

Women's subsistence fishing supports rural households in Fiji: A case study of Nadoria, Viti Levu, Fiji

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Introduction

Women actively participate in fisheries activities throughout the Pacific Islands (Vunisea 1996). Despite their active involvement, the role of women has been underestimated and overlooked, with the primary emphasis on men's fishing activities. Women's fishing activities are mainly confined to intertidal areas, although some women fish offshore using motorised boats and canoes.

Women in many Pacific Island countries rely on nearshore marine resources to feed their families. Marine invertebrates, such as shellfish, form a significant portion of these women's catch. Shellfish is a major source of cheap protein for human consumption, and is a source of income (Davis et al 1998; Fay-Sauni 2001).

There are very few income-earning opportunities available to Pacific Island women, who often have a very limited educational background. Their experience lies primarily with household-related activities, and so it is important to explore avenues to use their individual expertise and experience. The knowledge and skills they have with regards to their fishing-related roles are not easily transferred to other types of occupations.

Among the few documented reports on the involvement of women in fishing activities, there are very few quantitative or qualitative studies that have specifically focused on women in subsistence fisheries in the Pacific Islands. Such information is crucial to the overall management of marine resources and in the design of small-scale development projects for women. Because of increasing pressure on intertidal and shallow water resources, studies of this nature are needed in most countries in the region.

This study focused on the involvement of women in the subsistence fishery in Nadoria village, Rewa Province, Fiji. Subsistence fishing activities and

their importance at the household level in Nadoria were investigated. Because subsistence fisheries are particularly popular among women, they formed the basis for exploring the extent to which women support their families through subsistence activities and alternative means of earning money.

Study area

The village of Nadoria is on the southeast coast of Viti Levu, the largest island in the Fiji Group (Fig. 1). The village is close to the mouth of the Rewa River, the country's largest and longest waterway. Suva, Fiji's capital, is 30 km away, and Nausori, the nearest town, is about 15 km away. Nadoria is accessible by bus, taxi and private vehicle, and can also be reached by boat from the seaside.

In December 1996, there were 34 households in the village, and the population was 139. The village lies in an area of about 280 m from north to the south, and 540 m from west to east (Biturogoiwasa and Walker 2001). The village is surrounded by mangrove forest and the Toga River flows nearby.

Methods

There were two components to the study: a household survey and a creel survey. The household questionnaire survey was designed to extract socioeconomic information from individual households of fishers residing in Nadoria. This socioeconomic information was essential in assessing the role of women in subsistence fisheries. The overall aim of the creel survey was to determine the amount of fish and marine products caught by women, measured in kilograms per hour of fishing.

The household questionnaire was used in interviews with 16 fisherwomen. A maximum of two hours was devoted to completing each questionnaire. Fisherwomen were asked questions about household size

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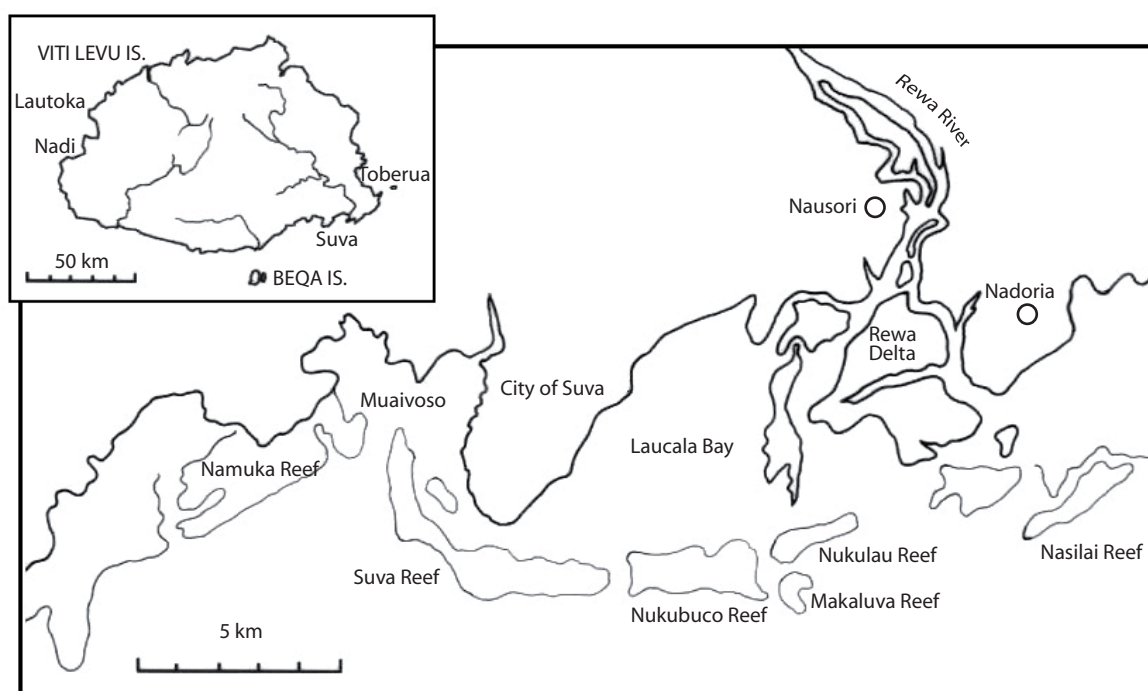


