
Fisheries Development in Fiji:



The Quest for Sustainability



Joeli Veitayaki

**FISHERIES
DEVELOPMENT
IN FIJI:**

**The Quest for
Sustainability**

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1995

USP Library Cataloguing-in-Publication Data

Veitayaki, Joeli

Fisheries development/ Joeli Veitayaki. - Suva, Fiji
: Institute of Pacific Studies, The University of the
South Pacific, 1995.

xii, 233p. : ill. ; 21 cm.

Bibliography: p.

ISBN 982-02-0104-7

1. Fisheries - Fiji 2. Fishery management - Fiji
I. Title

SH319.F5V44

338.372'099611

Copyright ©	Joeli Veitayaki, 1994
Cover photos	Joeli Veitayaki
Cover design	Mark Garrett
Photography	Joeli Veitayaki, Fiji Times, Fiji Fisheries Division
Graphics	Sashi Kumar
Wordprocessing	Keresi Tabete-Morris
Typesetting	Keresi Tabete-Morris and Leba Lua Sovea
Production	Linda Crowl
Indexing	Oliver Edwards
Printing	Star Printery Ltd.

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FOREWORD

Coastal fisheries in many of the populated areas of the Pacific Islands are under stress: overpopulation, urbanization, commercialization of the fishery and the consequent rapid loss of traditional life styles and knowledge have all contributed to this situation. At the same time, environmental issues have taken on paramount importance in the South Pacific, as they have globally. In the lead up to the United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992, Pacific Islands states participated in the development of a region-wide environmental strategy ("The Pacific Way") which in turn, contributed to Agenda 21, Chapter 17 of the UNCED conference, providing a blueprint for ocean governance for the next century. Sustainability of resources is one of the key objectives of Chapter 17.

In this book Joeli Veitayaki provides a fascinating account of the fisheries in Fiji which in itself is of value: he further addresses the question of sustainability, and examines the effects of the introduction of new technology on the traditional systems of fishing and management. Essentially, he argues that while traditional or customary systems were themselves flawed and at times destructive, overall they allowed for a sustainability of the resource. The breakdown of this sustainability is attributed to modernization, as well as other factors such as those I refer to here. Fisheries in Fiji is a major contributor to the country's wealth, and fish is a crucial component of the people's diet. It is likely that the full potential of fisheries has not yet been realized, but at the same time, as Joeli points out, the resource is already under stress or, in some areas, depleted. In these situations, the concept of sustainability is not even an issue.

In attempting to suggest a solution for the demise of Fiji's fisheries, Joeli suggests that a mix between customary and modern (e.g. western or developed world) management systems will be necessary; he is, however, unable to provide us with a detailed plan. The development of any management plan must, ultimately, depend on a detailed knowledge of the resources themselves: the biology, population dynamics and ecology of the fish. Much of this knowledge is part of the tradition passed from parents to children in Fijian society, and which is being rapidly lost. There is also a need, however, for scientific

information that can only be obtained from long term research: for almost all the commercially important reef and lagoon fishes of Fiji, this information is entirely lacking.

Given the scenario described here and in this book, we need to consider some short-term strategies while we find the time to gather the information needed for the development of sound management plans. Otherwise, the goal of sustainability will be meaningless. Sustainability means fishing the resources in such a way that stocks can be replenished through natural replacement; it also means the setting of realistic catch and size limits, and the need to close some areas from fishing at times. These were part and parcel of the customary marine tenure system developed over generations by Fijians, and which is now being replaced.

Joeli Veitayaki's book is timely in that it will bring people's attention to the demise of Fiji's fisheries. It will also, hopefully, stimulate us all, but in particular those who are in control of the fisheries, and the fishers themselves, to the realization that if the future of our fisheries is to be assured, then action is needed now.

G. Robin South



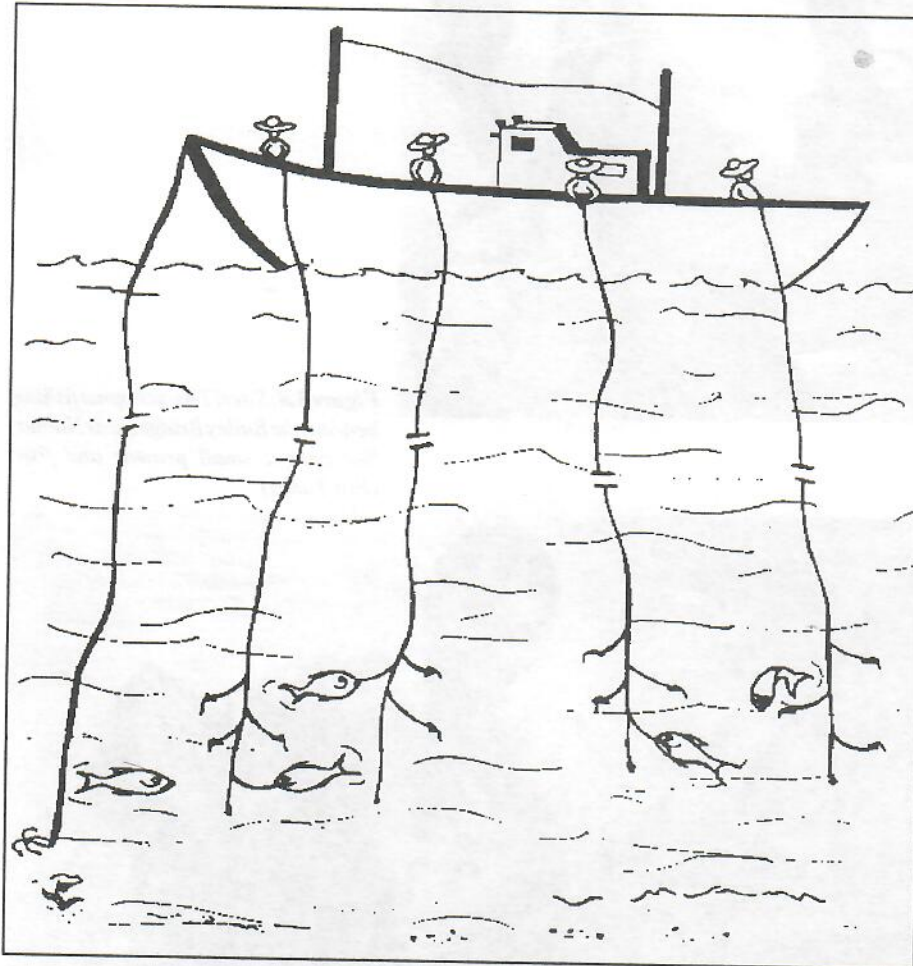
Figure 3.7: Spearfishing from the surface. (Fiji Times)

Figure 3.8: Siteri Tiko scoopnet fishing beneath the Bailey Bridge, near Nabua. She caught small prawns and fish. (Fiji Times)



Trolling involves the dragging of an unbaited line from a boat moving through the water. The fish are attracted by the lure which is attached to the line and hook. Trolling can be demanding because the fishers have to handle the canoe and/or the sail and line simultaneously. Top swimming pelagic fish dominate the trolling catch.

Figure 3.6: Handlining



Source: Office of International Affairs National Research Council, 1988

Spearfishing (*Cocoka, Vavana*)

There are two main types of spear fishing: surface or thrustspear fishing (*cocoka*) and underwater spearfishing (*vavana*). Surface or thrustspear fishing, with the use of pronged thrust spears or gigs, is still important but is not as widely used as in the past because of its relative inefficiency. This method of fishing requires skill which often is the first that coastal people, particularly the males, acquire. Good thrustspear fishermen can identify the fish by the waves they make, or the way they move, and can spear at prey metres away. This type of fishing is better in the night with the use of lights. Fish are caught while they rest.

Underwater spearfishing was practised well before the introduction of goggles and spearguns but was neither efficient nor well-known. In those days, diving was mostly for non-fish species such as turtles (*vonu*), echinoderms, bivalves, gastropods and crabs. Underwater spearfishing has been greatly facilitated by the use of goggles, underwater lights, fins, wetsuits and other modern gear.

The fishers stalk their fish patiently and understand their behaviour and the best way of killing different species. Turtles, for instance, are speared in one of the front flippers to force them to swim in circles, preventing them from fighting effectively, while big fish are speared at the back of the neck to kill them instantly. The behavioural traits of some fish are exploited to enhance the catch. Jacks and surgeonfish caught are used to attract other members of their school and provide easy targets for the fishermen. Wahoo (*wau, Acanthocybium solandri*), and barracuda (*ogo, Sphyraena spp.*) are never speared directly in front because they shoot forward when hit while trevally (*saqa, Caranx sp.*) are attracted when the fishers make farting sounds underwater.

Night spearfishing is widely practised and is more productive because fish that are commonly active during the day are inactive at night, making them easy targets as they rest on the bottom or in holes and crevices in the reef. Underwater night spear fishermen usually spear fish at close range making the gun's range and power less significant than its manoeuvrability. Barbs are removed from spears to facilitate the quick removal of fish so as to avoid attracting sharks, which are plentiful in inshore areas at night. Boats or canoes

are required to store the catch, and to ferry the fishermen from one spot to another, which is occasionally necessary because of sharks.

Net Fishing (*Qoli*)

Nets of varying mesh size and construction are used for different fish and fishing techniques. In traditional societies, nets were made from the bast fibre from trees, vines, and coconut sinnet. The nets were either dragged through the water or placed stationary in carefully chosen spots. The traditional materials have since been replaced by nylon, twine and monofilament material. Examples of net types include casting, different types of scoop, drag, stationary and barrier nets. A casting net is small and circular with light weights around its edge, carried on the fisher's shoulder, and thrown in a manner that allows the net to land over the fish or school thus trapping them.

Scoop nets are singularly operated nets that are manoeuvred by women while they wade through the shallow waters of inshore fishing areas. The nets are two to three metres long and are held stretched at both ends by sticks about a metre long. Like the other nets, the sinkers are fastened to the lower side while floaters are attached to the upper side. This type of fishing, such as that conducted by women catching shrimp in the estuaries, involves the enclosure of fish by the net. Once the fish is totally surrounded the two ends of the net are brought in and the whole thing is lifted off the water. The catch, if any, is then killed and placed in the *noke* or basket tied around the fisherwomen's waist.

