



ELSEVIER

Ocean & Coastal Management 38 (1998) 207–224

Ocean &
Coastal
Management

Fijian villagers adapt to changes in local fisheries

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Abstract

This paper analyzes some of the problems encountered by a village-run fishing cooperative in rural Fiji. Concern about the limited success of this fishing cooperative led the villagers of Kaba Point, Fiji to ask for biological and socioeconomic studies to determine the roots of the cooperative's problems. The villagers also required an assessment of their proposal to revitalize the cooperative through a development scheme that would enable them to increase their catch. The surveys, undertaken by researchers from the University of the South Pacific and the Fiji Fisheries Division, indicate that the area has been overfished, primarily through the widespread local and commercial use of gillnets and the reliance on fishing as a sole source of village income, and further expansion of the current resource exploitation patterns would be very damaging. In addition, although the cooperative provides an important sense of communalism in the village, only a few people regularly provide fish to the coop. The semi-subsistence lifestyle of rural Fiji is one factor limiting villagers participation in full-time fishing activities. The traditional social and management structures inherent in this village (especially, marine tenure, chiefly responsibility for the community, and a demonstrated history of communal projects) can form a strong basis for a modern community-based marine management program. However, if not carefully watched, resources can also be locally mismanaged because of the increasing demands of the modern market-driven economy. © 1998 Elsevier Science Ltd. All rights reserved.

1. Introduction

Community-based management of marine resources is much promoted throughout the world. Valiant efforts by resource managers are being made to incorporate local

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systems into the contemporary government-based management schemes. However, local management must be based on sound principles in order for it to achieve its goal of promoting the sustainable use of marine resources. Villagers may not fully understand their roles and effects in the complex web of marine resource use. They may believe they are making wise resource-use decisions, but may actually be causing harm to the resource base.

The traditional system of management in the Pacific islands can be a strong basis for community-based coastal management programs. These traditional systems, especially marine tenure systems in which specific areas are owned outright or are under the jurisdiction of specific villages or clans, traditional biological knowledge systems, prohibitions on collecting or consumption practices, strict ritual uses of certain rare species and communal activities, can function as fisheries management systems [1,2]. Unfortunately, many of the once strong traditional systems in the Pacific islands region have weakened over the years due to many factors, including the introduction and adoption of money-based economies, the breakdown of chiefly authority, education systems that take children away from home and away from the daily contact with their knowledgeable elders, increasing population pressures, and new legal and political systems [3,4].

In this paper we describe a situation in rural Fiji where villagers became publicly concerned about supplies of fish that were incapable of supporting their fishing cooperative. The villagers proposed a fisheries development scheme aimed at increasing catch to revitalize the failing cooperative and invited a team of researchers to scientifically assess the feasibility of the project. Preliminary biological and socio-economic surveys were conducted and both studies indicated that diversification of fisheries activities and other income-generating schemes would be more advisable than the further intensification of current fishing practices. As a result of these findings, the villagers have begun to redefine their goals and options for utilizing and managing their marine resources.

2. Kaba Point, Fiji

2.1. Fijian political environment

Throughout the Pacific islands, resource-use strategies developed in traditional communities have since been termed ‘traditional resource management’ systems. These practices often serve to protect resources from overexploitation by placing limitations on their collection, although they may or may not have been designed for such purposes. These systems have been described for many areas throughout the Pacific [5]. In Fiji, several traditional cultural systems that have influenced resource-use in the past include: (1) land and sea tenure, (2) sacred areas, (3) rituals designed to appease potentially wrathful spirits, (4) totemic taboos, and (5) simple fishing/collecting methods. Many of these practices have subtle influences on marine resource-use in rural areas to this day.

The most important resource management practice in Fiji is the traditional ownership of the land (*vanua*) and the fishing ground (*qoliqoli*) by coastal community units. Land and fishing areas are defined and owned by a clan that regulates the use and management in the area. Historically, people looked after their land and sea areas because of their importance to their livelihood. People seeking permission to use the land or the fishing grounds belonging to others were expected to make a formal presentation to the owners. Master fishermen with extensive local knowledge of fish and their habits were responsible for many decisions affecting the use of the waters of an area [6]. Currently fishing rights areas and permitting procedures for outside users are based on this system of local ownership of resources. The Fijian government is currently delineating Customary Fishing Rights Areas based on the traditional marine tenure system. This action illustrates the intention in Fiji to document a feature of the traditional management system to make it useful in the contemporary organizational structure. Customary Fishing Rights Area claims were documented and registered by the Fiji government and are the basis of current licensing arrangements. Every licensed fisher inside the demarcated area is expected to obtain the consent of the traditional owners of the Customary Fishing Rights Area where they intend to fish.

The concept of sacred areas is also prominent in Fijian societies. In some cases the sanctity of the area was such that people were barred from it. The sacred fishing grounds were special areas where rules were strictly adhered to. The association with the supernatural ensured that the sacred ground was respected and protected at all times and not only when there was surveillance. In such cases, 'a close association was perceived between the living and the dead, whose spirits inhabited sacred areas, who showed offense when customary taboos and rituals were not adhered to'. These strong beliefs made people follow sometimes restrictive fishing traditions and customs without the need to have full-time enforcement officers.

The threat of the omnipresent gods was a continuous reminder to the people to treat their resources properly. Land in Fiji was associated with the spirits that protect it. Siwatibau notes that in such societies the environment was not something separate, 'but an integral part of one's self, providing the physical manifestation of the vital link between the living and the dead' [7]. Outsiders, therefore, had to observe a specific code of conduct in any area where they were visitors. For this reason, visitors made a formal presentation to the host village (*sevusevu*) to publicize their arrival. This system ensured that the members of the community were aware of the presence of visitors amongst them and also protected the visitors from the wrath of the spirits who might be offended when customary protocol relating to entry was not adhered to. The arrangement also ensured that the customary owners of fishing rights were consulted every time someone wanted to use the fishery.