Figure 1. Nadoria Village near Rewa and Suva.

and composition, occupation of each family member, other employment opportunities, level of income from fisheries activities, and fishing methods used by women. The individual experiences of the women within their fishing areas, methods, catch composition and effort were also recorded.

The creel surveys determined the amount of fish caught by women. This was assessed by weighing each woman's catch using a handheld spring balance during the survey. Fishing effort was measured in the number of hours fished. The women were interviewed on their return from fishing, and were asked about their fish catch by species. Additional information was asked about fishing methods, fishing habitats visited, and time spent fishing.

Results and discussion

Demographics and household details

The subsistence fishery is an important fishery in many Pacific Island countries, including Fiji. In Nadoria, fisherwomen between the ages of 20 and 50 are likely to be unemployed and, thus, engaged in subsistence fishing, which is done in addition to their routine domestic activities.

Older fisherwomen are perceived to be more efficient and skillful in gleaning and fishing. These women have extensive local knowledge relating to tides, moon phases, cloud cover, and the best conditions for certain types of fishing. It is particularly obvious in Nadoria, where the majority of fisherwomen use

their traditional knowledge to carry out rotational fishing for mangrove crabs, *Anadara*, and reef fish. For some women, fishing skills and knowledge are handed down, and these women were reluctant to discuss them when they were interviewed.

Although women's involvement in fisheries is mainly at the household subsistence level, fishing has recently become a more commercial endeavour, thus highlighting the development in women's participation in fisheries activities. In addition, many women have gained an added sense of security and respect within their households through income generated from selling marine products.

In December 1996, there were 139 residents in Nadoria: 68 of whom were females (48.9%) and 71 (51.1%) of whom were males. The average number of people living under the same roof or household was 5, although there was a considerable range, from a single household resident to as many as 11. Women between the ages of 20 and 60 were mainly responsible for the sustenance of households.

About 56% of respondents were unemployed and 38% had paid employment. About 6% of respondents received social welfare from the government. Women who lived within households where a family member had some form of employment were still engaged in harvesting marine products to supplement earnings or help reduce spending on other protein sources. The variety of job opportunities and fortnightly earnings varied greatly. Some respondents received up to USD 200 per fortnight.

There is an important relationship between fishing and the average household income. Fishing activities correspond directly with relatively low-income households. Some 56% of respondents stated that they did not receive any income from paid employment. The most probable explanation for the survival of households with no income from paid employment is their reliance on the harvesting of marine products for protein and their sale for income.

Women's fishing activities

The women of Nadoria carry out fishing activities as part of their daily schedule. Most households have only one woman engaged in fishing, although some have two fisherwomen. Older (i.e. middle-aged) women are active in subsistence fishing activities in Nadoria. Women 19 years of age and less rarely fished. This trend is explained by the fact that most teenagers attend school or an institution of higher education.

In rivers and estuaries, women search for freshwater eels and shrimp. Women use drag nets, baskets and traps to catch freshwater prawns (*Macrobrachium* spp.), freshwater eels (*Anguilla* spp.), goby (*Sicyopterus* spp.) and crabs (*Scylla serrata*). Women travel to fishing grounds either on foot or by punt.