Drag nets are used mostly by women in shallow areas including rivers, estuaries and inshore fishing areas. Coral and rock heads are thoroughly searched and disturbed by some of the fishers whose aim it is to chase the fish towards the strategically placed net. Fish in that vicinity are surrounded and directed to the nets which are skilfully scooped out of the water and into the air.

Stationary barrier nets are used to block strategic paths the fish take as they leave inshore areas and the reef for deeper waters when the tide ebbs. These nets which have floaters at the top, sinkers at the bottom, and an anchor on both sides, are much longer and are placed in a L, J, V or U shape to block entry or departure routes. Occasionally, alterations are made to each of the methods to

reflect particular requirements. Stationary nets are at times placed before the fishers, who move as far as possible from the net and then noisily return to it. Fish swim away from the resulting commotion towards the placed nets and are caught and killed.

Weirs and Traps

Weirs and traps are built in the belief that the fish, if distracted sufficiently while in inshore enclosures, will not move away with the ebbing tide until it is too late. Weirs, wooden tidal traps (*ba ni ika*) and stone traps (*moka*) are found throughout Fiji and are used with differing regularity in different areas. The method is only periodically used because of its passive nature. The increase in the number of fishers and the availability of better fishing techniques have led to declining use of weirs and traps.

Weirs and traps are reflections of the fishers' understanding of the prey. In most fish traps, the funnel-shaped entrance often leads to the bait inside. The prey can force its way inside to the bait but cannot turn back once inside. Hidden openings in some of the traps are used to acquire fish that continue to swim around inside.

Dynamite Use

Dynamite sneaked away from the main mines and work sites in different parts of the country is still used occasionally to blow up the reefs, consequently killing all the fish in the vicinity. On arrival at the fishing ground and after sighting fish, the dynamite is lit and thrown into the sea. In some cases, the fisher is slow in throwing the bomb and he or she shares the experience with the fish. Despite the public ban on dynamite use, some fishers are still using this highly destructive method which not only kills small fish which are then discarded but also destroys the reefs which take a long time to regenerate. Most of the reported cases in recent times have been in the Yasawas, Ba and Vanua Levu waters.

The Fisheries Division is doing its best to combat the problem and recently introduced legislation involving stringent measures to address it. The employment of enforcement officers, the confiscation of catch, the termination



Figure 3.9: *Catching shrimp (moci) in the Rewa River. (Fiji Times)*



Figure 3.10: *The loloni, fish stupeficient. (Joeli Veitayaki)*

of the licences and the jailing of those found guilty of the offence are only some of the measures used at the moment.

Fish Poisons and Stupefacient

Fish poisons and stupefacient used to be widely used in Fiji. The increase in awareness associated with the destructive nature of this method has led to its reduced use. Most of the fish-poison plants contain either rotenone, tannin or saponin which are injurious to fish, damaging their respiratory organs and cell metabolism. Other sea creatures are on occasions used as fish poison and stupefacient. The sea cucumber (*loloni*, *Holothuria atra*) is rubbed in the sand to emit a red and purplish liquid which contains a nerve toxin capable of poisoning fish and chasing octopuses out of their lairs.

Fish poisons and stupefacient are wasteful and harmful to fisheries resources because they indiscriminately affect everything with which they come into contact, including small immature fish and the larval stages of sea organisms. Fish-poisoned areas take a long time to recover which is a major reason why the use of this method has been discouraged and outlawed.

Bleaching is a special form of fish poisoning which involves the addition of bleach, pesticides and chemicals such as chlorine to the water. The method is commonly used in fresh water because it can be quietly added. Bleaching is wasteful and destructive but its use is increasing because of the desire people have to maximize productivity. Fishers are using easily available chemicals to enhance their productivity without any consideration for the unlucky fisheries resource and the unsuspecting consumer. The corals, reefs and fish are killed and, as is the case with other poisoning methods, take a long time, if ever, to regenerate and recover.

Fish Drives (*Yavi rau*, *Yavi wala*)

Fish drives are conducted in carefully chosen fishing areas. Fish drives require many people and the use of leaf sweeps made of vines and coconut leaves. Fish drives are widely employed to yield large fish hauls, especially for important

occasions. This method, which involves long preparation, is slowly becoming a thing of the past, as most fishers have adopted modern fishing gear and individualistic methods. Fish drives, are occasionally practised in coastal villages.

Fish drives are conducted in the lagoon area inward of the reef. The master fisher commands the fishing. A major area on the inner edge of the reef is covered by fishers who form a huge semi-circle using the prepared rope of vine wrapped in coconut fronds. The fishers are guided by the master fisherman in their movement towards the shore. The semi-circle is reduced in size as the people move towards a designated spot on shore or the drying coastal sand or mudflat areas. Most fish drives commence just before the tide ebbs and conclude when the fish are gathered and collected as the lagoon dries.

This fishing method is efficient and is destructive, two of the factors responsible for the reduction in catch yielded by this method today. The efficiency makes this method a regular event when coastal people gather in large numbers. The regularity of drives is so high now that people are often lamenting their continuous inability to satisfy their need. Furthermore, the coral and reef outcrops are trampled or crushed during every drive, creating deserts in the lagoon areas which are incapable of supporting any viable fishery.

Fishing zones and fishing methods are closely linked. Obviously, knowledge and understanding of the fishing zones and fishing methods abound. This information is quickly disappearing as we aspire to boost our productivity and maximize our gain by depending on a limited number of contemporary methods such as underwater spearfishing. It must be remembered that while we employ more efficient methods and are more consistent in our effort, we are still mostly confining our effort to the coastal areas within the reef. For sustainable fisheries exploitation, we must venture out into deeper and more distant zones and exploit resources that are presently under-used. The fishing methods we use must not destroy the fisheries zones and resources and we must co-operate with all others to ensure the observation of methods of conservation and management that have been identified to protect our fisheries. Fishing zones and fishing methods should therefore be carefully chosen and the people should be committed to the sustainable management of fishing areas.

1990, were 17 per cent higher than 1989 while non-fish products increased by 46 per cent over the 1989 figure. The system of free bargaining which operates at the markets means that prices for both the fishers and consumers fluctuate with supply and demand. The predominant fish families, which included *Scombridae* (1,062 tonnes), *Lethrinidae* (682 tonnes), *Carangidae* (447 tonnes), *Sphraenidae* (436 tonnes), *Serranidae* (392 tonnes), and *Mugilidae* (320 tonnes) together constituted 72 per cent of the total artisanal fish catch. Non-fish sales consisting of shellfish, crustaceans, molluscs, holothurians, echinoderms, and seaweed totalled 1,865 tonnes, worth \$4.1 million. Freshwater clams (*kai*, *Batissa* spp), mangrove crabs (*qari*, *Scylla* spp) and painted rock lobster (*uraudina*, *Panulirus versicolor*) dominate the non-fish sales.

Artisanal fishing is now evident nationwide. In Dakuibeqa, Beqa Island, Daunasio Turaganivalu, a villager, operates a lucrative fisheries venture. Women go fishing in his boat and he buys their catch at \$1.50 per kilogramme. Daunasio has trained the women to operate the outboard themselves so that he does not have to go with them. This arrangement is better because there is no toilet facility on this small boat.

Daunasio sells his fish in Suva weekly for \$3.50 a kg. He stores the fish catch for the week using the seven bags of ice he brings in from Navua. Daunasio also collects bêche-de-mer which is sold to a Chinese in Suva. He prefers bêche-de-mer because it is less bulky and is more valuable. At the moment, this village-based artisanal fisher is paying \$150 per month to the Fiji Development Bank for repayment of a loan to buy the boat and engine. Being an Inside Demarcated Areas (IDA) licence holder, Daunasio is aware of the threat to his venture posed by the other artisanal fishers fishing illegally in his area.

In Ucunivanua, Verata, Tailevu the people are aware of declining fisheries resources. Noted for their ark shell (*kaikoso*, *Anadara cornea*) and sandfish (*dairo*, *tero*, *Metriatyla scabra*) supply to the main Suva and Nausori markets, these villagers agreed that exploitation has been too high and that resources were more abundant in the past. Fishing is now conducted further away and the villagers are currently observing a moratorium on their immediate inshore area. Stories of truck loads of these resources being taken as far as Lautoka and earnings of thousands of dollars a week are now only a memory. What is left

today is not only impoverished but has to be shared with other Fijian and Indian fishers who pay up to \$100 a year for a licence to fish in these areas.

Artisanal fishing is a major source of employment and income in urban centres. Of the fishers of Nabukalou Creek in central Suva, the overwhelming majority are full time artisanal operators who use their income to support their families. Most of the fishers are sole bread winners. Although the majority of these people are Fijians, there is no correlation with the ownership of fishing grounds. This is because most of these fishers have licences to fish Outside Demarcated Areas (ODA). Fishing trips are conducted two or three times a week. In some cases, the fishers go to a far off fishing area and are away for more than a week.

The average weekly income is \$100-\$150. This is one of the reasons why the majority of the fishers have remained in the trade for more than three years. Artisanal fishing, it seems has become a better source of income for the unemployed and the underemployed. Their survival as fishermen should be studied carefully because of its implication on overall fisheries development. As is the case of the Ucunivanua villagers, these fishers are already facing problems because they are being chased by coastal villagers who more than ever before are jealously protecting their fishing realm.

Subsistence Fishing

Subsistence living is marked by a paucity of material goods and is a way by which humans adapt to their environment in order to maintain a viable relationship. Fishing is an integral part of Fijian tradition and culture. The chiefs had specially designated professional fishermen (*gonedau*), who had to provide the chief's fish. These traditional professional fishermen were specialists in their field and well acquainted with different types of fish and the optimal methods, conditions and times of catching them. This knowledge was acquired from their elders who were regarded as authorities in such matters. The *gonedau* commanded communal fishing operations when required and in return, the chiefs compensated them with food and *yaqona* (*Piper methysticum*).

Fijians in certain communities have fish totems which they revere, regard as sacred and use as their symbol often depicting their relationship with others.

Totemic fish are not caught or eaten by their guardian people. The lack of adherence to fishing traditions and the execution of related sanctions in Fijian societies were serious events that caused the disintegration of certain communities. In Bau, the traditional fishermen of Ulunivuaka were banished to other parts of Fiji because of their failure to perform their fishing duty (Tippett, 1959).