Most Fijians have a plant, bird or fish totem. The taboo associated with totems restricted particular clans, families, age groups or sexes from catching and eating certain types of fish or invertebrates. A person was not allowed to eat his or her totem. Fishing was not a matter of non-selectively catching whatever happened to be available, since the fishers were always on the lookout for their totem.

The use of simple exploitation methods ensured small catches with little surplus. In addition, geographic isolation, difficulties of transportation, and poor marketing limited production and made people desire less. The people were more independent and self-sufficient in their subsistence communities. There was little need for trade.

Today, traditional resource management in Fiji is being undermined by such factors as the emphasis on production, participation in the modern economy, an increased capacity for resource exploitation, a lack of information on which to base management and the destabilizing effects of the cash economy. In most cases, village-based traditional societies have been replaced by contemporary and intricately linked towns that are part of the modern economic structure. Ethnic Fijians now share their fishing grounds with commercial fishermen of Indian and other descent. More and more people catch more than is necessary for home consumption in order to have surplus to sell in area markets.

2.2. *Geographic setting*

Kaba Point is situated on the eastern side of Fiji's main island, Viti Levu (Figs 1 and 2). Kaba is approximately 30 km from Fiji's capital city, Suva and 15 km from the bustling market town of Nausori. Although physically close to major population centers, Kaba is relatively isolated as it is accessible only by boat. Extensive mangrove and river areas effectively separate it from the rest of the island.

The two villages, Dromuna and Vatani, that share this point of land are approximately 2 km apart and are joined by a track through a tropical forest. Table 1 provides a brief comparison of the two villages. Both villages rely on rainwater as a fresh water supply. Vatani has the larger area of arable land, while Dromuna is predominantly hilly with patches used for shifting cultivation. Both villages have access to the Kubuna Customary Fishing Rights Area. This traditional fishing ground is more than 300 km², stretching from Kaba Point north nearly all the way to Moturiki Island off Ovalau.¹ Information obtained from village interviews in Dromuna and from speaking with the village's fishing cooperative's officers indicates that fishers use the immediate area and fish quite extensively in the roughly 25 km² adjacent to the point.

The area fished by the local fishers² is primarily shallow mud and sand flats, mangrove areas, and some deeper channels (to 20 m). There is one sacred area where no fishing is allowed unless under special orders from the high chief in Bau, who is the paramount chief for this region. Gillnet fishing is the most common method utilized to exploit the local resources. Other fishing methods include the use of handlines, spearguns and traps. Villagers noted that historically, the most commonly caught fish

¹Fishing rights areas are currently being delineated by Native Lands and Fisheries Commission, therefore, specifics about the actual boundaries of the Kubuna Customary Fishing Rights Area are not yet available.

²Detailed biological data was documented only in the areas primarily utilized by residents of Dromuna.

