

**The Women's Daytime
Urban Subsistence Fisheries
off Suva Point**

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ABSTRACT

The sand flat around Suva Point supported a subsistence fishery that is an important source of healthy marine food for many low income families around metropolitan Suva. It was also used by recreational fisher women on the weekends and during public holidays. The diversity of the edible assemblage at Suva Point was considered by the fisher women to be greater than at other flats nearby. *Kaikoso* (*Anadara antiquata*) and *Kuku* (*Modiolus agripetus*) represented 97% of the shellfish catch. *Kabatia* (*Lethrinus harak*) was the most common fish caught by hand line followed *Matu* (*Gerres oyanana*), and *Qitawa* (*Therapon jarbua*). *Nuqa* (*Siganus vermiculatus*) was the most common using a hand net or by hand. The mean CPUE was 0.6 kg hr⁻¹ for fishers and 1.1 kg hr⁻¹ for gleaners. About 30 - 50 women regularly used the area and provided seafood for an estimated 180 - 300 people. The number of people supported by this small stretch of coastal area was comparable to the populations on many small island village communities. Efforts should be made to insure that anthropogenic pollution does not diminish this fishery. The collection of quantitative gender-specific catch information is necessary to further the development opportunities of women in the fisheries sector.

1996). A household survey of the fishing patterns of a squatter settlement on Laucala Bay near Suva Point did not include a quantitative survey of the fishery (Tiraa-Passfield, 1995). It has been suggested that this lack of analytical gender-specific information works to inhibit development opportunities of women in the fisheries sector (Turara, 1995).

This study was an effort to determine the daytime usage of the inner tidal sand flats around Suva Point, identify species commonly caught, quantify catch rates, identify resource usage patterns, record biological and folk knowledge, and note conservation practices.

MATERIALS AND METHODS

People fishing between Leveti Creek and Corpus Christi Teachers Training College at Suva Point were interviewed on 18 days at varying times of the day and phases of the tide from 29 April to 7 June 1996. The interviews were conducted either along the coastal road or on the intertidal flat. At night primarily men and young boys used pressure lamps and torches to illuminate their fishing activities. This use of the intertidal flat was not included in this study.

The numbers of fisher women and their activities were recorded. People were interviewed regarding their primary purpose for fishing, period of fishing, frequency of fishing efforts, family size, living location, fishing methods, method of preparing the catch for consumption, and biological knowledge of the catch. The catch weight was visually estimated to the nearest 500 g. Larger animals were counted. Samples of species were taken, weighed

People came from all over Suva to fish primarily for food for the extended family. Many came from Delainavesi about 3.5 km away (Table 1). The women said that the variety of edible species at Suva Point was not found elsewhere nearby. Most of the women (55%) had families of six or more people (Table 2) and could not afford to buy seafood at the market. The catch was usually consumed by the family and was often shared with friends or neighbors (Table 3). We estimated the mean extended family size to be approximately six people. We considered six to be conservative in estimating the numbers of people that were fed by the catch.

The women reported that the seafood was commonly cooked in coconut milk (*Lolo*). A few species such as *Kaikoso* (*Anadara antiquata*), *Dairo* (*Metriatyla scabra*) are consumed raw after being marinated with citrus juice and chillies. Cassava or *Dalo* (Taro) accompanied the meals.

Although most of the fisher women were there to collect food, everyone interviewed indicated that they enjoyed fishing. During the school holidays a few teachers came to do some recreational fishing. On Saturdays and public holidays most of the people were out for recreational fishing. Few “regulars” fished Saturday. Sunday was a day of rest and it was rare for people to go fishing.

Most of the access to the marine resource was at low tide by foot. Occasionally women hired a wooden boat from one of two Indian families at a rate of \$6 day⁻¹ to paddle out into the channel. Boats were shared by two to four people. This commonly occurred on

people regularly fished at Suva Point and that 180 - 300 people, who were either extended family members or neighbors, were fed from this resource.

The time that fishing commenced was dependent upon tides and weather. Even if the tides and weather were perfect early in the morning, on weekdays no women were seen out before 8:30 am. Generally more women were out in the afternoon than in the morning, with a slight decrease around lunch time. Preferred times for fin fishing and gleaning differed. Gleaning could be done only while the sand flats were exposed, that was 4 to 5 hours around low tide. Fishing occurred anytime except during 2 to 3 hours around the high tide when it was too deep to wade in the water. Since the boat hire location was located at the mouth of a creek, people hiring boats went out independent of tidal conditions.

