

# 7. Comparisons with Outer Islands Study

A similar questionnaire survey was undertaken in coastal Fijian village communities in islands outside of Viti Levu by Rawlinson and Sesewa (1994). All the sites were primarily locations remote from the main urban centres of the country, and will be referred to as outer island locations. All sites were next to the shoreline and would have been classified in stratum 10 of the present study.

To compare the two surveys, data taken from the those locations in stratum 10 of the present study have to matched with results coming from the 1994 study.

## A) Household Size

Households in stratum 10 from Viti Levu had a higher mean number of members (6.06) than those in the outer island locations (5.73). The number of adults per household was higher on Viti Levu (1.84 males and 1.81 females) than the outer islands (1.54 males and 1.55 females). The situation was reversed for children: on Viti Levu (1.27 males and 1.13 females) and in the outer islands (1.43 males and 1.20 females).

## B) Source of Income

The number of households involved in selling marine products were similar for outer islands (62.5%) and Viti Levu (60.6%). The sale of copra was undertaken by only 9.0% of households in Viti Levu whereas 58.2% of households in the outer islands still undertook this occupation. Sale of copra was recognised as the most important income source in the outer islands. The sale of marine products was the most important on Viti Levu.

The sale of farm/garden produce was more important in the outer islands (39.8% of households) than on Viti Levu (33.7%). Wage income and an income from other means were more important on Viti Levu. The percentage of households making income from a wage earning occupation was 38.7% and from other means 16.7%. The figures for the outer islands were 23.1% and 5.7%, respectively. The number of

households running a business to make income was similar in both areas (6%).

Opportunities for wage employment would be far greater on Viti Levu than in the outer islands, as indicated by the figures. Few rural Fijian households actively run family businesses, except for the sale of local produce.

## C) Numbers of Households Involved in Fishing

In the outer islands 96.7% of households went fishing whereas 91.0% of Fijian households in stratum 10 of Viti Levu carried out this activity. The number of households fishing for subsistence purposes were 39.6% in the outer islands and 34.5% on Viti Levu. Artisanal activities were carried out by 57.1% and 63.7% of outer island and Viti Levu households, respectively.

## D) Number of People Involved in Fishing

From the total population, 31.8% from the outer islands and 26.7% on Viti Levu go fishing. The proportions for each of the following groups of the population were: adult males, 56.8% (outer islands) and 37.0% (Viti Levu), adult females, 55.5% and 47.7%, male children 4.7% and 2.1%, and female children, 2.8% and 4.6%.

The mean number of people who go fishing from each household was 1.82 in the outer islands and 1.66 from Viti Levu. The mean number of males was 0.88 and 0.72, females was 0.86 and 0.85, male children 0.07 and 0.03 and female children 0.03 and 0.05 for outer islands and Viti Levu, respectively within each group.

Overall it would appear that slightly less fishing activity takes place on Viti Levu as a proportion of the people involved. The primary difference being the activities of adult males. As more jobs are available on Viti Levu, it appears that some adult males work instead of going fishing.

## E) Frequency of Fishing Effort

In the outer islands, 51.2 % of the adult population undertake fishing activities at least once a week and only a small proportion (3.8%) of children do any fishing at all. In Viti Levu the percentages of adults fishing once per week is 36.4% and children fishing is 3.2%.

Of the adult males who go fishing, 90.8% and 81.9% from the outer islands and Viti Levu undertake at least one fishing trip per week. For adult females the equivalent figures are 92.9% and 90.2%, respectively. Forty seven percent and 54.9% of males and females from outer islands who go fishing reported undertaking trips more frequently than this (> 2/week). On Viti Levu, 39.3% and 47.5% of males and females were fishing at the same frequency.

These figures would reinforce the observation of slightly less fishing activity taking place on Viti Levu by the adult population. Children in both situations appear to participate in fishing to a very limited degree.

## F) Fishing Methods

A comparison of the percentage of households who utilised different fishing methods is summarised in Table 76.

Handlines, droplines and spear fishing are utilised by a greater proportion of households in outer islands. Collection and the use of wading nets are more important on Viti Levu. The use of gill nets was similar in both locations.

## G) Fishing Assets

The numbers of different fishing gears, boats and ice boxes for the outer islands and Viti Levu are detailed in Table 77.

More households in the outer islands own fishing gear than on Viti Levu. Except for push nets, they also possess more pieces of gear. The same was true for boats and ice boxes.

This would generally suggest there are fewer fishing assets on Viti Levu and there is a greater reliance on fishing in the outer islands.

## H) Habitat Areas

The major habitat areas used by households both in the outer islands and on Viti Levu are listed in Table 78.

Fishing in the lagoonal areas [along the shoreline, lagoon (shallow) and lagoon (deep)] are the most important fishing habitats for both areas although more households from the outer islands reported fishing there. Activities within estuaries and rivers and around mangrove systems were more important to households on Viti Levu. Fishing around the outer (barrier) reefs and in distant areas away from the villages were more important to households in the outer islands.

Viti Levu is a much larger island than any of the outer islands and possesses considerable areas of freshwater and mangrove habitats, which people use for fishing. Consequently, the use of push nets are a favoured technique in these areas.

## I) Target Species

Species from the family Lethrinidae (especially *L. harak*) were the most frequently targeted in the outer islands with serranids, hemiramphids, gerreids and scombrids also being prominent. A similar situation was noted in Viti Levu except that there was an increased importance of carangids. Invertebrates, especially mud crabs, *Scylla serrata*, were also identified as being more important on Viti Levu. This is a direct outcome of the increased use of mangrove areas.

**Table 76. Percentage of households reporting to use different fishing methods during the course of the questionnaire surveys of the outer islands and Viti Levu**

Fishing method	Outer islands (%)	Viti Levu (%)
Handline	86.0	51.3
Spear	36.1	16.3
Dropline	28.4	15.3
Collection	25.1	34.0
Gill nets	13.7	14.3
Wade nets	1.0	16.0

**Table 77. The percentage of households (% house) owning at least one of the fishing assets, the overall total of different assets owned (Number) and the number of each asset per household (No./house) for the outer islands and Viti Levu.**

	Outer islands			Viti Levu		
	% house	Number	No./house	% house	Number	No./house
<b>Fishing gear</b>						
Handline	87.3	856	2.86	52.7	643	2.14
Dropline	25.1	213	0.71	12.0	153	0.51
Towline	11.0	47	0.16	1.0	6	0.02
Spear (gun)	24.1	97	0.32	5.0	29	0.10
Spear (hand)	23.4	102	0.34	17.0	82	0.28
Dive goggles	39.5	179	0.60	12.3	49	0.16
Gill net	18.7	108	0.36	10.7	93	0.31
UW torch	21.7	72	0.24	4.3	14	0.05
Wading net	1.0	3	0.01	15.3	53	0.18
Other gear	20.7	83	0.28	9.6	82	0.27
<b>Boats</b>						
Paddle canoe	6.0	20	0.07	1.0	3	0.01
Marine ply	0.3	1	–	1.0	10	0.03
Fibreglass	1.7	5	0.02	1.0	3	0.01
Wooden punt	23.7	71	0.24	17.0	51	0.17
FAO design	3.3	10	0.03	0.0	0	0
Other	0	0	0	0.7	2	0.007
Total boats	32.4	107	0.36	23.0	69	0.23
<b>Ice boxes</b>						
Homemade	4.7	17	0.05	5.6	18	0.06
Eskie	1.3	4	0.01	0.7	2	0.006
Total	6.0	21	0.07	6.3	20	0.07

**Table 78. Main habitat areas where household fishing activities are undertaken. The number of houses (Houses) using these areas and the percentage of the total sample of houses (% houses) are given for outer islands and Viti Levu.**

Habitat area	Outer islands		Viti Levu	
	Houses	% houses	Houses	%houses
Distant area	49	16.4	11	3.7
Outside edge of outer reef	82	27.4	18	6.0
On outer reef	84	28.1	40	13.3
Inside lagoon (deep)	153	51.2	63	21.0
Inside lagoon (shallow)	132	44.1	110	36.7
Along shoreline	190	63.5	130	43.3
Along edge of mangroves	15	5.0	64	21.3
Amongst mangroves	13	4.3	61	20.3
Estuary/rivers	9	2.7	47	15.7

# 8. Total Estimates of Fishing Effort and Catch

## A) Estimation of Effort

From the questionnaire survey, estimates of the mean numbers of people per household who go fishing were made (Tables 24–27). By extrapolating these results by the total number of households involved in fishing for the different strata it is possible to estimate the overall number of people who go fishing within the sample area.

Table 79 details the total number of Fijian and Indian households and people by stratum within the sample area as compiled from the data from the population census figures in 1986 (Anon. 1989).

In order to estimate the actual number of Fijian and Indian households within each stratum who carry out subsistence and artisanal fishing activities, the total number of households had to be adjusted by a group of different factors:

Factor 1: A growth factor to account for an increase in population since 1986. This was set at 1.07.

Factor 2: The proportion of households within each stratum that undertake fishing as recorded from the questionnaire survey. This factor was taken for each strata, from the 'Fishing Total' columns in Tables 17 and 18 for Fijian and Indian houses, respectively.

**Table 79. Total population and numbers of houses on Viti Levu broken down by stratum and race.**

Race	Stratum	Population	Households
Fijian	10	23,660	4,165
Fijian	20	7,993	1,407
Fijian	30	15,014	2,537
Fijian	40	60,489	10,036
Indian	10	10,715	1,915
Indian	20	25,303	4,520
Indian	30	39,262	6,920
Indian	40	65,555	11,289

Factor 3: The proportion of households that carried out either subsistence or artisanal activities. These factors were taken from Tables 17 and 18 for Fijian and Indian households, respectively.

Factor 4: The mean number of people calculated to be fishing within each stratum, by race, by type of fishing activity and by age as detailed in Tables 24–27.

Using these figures the total number of people fishing and their frequency of fishing effort has been calculated and detailed in Tables 80–83 for adult males, adult females, and male and female children.

### Example of application of adjustment factors

For the number of Fijian adult males fishing 3–7 times/week who reside in stratum 10 and undertake subsistence activities:

i) Total number of Fijian households in stratum 10 from 1986 census (from Table 79) : 4165 households

ii) Total number of Fijian households in stratum 10 adjusted to account for population growth since 1986:  $4165 \times 1.07$

iii) Total number of Fijian households that reported fishing from stratum 10 (factor taken from Table 17):  $4165 \times 1.07 \times 91.0\%$

iv) Total number of Fijian households that reported subsistence fishing activities in stratum 10 (factor taken from Table 17):  $4165 \times 1.07 \times 91.0\% \times 34.5\%$

v) Total number of Fijian adult males that reported subsistence fishing activities in stratum 10 at the frequency of 3–7 trips/week (factor taken from Table 24):  $4165 \times 1.07 \times 91.0\% \times 34.5\% \times 0.14 = 195.9$  adult males.

This procedure was followed for the four different age and sex groupings in order to compile Tables 80–83.