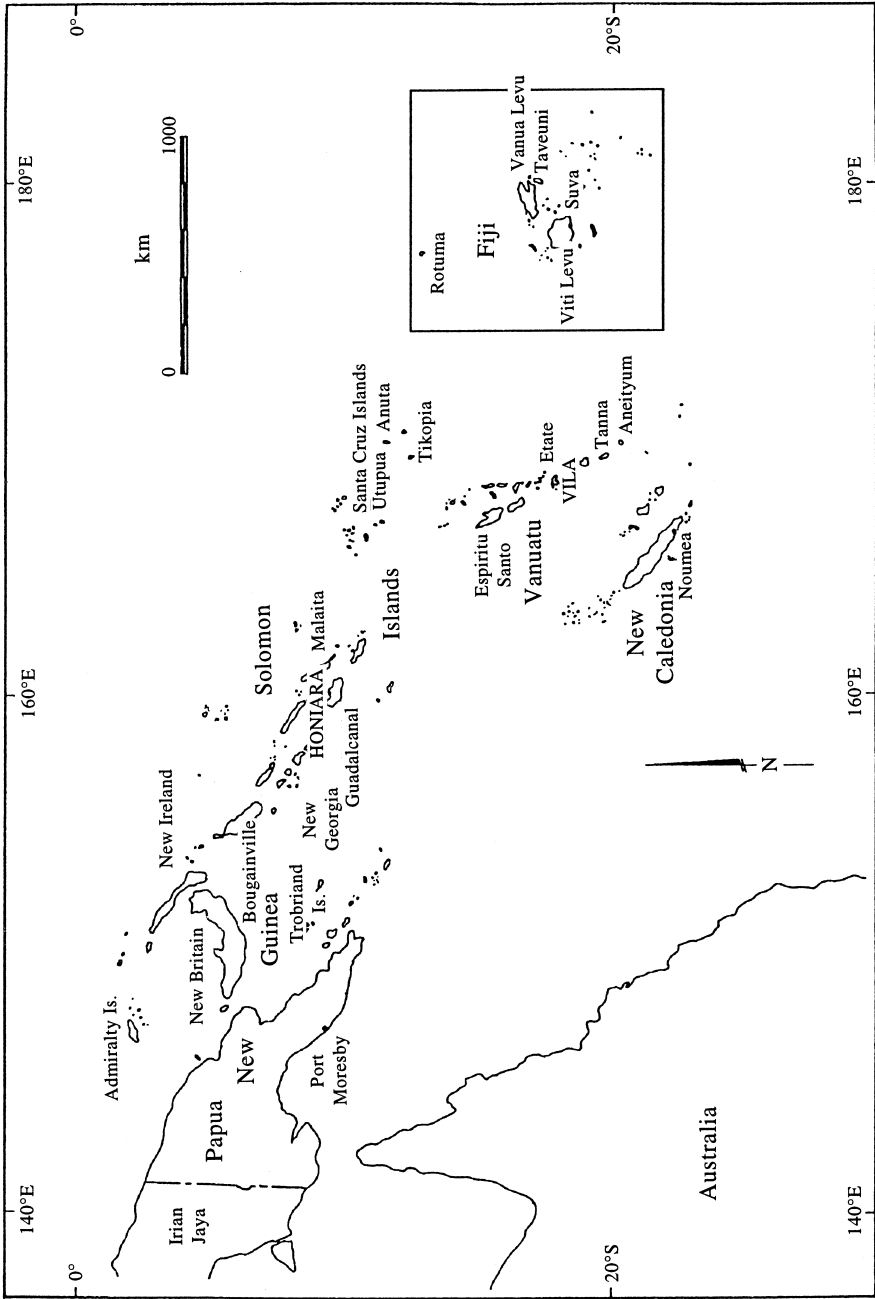


Fig. 1. The Fiji Islands.

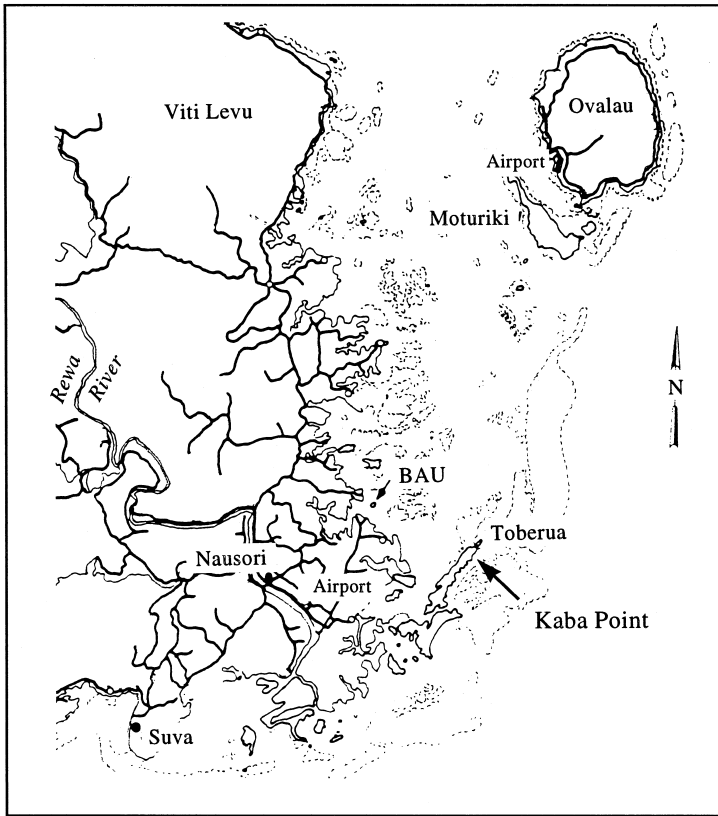


Fig. 2. Kaba Point, Fiji and the Kubuna Customary Fishing Rights Area.

Table 1
General comparison of Kaba Point's villages

	Dromuna	Vatani
Total population	91	192
Households	23	28
Primary sources of income	Fishing, visiting tourists (sell hand-crafts and shells), employees of Toberua Resort, remittances	Fishing, gleaning, farming, visiting tourists, resort employees, coral harvesting, remittances
Subsistence activities	Fishing, gleaning, farming	Fishing, gleaning, farming
Social services	Primary school, health center, community hall, electricity	Radio-telephone service, community hall, church, electricity
Fishing styles, equipment	Gillnetting, handlines, spears, gleaning (mostly for subsistence)	Handlines, gillnetting, gleaning (subsistence and commercial), two fish fences

were snappers, mullet and sting rays. Women glean the exposed inshore areas at low tide and collect sea cucumbers, shells (for both subsistence consumption as well as sale to tourists), small crabs, seaweeds (especially *Caulerpa* spp., sea grapes, described as the ‘most preferred’ seaweed served on Fiji’s tables [8]) and sea urchins. Women walk along the reef flats to collect primarily for subsistence uses or travel in groups by boat to more distant reef areas. Some women sell their catch in markets in town. Groups of people also dive in deeper channels further from shore for shells, sea cucumbers or other invertebrates.

Seventeen permits were issued in 1994–1995 for fishermen to commercially fish in the Kubuna Customary Fishing Rights Area. Commercial fishing operations are generally small-scale artisanal operations consisting of an individual fisher or a group of three or four people working together. The commercial fishers, who are generally of Indian descent, predominantly come from the Nausori area. They do not have traditional rights access to fishing areas of Fiji and hence need licenses to use the customary fishing rights areas. Most of the commercial fishing is done with gillnets that are set from boats.

Some Vatani villagers have been collecting corals for export since the 1970s. In the past 3 to 4 years small-scale coral harvesting activities have increased to meet the demand in the foreign market for live and dead corals. The collectors usually visit the reef two times a week, and transport the corals to the boat landing outside of the town of Nausori. The corals are packaged for export either in the village or at the boat landing, taken to the local airport and flown to the United States and elsewhere. Coral harvesting of this type is unregulated and undocumented and there is no publicly available quantitative information about the species being collected or about the actual scale of the harvest. In 1994, two companies were granted permits for collection of coral on a larger scale elsewhere in Fijian waters for medical and ornamental uses [9].

