they have been largely excluded from fisheries training programmes. For example, only men were selected to attend a training programme on beche-de-mer processing although this was usually the role of women. Women are

generally excluded from discussion and planning, and in later decision-making (Lal and Slatter, 1982). The importance of women in fisheries must be fully appreciated and they should obviously be included at all levels in extension training and management in the future.

(b) Fijian hierarchy

Although not actively involved in fishing, the elders retain their importance in decision-making. They might be more closely acquainted on fisheries programmes to make more informed decisions.

Ultimate decisions at the village level are generally made by the chiefs who do not actively engage in fishing. In the past the gonedau were the chiefs' advisors on fishing matters but this important function has declined. It is interesting to speculate whether the traditional role of the gonedau could be revived and "modernized".

Promotion of the Fijian artisanal fisheries

Despite Fijians' long association with the sea, their extensive fishing knowledge and their fishing rights advantages, they have not been highly successful in the commercial fisheries. The reasons are largely social: strong kinship responsibilities place great pressure on any Fijian in business.

Fisheries Division assists Fijian participation in the artisanal fishing through extension training programmes and low interest loans for subsidized vessels. The development of co-operative societies compatible with Fijians' close communal bonds, may be one solution. Despite many early failures in co-operatives, there have been sufficient successes to demonstrate the scheme's potential.

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FIGURE 1: Fiji (inset) and details of customary fishing rights boundaries (established by the Native Fisheries Commission) in the vicinity of Suva (shaded inset). Details: (1) Navakava yavusa (Mauivuso village). (1a) Nakurukura (Mauivuso village). (2) Nadonuma (Suvavou village). (3) Vanua ko Burebasaga (Rewa). (4) Vanua ko Noco (Noco village). (5) Dauninakelo (Naselai village). (6) Bau, Kubuna, Batikasivi, Natodua, Mataisau, Batiki (Bau Islands) 7.8.9.10.11. Minor yavusa. (12) Verata (12a) Bau, but Verata permitted to fish here.

TABLE 1. MAJOR FISH AND SHELLFISH MARKETED IN FIJI  
(Calculated from Fisheries Division Report, 1981)

FISH		% CATCH	
<u>Mugilidae</u> (mullet)**	13.4	<u>Batissa</u> (river mussel)	65
<u>Rastrillegor</u> (Indian mackerel)**	13.4	<u>Anadara</u> (cockle)**	21
<u>Epinephelus</u> spp. (Cod)*	7.2	<u>Thalassina</u> (mudlobster)**	3
Carangidae*	6.4	<u>Sesarma</u> (mangrove crab)**	3
<u>Lethrinus glyphodon</u> (emperor)	6.3	<u>Cardiosoma</u> (land crab)**	1
<u>Sphyraena</u> spp. (barracuda)*	6.1	<u>Penaeus</u> (prawns)**	1
<u>Lethrinus rhodopterus</u>	3.6	<u>Scylla</u> (mud crab)**	1
<u>Lutjanus</u> spp. (sea perch)	2.4	Octopus, Tridacna (clams)	+
<u>Leiognathus</u> (ponyfish)**	2.4	Holothurians, algae	
Many others		Many others	
WEIGHT (1981)		926 tonnes	1093 tonnes

\*\* inshore (mangrove, lagoon) species

\* inshore and coral reef species