**Table 80. The total number of adult males ( $\pm$  s.e.) of each ethnic group in each stratum who reported subsistence and artisanal fishing trips.**

Stratum	Race	Type	Number of adult males fishing from subsistence/commercial households							
			3–7 per week		1–2 per week		> 1 per month		< 1 per month	
			Total	$\pm$ s.e.	Total	$\pm$ s.e.	Total	$\pm$ s.e.	Total	$\pm$ s.e.
10	Fijian	Subsistence	195.9	$\pm$ 56.0	461.7	$\pm$ 97.9	111.9	$\pm$ 42.0	42.0	$\pm$ 28.0
10	Fijian	Artisanal	981.8	$\pm$ 103.4	775.0	$\pm$ 129.2	180.8	$\pm$ 51.7	155.0	$\pm$ 77.5
20	Fijian	Subsistence	25.8	$\pm$ 25.8	264.3	$\pm$ 70.9	128.9	$\pm$ 38.7	45.1	$\pm$ 25.8
20	Fijian	Artisanal	175.6	$\pm$ 62.7	495.3	$\pm$ 119.1	60.8	$\pm$ 31.3	0.0	$\pm$ 0.0
30	Fijian	Subsistence	60.2	$\pm$ 36.1	348.9	$\pm$ 84.2	60.2	$\pm$ 36.1	24.1	$\pm$ 12.0
30	Fijian	Artisanal	262.5	$\pm$ 84.0	472.5	$\pm$ 94.5	0.0	$\pm$ 0.0	0.0	$\pm$ 0.0
40	Fijian	Subsistence	934.3	$\pm$ 233.6	2958.6	$\pm$ 311.4	856.4	$\pm$ 155.7	467.1	$\pm$ 155.7
40	Fijian	Artisanal	332.3	$\pm$ 115.0	115.0	$\pm$ 63.9	140.6	$\pm$ 63.9	217.3	$\pm$ 127.8
10	Indian	Subsistence	–		–		15.8	$\pm$ 9.5	–	
20	Indian	Subsistence	73.1	$\pm$ 18.3	365.5	$\pm$ 54.8	383.8	$\pm$ 54.8	365.5	$\pm$ 54.8
20	Indian	Artisanal	509.1	$\pm$ 95.4	324.5	$\pm$ 63.6	95.4	$\pm$ 38.2	50.9	$\pm$ 25.5
30	Indian	Subsistence	21.3	$\pm$ 21.3	213.0	$\pm$ 42.6	383.8	$\pm$ 63.9	298.2	$\pm$ 42.6
30	Indian	Artisanal	187.0	$\pm$ 59.7	210.9	$\pm$ 63.7	127.3	$\pm$ 59.7	0.0	$\pm$ 0.0
40	Indian	Subsistence	25.5	$\pm$ 25.5	178.1	$\pm$ 25.5	254.5	$\pm$ 50.9	330.8	$\pm$ 50.9
40	Indian	Artisanal	177.9	$\pm$ 56.5	129.8	$\pm$ 56.5	16.7	$\pm$ 16.7	31.4	$\pm$ 31.4
All	All	Subsistence	1336.1	$\pm$ 416.6	4790.1	$\pm$ 687.3	2195.3	$\pm$ 451.6	1572.8	$\pm$ 369.8
All	All	Artisanal	2626.2	$\pm$ 576.7	2523.0	$\pm$ 590.5	621.6	$\pm$ 261.5	454.6	$\pm$ 262.2
All	All	Total	3962.3	$\pm$ 993.3	7313.1	$\pm$ 1277.8	2816.9	$\pm$ 713.1	2027.4	$\pm$ 632.0

**Table 81. The estimated total number of adult females of each ethnic group in each stratum who reported subsistence and artisanal fishing trips**

Stratum	Race	Type	Number of adult females fishing from subsistence/commercial households							
			3–7 per week		1–2 per week		> 1 per month		< 1 per month	
			Total	$\pm$ s.e.	Total	$\pm$ s.e.	Total	$\pm$ s.e.	Total	$\pm$ s.e.
10	Fijian	Subsistence	349.8	$\pm$ 70.0	573.7	$\pm$ 97.9	125.9	$\pm$ 42.0	28.0	$\pm$ 14.0
10	Fijian	Artisanal	1343.5	$\pm$ 129.2	878.4	$\pm$ 103.3	103.3	$\pm$ 51.7	51.7	$\pm$ 25.8
20	Fijian	Subsistence	70.9	$\pm$ 38.7	180.5	$\pm$ 58.0	25.8	$\pm$ 19.3	45.1	$\pm$ 32.2
20	Fijian	Artisanal	37.6	$\pm$ 25.1	307.2	$\pm$ 75.2	56.4	$\pm$ 31.3	18.8	$\pm$ 18.8
30	Fijian	Subsistence	312.9	$\pm$ 84.2	625.7	$\pm$ 132.4	60.2	$\pm$ 36.1	24.1	$\pm$ 24.1
30	Fijian	Artisanal	294.0	$\pm$ 84.0	682.6	$\pm$ 105.0	21.0	$\pm$ 4.2	0.0	$\pm$ 0.0
40	Fijian	Subsistence	622.8	$\pm$ 155.7	3347.9	$\pm$ 389.3	856.4	$\pm$ 155.7	389.3	$\pm$ 155.7
40	Fijian	Artisanal	370.6	$\pm$ 115.0	690.1	$\pm$ 166.1	140.6	$\pm$ 115.0	140.6	$\pm$ 63.9
10	Indian	Subsistence	0.0	$\pm$ 0.0	0.0	$\pm$ 0.0	0.0	$\pm$ 0.0	0.0	$\pm$ 0.0
20	Indian	Subsistence	18.3	$\pm$ 18.3	36.6	$\pm$ 18.3	36.6	$\pm$ 18.3	7.3	$\pm$ 7.3
20	Indian	Artisanal	0.0	$\pm$ 0.0	5.9	$\pm$ 5.9	0.0	$\pm$ 0.0	5.9	$\pm$ 0.4
30	Indian	Subsistence	0.0	$\pm$ 0.0	21.3	$\pm$ 10.6	42.6	$\pm$ 21.3	17.0	$\pm$ 12.8
30	Indian	Artisanal	0.0	$\pm$ 0.0	41.6	$\pm$ 26.5	60.5	$\pm$ 45.3	0.0	$\pm$ 0.0
40	Indian	Subsistence	2.5	$\pm$ 2.5	25.4	$\pm$ 7.6	0.0	$\pm$ 0.0	50.9	$\pm$ 15.3
40	Indian	Artisanal	0.0	$\pm$ 0.0	31.4	$\pm$ 31.4	0.0	$\pm$ 0.0	0.0	$\pm$ 0.0
All	All	Subsistence	1377.2	$\pm$ 369.4	4811.1	$\pm$ 714.1	1147.5	$\pm$ 292.7	561.7	$\pm$ 261.4
All	All	Artisanal	2045.7	$\pm$ 353.3	2637.2	$\pm$ 513.4	381.8	$\pm$ 247.5	217.0	$\pm$ 108.9
All	All	Total	3422.9	$\pm$ 722.7	7448.3	$\pm$ 1227.5	1529.3	$\pm$ 540.2	778.7	$\pm$ 370.3

**Table 82. The estimated total number of male children of each ethnic group in each stratum who reported subsistence and artisanal fishing trips**

Stratum	Race	Type	Number of male children fishing from subsistence/commercial households							
			3–7 per week		1–2 per week		> 1 per month		< 1 per month	
			Total	± s.e.	Total	± s.e.	Total	± s.e.	Total	± s.e.
10	Fijian	Subsistence	14.0	± 14.0	42.0	± 42.0	0.0	± 0.0	0.0	± 0.0
10	Fijian	Artisanal	25.8	± 25.8	25.8	± 25.8	0.0	± 0.0	0.0	± 0.0
20	Fijian	Subsistence	0.0	± 0.0	12.9	± 12.9	0.0	± 0.0	12.9	± 12.9
20	Fijian	Artisanal	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
30	Fijian	Subsistence	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
30	Fijian	Artisanal	0.0	± 0.0	52.5	± 42.0	0.0	± 0.0	0.0	± 0.0
40	Fijian	Subsistence	155.7	± 77.9	389.3	± 155.7	155.7	± 77.9	77.9	± 77.9
40	Fijian	Artisanal	0.0	± 0.0	38.3	± 38.3	38.3	± 38.3	0.0	± 0.0
10	Indian	Subsistence	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
20	Indian	Subsistence	0.0	± 0.0	54.8	± 18.3	36.6	± 18.3	0.0	± 0.0
20	Indian	Artisanal	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
30	Indian	Subsistence	0.0	± 0.0	21.3	± 21.3	6.4	± 6.4	6.4	± 6.4
30	Indian	Artisanal	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
40	Indian	Subsistence	7.6	± 7.6	2.5	± 2.5	25.4	± 15.3	15.3	± 7.6
40	Indian	Artisanal	0.0	± 0.0	0.0	± 0.0	31.4	± 31.4	0.0	± 0.0
All	All	Subsistence	177.3	± 99.5	522.8	± 252.7	224.1	± 117.9	112.5	± 104.8
All	All	Artisanal	25.8	± 25.8	116.6	± 106.1	69.7	± 69.7	0.0	± 0.0
All	All	Total	203.1	± 125.3	639.4	± 358.8	293.8	± 187.6	112.5	± 104.8

**Table 83. The estimated total number of female children of each ethnic group in each stratum who reported subsistence and artisanal fishing trips**

Stratum	Race	Type	Number of female children fishing from subsistence/commercial households							
			3–7 per week		1–2 per week		> 1 per month		< 1 per month	
			Total	± s.e.	Total	± s.e.	Total	± s.e.	Total	± s.e.
10	Fijian	Subsistence	0.0	± 0.0	56.0	± 28.0	0.0	± 0.0	28.0	± 28.0
10	Fijian	Artisanal	25.8	± 25.8	77.5	± 25.8	0.0	± 0.0	25.8	± 15.5
20	Fijian	Subsistence	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
20	Fijian	Artisanal	0.0	± 0.0	18.8	± 18.8	0.0	± 0.0	0.0	± 0.0
30	Fijian	Subsistence	36.1	± 36.1	72.2	± 48.1	0.0	± 0.0	0.0	± 0.0
30	Fijian	Artisanal	0.0	± 0.0	84.0	± 60.2	0.0	± 0.0	0.0	± 0.0
40	Fijian	Subsistence	0.0	± 0.0	311.4	± 77.8	155.7	± 77.8	0.0	± 0.0
40	Fijian	Artisanal	0.0	± 0.0	38.3	± 38.3	0.0	± 0.0	0.0	± 0.0
10	Indian	Subsistence	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
20	Indian	Subsistence	8.3	± 8.3	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
20	Indian	Artisanal	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
30	Indian	Subsistence	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
30	Indian	Artisanal	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
40	Indian	Subsistence	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
40	Indian	Artisanal	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
All	All	Subsistence	44.4	± 44.4	439.6	± 153.9	155.7	± 77.8	28.0	± 28.0
All	All	Artisanal	25.8	± 25.8	218.6	± 143.1	0.0	± 0.0	25.8	± 15.5
All	All	Total	70.2	± 70.2	658.2	± 297.0	155.7	± 77.8	53.8	± 43.5

## B) Estimation of Catch

In order to assess the amounts of fish that would be caught by the level of fishing effort estimated, the data from Fijian households in stratum 10 has been used.