3. Surveys

In January 1995, a team of five researchers from the University of the South Pacific, two staff members of the Fiji Fisheries Division, and three local government representatives visited Kaba Point for a preliminary 3-day survey [10]. Villagers from one of Kaba’s two villages invited the research team because they wanted a scientific assessment of the feasibility of their plan to revitalize the faltering fishing cooperative through a scheme to increase the catch. The survey, was primarily based in the village of Dromuna. The land-based socioeconomic survey was comprised of three parts: (1) interviews with fishermen and other household members; (2) analysis of cooperative records; and (3) general observations on living conditions and livelihood. The water-based biological survey also comprised three parts: (1) underwater visual fish census; (2) line intersect transects; and (3) preliminary reef flat survey. In addition, informal discussions were held with men and women from both villages throughout the visit. While the 3 days were insufficient to thoroughly understand the dynamics of the resource-use problems in the area, a useful database has been initiated.

3.1. Biological survey

3.1.1. Methods

The methods utilized in this survey include the Underwater Visual Census (UVC) Point Count Method³ for fish census reports, Line Intercept Transect for coral cover and assessment of benthic composition, and general impressions of the underwater environment, the mangrove area and intertidal mud flats. Only the results of the fish census results are reported here. See Veitayaki et al. [10] for a more thorough discussion of the coral cover and intertidal surveys.

Fish counts were performed at four sites in order to gain a general picture of the abundance of certain reef fish and sedentary species. The counts were executed during daylight hours using SCUBA and pre-printed underwater data sheets. Criteria that assisted in selection of the sites included depth, proximity to village and main reef, and location of commonly utilized fishing areas. For example, dives were done in channels and along slopes where fishing activities are most frequent. Each site of the census was composed of six random replicates that were spaced 1 minute's travelling time apart (by boat). The path of the boat generally went away from the land toward the main reef, following channels when possible. Replicate 1 was the spot where the diver entered the water for the first time; this marked the beginning of the survey for that site. Once the underwater census was completed at this site, the diver re-boarded the boat and the boat travelled for a period of 1 min. The diver then re-entered the water and performed a second replicate. This continued until six replicates were made. Keeping the travelling time constant between the replicate sites maintains a roughly equal distance between them and ensures a degree of 'randomness' in the sampling.

Pre-printed data sheets were used to count 12 families of reef fish. The species on these lists were chosen during a study done in Fiji in 1991 by a team from Queensland Department of Primary Industries, Australia and staff of the Fiji Fisheries Division. The species on the list include the most commonly seen shallow water reef fish in Central Fiji (an area that includes eastern Viti Levu and the Lau group). An attempt was made to include important food fish on the list. The data sheets used in the fish counts include the following fish families: Acanthuridae (surgeonfish), Balistidae (triggerfish), Chaetodontidae (butterflyfish), Haemulidae (sweetlips), Holocentridae (squirrelfish/soldierfish), Labridae (wrasses), Lethrinidae (emperors), Lutjanidae (snappers), Mullidae (goatfish), Scaridae (parrotfish), Serranidae (fairy basslets and groupers) and Siganidae (rabbitfish).

The UVC was performed as follows:

1. The diver entered the water and from the surface, selected a prominent rock or coral head as the centerpoint of the survey area. The diver also chose markers to define the 7 m radius from the centerpoint.

³ The UVC point count method was modified to accommodate specific situations encountered during the course of the survey.

2. The diver began the fish count during the descent, especially looking for large species that are fleeing the area.
3. Once at depth, using the pre-printed data sheets, the diver recorded fish (number and length) that were within the prescribed area, taking care not to count any inquisitive fish that had entered the area once the count had begun. The counts lasted 7 minutes.
4. The descriptive data for the site was then recorded. This included depth, actual diameter of survey area, time elapsed, tide, visibility, and area covered. A general description of the substrate was also recorded, as well as the presence of any sea cucumbers and giant clams.

3.1.2. Results and discussion

The Underwater Visual Census was conducted only during the day over a very short period of time. In order to be an accurate picture of the abundance of the local fish population, much more extensive surveys need to be conducted at different times of the day and at other times of the year. The results of the census are presented here as a preliminary picture of the status of the local fish populations near Kaba Point. However, combined with the discussions with local fishers, the census provides some evidence of depletion of some of the more commonly sought fish species in the region.

The majority of the fish recorded during the Underwater Visual Census are relatively small individuals of the smaller, less commercially valuable species (Figs 3–6). There was a preponderance of small species, especially snappers, seen during the fish counts. Very few of the large, commercially important fish (i.e. emperors, rock cod, jacks) were recorded. In addition, the species that were said to be most commonly caught in local nets (rabbitfish, mullets and goatfish) were poorly represented in the fish count data. Villagers spoke of days when one net would yield a boatload of mullets, yet nets brought in during our stay held only several dozen

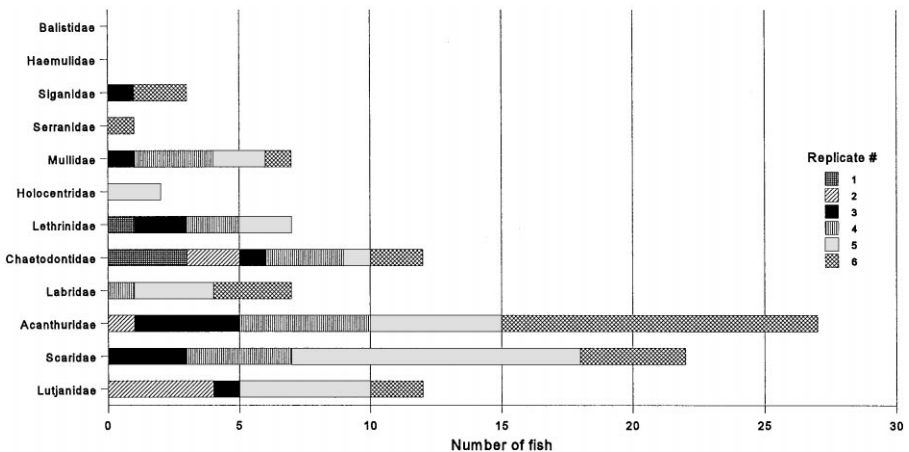


Fig. 3. Fish census at site 1 (by Family).