In some areas in Fiji, there exist peculiar relations between fish and people. In these areas, as Koroi notes, the "natural and supernatural merge, creating a world that defies rational thought" (1989: 22). On Naigani Island, for instance, the people fish for trevally (*saqa*) after they have sought the spiritual leader's (*bete*) permission. The trevally, which is caught in the sand and mudflat zone, is cooked whole and must not be kept overnight. Thus, the catch on a given occasion should all be consumed within that day. The following morning, the unbroken bone is thrown into the sea to acquire a new body. The rituals are strictly followed because the ensuing fishing will be unsuccessful unless all the requirements are met.

In Vanua Balavu, the people fish the Masomo inland lagoon only after they have obtained the *bete*'s permission. On the chosen day, ceremonies of presentation are conducted in thatched houses built for the occasion near the lagoon. Afterwards, everyone is required to jump into the shallow lake where they sing, dance and enjoy themselves. The fishers should wear only leafy skirts and must oil their bodies well. Failure to do as specified causes severe sunburn. The dancing continues for six hours before the people come out of the water around midnight, exhausted. Offerings are continued for the remainder of the night and at dawn the fish are gathered from the lagoon where they are floating. As many as 2,000 of these unique fish, which are not gutted, are collected each time (Koroi, 1989). The *bete*'s share of the catch will be those that jump from the water to the stone in front of his *bure* (thatched house).

On Koro, in the village of Nacamaki, members of a *mataqali* (clan) call for turtles. Clan members gather at the cliffs of Nacamaki and, under the leadership of the most senior member, usually the *bete*, psych themselves up into a trance and lure their fish god, Tui Naikasi with a chant. Eight to ten turtles rise from the depth below and lie flat on the water's surface (Tora, 1990).

Subsistence fishing involves catches for self-consumption, ceremonial exchange, and the occasional sale of surplus to enable the purchase of sugar, kerosene, canned fish or other desired goods. Many village people combine both working on land and fishing for two or three days per week to provide for their basic needs.

The right to harvest any part of the reef and the ownership of the fishing ground extending to the outer reef according to customary law is vested in the *mataqali* or *yavusa*, the land-owning social units. The areas beyond the reefs are not specifically owned or claimed because of the unimportant role these areas played historically in contributing to the people's food supply (Fiji Fisheries Division, 1982). Fishing ground owners and users are responsible for their respective fishing realms.

Fijian fishers, like other Pacific Islanders, use ingenious fishing methods that illustrate extensive and sophisticated understanding of the fish and fishing areas. A wide variety of nets, spears, traps, poisons and stupeficients are used for the catching and gathering of a wide range of marine resources. The nets, originally made of the bast fibre of plants and coconut husk sinnet, vary in size and mesh and are used for a wide variety of fishing methods depending on prevailing conditions at the fishing area. Spears of various types are used from the surface or underwater. Traps, either built of stones or sticks or woven, are used in shallow areas, particularly in the intertidal zone. Fish poisons and stupeficients are also used on the reefs and in shallow areas.

Most subsistence fishers, particularly older folks, still know the traditional calendar which summarized the people's understanding of their environment and the marine surroundings. January is noted for the abundance of land crabs (*lairo*, *Cardisoma carnifex*), trochus shell (*sici*, *leru*, *Trochus niloticus*), ark shell (*kaikoso*, *qeqe*, *Anadara cornea*), and spinefoot, rabbitfish (*nuqa*, *Siganus vermiculatus*). March is when green mangrove crabs (*qari*, *Scylla paramamosain*) mature, while in April bigeye scad (*tuqadra*, *Selar crumenophthalmus*) is normally plentiful. May is characterized by an abundance of chub mackerel (*salala*, *Rastrelliger brachysoma*). In June, great quantities of silver biddy (*matu*, *Gerres* sp.) and goldspot herring (*daniva*, *Herklotsichthys quadrimaculatus*), are fished for while in July marbled cod (*kerakera*, *Epinephelus microdon*) spawns and octopus (*kuita*, *Octopus* sp.) are fished in

great numbers. Octopus continue to be abundant in August. White-lined rock cod (*kawakawa*, *Anyperodon leucogrammicus*) spawn in September while in November an annelid (*balolo*, *Eunice vidis*) is collected, mangrove crabs (*qari*) start to lay eggs and Spanish Mackerel (*walu*, *Scomberomorus commerson*) is found in great numbers. In December, great trevally (*saqa*, *Caranx ignobilis*) spawn while juvenile *nuqa* become abundant.

Purely subsistence fishers are rapidly decreasing as increasingly greater numbers adopt artisanal or small-scale commercial fishing. This does not lessen the importance of subsistence fishing which remains the largest supplier of fish protein amongst rural dwellers. The subsistence fishery sector provides a significant protein source that would otherwise be imported. An estimated 14,000 tonnes in 1980 with an annual increment of 200 tonnes per year is the commonly accepted product of this sector in Fiji. Production in 1990 was estimated at around 16,000 tonnes (Fiji Fisheries Division, 1987) which would be worth \$58,533,120 at the current price of \$3,658.32 per tonne. This considerable sum is often neglected because the product of the sector is based on estimations.

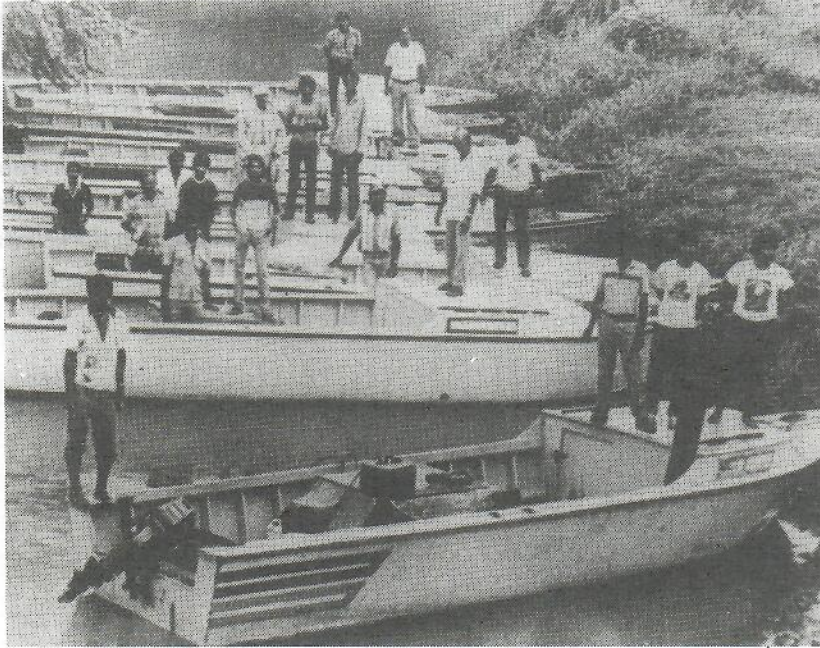


Figure 4.2: Fishing boats lying idle at the Elevuka Creek in Ba. More than 100 fishers were affected by the blockade put up by the Votua villagers. (Fiji Times)

harak), which must measure more than 15 cm and ponyfish (*kaikai*, *Leiognathus equulus*), which must be more than 10 cm. Green mangrove crab (*qari*, *Scylla paramamosain*) should not measure fewer than 12.5 cm across the widest part while no turtle with a shell under 46 cm can be harvested. Fishing methods such as the use of chemical compounds, fish poisons and dynamite are illegal. Fisheries and enforcement officers carry out random enforcement checks on all fish-marketing outlets confiscating all undersized fish that they find.

Net sizes and meshes are specified for sustenance purposes. Handnets may not be more than 1.5m although there is no limit on mesh size. Cast nets shall not be less than 3m when stretched. Wading nets and others not previously mentioned must not be less than 5m when stretched. A wading net must not be more than 4m wide. Net owners using nets that fail to comply with these specifications can face a \$100 fine, six months in jail or both.

National legislation and regulations are useful conservation measures. Fishers operating within the customary fishing areas are required to have a licence which is renewable every year. Such licences are given by the Fisheries Division upon receipt of the approval of the local chief or head of the *mataqali* and a permit from the District Officers office. Members of *mataqali* fishing within their own area are not required to have a licence. This arrangement makes it difficult to gauge the true extent of the exploitation level and is one of the reasons why fishing at this level is hard to control. The provision of financial assistance through the Fiji Development Bank was stopped in 1992 in an attempt to control the entry into the fisheries sector.

Turtle fishing is banned from November to February. The sale and export of turtle shells was banned in the early 1990s. The Fisheries Division is encouraging artisanal and commercial fishers to target offshore fisheries to spread the impact of fishing over a greater number of species. Fishers have been provided with ocean-going vessels and FADs to lure them to the offshore areas. Foreign fishers are allowed to fish in Fiji waters provided they satisfy the requirements under the Marine Spaces Act of 1977 and the Marine Spaces (Foreign Fishing Vessels) Regulation of 1979, both of which specifically address conservation and management issues.