Tables 84 and 85 summarise the numbers of Fijian adult males, females and children who reside in stratum 10 and undertake subsistence and artisanal fishing activities, respectively.

In order to estimate how this relates to the numbers of fishing trips per week, each frequency of effort category has been assigned a factor which has been used to convert numbers of people to numbers of trips. Factors of 3, 1, 0.5 and 0.25 were used to adjust the 3–7 trips/week, 1–2 trips/week, greater than once per month and less than once per month categories, respectively.

The numbers of trips per week were converted to numbers of hours per week by applying an average trip length. The trip length was taken from data collected during the creel survey. The average length of subsistence trips was 3.23 hours ( $\pm 0.31$ ,  $n = 80$ ) and artisanal trips were 4.88 hours ( $\pm 0.38$ ,  $n = 60$ ), which were used for these conversions.

The number of hours per year was calculated by multiplying the weekly total by 52. The total fisher hours undertaken by Fijians living in stratum 10 for subsistence activities was 495,295 and for artisanal activities 2,306,044, as summarised in Tables 84 and 85, respectively.

Using catch rates calculated from the creel surveys, this amount of effort can be converted into a predicted annual catch. During the creel survey, the weight of fish caught was 492.5 kg and 1,170.2 kg and the time spent fishing was 517.0 fisher hours and 977.2 fisher hours for subsistence and artisanal activities, respectively. This is equivalent to catch rates of 0.95 and 1.20 kg/fisher hour for subsistence and artisanal activities.

The annual subsistence catch by Fijians in stratum 10 would therefore be 470 t (495,295 fisher hours  $\times$  0.95 kg/fisher hour) and the annual artisanal catch would be 2,767 t (2,306,044 fisher hours  $\times$  1.20 kg/fisher hour).

The factors used for adjusting the frequency of effort have a strong influence on the estimated effort and in turn the catch. The factors used in our calculations are at the lowest level for the ranges available. This would imply that overall estimates of total catch and effort given are *minimum* values.

**Table 84. Estimated subsistence fishing effort by Fijians living in stratum 10.**

	3–7 trips per week	1–2 trips per week	> 1 trip per month	< 1 trip per month	Total
Males	195.9	461.7	111.9	42.0	1007.4
Females	349.8	573.7	125.9	28.0	1077.4
Children	14.0	98.0	0.0	0.0	112.0
Total fishers per day	559.7	1,133.4	237.8	70.0	2,000.9
Total fishers per week	1,679.1	1,133.4	118.9	17.5	2,948.9
Total fisher hours per week	5,423.5	3,660.9	384.0	56.5	9,524.9
Total fisher hours per year	282,022.0	190,366.8	19,968.0	2,938.0	495,294.8

**Table 85. Estimated artisanal fishing effort by Fijians living in stratum 10.**

	3–7 trips per week	1–2 trips per week	> 1 trip per month	< 1 trip per month	Total
Males	981.8	775.0	180.8	155.0	2,072.6
Females	1,343.5	878.4	103.3	51.7	2,376.9
Children	51.6	103.3	0.0	25.8	180.7
Total fishers per day	2,376.9	1,756.7	284.1	232.5	4,630.2
Total fishers per week	7,130.7	1,756.7	142.0	58.1	9,087.5
Total fisher hours per week	34,797.8	8,572.7	693.0	283.5	44,347.0
Total fisher hours per year	1,809,485.6	455,780.4	36,036.0	14,742.0	2,306,044.0

The total number of Fijian people living in stratum 10 is 23,660 (Table 79). If the subsistence catch (470 t) is divided amongst the population this would equate to the consumption of 19.9 kg of marine products (unprocessed) per person per year.

Fisheries Division survey data of the markets in the Central and Western Division estimated a throughput of marine products of 5,257.44 t coming from all sources (Anon. 1992). If the estimates of artisanal catches by coastal Fijians in Viti Levu from this survey are accurate, their activities would account for 53% of this total catch, which is a large segment when considering the proportion of the population that caught it.

However, the survey has highlighted that there are other outlets for the sale of marine products other than the main markets targeted by Fisheries Division. Their figures may not be an accurate estimation of the actual situation.

An artisanal catch of 2,767 t using an average price of FJD2.60/kg from 1992 figures (Anon. 1992) would be worth FJD7.2 million to the coastal Fijian villagers. This figure divided by the estimated number of households that go fishing, 4,055, and the number of weeks in a year, would mean that each household earns FJD34.15/week from the sale of marine products.

Estimates of total cash expenditure by households for the Division's within Viti Levu are available from 1989–90 (Anon. 1991). For villages in the Central Division the estimated weekly expenditure was FJD26.81 and for the Western Division was FJD27.94. Even taking into consideration the cost of inflation since the time the survey was made, an estimated income of FJD34/week from the sale of marine products for coastal Fijian households would cover the estimated expenditure. As this figure covered just about every aspect of living including food, rent, household equipment, transport, recreation and education, this would imply that coastal Fijian villagers who are actively involved in selling marine produce could be considered to be financially 'better off' than other village households within these two Divisions.

The value of the subsistence catch, 470 t at FJD2.60/kg, would be worth a further FJD1.8 million. Dividing this amount by the number of households that go fishing, 4,055, and the number of weeks in a year would mean a further FJD5.80 that did not need to be spent on food. Estimated weekly expenditure for food was FJD13.05 and

FJD15.09 for the Central and Western Divisions, respectively. Using these figures, the input from the subsistence catch would cover over one third of this expenditure.

### **C) Estimation of Total Effort for Rural Viti Levu**

If the same calculations are made across all strata and all age, sex and race groupings it is possible to estimate the total number of fishers who go fishing. By summing, from Tables 80–83, the numbers of people in each frequency of effort category, the total number of people who undertake subsistence and artisanal activities can be approximated. These figures can be converted to number of fisher trips by applying the factors used above for each of the frequency of effort categories.

Overall, the number of fishers undertaking subsistence fishing activities during the course of one week was 19,496 which converts to 22,027 fisher trips/week or 1,145,404 fisher trips/year. The number of fishers undertaking artisanal activities per week was 11,989 which converts to 20,379 fisher trips/week or 1,059,708 fisher trips/year. This equates to a total of 2,205,112 fisher trips/year for rural Viti Levu.

Although these levels of effort sound extremely large, if we consider the total population in the sample area ( $250,406 \times 1.07 = 267,934$  people) and the total number of days in a year (365 days), there are 97,796,063 people days available in a year to undertake activities of any description. A total of 2,205,112 fisher trips takes up only 2.3% of the available people days, which puts these levels of effort in a better perspective. The estimate of people days includes all the days of the week (but Sunday, a day of worship, should be excluded for Fijians as this is not a day available for fishing) and the total population (but Indian adult females and children in general undertake limited fishing). If the figures were adjusted accordingly then days spent fishing would take up a greater proportion of the time. However the 2.3% level does give an indication of the proportion of the overall time given to fishing.

Using these levels of effort and the estimated catch rates and trip lengths for subsistence and artisanal activities calculated for Fijian households in stratum 10, the subsistence catch would be 3,515 t and the artisanal catch would be 6,206 t/year. Although the catch rates from stratum 10 may well

not be the appropriate to apply and separate catch rates should be identified for each stratum by undertaking creel surveys, these figures do give an idea of the total catches from these levels of effort.

Using the data from Table 16 and the known number of Fijian and Indian houses (Table 79), the total number of households within rural Viti Levu that go fishing can be estimated. Overall 25,000 households go fishing of which 16,665 can be classified as subsistence and a further 8,335 can be classified as artisanal.

The subsistence catch per household would be (3,515 t/16,665 households) 211 kg/year or 4.1 kg/week valued at FJD10.66/week (at FJD2.60/kg). The artisanal catch per household would be (6,206 t/8,335 households) 745 kg/year or 14.3 kg/week valued at FJD37.18/week (at FJD2.60/kg). Overall the catch per household that go fishing would be (9,721 t/25,000 households) 389 kg/year or 7.5 kg/week valued at FJD19.50/week.

If the total catch of 9,721 t is divided by the total number of Fijian and Indian households (42,789) the catch per household would be 227/year or 4.4 kg/week.

All these extrapolations are based on the catch rates and trip lengths from stratum 10 being applied across the whole sample area.

The figures presented would suggest that artisanal catches are more important than those for subsistence use. The artisanal catches are also higher than those estimated by Fisheries Division (Anon. 1992) which would suggest that some areas of this fishery are not being adequately monitored.

## Recommendations

The results of this survey have highlighted several issues with regard to fishing activity in rural areas of Fiji. The survey was designed to subsample the entire rural population and questionnaires were administered throughout the island. However, there was no creel survey of inland fisheries even though the majority of the population lives in these areas, and the questionnaire results suggest that there is significant fishing activity in the rivers and streams of Viti Levu. Further, the fish consumption survey was conducted effectively at only two villages and both of these were coastal Fijian communities. Difficulties encountered during both surveys (creel and fish consumption) could be addressed in future studies. This study also shows that the level of fishing activity is

higher than previously reported and it indicates that similar surveys should be conducted on all major islands in Fiji. The most accurate results have come from a composite approach, combining a suite of survey methods (questionnaire, creel and consumption).

Major recommendations are as follows:

1. A fisheries survey should be conducted on selected outer islands to complement the current survey on Viti Levu.
2. Future surveys must employ the composite approach using questionnaire, creel and fish consumption surveys simultaneously in order to get an accurate assessment of the fisheries.
3. At least two strategic creel and fish consumption surveys should be conducted among inland rural communities on Viti Levu and emphasising Indian villages. These data were lacking in this study and will ensure that all fisheries on Viti Levu are taken into account when assessing the relative importance of particular habitats and fisheries.
4. Future creel surveys should be undertaken at different times in the year to take into consideration any seasonal effects on catches.
5. Future fish consumption surveys should attempt to verify that families are filling in the data sheets accurately and include a question about the source of any fish eaten.
6. The importance of subsistence fisheries in Fiji should be recognised and monitoring of the fishery should be carried out to ensure the long-term sustainable use of resources including protecting habitats.
7. This survey has identified coastal coral reef lagoons and rivers and estuaries as the most important habitats used by subsistence fishers. The distribution of these habitats within Fiji should be mapped in relation to the distribution of rural coastal communities and their relative areas calculated, including the length of the coastline.
8. All future coastal development should take into consideration the possible impacts on artisanal and subsistence fisheries into account as they are a vital source of income and food for rural communities, especially Fijian.
9. Populations of the important invertebrates should be closely monitored.

10. Careful selection of interviewers to carry out the questionnaire survey should be made and it is imperative that all interviewers understand all the terms within the form. Training is essential.

11. Stratification of villages and settlements should include proximity to different habitat types as well as distance from the coast. This would enable a more accurate estimate of the most important taxa overall to be made.

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## **Attachment A. Field Manual**

FISHERIES DIVISION  
MINISTRY OF PRIMARY INDUSTRIES AND CO-OPERATIVES

SUBSISTENCE FISHERIES QUESTIONNAIRE SURVEY  
OF VITI LEVU

FIELD MANUAL

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SUVA, FIJI  
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## Introduction

The subsistence fisheries of Fiji were estimated to account for approximately 80% of total annual domestic landings and just under 50% of total landings (from all sources) in 1992. (Source Fiji Fisheries Division Annual Report 1992).