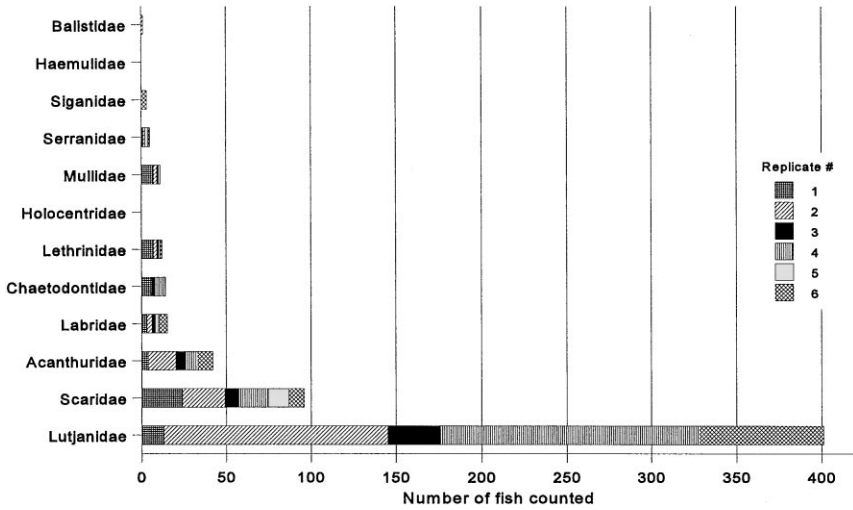


Fig. 4. Fish census at site 2 (by Family).

emperors (< 30 cm), a few snappers (*sabutu*), one trevally (*saqa*), a shovel nosed ray and a small hammerhead shark.

Some areas surveyed had relatively large groups of fish. For instance, 400 snappers were counted at site 1, most of these were found in schools in two of the replicates. Over 100 juvenile parrotfish and a school of more than 30 squirrelfish were counted at site 4. This may appear to be good news, but snappers have been known to school in the thousands and some species of mature scarids have been observed in Fijian waters foraging in groups exceeding several hundred individuals.⁴

Comparative data must be treated carefully, as each localized area is in fact very different in terms of available niches, influx of organisms and nutrients, water salinity, substrate/bottom composition, reef habitat quality and character. However, a similar survey conducted in the Verata waters, just to the north of Kaba's fishing rights area, is useful because of the proximity of the study sites. This survey reported a predominance of emperors, butterflyfish, mullet, goatfish, rabbitfish and squirrelfish in order of abundance [11]. This report interestingly concluded that those waters were overfished because of the low density of carnivorous species (i.e. sweetlips, coral trout and rock cod). However, in comparison with the results from the UVC-fish census from Kaba Point, the Verata waters sound very rich in the important commercial species, particularly those that are usually caught in nets.

The Verata report indicates that Serranidae (groupers) are a valuable species to fisherfolk and can be used as an indicator of fishing pressure. Mullidae (goatfish),

⁴ A. Ballou. Pers. obs, 1995.

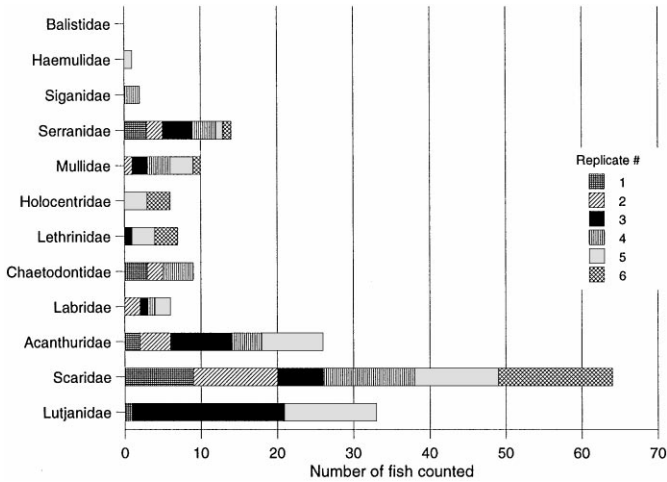


Fig. 5. Fish census at site 3 (by Family).

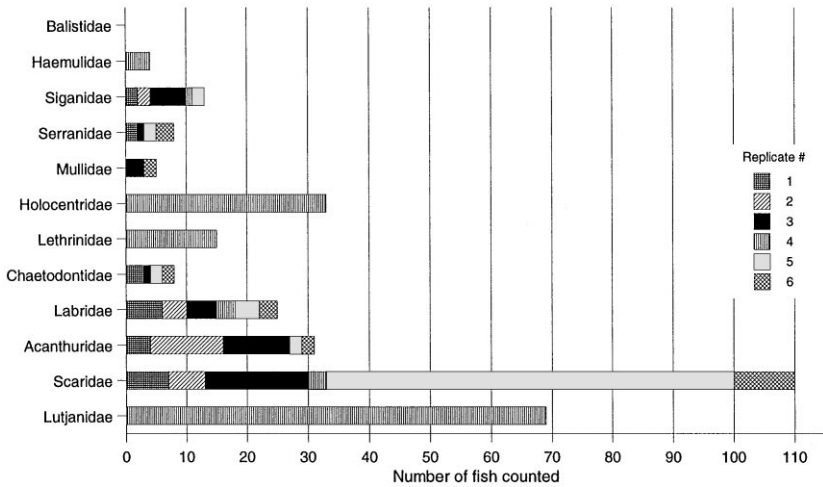


Fig. 6. Fish census at site 4 (by Family).