Equipment

The equipment used was simple and inexpensive. For finfishing monofilament lines and hooks of various sizes were used. The line was wound around a small jar or bottle. A small bag or bucket for carrying bait and a knife and a larger one for the catch and personal belongings were carried. For gleaning only a knife and plastic bags were used. Occasionally a small hand net was used to catch fish or shrimps for bait. Animals used as bait included earthworms, shrimp, small fish (mackerel from market or earlier catch of *Matu* (*Gerres oyenana*), or *Qitawa* (*Therapon jarbua*)), bivalve shells (especially *Kaikoso* (*A. antiquata*)), opisthobranchs, or polychaetes.

modern defensive response to resource utilization questions from strangers or its origins may be older.

Catch species

Kabatia (Lethrimus harak) was the most common fish caught by hand line followed *Matu (Gerres oyenana)*, and *Qitawa (Therapon jarbua)*. *Nuqa (Sigamus vermiculatus)* was the most common using a hand net or by hand followed by, *Durui (xxx)* and *Ose (Mulloidichthys vanicalensis)*. *Kabatia (Lethrimus harak)* caught ranged from 13-30 cm in total length. *Matu (G. oyenana)* and *Qitawa (T. jarbua)* were slightly smaller. Smaller individuals were most common. According to the women larger individuals were caught in February and March. *Nuqa (S. vermiculatus)*, *Durui (xxx)*, and *Ose (M. vanicalensis)* ranged in size from 9 - 15 cm, xx- xx, and 11 - 14 respectively. The lengths and weights for several individuals of these species are listed in Table 9.

Of the four species of bivalve shells collected, the most common were *Kaikoso (A. antiquata)* and *Kuku (Modiolus agripetus)* and represented about 97% of the catch. Their length ranged from 4.2 - 6.5 cm and 3.9 - 5.3 cm respectively. Individuals of *A. antiquata* were found up to 8.3 cm in length. We suspect that the larger shells represent the previous year's recruitment. Other gastropods collected included the bivalve, *Kaidawa (Periglypta puerpera)*, and the opisthobranch, *Veata (D. auricularia)*. *Kaikoso (A. antiquata)* and *Veata (D. auricularia)* were the preferred species of most women. They commonly occurred on a big patch of soft sand close to the channel between the bus stop and the Lighthouse Restaurant. *Veata (D. auricularia)* were usually found in deeper

(Quinn, 1984; Mathews, 1995), and made a significant economic contribution to the community (Quinn, 1984; 1985).

While quantitative studies of women's fisheries are uncommon several researchers have found that the contribution ranged from 20% in south Tarawa, Kiribati (Schoeffel, 1985), to 31% in an American Samoan village (Hill, 1977) to 20 to 50% in some regions of Papua New Guinea (Haines, 1982). These studies were of rural populations. We were unable to locate any quantitative studies of a women's subsistence fishery from an urban area.

During the past few decades studies of women in fisheries revolved around their "role in fisheries" without quantifying their contribution (Baines, 1982; Chapman, 1987; Chilcott and Lucas, 1984; Drewes, 1982; Lal and Slatter, 1982). The conviction that "gender is a fundamental aspect of the relations of power, of individual and collective identity . . ." (Davies and Klein, 1992) may have contributed to the focus that many researchers had on "gender issues" when studying women's fisheries. This is perhaps a necessary first step in the acknowledgment of the role of women in fishing, but resulted in a lack of studies that focused on women's technical knowledge or the actual product of the activity.

Consequently, the specific quantitative contribution of the women and their specialized technical knowledge of the fishery was commonly absent from studies of women's fisheries (Des Rochers, 1992; Falanruw, 1994; Mathews and Oiterong, 1995). Studies utilizing questionnaires were conducted by interviewing women in households rather than on the shore immediately after a fishing trip or at the fishing site (Vunisea, 1995). The

occurred in other in shore areas of Suva Harbor and Laucala Bay. The subsistence fishery off Suva Point was an important activity for an estimated 30 - 50 women who regularly utilize the resource. We estimate that these fisher women provide seafood for a total of 180 - 300 people. The number of people supported by this small stretch of coastal are was comparable to the populations on many small island village communities. Although the numbers of women who fish off Suva Point was relatively small and the percentage of the Suva population it feeds was not more than 0.2%, it should not diminish our responsibility to insure its continual safe utilization.