At present Fiji Fisheries Division has monitoring systems in place to gather information on the catches being made in the commercial and artisanal fisheries sectors within the country but no method to monitor the subsistence fishery.

The Australian Centre for International Agricultural Research (ACIAR) agreed to fund a six month collaborative research project between the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Fiji Fisheries Division in order to investigate the levels of fishing activity within the subsistence fisheries sector in Fiji. The project was initiated to capitalise on similar work that was started during the ACIAR funded Baitfish Research Project.

The six month subsistence survey has two main components:-

- a) A household questionnaire interview survey;
- b) Collection of catch data from subsistence fishermen as well as data on the household consumption of fish.

The survey will be based on the island of Viti Levu. Further work is planned for a similar survey of the whole of Fiji after appropriate methodologies have been developed during the course of the Viti Levu survey.

This manual has been produced to give some information on the questionnaire interview survey and to give enumerators using the technique some guidelines on how to complete the questionnaire forms. The manual aims to act as a field guide and as a backup to formal training classes for enumerators using the questionnaire survey.

## Definition of Subsistence Fishery

For the purpose of this survey the subsistence fishery will be defined as follows:-

THE COMPONENT OF THE FISHING ACTIVITIES IN FIJI IN WHICH THE CATCH IS NOT SOLD BUT IS GENERALLY CONSUMED BY THE FISHERPERSON AND HIS (OR HER) FAMILY/FRIENDS.

Fisheries Division presently undertakes sampling of the main fish markets, road-side markets, shops etc. However those fish which are not sold are not being monitored.

## Importance of the Subsistence Fishery to Fiji

Fresh fish remains an essential part of the diet in many areas of Fiji and consumption estimates are amongst the highest recorded in the world. Estimates of average annual fish

consumption (including imports) are around 40 kg per capita. Annual consumption of local fish range from about 15 kg per capita in urban areas (Zann 1984), to 50 kg per capita in agricultural areas on the fertile main islands (Anon. 1990; Vuki, 1991; and Zann, 1984), to 100 kg per capita in the less fertile islands of Lau.

Fisheries Division estimates the average annual consumption figure as 22 kg per capita for fish which is consumed which is not purchased ie fish caught by the subsistence fishery. If this figure is applied to the total population of Fiji then an approximation of the total fish consumed can be made:-

730,000 people × 22 kg per person = 16,060 tonnes per year  
consumed which is  
caught by consumers.

This figure gives an indication of the size of the fishery and although it is of great importance to the rural Fijian population, there are presently no reliable estimates of the subsistence catch.

#### Previous Work

A Fisheries Division survey in 1978-1980 indicated that the annual landings were about 14,000 tonnes per year. The estimate has been increased by an increment of 200 tonnes per year to allow for population growth - 1991 estimate now stands at 16,400.

The above estimate was based on a questionnaire of 9% of coastal villages in which village leaders were asked to "estimate" landings in their village.

Several other localised studies have been done but no further assessment of the total subsistence fishery catch for Fiji has been made since 1978-80.

#### Pressure on the Fishery

As the population of Fiji continues to rise further pressure will be applied to the stocks of fish which are targeted by the subsistence fisherpersons. This coupled with the introduction/increased use of more efficient fishing gear eg nets will combine to produce greater fishing effort on many stocks of fish.

#### Expected Outcomes from the Survey

1. The expected information to be collected during the Subsistence Fisheries Questionnaire Survey for Viti Levu is as follows:-

a. The main habitat areas where subsistence fishing activities are being carried out;

b. The main fishing techniques being used and the people who are using them;

c. The frequency of fishing activities and the average length of fishing trips;

d. The potential fishing power of families based on establishing their fishing assets;

e. A list of the marine products that are being utilized, including the main fish groups;

f. The frequency of fish consumption by household groups;

g. The importance of the sale of marine products as a source of income;

h. Other general information that the interviewees wish to volunteer including fishing seasons, problems experienced and traditional fisheries knowledge.

The questionnaire is not being used to ask people to make estimates of the actual quantity of fish being caught due to the inaccuracies in such an approach.

After the questionnaire survey has been completed it will be possible to assess where effort for the catch sampling should be undertaken. The expected outcomes in terms of data from this work will be:-

i. A realistic estimate of the importance of the subsistence fishery to the people of Fiji;

ii. The provision of framework for research methods for use in the future;

iii. Relative fishing effort between different regions of Fiji and the relative importance of subsistence versus artisanal fisheries;

iv. Accurate identification to species level of fish taken by different fishing techniques;

v. Estimate of the quantity of fish and other marine products that are taken in the subsistence fishery;

vi. Identification of the most commonly used fishing techniques in Fiji;

vii. The role of women in fisheries in Fiji.

The expected users of this data will be:-

a) Fisheries Division

i. To assist to identify priority areas for future research;

ii. To advise customary fishing right owners on the management of their resources;

iii. To identify the development requirements of local communities in terms of fishing assets;

iv. As a basis for fisheries infrastructure planning;

v. As a baseline to assess the impacts of future proposed developments.

b) National Government

i. There is a need to put a dollar value on the subsistence fishery in order to be able to make an assessment for compensation payments that are required due to future developments;

ii. For National Policy Planning;

iii. There is a requirement for accurate information on the current use of natural resources to certain Government Departments eg National Environmental Plan.

#### Questionnaire Survey Method

The questionnaire survey will be based on a team of officers (enumeration team) interviewing a member of different households within a number of selected villages.

#### **A. Team Job Description**

Each enumeration team will include a team leader or supervisor, three or four enumerators and a driver. Specific duties of each member of the team are as follows:-

##### **a. Supervisor**

He is responsible for:

i) The adequate availability of survey materials such as questionnaires forms, clip boards, pencils, rubbers, fish identification albums and any other items to successfully undertake the survey.

ii) The administrative procedures of the whole team. This means ensuring that there is sufficient fuel for the vehicle, accommodation arrangements have been organized, meals have been arranged, and payment of allowances for enumerators has been organized.

iii) Introduction and presentation of 'sevusevu', where necessary, of the survey team to the village chief. It is essential that people living in the area where the survey is being carried out are aware of what is happening and the proper protocol has been undertaken.

iv) To make sure radio messages, informing people of the survey teams schedule, have been transmitted.

v) The technical aspects of the enumeration. He must check each questionnaire before the team leaves the field, and afterwards, before the questionnaires are sent to Fisheries Headquarters in Lami.

vi) Complete the Site Information Form for each village/settlement that is visited by the survey team.

vii) To participate in conducting some of the interviews.

### **b. Enumerator**

The enumerator is responsible:-

i) For conducting the interviews and completing the questionnaire forms.

Even though it is the supervisors overall responsibility to ensure that the enumerator has all the required items to undertake the planned schedule of interviews for the day, the enumerator can assist by preparing all his own requirements before departing for the days events.

### **c. Driver**

i) He is responsible for checking and keeping the vehicle in good working condition. Preparation of the vehicle before each days work eg refuelling, checking tyre pressures etc, should be done early in the morning so that no time is lost for undertaking the survey work.

ii) He must at all times follow the instructions of the supervisor and must work according to his directions.

## Completion of Questionnaire Survey Forms

### General

Accuracy of Data:-

1. It is absolutely essential that data recorded on the questionnaire forms is done NEATLY so anyone can understand what has been written.

2. It is equally essential that accurate answers are obtained from the respondent and this information is recorded on the questionnaire forms. Mis-information could effect the results badly which in turn would influence any decisions made which use the data collected.

3. It is essential that ALL questions on the form are answered. Even if some sections of the questionnaire are not applicable to the household member being interviewed, make sure that this is made clear on the form. Either mark the boxes with a cross or put a line through the whole section. This will make it clear to the person entering your data into the computer that the question was asked but the question was not relevant to

that particular household. If nothing is written on the form, confusion could be caused as a blank could mean none of the questions were actually asked to the respondent.

4. ALWAYS remember that the form you have completed is going to be read by some body else who will be responsible for entering the data into the computer. Keep it in mind that even though the personalised notes or marks might mean something to you, to another person they may not make any sense at all. While filling in the form ensure that anything you write can easily be read and interpreted by another person.

#### a) The Site Information Form

This form must be completed by the supervisor for every village or settlement which is visited by a survey team for undertaking household interviews. A copy of the form can be found as Appendix 1 in this manual.

The boxes that are shaded will be completed before the team goes out into the field and will give details already known about the site. The province, tikina, name and stratum code of the village or settlement to be visited will be recorded in these shaded boxes. It is essential that the supervisor makes sure that all members of his team are aware of these details so they can record them on their questionnaire forms.

Details of the composition of the particular village or settlement will also be marked in the shaded boxes provided. The number of Fijian, Indian, Other and Total people and houses will be specified in the space provided using the information from the 1986 Population Census.

The number of houses to be interviewed will be recorded in the next shaded box as well as the number of the house to start the interviews from.. In each village or settlement, the supervisor will have to identify a starting point to begin the interviews. Once this has been identified, he should then start the interview at the first, second, third etc house depending on the number recorded in the "Starting with House Number" box. This approach is used is used in order to keep the selection of houses as a random process.

This will be the only information recorded on the forms before the supervisor leaves to undertake the interviews. The other sections of the form should be completed by the supervisor on his arrival at the site.

The form allows space for the supervisor to record his or her name along with the names of the enumerators who are in the team to carry out the interviews in this particular village/settlement.

The next section allows the supervisor to record the number of houses and people in the village/settlement who are presently living there. This may not be achievable in all situations but in some cases it may. In villages, it should be possible to

actually count the number of houses in the village though it will be difficult to count the actual number of people. On the other hand the 'Turag-ni-koro' may well have the latest details on the number of houses and people in his village which would be important information to record. Depending on whether the numbers have actually been counted by the supervisor or he has been informed of these details then either the COUNTED or INFORMED box should be ticked. Wherever possible the supervisor should try to attain this information.

If a more accurate number of houses in the village/settlement from the 1986 census can be obtained then this figure should be used to calculate how many houses should be disregarded between houses to be interviewed (N). This can be calculated by dividing the number of houses in the village by the number of houses to be interviewed. The value of N should be recorded in the box provided and every Nth house should be interviewed. Where possible this approach should be used in all cases. However on the day of the interviews it might be that there is nobody in the house to be interviewed. In this case go to the next house where there are people in.

The next part of the Site Information Form requires the entry of the date the village/settlement was visited, the time of arrival at the village, the time of the first interview was undertaken and the time of departure from the village. This is important information for planning of interview surveys in the future.

The next section requires the supervisor to record any observations that were made pertaining to fishing activities within the village that were seen on the day of the visit. Such observations can give an overall idea of any fishing activities that might be taking place in that area. The form requires the supervisor to note numbers of people fishing, boats, fishing gears, processing activities and fish ponds that were seen. If any of the above were seen then space is provided to write more details about the observations made eg. what type of fishing were people seen doing, the type of fishing gear seen, the actual products being processed etc.

There is a space provided underneath this section to record the actual number of interviews (questionnaire forms) that were completed at the village/settlement. In most cases this should equal the number of houses to be interviewed in the shaded box detailed.