International Legislation and Regulations

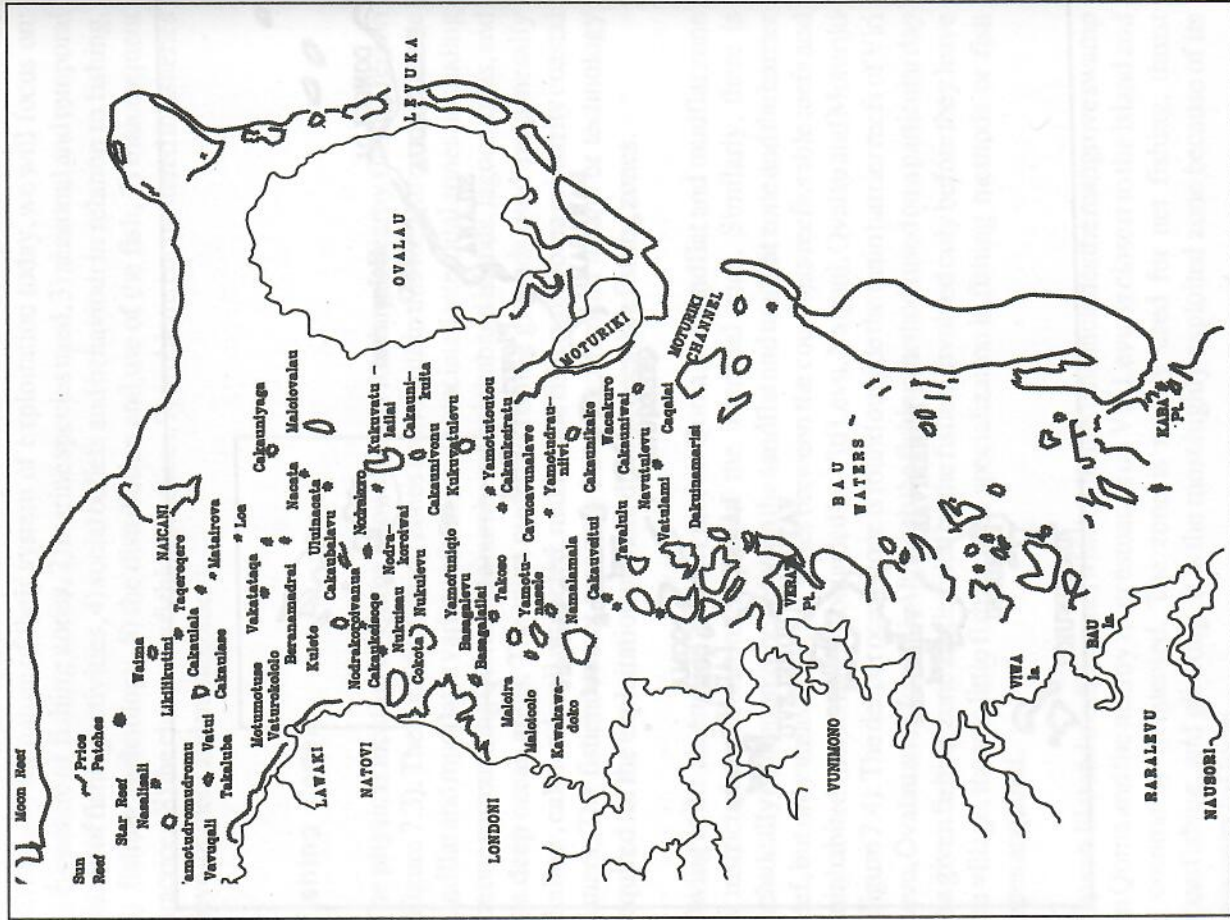
Part XII of the Law of the Sea Convention consisting of Articles 192 to 237 is on the protection and preservation of the marine environment. While the nations have the sovereign right to exploit their natural resources, they are to take all measures, individually or collectively, to prevent, reduce and control pollution of the marine environment. Owing to the nature of marine environments, nations are encouraged to cooperate on a regional and global basis to formulate international rules and standards and recommend practices for their protection and preservation.

Together with the other South Pacific countries, and in accordance with the provisions of the Convention, Fiji is taking an active role in the management of tuna stock within her EEZ and the South Pacific in general. In May 1983, working through the South Pacific Forum Fisheries Agency (FFA), the countries of the Pacific established a Regional Register for Fishing Vessels, a collective form of exercising control over fishing operations. Under the FFA initiative, member nations agreed to register all fishing vessels fishing within their Exclusive Economic Zone and not to licence a foreign fishing vessel for tuna unless the vessel is in good standing on the Regional Register. All fishing boats in the region are required to register.

The withdrawal of good standing may be instigated by any participating country after trying to investigate fully the alleged infringement and to obtain an explanation from the vessel operator concerned. Supporting documentation including evidence of the alleged offence, response to the evidence by the vessel's operator and record by the country concerned are to be made available. The Director of FFA must notify the vessel operator when a withdrawal request for his vessel is being considered.

Approval for withdrawal of good standing requires a favourable response from at least 10 of the participating nations with no dissenting responses. The Director of FFA must notify all participating states accordingly and indicate when the withdrawal date is to be effective. The date must be no earlier than 14 days after the notification date and stands unless an objection is received by him before then.

Figure 7.4: Fishing Zones used by Qoma Islanders. (Scale 1:220,000)



Yet the most commonly used zone is the reef or *cakau*. This zone is the most extensive and includes nearby barrier reefs, fringing reefs and intertidal flats including the fringing reef surrounding Qoma and the many table reefs and reef patches within the wider fishery zone, many of which are submerged even at low tide. The fringing reefs and associated intertidal flat component of the reef, which periodically dry up at low tide, are used almost daily for reef gleaning, thrust spearing and net and linefishing methods. The offshore reefs are commonly a variety of fishing methods, but are specially favoured for spearfishing, linefishing from boats and reef gleaning.

The lagoon zone or deeper sea between the islands and the reefs can be used at any tide, usually by spear and handline fishers. This zone is up to 20m deep, but the nearness of the reefs and the presence of reef patches distinguishes it from the deeper ocean, makes it rich in fish, particularly species of pelagic finfish and sedentary species such as rock cod which inhabit caves or holes in the deeper areas along the reef or in reef outcrops.

The deep ocean zone is the farthest from Qoma and is only rarely used. The use of this zone commenced recently with the introduction of deep water snapper (*pakapaka*, *Pristipomoides*) fishing using very long handlines (over 100 m in length). In addition, the deeper ocean zone was untapped in the past because of the richness of the reef and lagoon zone resources. The Islanders have neither the equipment nor the means to allow them to use this zone efficiently and to benefit from the luxury fish export market.

The villagers have a sacred fishing ground, Cakau Davui, a reef where, as legends go, their first chief was bathed after his anointing. Cakau Davui, as the farthest and northernmost reef within the fishing zone, is only occasionally fished by the villagers. On arrival at Cakau Davui, the people chant and perform an imitated traditional presentation of *yaqona* and food. According to the villagers, they would then make big catches provided by their ancestors. The fishers are not allowed to litter and cause unnecessary commotion at the reef as mishaps would befall those disobeying the code of conduct set by the village elders.

MARINE SPECIES

The people of Qoma use a wide selection of marine food species including seaweeds, shellfish, cephalopods, crustaceans, holothurians, turtles and a wide

range of finfish. The diversity of species caught generally reflects the level of abundance at a given time or location, and is exploited using appropriate fishing methods. Non-fish are normally gleaned or collected and caught by hand. Crustaceans and turtles may also be caught by net and spear. Finfish are commonly trapped or killed using various fishing methods such as net fishing, line fishing, spearfishing and poisoning. A complete list of the non-fish used in Qoma is provided in Appendix III.

The seaweeds which include the sea grapes (*nama*, *Caulerpa racemosa*) and nodium (*totoyava*, *Codium geppii*) are commonly obtained for subsistence consumption from the reef and shallow waters.

The bivalves including different types of clam such as surf clam (*sigawale*, *Actinocyclus striata*) and littleneck clam (*kai vadra*, *Tapes literata*), various species of giant clam including smooth giant clam or (*vasua*, *Tridacna derasa*), huge giant clam (*katavalu*, *Tridacna maxima*), and fluted giant clam (*cega*, *Tridacna squamosa*), and various types of pearlshell and oyster such as blacklip pearlshell (*melamela*, *Pinctada margaritifera*), pigmy pearlshell (*civaciva*, *Pinctada martensi*), thorny oyster (*kolakola*, *Spondylus ducalis*) and mangrove oyster (*dio*, *Crassostrea mordax*). They are collected primarily in the sandflat and mudflat zones bordering the mangrove swamp, the lagoon and reefs. These non-fish are mainly used for subsistence, although some species such as blacklip pearlshells are also sold.

The gastropods, which include the turban shell or (*lasawa*, *Turbo chrysostrumus*), top shell (*tovu*, *Trochus pyramis*), trochus shell (*sici*, *Trochus niloticus*) and spider shell (*yaga*, *Lambis lambis*), are gathered from the same zones as the bivalves. Some of these shellfish are sold commercially; others are used primarily for subsistence.

Cephalopods such as octopus (*kuita*, *Octopus* spp.) and squid (*kuitanu*, *Epioteuthis lessoniana*) are commonly sought during reef gleaning on the reef. Cephalopods, although occasionally sold, are a favourite delicacy among the islanders.

Crustaceans include prawns, crabs and lobsters that are fished for in the sandflat and mudflat and reef zones. Prawns include the witch prawns (*ura ni cakau*,

Penaeus canaliculatus), mangrove prawns (*moci*, *Palaemon concinnus*) and giant tiger prawns (*ura kei saqa*, *Penaeus monodon*), while the crabs include the three spot reef crab (*tavutolu*, *Carpilius maculatus*, redeye crab (*motodi*, *Eriphia sebana*) and the green mangrove crab (*qari*, *Scylla paramamosain*). The lobsters include the banded prawnkiller (*urata*, *Lysiosquilla maculata*), the painted rock lobster (*uradina*, *Panulirus versicolor*), ornate rock lobster (*moci*, *Panulirus ornatus*) and the golden rock lobster (*urauvatuvalu*, *Panulirus penicillatus*). The prawns and crabs are mostly eaten at home while the lobsters are sold.

The holothurians, which include the black teatfish (*loaloo*, *Microthele nobillis*), the white teatfish (*sucuwalu*, *Microthele fuscogilva*) and the brown sandfish (*vula*, *Bohadschia marmorata*) are gathered from the lagoon and reef. The *loaloo* used to be commercially exploited in the past but is now mostly eaten locally. The (*loloni*, *Holothurian atra*) can be used as a fish stupeficient which emits a reddish solution when rubbed in the sand.

Turtles are the Islanders' most prestigious catch. The two main species, the hawksbill turtle (*taku*, *Eretmochelys imbricata*) and the green turtle (*ikadina*, *Chelonia mydas*), are so important that the villagers can easily distinguish six different varieties based on their characteristics. *Ikadamu*, is a very small green turtle with a reddish shell. *Guru* is a meek, fatty green turtle similar to the hawksbill but slightly bigger. *Tuvonu* is a very big green turtle with a head that seems large in relation to the rest of its body. *Tanoa* is similar to the *tuvonu* but its head is more proportional to the rest of its body. The *mokoloo* is the biggest of the green turtles with a blackish shell. The turtles, except during spearfishing, are specially sought after at the reefs on long trips that can take up to 5 days during which the fishermen live off their punts and boats and uninhabited islands. Turtles, because of their spiritual significance, are used only for specified purposes which include sale, family-hosted feasts and obligatory food offerings (*magiti*).