Lutjanidae (snappers) and Siganidae (rabbitfish) are the species most often caught in gillnets and their relative abundance can be used as an indicator of the pressures of gill netting specifically. Aside from snappers, few of the other indicator species were recorded during the Kaba Point fish census. Lastly, the report points out that Chaetodontids (butterflyfish) are both colorful and conspicuous reef species

and could be used as an index of abundance and species richness of both reef fish and corals.

The Verata survey was designed to assess the possibility of setting up giant clam farms to supplement the local diet and income and to restock this once abundant organism in the area. The focus was on sedentary organisms such as giant clams, sea cucumbers, urchins, seaweed, shellfish and corals, rather than fish. Unfortunately the report did not include quantitative data for the census. Because commercial gill netting has been recently banned from the Verata waters, it would be interesting to have more detailed baseline data for the fish species there as well. It would help to both evaluate the effect of the ban and would also provide comparative data for regional surveys and studies.

3.2. Socioeconomic survey

3.2.1. Methods

Two researchers conducted household interviews to determine living conditions in the villages and the types of activities carried out by family members. Informal discussions were held with local fishers. In addition, the fishing cooperative's department officer, who was auditing the cooperative's accounts during the time of the survey, was also interviewed. He kindly provided access to the records and accounts kept by the cooperative's management.

3.2.2. Results and discussion

Records from the cooperative were available for fishing activities from mid 1992 until late 1994. The months of April and December were chosen as representative months for more detailed analysis of weekly performance by fishermen. In general, annual production figures showed variable catches throughout the year.

Fig. 7 indicates the total weekly catch and revenue of randomly chosen fishermen over the months of December 1992, April and December 1993, and April and December 1994. Based on the weekly performance of these fishermen during the months analyzed, only three of the six fishermen (*d*, *e* and *f*) showed some reliability in their production. Two of the fishermen (*a* and *c*) sold fish to the cooperative only in April 1993. Fisherman *b* operated in December of both 1992 and 1993, but did not sell any fish to the cooperative in April and December 1994.

The weekly data indicate that some fishermen in Kaba fish and sell to the cooperative consistently over short periods of time and then do not sell fish for more extended periods of time. There are several possible reasons for this behavior. The first is that they sell only when there is an urgent need for cash. Secondly, the cooperative probably does not offer the optimum price from their catch. Third, fishermen do not always have sufficient surpluses to sell. The last reason may be the most likely in the case of the fishermen in Kaba. A more detailed analysis on the nature of the fishermen's practices is needed in order to more accurately pinpoint the reasons for the current fishing and selling practices in this area.

The fishing cooperative has been operating in some form since 1963, when the people from both Dromuna and Vatani villages started the Naitodua Fishing

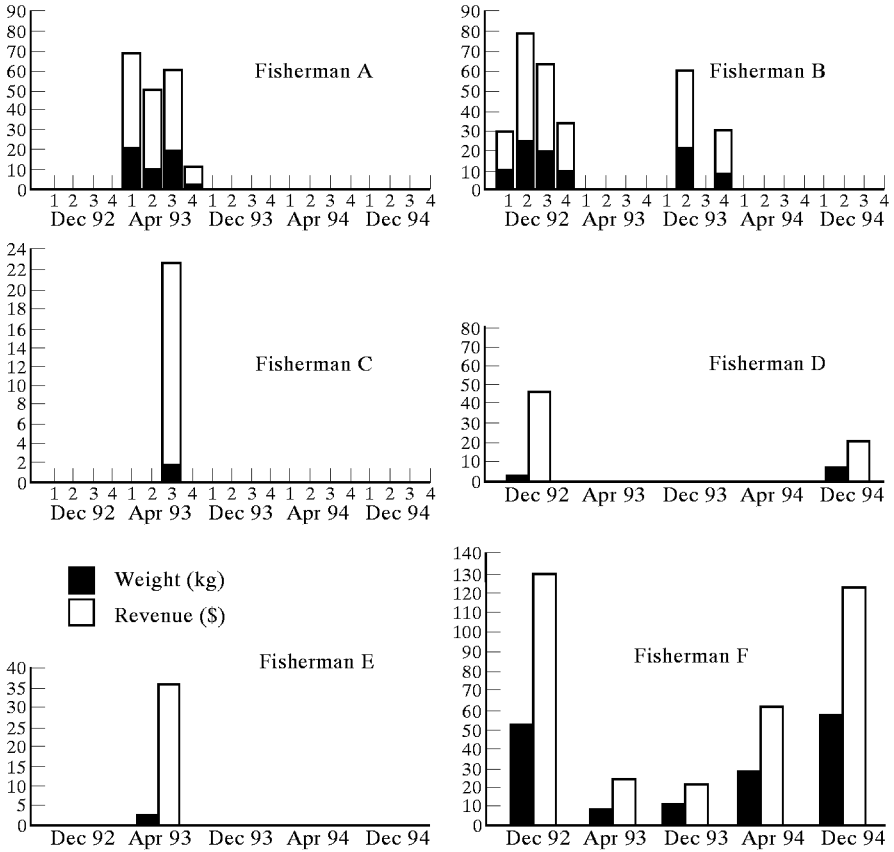


Fig. 7. Weekly performance by individual fisherman.