Women are also experts in trapping mud lobsters (*Thalassina anomala*). They do this by locating the lobster's burrow in the mud among the mangrove roots. Fisherwomen insert a bamboo tube (with a string) into the mud in order to form an extension to the mud lobster's tunnel. When the mud lobster surfaces from the mud, its movement triggers the spring trap, and the mud lobster is caught in the string.

Women use knives, spears and baskets when gleaning. In Nadoria, fisherwomen, glean the mudflats and reefs for many types of shellfish, including trochus (*Trochus niloticus*), giant clams (*Tridacna maxima*, *T. squamosa* and *T. derasa*), driloli (sea cucumber, (*Stichopus chloronotus* and *Holothuria scabra*), veata (*Dolabella auricularia*) and cawaki (sea urchin) (*Tripneustes gratilla*).

Other species collected from the mudflats include kaikoso (*Anadara antiquata*), hard shell clam (*Periglypta puerpera*), kuku (*Modiolus agrietus*) and drevula (*Polinices flemingianus*). Women often form groups and hire a boat to take them to the barrier reef. They often leave at high tide and return at the next high tide. The boat fare usually costs FJD 5.00 per person per trip. If the women cannot afford the boat fare, then they will walk out at low tide. Using a hook and line, they usually catch finfish such as yellow-tailed emperor (*Lethrinus mahsena*), perch (*Therapon jarbua*) and trevally (*Caranx* spp.).

Fishing methods and target areas

Women use different fishing methods. Methods and gear employed by fisherwomen are still very traditional with minimal impact on surrounding habitats. However, overturning stones and uprooting seagrass areas are popular practices while searching for shellfish. These activities can cause potential damage to the substrate and organisms inhabiting the substrate.

Women use their fingers and toes to search in the mud for ark shells (*Anadara antiquata*). Women also look for signs of ark shell siphons at the water's surface on an incoming tide. The women visually spot the half-covered *Anadara* shell gape in clear water at low tide.

Women wade out from the beach towards the seagrass beds at high tide, feeling in the muddy sand with their toes for shells. They fish as far out as they can stand with their heads still above water. As the tide recedes, the women use their fingers.

Nadorian fisherwomen are also involved in other fishing activities and use a variety of fishing methods. Other fishing methods commonly used include the use of a lantern for scoop fishing at night and netting for prawns. By far the most common activity is gleaning for invertebrates.

The fishing equipment used by the women was simple and inexpensive, and included monofilament lines and nets for catching fish. The use of this gear requires little or no technical skills to operate. Likewise, harvesting shellfish requires no form of sea transport and no fishing gear.

Nadorian fisherwomen are expert crab catchers, digging in the mud using bare hands or using a stick and placing the crabs in a basket. Catching crabs requires knowledge and technique in order to avoid fingers from being badly pinched. Most crab catching occurs in mangrove swamps near the village. The women are able to distinguish different crab species by the marks they leave in the mud and sand.

Selling marine products

About 44% of respondents sold marine products once a week. Of these, 25% received a dual income from both paid employment and selling marine products. Women who do not have paid jobs go out fishing everyday and keep their catch frozen until Saturday, when they sell it at the markets in Nausori or Suva.

The marine products sold by women included trochus, prawns, crabs, octopus and inshore finfish species.

Creel catch analysis

About 90% of the catch from women consisted of invertebrates; the other 10% consisted of vertebrate species such as inshore finfish. Nadorian fisherwomen usually catch between 1 kg and 2 kg per person hour of fishing, with 2 kg per person hour being the most common (48%). A higher catch per unit of effort may be obtained if fishing is carried out in the seagrass areas at the lagoonward edge of the intertidal flats on the outer reefs.

Summary

We found that women play a very important role in Nadoria's subsistence fishery. Women are increasingly dependent on marine resources for subsistence purposes and for income generation. Seafood is the main component in the diet of most Nadorian households, and subsistence fishing continues to play a very important cultural role.

The sale of marine products contributes to household income. Women's ability to earn income and contribute financially enables them to participate more actively in household decision-making.

Women in Nadoria fish mainly for their own household's consumption. The four most commonly used fishing methods are gleaning, handlining, netting and crabbing. Although the fishing methods are simple, these methods require high level of knowledge and skills. In addition to subsistence fishing, women also sell their excess catch at the local market or trade the catch within the village. Revenue from the sales of fish and marine products are spent on school fees and buying household necessities.

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