Finfish

A wide variety of finfish species are caught by Qoma Islanders. Both pelagic and demersal species are caught depending on the fishing zone or fishing method employed. Finfishing is conducted in all the fishing zones with the species and the method employed varying slightly in different zones. Thus, thrustspear fishing

Night Spearfishing (Nunu Bogi)

Night spearfishing is solely men's work and is conducted at night when the fish, according to the fishermen, are particularly vulnerable. This fishing method is a contemporary one made possible by the introduction of underwater torches. The spearfishermen do not use diving or wet suits but they apply coconut oil to their bodies for insulation against the cold. The shortage of torches has meant that on occasions two or three spearfishermen share a torch. Such fishing never lasts long, and the time spent in the water depends on the time of the year and the temperature of the water. Although used infrequently, night spearfishing remains a very attractive and productive method.

Fish Poisoning (Duva)

Men and women practise fish poisoning which involves the use of poisonous substances, ranging from roots, fruits and bark of plants and secretions from organisms to stupefy and kill fish. Fish poisoning is conducted at low tide in and around the reef. Pools on the reef and intertidal flats are common fish poisoning areas.

The people of Qoma know of a wide selection of fish poisoning and stupefying methods but no longer use them frequently. The use of this fishing method has generally decreased as the fishers become more aware of its destructiveness. Nevertheless fish poisoning and stupefying is still occasionally employed. At the designated spot, the poison or stupefiant is added to the water and the fishers wait for a few minutes before the collection and gathering of the fish that float or swim to the surface begin.

The fish poisons and stupefiant known to Qoma Islanders are all produced from natural sources; no dynamite, bleach or pesticides are employed for the purpose. The main varieties are the *duva* plants (*Derris trifoliata*, *Derris malaccensis*, *duva ni niukini*), *duva* fruit (*Neuburgia collina*), the seeds of *vuvu* (*Barringtonia asiatica*), *soto* (*Euphorbia tannensis*) and *loloni* (*Holothuria atra*). The *derris* root (*Derris trifoliata* and *Derris malaccensis*) is well pounded and wrapped before it is taken to the fishing area. The *duva* fruit (*Neuburgia collina*) is boiled in water and the solution is poured into containers, mainly bottles, which are then taken to the reef. The *soto* (*Euphorbia tannensis*), a plant that grows only on neighbouring Naigani Island, has its bark

stripped in the sea to provide the toxic solution. The *loloni* (*Holothuria atra*) is a small sea cucumber that emits a dark reddish solution when rubbed in sand. Out of all these methods the *loloni* is most commonly used today because it requires no prior preparation and is freely available in the sea.

Thrust Spearfishing (Cocoka)

Thrust spearfishing is the use of multi-pronged and long-handled spears in shallow water as the fisherman walks and wades along the sandflat, mudflat or the reef. The method involves the identification, pursuit and spearing of fish. Thrust spearfishing is demanding and requires great skill, particularly when the prey is at a distance from the fisherman and moving farther away.

This method can be used at any time and anywhere but is popular only amongst men. It is commonly used during the incoming and high tide, especially in the morning. Thrust spearfishing is also frequently used during the passage to and from the fishing grounds. During night thrust spearfishing (*cina*), which can be conducted from boats and punts or on foot, benzine pressure lights are used to attract and illuminate the fish.

Diving Linefishing (Siwa Nunu)

Diving linefishing, which is restricted to women, is similar to linefishing from the water but in this case the fisherwomen swim and dive because of the greater water depth. The fisherwomen swim or wade to the chosen spot which is normally the reef edge or coral outcrops scattered within the reef edge region. Goggles are used because the method is used at high tide to catch reef fish. The bait, which can either be hermit crab (*uga, kasikasi*) or shrimp (*moci, Palaemon concinnus*), is neatly wrapped in plastic or cloth which is then wrapped around the fisherwomen's waist. The catch is neatly stored in a fish basket (*noko*) secured around the fisherwomen's waist. Diving linefishing is advantageous because the fisherwomen can see the fish they are trying to catch.

Turtle Fishing (Qoli Vonu)

The people of Qoma are traditionally turtle fishers. According to the villagers, they are among the best turtle fishers because their ancestral spirits assist them, particularly if they are righteous. The failure to obtain a catch is therefore a known

penalty for people who are immoral and unethical. Stealing, adultery and untruthfulness are prohibited. During the days the fishers are out at sea, they are forbidden to help themselves to the fruits and produce that they come across. Pre-marital sexual relationships prior to a fishing trip are taboo. Money and goods such as *tabua*, coconut oil, pandanus leaves and food earned or offered in return for turtles must all be accounted for and shared equally amongst the members of the households and anyone else present at the time of the distribution.

The first catch of a new turtle net is slaughtered and shared by every one who laboured in the making of the turtle net (*nukui ni lawa*). All other trips afterwards may be for specified purposes such as ceremonies and fundraising. The turtle fishing net is often regarded as an image of the owners' morality because it is believed the turtles can be caught only if the ancestral spirits are satisfied by the fishers' behaviour and are thus supportive of them.

Turtle fishing is further characterized by a well-defined set of traditional rules and rituals which generally are protective of the species and the fishers. A *yaqona* ceremony to summon the fishing of the turtle net (*vakasobu ni lawa*) is presented by the head of the turtle-net-owning unit, normally the extended family, every time the net is to be used. The first bowl of *yaqona* is always for the head of that family regardless of who else is in the house at that time. This ceremony, which is attended by all members of the family, will publicize the reasons for the intended fishing trip, whether it be for money, graveyard clearing or a wedding feast. Only one activity can be undertaken at a time and, according to the Islanders, the righteous fishermen will always successfully return with a catch to suit the purpose for which the fishing was requested.

Through their experiences at sea, the fishermen can tell many things about a particular fishing trip. For instance, if turtle fishing is requested by an outsider, the catch from that trip will be indicative of the traditional exchange that will follow the delivery of the catch. During the fishing, the turtle fishermen will continue to catch turtles until one swims past the net without getting entangled, the sign that the catch is then comparable to the expected reciprocity exchange. The turtle fishermen will know of a wrong if they see a turtle from time to time on alternate sides of the placed net. Confession will then be voiced aloud and the fishermen will return without a catch unless their confession at sea is accepted.

Figure 7.6a and b: Bi is a stick enclosure to keep turtles in the sea until they are used. It is built on the sandflat, where it is flooded at high tide. The turtles eat and are able to swim at this time. (Joeli Veitayaki)

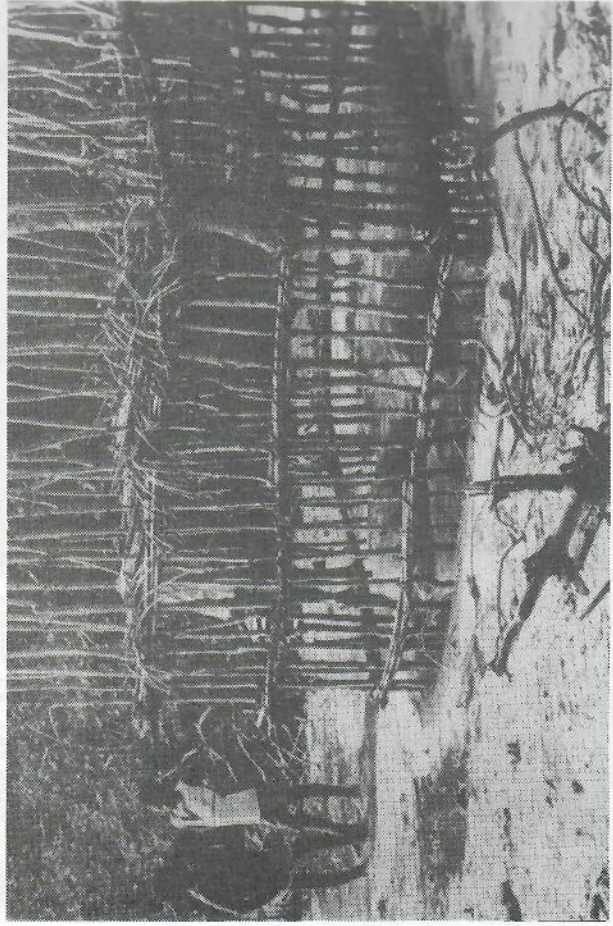
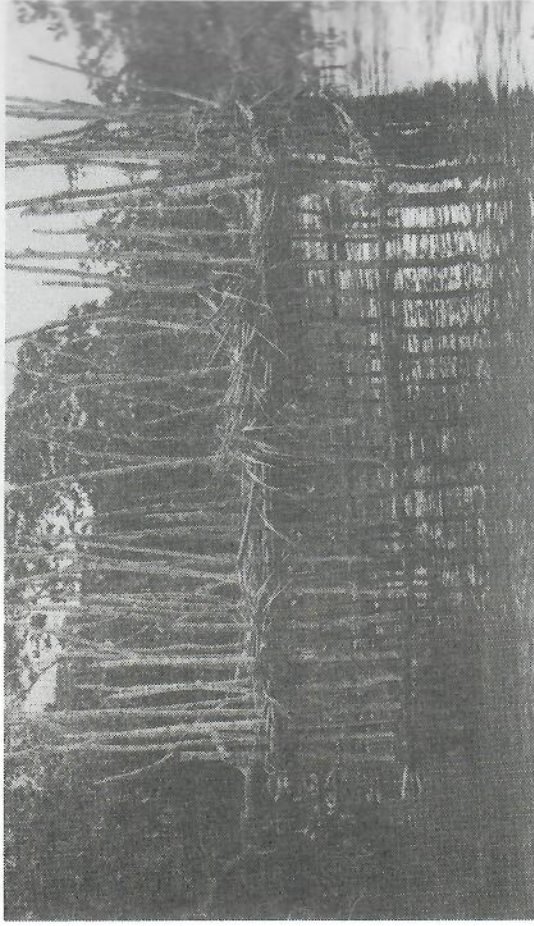




Figure 7.7: Turtle is killed by removing its intestine. (Joeli Veitayaki))