At the bottom of the form is a space provided for the supervisor to record Any Other Information. This should include a brief description about the village/settlement, any interesting information that came to light at the village/settlement which would not have been recorded elsewhere and some general comments on how the visit went. The supervisor must use his common sense when completing this section but must bear in mind that if he ignores to record any useful information that was noted at the site visited, the information could well be lost.

## b) Fishing Interview Survey Questionnaire

The Fishing Interview Survey Questionnaire has been designed to gather information on household activities which relate to fishing. A copy of the form can be found as Appendix 2 in this manual.

The Questionnaire is divided into nine sections - eight of the sections require answers to certain questions and the last one (Miscellaneous) allows space for any comments or points of view that might come to light during the course of the interview, which should be noted for future reference.

The following notes define what the questions refer to in each section and are to be used as a guideline for the enumerators.

### Definitions

There are a few terms which appear in various sections of the questionnaire but their meaning is the same throughout. These are detailed here:-

**Rank** - for certain questions a list of possible answers has been provided. The actual answer could be a combination of more than one of these possibilities and so it is necessary to rank them in their order of importance to the answer of the question. For the most applicable answer an entry of 1 should be entered into the rank box, for the second answer 2 should be entered, for the third it should be three and so on. It is important that this procedure is carried out for those questions where the rank is requested. Even if there is only one possible answer identified out of the group, enter a 1 in the rank box.

### Section 1: Respondents Identification

**Aim of Section:** To record relevant information on where and when the interview took place and who the interviewer and respondent were. It is vital that this is completed neatly at the time of the interview as this data will be vital to the analysis of the questionnaire forms.

Details required for each question:-

- 1. Interviewer** - the name of the person asking the questions (your own name).
- 2. Code Number** - DO NOT ENTER ANYTHING IN THIS BOX - a number will be given to each completed questionnaire in the office prior to data being entered in the computer database.
- 3. Date** - the date the interview takes place.
- 4. Time** - the time the interview takes place.
- 5. Village** - the name of the village or settlement.

**6. Tikina** - the name of the tikina in which the village/settlement is situated.

**7. Area Code** - an area code will be given to each village - your supervisor will have this code and should give it to you before you commence your interviews - ask if the code has not been given to you. (The area code is the same as the stratum code).

**8. Respondent** - the name of the person to whom you are asking the questions.

**9. Household Status** - the position of the respondent in the household's family eg father, mother, brother, aunt etc.

**10. Race** - the ethnic race of the respondent eg Fijian, Indian, Rotuman etc.

## Section 2: Personal and Socioeconomic

Aim of Section: To assess the number of people who are living in the household, the main source(s) of income to the household, the importance of fishing as a source of income, whether fishing activities are mainly for subsistence or commercial use, and the level of fishing effort by members of the family.

**1. Number Permanently Living in Household?** - the figure entered in the box provided should be the number of people who usually live in the household. Please make sure that the number does not include members of the family who are no longer living in the household eg sons and daughters who have moved away from home.

**2. Composition of the Household?** - this question requires the breakdown of the number of people permanently living in the household by sex and age. Children should be considered as persons who are under 16 years of age. The actual age of the household residents should also be recorded in the box provided. NB. MAKE SURE THE TOTAL NUMBER OF ADULTS AND CHILDREN EQUALS THE NUMBER PERMANENTLY LIVING IN HOUSEHOLD FROM QUESTION 1.

This information is very important as the age and sex of people influences the types of fishing activities they are likely to undertake.

**3. Households Main Sources of Income?** - the main source of income to the household should be ranked in order of importance to the household. There could well be more than one source of income coming into the household so it is important to determine which activity provides the most income to the family by ranking accordingly.

The options for the answer to this question are:-

a) Sale of Marine/Freshwater Products - this is the sale of any fish, shells, shellfish etc which were removed from either the sea or from freshwater bodies eg lakes or rivers.

- b) Sale of Copra
- c) Farming - income from the sale of products produced by farming eg sugar, vegetables from the garden etc.
- d) Wage Employment - income received from a job paying a salary eg government officer, farm worker, hotel staff etc.
- e) Own Business - income received from the household running its own business eg store, sale of mats etc.
- f) Other - income received from another source not detailed above eg. pension. Please enter name of this source next to the word Other.

If any of the activities identified only provide income for a part of the year then enter this in the Season box. Enter the months involved eg Jun-Aug, or Jan-May. If the activities provide income all year around the enter All Year.

**4. If Marine Products are Sold then How Often?** - if in question 3 the respondent identified the SALE OF MARINE/FRESHWATER PRODUCTS as a source of income then complete this question. If not then ignore question 4 and go straight on to question 5.

Question 4 requires the respondent to estimate how often his household sells marine/freshwater products. The answer can either be FREQUENTLY (once a week or more), OCCASIONALLY (once a month or more, but not greater than once a week) or INFREQUENTLY (less than once a month). The box with the most appropriate answer should be ticked.

The second part of the Question requires the respondent to identify what types of marine/freshwater products are sold. The products should be ranked in order of their importance. The options for the type of product are:-

- a) Fish
- b) Shellfish - this means crabs, lobsters, prawns etc.
- c) Bêche-de-mer - sea cucumbers.
- d) Shark Fin
- e) Shells - this means bivalves, gastropods etc.
- f) Other - this will include such products as sea urchins, worms, turtles etc. Write down the name of the product mentioned by the respondent.

For whatever product is sold details of the market it is sold at or to, at what price (please ensure the price given is for a defined amount of the product eg \$2 per kg, \$15 per bundle, \$5 for one etc) and estimate of how much, in terms of weight or money, and how often the product is sold, are required.

**5. Members of the Family Who Go Fishing and How Often Do They Carry Out Fishing Activities?** - this question is to identify the members of the household who undertake fishing activities and how often.

The number of adult males and females, and child male and females of the household who undertake any fishing activities at all should be entered into the Column marked Number. If no one

in any of the categories goes fishing then enter a 0 in the number box.

The frequency of these peoples activities should then be entered in the appropriate box. This selection can be either 3 to 7 times per week (3-7 week), 1 to 2 times per week (1-2 week), more than once a month but more than once a week (> 1 Month) and less than once per month (< 1 Month). If there is more than one in the number category it maybe that the individuals referred to do not undertake fishing activities at the same frequency. If this is so, place the number of people undertaking fishing activities in different but the appropriate boxes.

**6. Amount of Fish Caught by Household which is Consumed by the Household?** - if no fishing is carried by any members of the family then this question should be ignored and the interview should then continue from SECTION 4: FISHING ASSETS.

If at least one person from the household goes fishing then the interviewer must establish how much of the fish caught is consumed by the family. The options are ALL, SOME or NONE. The box next to the appropriate answer should be ticked. If ALL is the answer given then go directly to SECTION 3: FISHING METHODS.

If only SOME or NONE of the fish caught by the household is consumed by the household then the second part of the question should be asked. This part tries to establish what happens to the fish which is not consumed by the family. Is it either SOLD, GIVEN TO FAMILY, GIVEN TO FRIENDS, GIVEN TO ANIMALS (eg pigs for food) or does it go to some OTHER use? The most appropriate answers should be ranked by their importance.

**Question 6 is vital for establishing whether a household is undertaking fishing activities for subsistence or commercial purposes.**

### Section 3: Fishing Methods

Aim of Section: To assess what are the most important fishing methods used by members of a household and if season or moon phase has any influence on the timing of the methods used. The section also aims to assess the main hook baits used and also the use of lights during fishing activities.

**1. What are the Main Fishing Methods used by the Members of the Household?** - there are 14 fishing methods which have been identified as likely alternatives to those being used by household members and these should be ranked in order of importance to the household. If a fishing method is identified by a household which is not in the list then record this next to the OTHER box and make a note of the method being referred to in SECTION 9: MISCELLANEOUS. The alternative fishing methods listed are:-

a) Hand line - the use of a hook and line without using any sinker (a small one might be pinched to the line in order to

- assist the propulsion of the bait away from the fisherman) eg a line being thrown from the shore, usually used in shallow water.
- b) Drop line - the use of a hook and line with the addition of a sinker. Usually used in deeper water than a hand line.
- c) Tow line - the use of a line to drag a lure or bait behind a boat which is moving forward.
- d) Gill net (Set) - the use of a gill net by anchoring it in one position for at least a few hours at a time. No people chasing fish into the net.
- e) Gill net (Drive) - the use of a gill net which is set in a position and then fish are chased towards it by fishermen in their boats.
- f) Spear - the use of a sharp pointed stick/metal pole to stab fish with.
- g) Collection - the use of hands to pick up and collect marine/freshwater products eg shells, seaweeds etc.
- h) Duva - the use of poison to kill fish.
- i) Yavirau - the traditional fish drive using vines to capture the fish.
- j) Qoli samu - a fish drive, usually in shallow water, with fish either being caught in nets after being herded towards it by people splashing/making a noise in the water.
- k) Fishing poles - the use of a hook and line which is attached to the end of a pole to act like a fishing rod.
- l) Cast net - the use of a net which surrounds a fish/school of fish when it is thrown (cast) at them by the fisherman.
- m) Push net - the use of a short piece of net which is tied at its ends to pieces of stick which can then be pushed along by one person.
- n) Crab trap - the use of a baited net trap to catch crabs.
- o) Other - any other fishing technique which is not listed above.

After a method has been identified as being used by a household it is important to establish who uses each method. This should be entered in the BY WHO column. The time of use eg day or night should be entered in the USUAL TIME column and the preferred moon phase for undertaking the fishing method should be entered in the MOON PHASE column. Finally the best months for using the fishing method should be identified by placing an asterisks under the appropriate month(s) identified by the respondent.

**2. What is the Main Hook Bait Used?** - the most common baits used for fishing used by a household should be ranked in order of their importance. The options for the types of bait are:-

- a) Crab
- b) Squid/Octopus
- c) Small fish - the use of small (generally whole) fish eg daniva and sardines (walu bait).
- d) Larger fish - the use of sections of flesh cut off a fish too large to be put on a hook.
- e) Other - any other type of bait identified. Write down the name of the bait referred to.

**3. Does Anyone in the Household Use Lights During Any of Their Fishing Operations?** - this question refers to the use of kerosene lamps or torches at night during fishing operations.

Tick either the box for Yes or No depending on the answer. If the answer is Yes ask for details of what type of light is used and why it is used? Record this information in the box provided.

#### Section 4: Fishing Assets

Aim of Section: To assess the gear and equipment owned in order to estimate the potential fishing power of a household. Fishing gear owned also gives further evidence of the main fishing methods likely to be undertaken.

**1. Number Possessed by Household?** - the number of items of each different type of fishing gear should be recorded under number. It is imperative that only those items actually owned by the household are recorded and not those that they might borrow.

If the household possesses an item of fishing gear listed then include the size of gear where applicable eg mesh sizes for gill nets, breaking strain (test) of line etc.

**2. Number Possessed by Household?** - the number of boats alongside the descriptions listed should be recorded in the Number column. The different types of boats are as follows -

a) Paddle Canoe - a small, usually one-man vessel, that is propelled by the operator using some form of paddle eg dugout canoe, canoe made out of roofing iron etc.

b) Marine Ply-wood Boat

c) Aluminium Boat

d) Fibreglass Boat

e) Local Wooden Punt

f) FAO Design Boat

g) Other - any other design not covered by the above list.