Cooperative. This cooperative functioned until the villagers in Vatani pulled out over management conflicts in 1989.

In 1992, villagers in Dromuna started their own cooperative: the Muaikaba Cooperative. Although the villagers agree that the fisheries cooperative is providing a valuable service to the people in the purchase of their catch, the commitment of the members has not been forthcoming. The fact that the cooperative is around today is largely the work of a handful of members. One particular member, at present, holds four positions of responsibility within the cooperative. In addition, while 17 of Dromuna’s 23 households are officially members of the cooperative, only five fishermen are active members. These men, however, are the village’s most active fishermen. Among the reasons given for the lack of participation are the intense social and community demands imposed by tradition that take time away from full-time fishing activities. For instance, during the researchers’ visit, many men were helping a government team with their electrical wiring work and the women were collecting and

preparing food for the research team. Customary practices demand that villagers provide visitors and guests with food during their stay and gifts at their departure. In addition, villagers in Kaba Point generally follow a semi-subsistence lifestyle; they usually only sell fisheries or agricultural products that are surplus to their family or community needs.

The cooperative's facilities are limited: catch is recorded in a storage shack located near the seawall. Inside the shack, are a weighing scale and two old freezers to hold ice bought in town. The treasurer weighs the catch brought by the fishermen and pays them according to weight and species. The catch is kept on ice in these freezers until enough catch has been accumulated to justify a trip to the market, which happens at least once a week. At the moment, the cooperative buys fish, lobsters and crabs. Attempts are being made to diversify the commodities by buying other products, such as dried sea cucumbers (*bêche-de-mer*), and looking for new markets.

Despite its shortcomings, the existence of the cooperative in Dromuna gives the village a sense of 'communalism'. It fulfills an important socioeconomic function by facilitating the supply of ice, fuel and fishing gear. It also facilitates the marketing of catch. Without the cooperative, the individual fishers would have to make their own provision for these services, which would result in a much higher cost to the individual. Secondly, the existence of the cooperative also generally makes fishers obliged to sell to the cooperative because of the benefit they derive from it. This provides a sense of common practice as individuals in the village usually want to uphold the status quo.

Initially, the Dromuna cooperative members' response to the limited success of their cooperative was to want to increase effort and efficiency in order to tackle the declining catch per unit effort. This immediate reaction has been well documented throughout the history of commercial fishing operations and tends to lead to the collapse of the fishery [12,13]. Rather than simply increase the cooperative's ability to catch fish, a successful cooperative in Kaba would be one that could be sustainable within the given ecological and social constraints. In other words, this would be a cooperative operation that has an optimal storage capacity and provides marketing services and infrastructural support that caters for sustainable levels of harvest. Expansion will be dependent upon crucial factors like the availability of resources as well as market demand.

Failure of many cooperative projects has been a result of imposition of business practices and perceptions on how it ought to function as a profit maximizing venture. Its performance and success is often measured by such indicators as level of investment, equity, profitability and the level of managerial skills. While financial viability and good management are crucial for the economic success of commercial projects, high levels of profitability and investment may not be as crucial and necessary as these are only relative measures. It must be borne in mind that in Kaba and in many other coastal villages, the community is still predominantly semi-subsistence, therefore maximizing profits is not a practical goal.

In coastal rural villages, where there is no direct access to the urban centers by roads, the cooperative plays an important role in facilitating the socioeconomic livelihood of the people. On the other hand, the success of the cooperative as

a business venture depends upon the availability of an adequate resource base to ensure a continuous supply of fish and on how people perceive the role of the cooperative. Since the traditional communal social structure itself forms a foundation for cooperative commercial operations, as opposed to individually owned ventures in a communal setting, the cooperative in Kaba Point can serve as a basis for contemporary use and management of community resources. In fact, the cooperative is already serving as the focal point for community-based management and monitoring of resources in this area. In the future, its structure can be utilized as a place for the necessary education and extension work that needs to be done in the region.

4. Conclusion

In the past, the sustainable use of marine resources was easier to achieve in part because fishers were fewer in number, had fewer needs and used less effective fishing methods. Although the traditional communities in the Pacific islands were at particular times very destructive in their activities, (i.e. traditional fishing methods include the use of plant poisons and the physically destructive leaf sweeps where people pounded on coral heads to scare fish into nets) [14], small population and limited capacity reduced their overall impacts. Furthermore, the sociocultural conditions in the coastal communities were such that custom and tradition were strong enough to support and enforce management practices. Today marine resource management is being undermined by such factors as the emphasis on production, participation in the modern economy, an increased capacity for resource exploitation, a lack of information on which to base management and the destabilizing effect of the cash economy. In most cases, village-based traditional societies have been replaced by contemporary and intricately linked settlements and towns that are part of the modern economic structure.

Many of the traditional systems are still at least marginally influential in Fiji today. In fact, national fisheries policy is based upon the traditional marine tenure system and a licensing system has been devised to control access to fishing grounds based on hereditary ties to the land and coastal areas. The traditional social system is still influential in maintaining harmony and social stability within villages in the Pacific. The land and marine resource-use patterns are strongly guided by the cultural values. In Fiji, traditional management systems that have guided village resource-use patterns through cultural norms and beliefs are still considered as paramount in terms of allowing access to the fishing grounds. In rural areas throughout Fiji, people live subsistence or, increasingly, semi-subsistence lifestyles. However, at the same time, there is increasing demand for cash to pay for school fees, medical and transportation expenses and to purchase store goods (foodstuffs, clothing, cooking gas, etc.). Many villagers in Fiji turn to the marine environment for products to sell. This has directly led to increased pressure on the marine resources in the fishing grounds close to the villages to satisfy such needs. In general, marine resources are under increasing pressure and some species have shown signs of local depletion throughout the Pacific [15].