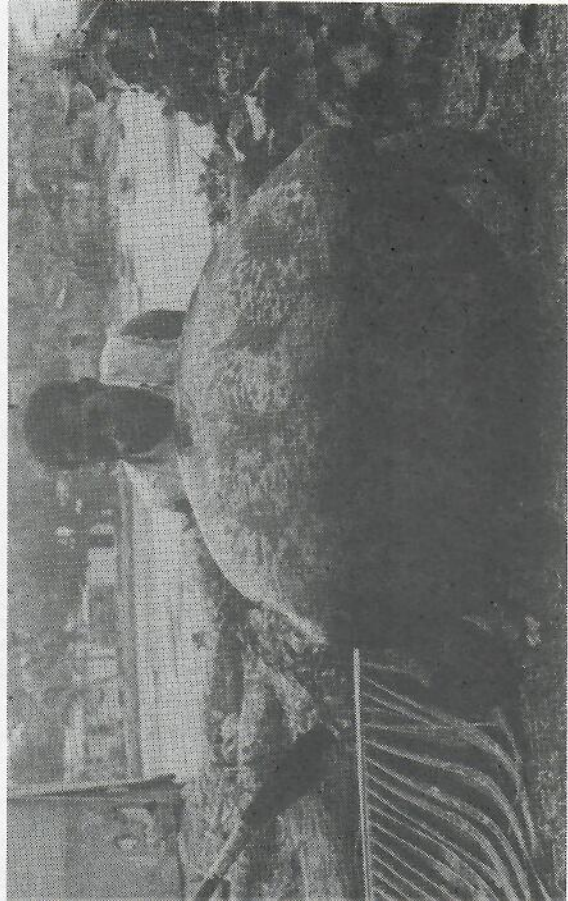


Figure 7.8: The turtle is about to be roasted in the earth oven (lovo). (Joeli Veitayaki)

In the past, the sounding of a triton shell (*davui*, *Charonia tritonis*) on the island informed the people in the village of a catch at sea. Preparations would then be made to welcome the fishermen. The women would chant at the coast with their offering of food and goods. The fishermen, when they arrived chanted to explain their catch. A *yaqona* ceremony in honour of the turtle catch (*sevusevuni vonu*) would then be performed by relatives in the village to thank the fishermen for their catch. The trip would then be discussed and the necessary activities carried out. A turtle that had bitten someone at sea, for instance, would be killed and eaten because it was an omen that could result in the death of a close relation.

During my stay on Qoma in 1987, I made observations that seemed to support the villagers' contentions. In one particular instance, a head of a household had summoned the fishing of their turtle net so as to allow him to pay a \$90 debt. His kinsmen returned with two large turtles which fetched only \$90 because of the large quantity of unsold turtle meat. The net owner, instead of re-paying all his debt, shared some of the money with his fishermen and then summoned them the following week to fish for the repayment of the balance. The fishermen made no additional catch that particular week although turtles were sighted. The household leader acknowledged the blunder and apologized for his mistake of sharing some of the money instead of using it all for the original purpose before his folk were again able to catch turtles.

The misdeeds people commit are varied and can be corrected differently. Some of the mistakes can be acknowledged or confessed at sea while fishing is in progress. For this the fishermen have to mention the likely problem caused by any of them. Forgiveness and the acceptance of the confession can be proved if the fishermen's luck changes and they begin to catch turtles. Remorse and confession for more serious mistakes can be done with the presentation of *yaqona* while the most serious offence can only be corrected and forgiven with the preparation and presentation of a traditional sweet dish or dessert (*vakalolo*).

Women, although not participating in turtle fishing, can also assist their men in its success. The women in Qoma, except for those of the chiefly family (Tui Nabulebulewa), are not to weave mats, drink *yaqona*, or have festivities in their houses if their men are at sea. On Fridays, the day on which the turtle fishermen normally return, the women can visit the *bitu ni ceva*, a special bamboo stand at the very top of Qoma Levu, and pick some leaves which result in a southerly wind

which will aid the fishermen to return home from distant fishing grounds. This has today become unnecessary because of the use of outboard motors.

Turtle fishing, which involves the traditional pursuit of turtles using turtle nets, is prohibited by government during their breeding season which falls from the first of November to the end of February. Even though no figure is available to indicate the frequency of turtle fishing, it remains a very important method on which a significant number of hours are spent. During the turtle season, the men fish for turtles between Tuesdays and Fridays for two to three weeks of the month. Turtle fishing, which may be done at any time of the day, is conducted by a group of three to four men who will normally not return home until Friday afternoon unless they make a catch early. The trip is commanded by the oldest person on the trip and covers a considerable geographic area. The fishermen, when they are not looking for turtles, would either be resting or looking for food.

Once a turtle is sighted, a variety of netting methods are used for its capture. During the day, turtle fishing is done at high tide when the fishermen make careful observations as they pole their punt near the reef or reef edge. Turtles can easily be distinguished from rocks deep down in the sea and can be heard or sighted when they surface to breathe. Once an identification is made, the net is quickly placed (*viriri*) to block the likely escape path that the turtle will take out of the reef. Disturbance (*samu*) by noise and the beating of the boat and water is then started close to the shore or the other side of the reef and continues as the party advances, driving the turtle towards the placed turtle nets. This type of fishing may continue from high tide to when it is completely dry with the occasional placing (*viriri*), disturbance (*samu*) and retrieving (*yavi*) of nets consequent to the sighting of turtles.

The decision regarding the placing of the net is important and requires great skill. According to the fishermen, turtles on a particular reef will always return the same way they entered. If the prey escapes, the fishermen then take note of their bearing, the tide and the flight path taken for use in the future. Under similar conditions, the fishermen should meet their prey at the same spot and given their knowledge of the escape route should make the catch.

If turtle fishing is conducted in deeper seas, there is always the danger that the prey will miss the net which is only about 30 metres long. In such instances, two

people, one at each end of the placed net, will ensure the turtle goes to the desired area. The men will use sticks and oars to cause a commotion at their ends of the net and will throw pebbles to direct and guide the turtle to the net.

The main nocturnal turtle fishing methods are *rabe*, *siwa* and *taratara*. *Rabe* involves a large number of fishermen divided into two groups. One group of three to four men will be in a punt creating a disturbance along the coast while the larger group will wade and swim, along the reef edge (parallel to them). The latter group will move silently behind a leader in single file, carrying the net in such a way that the sinkers hang around their knees while the net and floats are skilfully carried over their shoulder. When a turtle is sighted by those in the boat and the command to drop the net passed on by the leader, the fishermen will quickly drop the net and remain stationary behind it. The turtles and fish that escape from the shore disturbance will be caught and held by the fishermen who will then shout a special word to notify others of the catch and summon the punt. Once the turtle or fish has been collected, the net will then be retrieved and the process repeated.

Siwa is used in the deep sandy areas. The turtle net is placed at high tide with a string tied from it to someone in the boat or punt that will be anchored nearby. The fishermen will be warned of a catch by the movement of the net. The net is then checked and the turtle or fish is collected.

Taratara is conducted after observations in the afternoon during low tide. The fishing grounds are observed for signs of turtle activity. After confirming the presence of turtles, a marker is then planted in that area. The net is placed at high tide close to the marker before the fishermen disturb (*samu*) the areas close to the shore. Turtles fleeing from the commotion will be caught in the waiting nets.

Fish Drives (Yavi Rau)

Fish drives are conducted occasionally, particularly when large quantities of fish are required for special occasions. The frequency of use of this method is influenced by the large number of fisherfolk needed. There are a variety of fish drives, all involving the use of the traditional fish drag (*rau*) by Qoma people either in the river estuaries on Viti Levu or on the lagoon and reef. Although the actual fish drive takes only a few hours, preparation is time-consuming. Examples of fish drives include catching *tikawa* (*sili tikawa*) and various types of *qege*.

Sili tikawa is conducted only on Qoma. The method involves fishing for *tikawa*, a small colourful fish that moves in large schools in the deep blue waters around the reefs, feeds on foam in the sea, and loses its scales when it jumps about the boat after capture. The drive for *tikawa* commences in the deep blue sea at the reef's edge. It requires the use of a long rope draped with coconut leaf fronds (*rau*), long sticks, some nets, a piece of canvas and a few punts.

At the reef, people dive for a type of soft coral (*bulewa*) that adheres to reefs, and on which fish feed. They squeeze it on to the sea surface to calm it. The people then observe the area for the presence of *tikawa* schools. Once the fish are sighted, the fish drive begins by placing the *rau* at the chosen spot. The fishers will then be off-loaded in the deep blue sea of the lagoon some distance away from the *rau*. Forming a semi-circle that faces the *rau*, the fishers will then pound their way (*vutu*), using long sticks and boat anchors while moving towards the reef and *rau*. The disturbance is necessary to frighten the fish towards the intended place where the *rau* functions as a 'psychological' barrier. The fish will be surrounded totally when the people advancing from the sea meet those holding the *rau*. By joining the two ends of the *rau* the fishermen encircle the fish. After sufficiently reducing the circle, the net and piece of canvas will then be brought in to scoop the fish into the waiting punts. The greatest skill is needed here because the fish can easily be lost if the scooping is slow or poorly done.

Sili tikawa is also done early in the morning in the passage on the western side of Nabulebulewa, the smallest of the three islands of Qoma. The fish sleep in the area, and the early morning drive intercepts them before they return to the outer reefs at daybreak. The narrow passage is noisily blocked. Once the fish are grouped together the drive will head towards shallower water where the *rau* has been placed. The whole process, as mentioned earlier, is then repeated until the fish are gathered.

Qeqe is done in river estuaries on Viti Levu. At high tide a strong reed fence is erected across the river mouth with the two ends firmly stuck on land. In the centre of the fence in the middle of the river is a compartment with an even smaller fence adjoining it. The drive is conducted at low tide when the river mouth is dry and starts from somewhere up the river mouth. A woven net made from the bast fibre of the hibiscus tree (*vau*, *Hibiscus tiliaceus*) with trochus shell sinkers and plantain (*vudi*, *Musa AAB Group A*) leaves firmly tied on its upper

end is dragged along the river by a few men causing a commotion. Three or four other people pull the vines tied to the two ends of the net along the edge of the river sides which has been cleared for the occasion. The advance to the fence, is often stopped along the way to empty the smallest compartment, the place from where the fish are gathered and collected.