The size of the boats that are owned should be recorded in the column Boat Size and the size of the engine, in terms of horsepower, used to propel the boat should be detailed in the column Engine HP.

**3. Number of Ice Boxes Owned by Household?** - the number of either homemade iceboxes eg old refrigerators, or plastic eskies owned should be included in the Number column.

**4. Does your Household use Ice?** - tick either the Yes or No box depending on whether ice is used during the course of fishing activities.

If the answer to question 4 is Yes then enter in the space provided where the household gets its ice from.

#### Section 5: Fishing Grounds

Aim of Section: To establish in broad terms where most of the households fishing activities take place, the type of fishing methods they would use in those areas and the type of marine/freshwater products they are trying to capture/collect. Information on the ownership of fishing rights and access to

fishing grounds, in order to assess range of operation of fishermen should also be recorded in this section.

**1. Does Anyone in your Household go Fishing in the Following Areas?** - the areas used by members of the household for fishing should be ranked in order of importance and the value entered in the Rank column. The alternative fishing grounds listed are as follows:-

a) Distant Area - fishing in an area distant from the village/settlement where the household is located eg in the open ocean, on another island etc.

b) Around a Fish Aggregating Device - fishing around an anchored raft which has been deployed to attract fish.

c) Outside Edge of Outer Reef - fishing on the ocean side of the drop off of the outer (barrier) reef.

d) On the Outer Reef - fishing actually on the outer (barrier) reef.

e) Inside Lagoon (Deep water) - fishing in the area between the outer reef and the shore in depths of water greater than 10 meters.

f) Inside Lagoon (Shallow water) - fishing in the area between the outer reef and the shore in depths of water less than 10 meters. This usually means fishing around shallow patch reefs.

g) Along Shoreline - fishing from the shoreline or standing in the shallow water adjacent to the shoreline. This area can be reached by foot and a boat is not required. This could well be an inter-tidal area.

h) Along Edge of Mangroves - fishing in the shallow area adjacent to patches of mangroves. This could well be an inter-tidal area.

i) Amongst mangroves - fishing in an area (or channel) that is surrounded by mangroves.

j) Estuary or River - fishing anywhere along the stretch of a river.

k) Other - fishing in an area not covered by the above list.

If one of the fishing areas is reported to be used then it is important to find out which members of the family operate in that area. This should be recorded in the BY WHO column.

If there are any particular months which are considered better for fishing in the area identified then mark this neatly with an asterisk under the appropriate letter referring to the month.

The main fishing method used in the fishing referred to should be detailed in the column FISHING METHOD.

The marine/freshwater products which the household member is intending to catch or collect from the fishing area should be detailed under the TARGET SPECIES column. Local or English names can be used. A list of the Fijian names of the most common fish and non-fish species are detailed in this manual. If a name given by the respondent does not appear in either of the lists then ensure that you know what is being referred to and make a note of it in Section 9: Miscellaneous. Photograph albums of the most common species caught will also be provided.

**2. Are there any Areas where your Household has Ownership/Fishing Rights?** - tick the appropriate Yes or No box for the answer to this question.

If the answer is Yes, ask the name of the fishing right area and write this down in the space provided.

**3. Does your Household Allow Other People to Fish in these Areas?** - tick the appropriate Yes or No box.

**4. Are there Areas where your Household is not Allowed to Fish?** - tick the appropriate Yes or No box.

#### Section 6: Fishing Effort

Aim of Section: To assess the usual length of a fishing trip by different members of the household and to identify days when fishing can not be carried out.

**1. What is the Average Length of a Fishing Trip?** - the usual time spent fishing on anyone occasion by members of the household should be ranked according to length of a fishing trip. The rank number should be recorded in the RANK column against the most appropriate time period.

The persons who undertake the length of fishing trips selected should be recorded in the BY WHO column.

**2. Are there Any Days not Available for Fishing?** - if there are any days which can not be utilized for fishing by members of the household due to religious beliefs, tradition or social commitments then the Yes box should be ticked. If not, the No box should be ticked.

If the answer is Yes, then write in the day (or days) which are not available for fishing in the space provided.

#### Section 7: Fish Consumption

Aim of Section: To establish how often a household consumes marine/freshwater products, what the main source of the fish consumed is and the actual supplier or fishing ground from where these products come from.

**1. How often does your Household Consume Fish?** - five alternatives are given for the average rate at which the members of a household consume marine/freshwater products including tinned fish. The appropriate answer given by the respondent should be recorded with a tick. The alternatives are as follows:-

a) Every day - this means that at least one member of the household would consume marine/freshwater products on at least one occasion everyday.

b) 4-6 Times per Week - this means that marine/freshwater products are consumed by a household for at least one meal per day for 4 to 6 days of the week.

- c) 1-3 Times per Week - this means that marine/freshwater products are consumed by a household for at least one meal per day for 1 to 3 days of the week.
- d) 1 Time per Week - this means that marine/freshwater products are consumed by a household for at least one meal per day for 1 day each week.
- e) Never - this means that marine/freshwater products are never consumed by any member of the household.

**2. What is the Source of this Fish?** - the main source of the marine/freshwater products, in general terms, consumed by the household is required. If there is more than one source identified, the different answers should be ranked by order of their importance. The alternative answers to this questions are:-

- a) Own Caught - this is the consumption of marine/freshwater products that have been caught by a member of the household.
- b) Bought Fish - this is the consumption of marine/freshwater products that have been purchased.
- c) Free Fish - this is the consumption of marine/freshwater products that have been given to the household.
- d) Tinned Fish -this is the consumption of tinned fish eg tinned tuna or mackerel.
- e) Other - this is the consumption of fish which has come from an alternative source to those listed above. Details of the source should be detailed next to the word Other.

**3. Where does the Fish come from? eg. Name of Fishing Area or Supplier** - if a source of fish has been identified in question 2 then actual details of this source should be provided in the space available for question 3. For instance if Own Caught has been identified in question 2 then the name of the fishing area should be recorded for the answer to question 3; or if Bought Fish has been recorded in question 2 then the name of the market or store it has been purchased from should be recorded for question 3.

#### Section 8: Fishing Licence

Aim of Section - to establish whether the household possesses a fishing licence and if so what type.

**1. Does your Household Possess a Fishing Licence?** - depending on whether the household owns a fishing licence the appropriate Yes or No box should be ticked. If the answer is Yes then the type of licence (either IDA or ODA) should be recorded in the box provided.

#### Section 9: Miscellaneous

Aim of Section - to record information that has been supplied by the respondent which is of relevance to the interview but has not been detailed in another part of the form.

## INTERVIEWING TECHNIQUES

The way in which you approach respondents determines the success or failure of the interview. Proper interviewing techniques are reviewed below.

### **1. Introduction**

You must properly introduce yourself to the respondent and explain the purpose of the visit. Immediate identification helps avoid being mistaken for being at the village and/or household for another purpose. An identification card will assist you to make yourself known to the respondent.

Explain the subject and purpose of the Subsistence Fisheries Questionnaire Survey. It may be necessary to convince the respondent of the usefulness of the Survey. It will be much easier if the respondent is convinced of the importance of the survey and believes that their cooperation is needed. Here is where self-confidence on your part is essential.

**EXPLAIN THAT CONFIDENTIALITY OF DATA IS ABSOLUTE.**

### **2. Voluntary Cooperation**

Explain that cooperation with the Survey is voluntary. Information given by respondents in a friendly atmosphere is the best.

### **3. Appearance**

As a representative of the Government you should be clean and neat.

### **4. Place for the Interview**

Sometimes this can not be controlled, but, if possible, select a place out of the weather with no distractions, noise, etc.

### **5. Call Backs**

Do everything possible to obtain all the information in the first visit. Since some villages and/or houses are in hard to reach areas, returns for successive interviews will be limited.

### **6. Attendance during Interviews**

Do not conduct interviews in the presence of other people unless the respondent gives his/her permission. Sometimes the answers given by the respondent are influenced by the person who is listening.

### **7. Probing**

Never suggest an answer. If the respondent persists with "I don't know" ask him for his best estimate.

If some replies seem out of the ordinary, probe and write notes on the questionnaire for the answers that seem unusual. A good probe to use is "What do you mean by that answer?".

## **8. Refusals**

A few respondents may be hostile or unfriendly. Do not argue with them, do not agree with them. Many will cooperate after "letting off steam". Sometimes it's helpful to talk for a while about other things before beginning the interview. Be sincere when giving praise about his/her activities.

### Desirable Attributes for the Enumerator

A successful enumerator must possess certain essential qualifications and characteristics and undergo training. It is conceded that ability to interview rests not on any single trait, but on a vast complex of them. Habits, skills, techniques and attitudes all are involved. Competence in interviewing is acquired only after careful and diligent study, training and prolonged practice and a good bit of trial and error and plain common sense.

There is always a place for individual initiative, for imaginative innovations, and for combinations of old approaches. The skilful enumerator cannot be bound by a set of rules. Likewise, there is no set of rules which can guarantee to the enumerator that his interviewing will be successful. There are however, some accepted, general guidelines which may help the beginner to avoid mistakes, learn how to conserve his efforts, and establish effective working relationships with the respondents, to accomplish, in a short time, what he sets out to do.

#### **1. Preparation for the interview.**

a) The enumerator should plan his daily routine for interviewing. It is important that the enumerator knows clearly what he wishes and feels able to accomplish. It may be desirable, especially for beginners, to write down these objectives, spell out possible problems and possible modification. In other words, he should plan and decide what is to be accomplished.

b) It is desirable to have advance information about the area of interview and the people to be interviewed. If possible, as it usually is, the enumerator should learn as much as possible about the place the interview will be conducted and persons to be interviewed. What needs to be known will vary with the situation, but the general principle of knowing the respondents holds in all cases. This advantage is available to the local enumerator.

If the area involved is one of a cultural group, it is often wise to interview the leaders first to enlist their cooperation and if they see justification for the interview, to have them recommend the enumerator to others in the group.

The principle of interviewing the leaders first does not only apply to cultural groups. It is also applicable where there exists an organization or an institution. The persons in charge should be approached and their cooperation secured before interviewing others in the organization or institution.

c) If possible, appointments should be made in advance. Such appointments can be made through publications, announcements, etc. and should detail the date the census will begin. In some countries, every household is requested to have somebody present in the house during the time the enumerator is expected to be in that vicinity. The enumerator can also make his own appointment. This means that he should have the knowledge of the daily routine of the respondent if a proper time and place are to be chosen.

Some experiences in surveys show that when interviewing the householder it is advantageous to have the wife present. She usually remembers a lot of details involved in the fishing operations, especially those pertaining to financial matters.

d) The enumerator should practice taking the respondents point of view. The objective in this practice is to be able to see the problems as another sees them and to feel towards them as he does (this is known as empathy). A substantial amount of emphatic ability is essential for successful interviewing.

e) The enumerator should know himself. Few people realize the extent to which everyone is committed in advance to certain opinions, convictions, attitudes and preconceptions. Everyone has some prejudices whether he realizes this or not; everyone carries with him certain stereotypes, preconceived notions about individuals or groups. There is probably no such thing as a truly open mind, one totally unencumbered by preconceptions, and totally perceptive to new ideas. This does not mean, however, that such preconceptions cannot be reduced in number and effect or that they should not be faced and either eliminated or discounted.