Traditional systems provide a strong basis upon which to build community-based management systems [16]. However, traditional management systems that evolved to handle subsistence-level fishing and gleaning activities need to be reevaluated and adapted to handle the changes that have occurred in the way people live, with the resulting increase in pressures due to commercial harvest, population growth and habitat degradation. These systems provide a strong basis for viable community-based management systems if they are developed with care and with some degree of supervision. Not all traditional practices are inclined towards conservation; in fact some practices are wasteful and have led to destruction of habitat as well as decimation of certain species. For instance, several species, most visibly giant clams and sea turtles, are severely threatened as a result of widespread subsistence and commercial overfishing. If, as in the case of the Kaba fisheries cooperative, villagers are left on their own without proper environmental and development guidelines, overfishing and mismanagement can result from the apparent need and desire to fish as often and as much as possible in order to make a profit.

Although Pacific islanders are renowned for their history of traditional resource knowledge and sensitivity and have systems of local resource stewardship, few community-based programs for resource management and monitoring exist in the region. Aside from the recognition of the importance of incorporating traditional marine tenure systems into contemporary management schemes, local participation in resources management is not widespread. In fact, in a global overview of community-based reef management projects, only three from the Pacific islands region were included (Fiji, Solomon Islands and Kosrae), two of which, Fiji and Solomon Islands, were included because of their marine tenure systems [16].

In addition, Fiji lacks a comprehensive coastal management plan. Fisheries statistics are publicly viewed as economic statistics with little apparent regard for the consequences of increased fishing efforts. Emphasis is on encouraging fishermen to fish further offshore for commercial markets, but this leaves a large gap in the management regime as local villagers continue to fish locally both for home consumption as well as area markets. This can be especially dangerous if the assumption exists that marine resources are adequately protected from overexploitation since some traditional management systems are still viable.

Local management programs that incorporate and utilize the traditional systems inherent in these coastal communities can be more cost effective than other more institutionally based mechanisms. They are also potentially more successful as any management project needs local cooperation in order to succeed. Developing nations throughout the world are faced with burgeoning environmental and resource-use dilemmas as the cash economy becomes more pervasive. Enforcement of regulations designed to restrict certain fishing activities is underfunded and ineffectual on a large scale in many countries. Local involvement, especially programs including extension and education to encourage the sustainable use and monitoring of local resources, provides a way for management systems to continue with lessened outside effort. Holistic approaches to coastal fisheries management and development are necessary because of the complexity of the coastal zone with its ties to land, water and human populations.

According to the fishers in Kaba Point, the fishing catch is now a quarter of what it was only 5 years ago. Out of necessity, the villagers have initiated a local management program to deal with the changes in their environment. As a result, the chiefs who have jurisdiction over Kaba and its local resources, as well as the Fiji Fisheries Division, have placed several restrictions on fishing and collecting in the past few years. In 1995, the paramount chief of Kubuna, the custodian of the Kubuna Customary Fishing Rights Area, decided to allow gillnetting in these waters only between January and June and to allow only line fishing between July and December. The Fiji Fisheries Division also banned coral collection on Viti Levu and turtle harvesting except when done for subsistence or cultural purposes. In 1996, the paramount chief of Kubuna, after hearing the preliminary results of this study, decided not to offer any license to any commercial fisher and to allow only the fishers of the Kubuna area total use of the fishing ground. Finally, in the spirit of community-based participation and the desire to do more than just place limits and restrictions on catch, the villagers themselves began to think about the future of their resources. In May 1996, a workshop was held in Kaba and the villagers began to formulate a plan for their own sustainable use of their marine resources. They decided to restrict the use of efficient gear, such as gillnets, and to ban the taking of coral. Mangrove forests will also be protected because of their importance to marine lifeforms.

The villagers in Kaba insist that any future development project be thoroughly evaluated before it is undertaken. They realize that their marine resources are in need of proper care and that they cannot continue to rely on the fisheries the way they have done in the past. The people have agreed to reduce gillnetting and have begun to accept the painful fact that they cannot revitalize their fishing cooperative by simply increasing catch given the present state of the resources. Alternatives now being considered by the people of Kaba include small-scale mariculture, deep sea fishing, Fish Aggregation Device deployment, expanding fishing operations to other areas within the Customary Fishing Rights Area, and the development of non-marine based ventures such as ecotourism and agriculture.

The villagers are considering the options available to them since they agree that drastic changes are required to save their fisheries resources. In Kaba the people are naturally using the traditional management system as the basis for a contemporary and scientifically oriented management system. The traditional system of resource management in Fiji continues to evolve as it adapts to new demands.

Acknowledgements

We would like to thank the Fiji Fisheries Division, especially Benedito Tikomainuisiladi and Apolosi Turaganivalu, for their invaluable help throughout this study. Thanks also to Anne Ballou for her work on the underwater portion of this study and to Aliti Vunisea for her help on the interviews. This project was supported by the University of the South Pacific and the Fiji Fisheries Division. The US Fulbright Scholarship Program enabled the participation of Elizabeth Matthews and

Anne Ballou. Special thanks are reserved for all of the people from Kaba Point who generously welcomed us into their homes and lives for the duration of our surveys. This study is for them.

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