The *qeqe* technique is also used in intertidal areas for the capture of garfish (*busa*, *Hyporhamphus dussumieri*), Fiji sardine (*vaca*, *Sardinella fijiense*), and goldspot herring (*daniva*, *Herklotsichthys quadrimaculatus*). The drive is conducted at high tide but instead of using a fence the people use nets. Disturbance (*samu*) is made to drive the fish straight into the nets.

Fish Traps and Fences (*Bai ni Ika*)

An abundance of fish traps and fences ranging from woven materials placed across the fish path, such as *bakeke*, to stone weirs (*moka*) and stick-fences (*ba*) are known to the Islanders. These are no longer used much because of their relatively low efficiency and the increase in number of fishers which has led to the frequent use of all fishing areas. According to the villagers, fish are now wary of traps and fences and stay away from them, hindering productivity.

The woven fish trap (*bakeke*) is similar to a circular basket, with a funnel-shaped entrance at the side where the fish enter. The bait inside the trap lures the fish which can force its way in through the funnel-shaped entrance. Once inside, it cannot escape.

A *moka* is essentially a low stone wall built out from the shoreline to enclose an area up to 100 m. The wall is submerged at high tide and traps the fish when the tide recedes. The trapped fish are then collected at low tide.

A *ba* is a fence made of sticks and reeds, built in sections and attached firmly to the sand. The fence is either J or U shaped with the bend towards the sea. The fish enter the enclosed shape at high tide but are caught in the traps in the bend when the tide ebbs.

The fishers of Qoma use simple and traditional equipment which has a different impact from the use of modern and more efficient methods. The main equipment

used is of two main categories: 1) handlines, spears and nets that are directly used in the catching of fish, and 2) punts, oars, sails and outboard engines to travel to and from the fishing area. There is a marked absence on Qoma of modern, sophisticated, efficient and expensive equipment such as gillnets, large fishing boats, compass, and echo sounders as used by Suva-based professional, export-oriented fishers and fishing companies. The most commonly used equipment included handlines, sling spears, goggles, and scoopnets. Younger fishermen now use spear guns, and outboard motors are becoming more prevalent. Swimsuits and flippers are also beginning to be used.

DISTRIBUTION OF FISH PRODUCTS

Fish caught by Qoma Islanders are used for subsistence, sale and ceremonial purposes. Fish for subsistence and sale are normally sought together; the sorting takes place after the catch. If the catch is plentiful, bigger and heavier fish are normally left aside for sale while the smaller finfish in less demand and non-finfish are reserved for home use. Fish for ceremonial purposes are generally caught on special trips or using fishing technologies or activities specifically designed for that purpose.

Subsistence

The dominance of fish in the people's diet on Qoma is indicative of the subsistence importance of marine fisheries. There is little difference between fish for subsistence and those for sale because, in addition to all the common subsistence-destined species, all unsold fish is eaten at home or distributed to relatives. Fish for subsistence include those caught by the fishers or those received as gifts from relatives. Rarely do fishers purchase fish from other villagers for their subsistence use. Fish exchange, involving sharing, offering and receiving fish, is still widely practised, and, catch permitting, is conducted on an almost daily basis.

It seems that, in Qoma, subsistence is still the primary objective of the fishing. Not only is the sale of fish conducted after subsistence needs have been met, but the sale and exchange of fish seem to be mere measures to supplement the subsistence effort. Fishing is a daily activity which, although predominantly for subsistence, is conducted in such a manner that the bulk of the catch ends up being sold. At the end of a fishing trip, one or two offerings will be used for subsistence purposes while the rest will be sold.

Species of particular importance for subsistence production include non-finfish species such as seaweed, bivalves, gastropods, cephalopods, crustaceans, holothurians and finfish. The most common finfish species of subsistence importance include crescent perch (*gitawa*, *Therapon jarbua*), spinefoot rabbitfish (*vekaci*, *Siganus spinus*), orange-lined triggerfish (*cumuuti*, *Balistapus undulatus*), eeltail catfish (*kaboa*, *Plotosus lineatus*), leopard flounder (*davilai*, *Bothus pantherinus*), porcupine fish (*sokisoki*, *Diodon hystrix*), green triggerfish (*cumu*, *Pseudobalistes flavimarginatus*), Fiji sardine (*vaca*, *Sardinella fijiense*), goldspot herring (*daniva*, *Herklotsichthys quadrimaculatus*), sharks and sting rays (refer to Appendix III, IV and V). These fish are generally not attractive to buyers.

Other finfish species, particularly those in high demand commercially, are also eaten at home if the catch on a given fishing trip is unsold, is not sufficient to make a string, or is partly eaten by other fish, as is common during spearfishing. Storage facilities are poor; therefore, catches have to be used before they spoil.

Fish Sale

The largest proportion of the fish caught by Qoma Islanders is sold because it is their major, and for some households, only source of income. Fish sale and marketing in Qoma is essential because the Islanders' catches have consistently outweighed local demand on Qoma. Fishing income, which ranged from \$10 to \$100 per household per week, is highest amongst the spearfishermen who averaged \$15 per day compared with the \$5 per household per day for handline fishers. Fishing, and fish marketing occurs primarily on a household or family basis. Large-scale communal fishing schemes were tried in the past by the villagers, e.g. the former *bêche-de-mer* project, and recently, when they had the use of the *Tui Nabulebulewa*, a fishing boat provided through a Fiji Development Bank loan. Under the latter scheme, the different *mataqali* on Qoma provided men to work the vessel on a weekly rotational basis and shared half of the weekly earnings, with the balance going to repay the loan. Although commercial fishing from the *Tui Nabulebulewa* was over short periods and irregular, it provided an important source of income.

In both commercial ventures, fishing was generally undertaken on a part-time basis in nearby fishing areas. Although the village and the *mataqali* received

some income, individual villagers were not paid for the work they rendered to the schemes. Owing to this lack of incentive, fishing was sporadic and flexibly organized while marketing was mostly through the middlemen, factors that later resulted in great dissatisfaction amongst the villagers and eventual collapse of the commercial schemes.

Another important point to consider is the conflict of interests between traditional obligations and economic operations. Although the boat was occasionally used to transport the people to Naigani, Ovalau and other areas, there was no clear arrangement for the payment. Commercial activities were not attended to when the social activities were organized. The free use of labour from the village was a recipe for failure because often the fishers were expected to contribute freely to a commercial venture. Like the situation in most Fijian villages, the enthusiasm and drive burns off after a while and the project is left in the hands of the few people who will then operate it the way they please until the whole project collapses.

The accumulation and distribution of the fish catch on Qoma is restricted because of the shortage of proper storage facilities. Marketable fish species are sold fresh at the main markets if they comprise one or more strings or are big enough individually to fetch \$3 or more. The Queen Victoria School is the main market, where large catches are sold at \$1.70 per kilogramme, while strings (4 or 5 fish) are sold around the school compound to staff and individual families for \$5 each. Fish are sold at the Ratu Kadavulevu School if they are obtained along that coast, or if the fishers are turned away from Queen Victoria School because of market saturation. Indian middlemen who collect fish from the Queen Victoria School coastline area are also a notable market outlet.

Marketing is a problem during the school holidays because the boarders at Queen Victoria School and Ratu Kadavulevu School are absent. The fishers then have to sell at the urban markets or to the nearby small-store owners.

The fish market within Qoma is insignificant as nearly every one is a fisher. Yet there has been occasional purchasing of fish from other villagers. Fish sale is minimal in Qoma because of the customary fish exchange, high concentration of producers, and peoples' traditional customs which have significantly limited fish marketability.

Turtles and most non-fish are commonly sold at the markets in Korovou, Nausori and Suva because nearby markets for these products are restricted. Furthermore, these species are less perishable and can be carted easily over longer distances.

Some of the fish commonly sought after for sale include: wahoo (*wau*, *Acanthocybium solandri*), Spanish mackerel (*walu*, *Scomberomorus commerson*), great trevally (*saqa*, *Caranx ignobilis*), yellow-tailed emperor (*sabutu*, *Lethrinus mahsena*), marble cod (*kawakawa*, *Epinephelus microdon*), big-spot coral trout (*donu*, *Plectrophomus* sp.), harlequin sweetlip (*drekeni*, *Plectorhynchus chaetodonoides*), hump-headed maori wrasse (*varinaivoce*, *Cheilinus undulatus*), double headed parrotfish (*kalia*, *Bolbometopon muricatus*), golden trevally (*vilu*, *Gnathanodon speciosus*), black-spotted swallowtail (*iribuli*, *Trachinotus bailloni*), spangled emperor (*kawago*, *Lethrinus nebulosus*), and spinefoot rabbitfish (*nuqa*, *Siganus vermiculatus*).

CEREMONIES

Fishing happens for ceremonial purposes. In such cases, a traditional exchange is held when the fishers arrive with the catch. The variety of ceremonial fishing types include fishing for any individual family, communal ceremonies and those requested by relatives outside Qoma. Fish caught during ceremonial fish drives, reef gleaning and spearing are used entirely for the given purpose, in the same way turtles are used. In contrast, fish caught during turtle trips are used by the people in whatever way they please.

The villagers occasionally fish collectively for ceremonial purposes. During the annual burial ground-clearing period, the chief, in the traditional manner, requests the people to fish for turtles. On such occasions, the chief becomes the 'owner of the turtle nets' (*taukeyi ni lawa*) and will continue in that capacity until he returns the nets in the traditional way after the ceremony by making a presentation to his people. As the 'owner of the turtle nets', the chief is the owner of the turtles caught as well; all he has to do is to present the fishermen with *yaqona* as a ceremonial offering to acknowledge their effort.

Ceremonial finfishing may be conducted through communal fish drives, reef gleaning or spearfishing. Villagers rely upon these methods, because of their

efficient nature when catering for large groups. At such times the people will offer everything including their services and belongings to make the ceremonies possible. Punts and other boats and outboard engines are thus used with the compliments of the owners, thus constituting a major problem for the commercial fishing ventures.