## **2. Some tips on interviewing**

The adequacy of a technique for collecting data is ordinarily judged in terms of criteria of 'reliability' and 'validity'. Reliability requires that repeated measurements yield results which are identical or fall within narrow and predictable limits of variability. The criterion of validity demands that the measurement be meaningfully related to the objectives.

Both these criteria apply not only to the data collection instrument but also to the technique and procedure specified for using the instrument. The reliability and validity of census data depend not only on the design of the questionnaire but also on instrument to the technique and procedure specified for using the instrument, which in this case is the technique of interviewing. The following are some tips on conducting interviews to aid the information-getter in achieving the two-

fold goal of reliability and validity in his/her data collection.

The enumerator should establish a relationship of confidence. The first step is often the most difficult for the enumerator because at the initial contact the respondent needs to be motivated to permit the interview. The ideal atmosphere for such motivation is one of mutual confidence. The confidence must not just be one-sided. It must also rest on genuine and deeply felt respect on the part of each for the other person. It is the enumerator's responsibility to take the lead in establishing the relationship of mutual confidence.

Ordinarily the enumerator may follow a sequence of procedure as follows:

- (a) identify himself/herself by showing an authorization card
- (b) explain the purpose and objectives of the census
- (c) explain that this household was selected by sampling or by chance
- (d) state the anonymous or confidential nature of the interview as provided by the Statistics Act.

In many cases this is enough to secure cooperation and confidence. Most people are only too ready to talk about themselves and air their views. Common politeness, mixed with curiosity, does the rest.

The enumerator should help the respondent feel at ease and make him ready to talk (motivated). To achieve this end, the interviewer should also be at ease. Show this to the respondent by using an informal and natural (conversation) manner of talking. Begin by a conversation on something of mutual interest or easy to talk about, topics such as ball games or the weather. Carry on such a conversation to allow the respondent a little time to get accustomed to the situation. However, this warm-up conversation should not be too prolonged for it may suggest to the respondent that the enumerator is reluctant to deal with the real purpose of the interview.

Good interviewing means attaining uniformity in the asking of questions and in recording of answers. The enumerators are expected to ask all the applicable questions; to ask them in the order given with no more elucidation and probing than is explicitly allowed and to make no unauthorized variations in the wording. The manner of asking the question will differ and affect the way it is answered. The enumerator should be warned about this and instructed to adhere to the prescribed wording and not to give any lead by explanations.

It is essential that the respondent feels free to talk unhampered by unnecessary interruptions. Once the interview is proceeding, the respondent should be allowed to talk freely with little prodding from the interviewer. The enumerator should not dominate nor make any prejudicing remarks. The interview must be in a warm and cordial atmosphere.

One of the most important qualities which the enumerator should develop is to listen. Listening is a skill which must be learned and practiced. Only through proper listening, the enumerator can discriminate between what should and should not be recorded.

Enough time should be allocated for the interview. The time to be allocated for the interview should be sufficient for the respondent to ponder on the answers. The respondent should not feel that he is being pressed to complete the interview in as short a time as possible. The enumerator should not cut the interview short because he is under pressure to complete the census of an area in a definite period. Otherwise the interview will be a hasty one and the respondent may be forced to withhold information.

The enumerator should keep the interview under control. Quite often respondents will avoid certain questions by trying to wander to other topics in the course of the interview. The enumerator should learn the technique of rationing and putting up timely questions.

Some questions are necessary and often unavoidable in some items in the census questionnaire. The respondent may run dry of answers and need restimulation. On other occasions he may be engaging in irrelevant accounts of how he happened to use a particular spark plug for his outboard engine. Raising a well-timed question will put the interview back on its proper course.

Responses should be recorded during the interview. Experience has shown that the only accurate way to reproduce the responses is to record them during the time of the interview. A good deal of relevant information is almost certain to be lost if the recording is left until the interview has been completed.

Completion of the interview does not mean the interview is closed. Even after the usual exchanges of departing remarks, the interview is not yet closed. There are still post-census activities to be done and therefore the respondent should already be warned about these at the completion of the interview.

### **3. Some suggestions on resolving common problems in interviewing.**

Available literature does not provide the enumerator with adequate methods for dealing with all the variables at work during the interview. Much of the available literature consists of rules of thumb presented as lists of "do's and don't's" for the enumerator. These do's or don't's are compiled and based on interviewing experience derived from a variety of situations over a considerable period of time. They represent practices which have achieved a degree of success in a variety of situations. As yet, there is no integrated theory on which to base a complete understanding of the communication process and the interaction between interviewer and respondent. A lot must depend on experience and theory in communication.

The way the question is asked will have a great effect on the answer that is likely to be given. Some of the ways of wording questions that should be avoided are listed below:-

\* CATCH all QUESTIONS - this is trying to cover several different questions (or topics) within one question. This is an attempt to save time - NOT GOOD!

For example: "Can you tell me the time, gear used and target species when you go fishing?"

\* DOUBLE BARRELED - this is asking the question in such a way that there is a single response to two different questions.

For example: "What species do you catch using gill nets and handlines?"

\* LONG QUESTIONS - using long questions, one part will get lost and responses tend to relate only to the beginning or end.

For example: "Do you think there are enough crabs left for a commercial fishermen like yourself to make a living in this district or do you think there is a better possibility elsewhere for a person like you?"

\* LEADING / LOADING QUESTIONS - a question asked in such a way that it is easier, or more desirable, for the respondent to choose a particular alternative over others. This can be caused by:-

- emotionally charged wording
- appeal to stereotypes
- reference to the status quo
- partial mention of alternatives/a better way
- items which touch matters of prestige or pride;and
- personalization of questions.

For example: "How do you generally catch walu - trolling, or what?"

\* NEGATIVES - try not to use negatives in your question.

For example: If I disagree with this statement "Should fishermen who use poison, not be punished?", what am I disagreeing with?

Find positive ways of expressing a negative. eg. "Should fishermen who use poison be let off with a caution?"

\* HYPOTHETICAL QUESTIONS - in attitudinal research hypothetical questions cannot always be avoided but they give rise to unreliable results because people answer them from different assumptions. They answer either from:

- :the ideal
- :what they might achieve
- :levels of expectations



# Appendix 1

## SUBSISTENCE FISHERIES QUESTIONNAIRE SURVEY

### SITE INFORMATION FORM

Confidential

This form must be completed by the supervisor for every village /settlement which is visited by the survey team for the purpose of undertaking household interviews.

PROVINCE	TIKINA	VILLAGE/SETTLEMENT	STRATUM
FROM 1986 CENSUS	NUMBER OF HOUSES	POPULATION	
FIJIAN			
INDIAN			
OTHER			
TOTAL			
NUMBER OF HOUSEHOLDS TO BE INTERVIEWED			
STARTING WITH HOUSE NUMBER			
NUMBER OF HOUSES BETWEEN INTERVIEWS (N)			
NAME OF SUPERVISOR			
NAMES OF ENUMERATORS		1.	
		2.	
		3.	
		4.	
		5.	
NUMBER OF HOUSES IN VILLAGE/SETTLEMENT			Houses
SOURCE:	COUNTED	INFORMED	
Use number of houses in village to calculate N (N=Number of Houses/House to be Interviewed).			
POPULATION IN VILLAGE/SETTLEMENT			People
SOURCE:	COUNTED	INFORMED	
DATE		TIME OF ARRIVAL	
TIME OF FIRST INTERVIEW		TIME OF DEPARTURE	
RECORD OF OBSERVATIONS MADE:			
	NUMBER	DETAILS	
PEOPLE FISHING			
BOATS			
FISHING GEAR			
PROCESSING			
FISH PONDS			
NUMBER OF INTERVIEWS UNDERTAKEN:			
ANY OTHER INFORMATION:-			

# Appendix 2

## FISHING INTERVIEW SURVEY QUESTIONNAIRE

Confidential

SECTION 1: RESPONDENTS IDENTIFICATION									
1. INTERVIEWER				2. CODE NUMBER					
3. DATE				4. TIME					
5. VILLAGE				6. TIKINA					
7. AREA CODE				8. RESPONDENT					
9. HOUSEHOLD STATUS				10. RACE					
SECTION 2: PERSONAL AND SOCIOECONOMIC									
1. NUMBER PERMANENTLY LIVING IN HOUSEHOLD						3. HOUSEHOLDS MAIN SOURCES OF INCOME:		RANK	SEASON
2. COMPOSITION OF HOUSEHOLD:-						SALE OF MARINE/FRESHWATER PRODUCTS			
	NUMBER	AGES				SALE OF COPRA			
ADULT MALE						FARMING			
ADULT FEMALE						WAGE EMPLOYMENT			
CHILD MALE						OWN BUSINESS			
CHILD FEMALE						OTHER			
4. IF MARINE/FRESHWATER PRODUCTS ARE SOLD, THEN HOW OFTEN?				→		HOW OFTEN? FREQUENTLY (> 1/WEEK)			
5. WHAT TYPES OF MARINE/FRESHWATER PRODUCTS ARE SOLD?				↓		OCCASIONALLY (> 1/ MONTH)			
						INFREQUENTLY (< 1/ MONTH)			
	RANK	TO WHAT MARKET?				AT WHAT PRICE? DOLLARS/AMOUNT		HOW MUCH/HOW OFTEN AMOUNT/TIME PERIOD	
FISH		→				/		/	
SHELLFISH		→				/		/	
BECHE-DE-MER		→				/		/	
SHARK FIN		→				/		/	
SHELLS		→				/		/	
OTHER		→				/		/	
6. MEMBERS OF THE FAMILY WHO GO FISHING AND HOW OFTEN DO THEY MAKE FISHING TRIPS?					7. AMOUNT OF FISH CAUGHT BY HOUSEHOLD WHICH IS CONSUMED BY THE HOUSEHOLD?				
	NUMBER	3-7 WEEK	1-2 WEEK	> 1 MONTH	< 1 MONTH	ALL			
						SOME			
ADULT MALE						NONE			
						8. IF NOT ALL WHAT ABOUT REST		RANK	
ADULT FEMALE						SOLD			
						GIVEN TO FAMILY			
CHILD MALE						GIVEN TO FRIENDS			
						GIVEN TO ANIMALS			
CHILD FEMALE						OTHERS			

### SECTION 3: FISHING METHODS

1. WHAT ARE THE MAIN FISHING METHODS USED BY THE MEMBERS OF THE HOUSEHOLD?

	RANK	BY WHO	USUAL TIME	MOON PHASE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
HAND LINE																
DROP LINE																
TOW LINE																
GILL NET (SET)																
GILL NET (DRIVE)																
SPEAR																
COLLECTION																
DUVA																
YAVIRAU																
QOLI SAMU																
FISHING POLE																
CAST NET																
PUSH NET																
CRAB TRAP																
OTHER																

2. WHAT IS THE MAIN HOOK BAIT USED?

	RANK
CRAB	
SQUID/OCTOPUS	
SMALL FISH	
LARGER FISH	
OTHER	

3. DOES ANYONE IN YOUR HOUSEHOLD

USE LIGHTS DURING ANY OF THEIR FISHING OPERATIONS? YES or NO

IF YES, GIVE DETAILS?