Fijians commonly share their goods within village communities and this custom prevails among many people in Suva. Many of the women did not consider their fishing activities as commercial activity. It seemed to be much more important to have things to share with friends if the catch exceeded the family needs. If some of the catch was sold on the market, it was to cover expenses and to purchase a few luxuries.

Most of the women had no other means of earning an income for themselves and needed to utilize marine resources off Suva Point to provide food for their families. They did have ample time and the necessary skills and knowledge. Using just simple, inexpensive equipment they were able to gather fresh, "good food" that they could not otherwise afford. There was also less risk in gleaning than in fishing. One could always find something to eat on the flat, but catching a meal fishing was more uncertain. Efforts gleaning were almost twice as productive as fishing. Experience and local knowledge helped to increase the catch size. No special skills were needed for gleaning and the shells were

not occurring there. They also indicated that they did not fish there because of the pollution.

The National Environmental Strategy notes that “the extent of marine pollution is so severe in the Suva area that the consumption of seafood from certain areas is a human health hazard.” (Govt. of Fiji, 1993). While this may be true it is limited in scope and unrealistic for many low income earners. It is considered necessary to extend pollution studies to include subsistence fisheries products. Such studies are essential to assess the actual potential public health hazard. We suggest that the benthic population densities around the Suva Harbor flats vary as a function of distance to anthropogenic pollution sources. Suva Point was well flushed with tidal currents. Rather than being totally polluted and completely non productive, there are plentiful marine resources around Suva Point. These populations were vital to the subsistence of many people and provided an important income supplement to many low income earners. Instead of being a “tragedy of the commons” as suggested by Chung (1995), Suva Point is an important source of healthy sea food for about as many people as is supported in some rural coastal areas.

Although the women were knowledgeable about some aspects of the biology of their catch we were only able to gather a small amount of information. The list of species utilized is probably incomplete and is likely to change with the seasons. It is also likely that species abundance could change seasonally. Only species that were either shown or given to us were identified. The women did not report on any spawning aggregations or other biological phenomenon. We suspect that recruitment of shells occurs during the warmer months. The mean size of the population is then likely to increase through the

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TABLES

Table 1: Residential areas of women fishing off Suva Point. N=22.

Residential area	Number of fishers
Delainavesi	5
Samabula	2
Central Suva	3
Raiwaqa	4
Raiwai	2
Nasese	4
Valelevu	2

Table 2: Total family size; numbers include the women themselves. N=9.

Family size	Frequency of responses
0 - 1	0
2 - 4	1
5 - 6	3
> 6	5

Table 5: Fishing/gleaning activities at Suva Point. n.a.: no observations made.

Date	# people finfishing	# people gleaning	# people in rented boats	Total # fishers	Weather	Time of observation	Low tide
29. 4. 96	7	3	n.a.	10	fine	10:00-12:00	09:17
30. 4. 96	4	0	n.a.	4	rain	14:30-16:00	10:04
03. 5. 96	3	9	n.a.	12	fine	11:00-14:30	12:21
06. 5. 96	0	3	0	3	cldy, wind	15:30-17:30	14:48
09. 5. 96	12	10	0	22	fine	16:00	17:38
10. 5. 96	10	5	0	15	fine	16:00	18:38
11. 5. 96	0	3	0	3	heavy rain	9:30-10:30	07:12
23. 5. 96	0 6 4	0 3 19	0 13 0	0 22 23	chilly at 7 am, fine	7:00 1-1:30 16:30-17:45	04:20 / 16:53
24. 5. 96	10 6 0	0 8 0	11 0 0	21 14 0	clouds, dry	12:30 14:00 16:00	17:40
28. 5. 96	8	5	0	13	fine	11:00	08:39
29. 5. 96	9	7	0	16	fine	12:00	09:30
30. 5. 96	0 7 7	4 17 0	0 0 0	4 24 7	clouds, mainly dry	8:30 11:30 13:30	10:20
31. 5. 96	4 5	12 0	0 0	16 5	clouds, windy	12:30-14:30	11:10
03. 6. 96	0	2	0	2	rain/cool windy	15:30	13:40
04. 6. 96	0	8	0	8	rain/cool windy	13:00-15:00	14:30
05. 6. 96	1 by creek	0	0	1	heavy rain	8:30	15:28
06. 6. 96	2	19	0	21	rain, windy	15:00-16:30	16:38
07. 6. 96	3 0	0 5	0 0	3 5	clouds, windy	12:30 15:00-16:30	17:20

Table 8: Invertebrate and algal species gathered by gleaning.