CONSERVATION AND MANAGEMENT

Qoma Islanders are not specifically aware of the need or reason for conservation and management, and to some extent believe that the fisheries resources will not be depleted as the sea will always provide for them. The villagers agree that the sea is the main resource their children will inherit from them and mention that they are teaching their children how to use the sea. The elders restrict use of fish poison and stupeficient; dynamite and pesticides are strictly prohibited because of their destructiveness. In a number of instances, villagers have been banned from using fishing areas belonging to others. The depletion of certain fishing areas and the popularity of artisanal fishing amongst coastal villagers and the association of fishing with income-earning has made customary fishing ground owners desire to keep for themselves all the resources in the fisheries. The villagers are now more aware of the great importance of maintaining and conserving their limited fishing grounds and are doing their utmost for their protection.

The fishers are beginning to guard jealously their fishing areas. Outsiders fishing in their realm are chased away. This is highly volatile because of overlapping claims of ownership. Government through the Fisheries Commission of the Native Lands Trust Board is working on delimitation maps, but the situation now is based on verbal claims. Indian fishermen are often carefully watched because their use of gillnets is regarded as a threat to the fish and fishing areas. Gillnets can only be used on Qoma if permission is granted by the chief, which he does only on special occasions.

The periodic prohibition of the fishing areas is another conservation measure. On Qoma, when a member of the chiefly family dies, fishing is banned on a portion of the reef flat around the islands. Fishing is resumed after approximately three months to provide the fish for the feast to mark the end of the mourning period. The ban on turtle fishing from November to March, during the breeding season,

is strictly observed on Qoma. The triton shell (*davui*, *Datura candida*) is untouched because of the national ban on it.

Totemic and other taboos such as those that restrict particular clans, families, age groups and sexes from eating certain types of marine food also contribute to marine stock sustenance. In Qoma, people do not fish for or eat their totem, thus reducing the number of the fishers involved in fishing.

The traditional form of exchange that is still practised today spreads resource-use pressures. Amongst the fishermen of Qoma for instance, traditional wealth of *yaqona* and *tabua* are expected by the people when they are asked to fish for a purpose. When the fishermen are asked to fish for turtle in the traditional way, the exchange goods will match the catch. The fishermen can thus tell the magnitude of the exchange by the turtles they catch at sea because according to them, their gods will provide a catch to suit the offerings prepared by the other party; there is no wastage or over-use of fisheries resources. Similarly, the tradition of taking fish, particularly non-turtles, to other villagers during turtle fishing trips, ensures that the catch is profitably used and that it is not discarded as is the by-catch in industrial fishing.

The presentation of *yaqona* to summon the fishing by turtle nets (*sevusevu ni lawa*) is a means of limiting the catch and safeguarding the resources. The Islanders believed their ancestors will provide a catch to match the purpose for which the fishing is requested. People also believe that unless the turtle fishermen are righteous, they will fail to make a catch. This represents a limit on the fishing because some people have stopped fishing for turtles because they have tried unsuccessfully on so many occasions.

On Cakau Davui, the villagers' sacred fishing ground, which is infrequently visited, and from where the catch is always plentiful, the fishers are forbidden to be noisy and to litter. In fact the fishers have to seek prior approval of the *bete* in the village and undertake all necessary preparations; factors that limit the use of this fishing ground.

The spearfishermen or divers, also exploit resources on a selective and sustainable basis. The size of the spear used determines whether a fish is caught because fish that are too small for the spear size used are not sought.

Another change mentioned relates to the size of species. The majority of these fishers believed that fish are smaller today. They argued that the great demand placed on fishing resources was resulting in depletion of larger fish. Some fishers mentioned the change in the villagers' exchange system. Some elders related their ancestors' total reliance on exchange and how sharing was widely practised. Fishers now sell their catches so they can buy sugar, flour, matches, kerosene, and other essential items which must now be bought. The villagers are not seeking money for money's sake but are doing so because the economics have changed.

The changes mentioned are varied and mainly reflect the growing emphasis on monetary return and technological changes. Money is necessary to buy other things, and technological change has made fishing easier. The changes seem to reflect clearly the people's desire to adopt contemporary ways of life.

THE MAIN PROBLEMS

Marine fisheries are vital to the people of Qoma. They are presently hindered by many problems which include lack of equipment and storage facilities, dependence on weather conditions, community work, equipment maintenance, turtle-fishing rules and the planning of fishing times.

The fishers felt hindered in their effort because of the shortage of efficient equipment. Many households still required boats, engines and gas tanks. Gillnets, very long handlines used for deep sea snapper fishing, and launches are still needed to allow the fishers to reach their maximum productivity levels and to shift emphasis of commercial fishing to less-exploited species or fishing grounds.

The villagers mentioned the lack of storage facilities as a major problem which forced them to make many trips between the village and the fishing grounds. Each short trip means great wastage in terms of time and money. With better storage facilities, the individual trips could be lengthened and costs reduced as the catch could be accumulated until sufficient quantities of fish are acquired.

Dependence on weather is inevitable but is particularly constraining. The most trying times are during bad weather for which people must always be prepared.

Weather significantly affects the success of the trip. Turtle fishermen for instance, are often forced to return when the rain is heavy and continuous or when the wind is strong and the sea rough. Floods accompanying heavy rain also inhibit underwater visibility and adversely affect fishing because of high sediment mobility in littoral waters.

Community work and social gathering are regarded as problems because they limit fishing time. Community work and social gatherings are so heavily emphasised that the people are often unable to go fishing regardless of the suitability of the weather. Likewise the fishers were not always free to fish at the best times such as early in the morning and during certain tides because of their other commitments such as household chores and the preparation of children for school.

Equipment maintenance is regarded as a problem. Very few people have the necessary skill to repair boats and outboard motors. Sometimes, arrangements have to be made to take the equipment to the maintenance workshops elsewhere, including Suva. This is too expensive for most fishermen, resulting in the relatively shorter life span of the equipment. Five outboard engines and four punts were inoperative at the time of the 1987 survey because of lack of maintenance or the inability to repair them.

Turtle fishing is becoming less attractive because of the strict traditional guidelines and increasing governmental regulation. There is concern that some fishers will not practise turtle fishing in the future.

Some people regarded the high cost of equipment as a major problem. People were reluctant to invest money in new and better equipment because they will lose money if their catches are insufficient; others considered it beyond their reach because of the difficulty of raising money. For example, a speargun costs \$98-\$135; an underwater flashlight costs \$50-\$68; punts cost about \$750; and a 15 horsepower outboard engine costs around \$1680.

Islanders argued depletion of marine fisheries was more evident in nearby fishing areas, forcing them to go farther away. They associated depletion of fisheries with the increase in the number of fishers, their consistent effort and increased efficiency resulting from the use of better equipment.

The present markets are insufficient. The people are occasionally turned away from Queen Victoria School particularly in the best fishing times when the supply surpasses the demand. The fishers were thus at the whims of the limited market. Unsold fish are an economic loss that have to be eaten or shared. According to the Islanders, they could easily increase productivity if the markets are guaranteed.

Some fishers regarded the provision of government assistance as a problem. They said they have had to pay for all forms of government assistance so far received. The government, the people claimed, was not doing enough and it would be of great help if it assisted with equipment acquisition, marketing and storage development.

The fishers unanimously agreed that their most urgent need was to have training on engine maintenance and the use of new methods such as different nets, deep sea handline fishing and diving. Some people also mentioned the need for training in management of sea resources and fish farming. Others suggested the need for cooperative training, capital management and savings training.

Village-level fishing will become more important as commercial fisheries development diffuses to other areas of Fiji. The situation can be characteristically volatile unless the issues that are raised here are appropriately addressed and are given more prominence by those decision makers who are responsible for the sustainable development of our fisheries resources.

Figure 7.9: Fishing boats, needing money and skill to be repaired, are often abandoned or set aside. (Joeli Veitayaki)

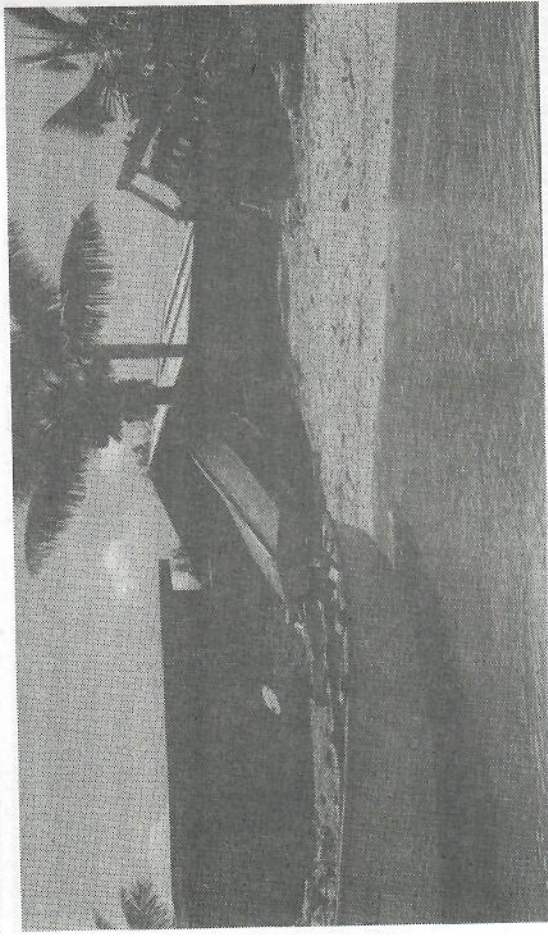


Figure 7.10: Derelict outboard engines. (Joeli Veitayaki)



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Fisheries Development in Fiji: The Quest for Sustainability

Joeli Veitayaki

Overpopulation, urbanization, and contemporary commerce have heightened concern for long-term sustainability of one of Fiji's greatest assets: its fisheries. Dietary, environmental, and income concerns mean Fiji must develop management practices if it is to care for its people in future.

There is no doubt of the changes in Fiji fisheries. Skills and technology are evolving: some traditional ones are lost forever, some new ones are developing. Customary land tenure is changing as well. Joeli Veitayaki argues here for a mix of old and new ways to accommodate changes in society's needs and capabilities. Among the means of developing fisheries are replenishing stocks, imposing catch and size limits, periodically closing grounds, and certainly gathering as much knowledge as possible of the resources themselves.

This volume of solid research and thoughtful analysis is a timely addition to the field of marine studies.

ISBN 982-02-0104-7



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