Classification	Fijian name	English name	Latin name
Bivalvia	<i>Kaikoso</i>	Arc shell	<i>Anadara antiquata</i>
	<i>Kuku</i>	Mangrove mussel	<i>Modiolus agripetus</i>
	<i>Kaitakadiri</i>	Venus shell	<i>Gafrarium tumidum</i>
	<i>Kaidawa</i>	Hard shell clam	<i>Periglypta puerpera</i>
Brachiopoda	<i>Ivoce</i>	Lamp shell	<i>Lingula unguis</i>
Holothurian	<i>Mudra</i>	Sea cucumber	<i>Stichopus sp.</i>
	<i>Dairo</i>	Sea cucumber	<i>Metriatyla scabra</i>
Opisthobranchia	<i>Veata</i>	Green sea hare	<i>Dolabella auricularia</i>
Algae	<i>Lumicevata</i>	Maidenhair	<i>Hypnea nidifica</i>
	<i>Lumiwawa</i>	Glassweed	<i>Gracilaria verrucosa</i>
	<i>Lumitamana</i>	Goldenweed	<i>Solieria sp.</i>
Crustacean	<i>Qari</i>	Swimmer crab	<i>Thalamita crenata</i>
	<i>Qari</i>	Mud crab	<i>Scylla spp</i>

Table 9: Length (cm) and weight (g) of single individuals of the main three species of fish caught by hand line.

Species	Length	Total Weight
<i>Lethrimus harak</i>	15.0	48.2
<i>Therapon jarbua</i>	12.5	29.2
<i>Gerres oyeana</i>	12.0	21.2

Table 11: Length (cm), mean weight (g), and mean net food weight (g) of *Modiolus agripetus*.

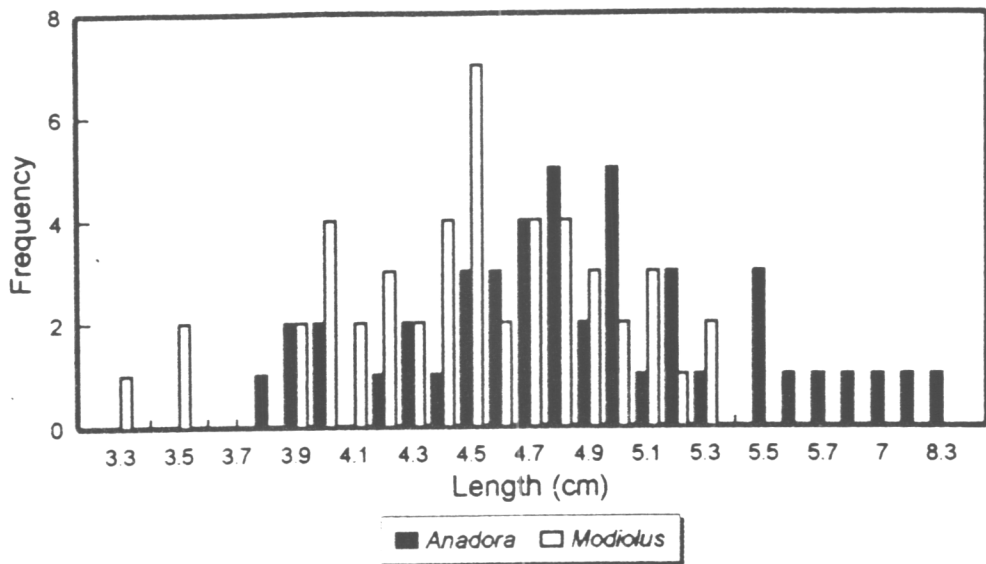
Length	Frequency	Mean total wt.	Mean net wt.
3.3	1	3.6	1.2
3.5	2	4.1	1.0
3.9	2	4.8	1.6
4.0	4	5.9	1.7
4.1	2	5.5	1.3
4.2	3	7.1	1.7
4.3	2	6.8	1.7
4.4	4	7.8	1.8
4.5	7	7.8	1.8
4.6	2	7.7	2.3
4.7	4	8.2	1.9
4.8	4	9.4	2.3
4.9	3	9.4	2.1
5.0	2	7.0	2.0
5.1	3	10.1	2.5
5.2	1	7.9	2.1
5.3	2	11.0	3.1
Total no. of shells	48		
Total weight		363.6	91.0
Soft body % of total weight			25

FIGURE CAPTIONS

Figure 1: Map of Suva Point and surrounding locations.

Figure 2: Length frequency distribution of *Anadara antiquata* and *Modiolus agripetus*.

Suva Point Shell Lengths



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