### SECTION 4: FISHING ASSETS

1. NUMBER POSSESSED BY HOUSEHOLD?			2. NUMBER POSSESSED BY HOUSEHOLD?				
	NUMBER	SIZE		NUMBER	BOAT SIZE		ENGINE HP
HAND LINE			PADDLE CANOE				
DROP LINE			MARINE PLYWOOD BOAT				
TOW LINE			FIBREGLASS BOAT				
SPEAR (GUN)			LOCAL WOODEN PUNT				
SPEAR (HAND)			FAO DESIGN				
DIVING GOGGLES			OTHER				
GILL NET			3. NUMBER OF ICE BOXES OWNED BY HOUSEHOLD?				
PUSH NET				NUMBER			
FISHING POLE			HOMEMADE ICEBOX				
U/W TORCH			PLASTIC ESKIES				
SCUBA GEAR			4. DOES YOUR HOUSEHOLD USE ICE?	YES		NO	
OTHER			5. IF YES, FROM WHERE?				

**SECTION 5: FISHING GROUNDS**

1. DOES ANYONE IN YOUR HOUSEHOLD GO FISHING IN THE FOLLOWING AREAS?

	RANK	BY WHO	J F M A M J J A S O N D	FISHING METHOD	TARGET SPECIES
DISTANT AREA					
FISH AGGREGATING DEVICE (FAD)					
OUTSIDE EDGE OF OUTER REEF					
ON OUTER REEF					
INSIDE LAGOON (DEEP WATER)					
INSIDE LAGOON (SHALLOW WATER)					
ALONG SHORELINE					
ALONG EDGE OF MANGROVES					
AMONGST MANGROVES					
ESTUARY or RIVER					
OTHER					

2. ARE THERE ANY AREAS WHERE YOUR HOUSEHOLD HAS OWNERSHIP/FISHING RIGHTS?	YES or NO	
IF YES, WHERE?		
3. DOES YOUR HOUSEHOLD ALLOW OTHER PEOPLE TO FISH IN THESE AREAS?	YES or NO	
4. ARE THERE AREAS WHERE YOUR HOUSEHOLD IS NOT ALLOWED TO FISH?	YES or NO	

**SECTION 6: FISHING EFFORT**

1. WHAT IS THE AVERAGE LENGTH OF A FISHING TRIP?		RANK	BY WHO
	0 - 4 HOURS		
	4 - 12 HOURS		
	12 - 24 HOURS		
	1 - 2 DAYS		
	3 - 7 DAYS		
	> THAN 1 WEEK		
2. ARE THERE DAYS NOT AVAILABLE FOR FISHING?	YES or NO		IF ANY WHICH?

**SECTION 7: FISH CONSUMPTION**

1. HOW OFTEN DOES YOUR HOUSEHOLD CONSUME FISH?	TICK	2. WHAT IS THE SOURCE OF THIS FISH?	RANK	3. WHERE DOES THE FISH COME FROM? EG. NAME OF FISHING AREA OR SUPPLIER
EVERY DAY		OWN CAUGHT FISH		
4 - 6 TIMES PER WEEK		BOUGHT FISH		
1 - 3 TIMES PER WEEK		FREE FISH		
1 TIME PER WEEK		TINNED FISH		
NEVER		OTHER		

**SECTION 8: FISHING LICENCE**

1. DOES YOUR HOUSEHOLD POSSESS A FISHING LICENCE?	YES		NO		IDA or ODA	
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**SECTION 9: MISCELLANEOUS**

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## Appendix 3

### Fijian Fish Names

FIJIAN NAME	GROUP	ENGLISH NAME	SCIENTIFIC NAME
<b>B</b>			
Bati	Coral reefs, cakau	Red bass	<i>Lutjanus bohar</i>
Bedford	Deep bottom	Kusakars snapper	<i>Paracaesio kusakarii</i>
Bo	Coral reefs, cakau	Paddletail snapper	<i>Lutjanus gibbus</i>
Busa	Estuaries, lagoons	Barred garfish	<i>Hemirhamphus far</i>
Buse	Estuaries, lagoons	Garfish	<i>Hyporhamphus dussumieri</i>
<b>C</b>			
Canati	Deep bottom	Blue-lined flower snapper	<i>Pristipomoides amoenus</i>
Ceva	Coral reefs, cakau	Purple rockcod	<i>Epinephelus cyanopodus</i>
Cevaninubu	Deep bottom	Wirennetting cod	<i>Epinephelus chlorostigma</i>
Corocoro	Coral reefs, cakau	Soidier fish	<i>Myripristis violaceus</i>
Cumudamu	Coral reefs, cakau	Green trigger fish	<i>Pseudobalistes flavimarginatus</i>
Cumulacai	Coral reefs, cakau	Orange-lined trigger fish	<i>Balistapus undulatus</i>
<b>D</b>			
Dabea	Coral reefs, cakau	Moray eel	<i>Gymnothorax fimbriatus</i>
Damu	Rivers	Mangrove jack	<i>Lutjanus argentimaculatus</i>
Daniva	Estuaries, lagoons	Goldspot herring	<i>Herklotisichthys quadrimaculatus</i>
Davilai	Estuaries, lagoons	Leopard flounder	<i>Bothus pantherinus</i>
Dokonivudi	Coral reefs, cakau	Long-nose emperor	<i>Lethrinus elongatus</i>
Donu	Coral reefs, cakau	Big spot coral trout	<i>Plectropomus sp.</i>
Donu	Coral reefs, cakau	Coral trout	<i>Plectropomus leopardus</i>
Drekeni	Estuaries, lagoons	Brown sweetlip	<i>Plectorhinchus nigra</i>
Duna	Rivers	Freshwater eel	<i>Anguilla marmorata</i>
<b>I</b>			
Ikadroka	Rivers	Flagtail	<i>Kuhlia rupestris</i>
Ikasa	Estuaries, lagoons	Pike eel	<i>Muraenesox cinereus</i>
Ikavuka	Pelagic	Flying fish	<i>Cypselyrus spp.</i>
Ikibuli	Coral reefs, cakau	Black spotted swallowtail	<i>Trachinotus bailloni</i>
Isulutavoi	Coral reefs, cakau	Lunar-tailed bullseye	<i>Priacanthus sp.</i>
<b>K</b>			
Kabatia	Estuaries, lagoons	Thumbprint emperor	<i>Lethrinus harak</i>
Kabatia ni cakau	Coral reefs, cakau	Variiegated emperor	<i>Lethrinus variegathus</i>
Kaboa	Estuaries, lagoons	Eeltail catfish	<i>Plotosus lineatus</i>
Kacika	Coral reefs, cakau	Slender emperor	<i>Lethrinus xanthochilus</i>
Kaikai	Estuaries, lagoons	Pony fish	<i>Leiognathus equulus</i>
Kake	Coral reefs, cakau	Blackspot sea perch	<i>Lutjanus fulviflamma</i>
Kake	Coral reefs, cakau	Blue-lined snapper	<i>Lutjanus quinquelineatus</i>
Kalia	Coral reefs, cakau	Double headed parrot fish	<i>Bolbometopon muricatus</i>
Kanace	Estuaries, lagoons	Bluetail mullet	<i>Valamugil seheli</i>
Kanailagi	Pelagic	Rainbow runner	<i>Elagatis bipinnulata</i>
Kasalaninubu	Deep bottom	Spotted fin cod	<i>Epinephelus fuscus</i>
Kasaledamu	Coral reefs, cakau	Marbled cod	<i>Cephalopholis miniatus</i>
Kava	Estuaries, lagoons	Diamond scale mullet	<i>Liza vaigiensis</i>
Kawago	Coral reefs, cakau	Spangled emperor	<i>Lethrinus nebulosus</i>

FIJIAN NAME	GROUP	ENGLISH NAME	SCIENTIFIC NAME
Kawakawabailotu	Coral reefs, cakau	White-lined rockcod	<i>Amyperodon leucogrammicus</i>
Kawakawaloa	Coral reefs, cakau	Peacock rockcod	<i>Cephalopholis argus</i>
Kela	Estuaries, lagoons	Milk trevally	<i>Lactarius lactarius</i>
Ki	Estuaries, lagoons	Yellow striped goatfish	<i>Upeneus vittatus</i>
Koto	Estuaries, lagoons	Sea mullet	<i>Mugil cephalus</i>
<b><u>M</u></b>			
Maimai	Pelagic	Dolpin fish	<i>Coryphaena hippurus</i>
Malaka	Deep bottom	Snake mackerel	<i>Prometichthys prometheus</i>
Maleya	Rivers	Tilapia	<i>Tilapia mossambica</i>
Mama	Coral reefs, cakau	Blue lined large-eye bream	<i>Gymnocranius robinsoni</i>
Mama	Coral reefs, cakau	Large eyed bream	<i>Monotaxis grandoculis</i>
Mamaninubu	Deep bottom	Roundtail seabream	<i>Gymnocranius lethrinoides</i>
Marshi	Deep bottom	Red snapper	<i>Etelis carbunculus</i>
Mataba	Rivers	Flagtail	<i>Kuhlia bilunulata</i>
Matu	Estuaries, lagoons	Silver body	<i>Gerres sp.</i>
Motomoto	Estuaries, lagoons	Sea pike	<i>Sphyraena flavicanda</i>
<b><u>N</u></b>			
Nuqa	Coral reefs, cakau	Rabbit fish	<i>Siganus spinus</i>
Nuqa	Coral reefs, cakau	Spine foot	<i>Siganus vermiculatus</i>
<b><u>O</u></b>			
Ogo	Pelagic	Dark finned barracuda	<i>Sphyraena qenie</i>
Ogo	Pelagic	Great barracuda	<i>Sphyraena barracuda</i>
Onaga	Deep bottom	Longtail snapper	<i>Etelis coruscans</i>
Ose	Estuaries, lagoons	Goatfish	<i>Mulloidichthys vanicolensis</i>
<b><u>P</u></b>			
Pakapakabuidromo	Deep bottom	Yellow finned pakapaka	<i>Pristipomoides flavipinnis</i>
Pakapakaqia	Deep bottom	Purple cheek pakapaka	<i>Pristipomoides multidentis</i>
<b><u>Q</u></b>			
Qawaqawa	Coral reefs, cakau	Snubnosed dart	<i>Trachinotus blochi</i>
Qitawa	Estuaries, lagoons	Crescent perch	<i>Therapon jarbua</i>
<b><u>R</u></b>			
Reve	Rivers	Orange-spotted Therapon Perch	<i>Mesopristes kneri</i>
Rosinibogi	Deep bottom	Scarlet seaperch	<i>Lutjanus timorensis</i>
<b><u>S</u></b>			
Sabutu	Coral reefs, cakau	Yellow-tailed emperor	<i>Lethrinus mahsena</i>
Sabutu damu	Coral reefs, cakau	Yellow-spotted emperor	<i>Lethrinus kallopterus</i>
Sabutu kula	Deep bottom	Large eye bream	<i>Gnathodentex mossambicus</i>
Sakelo	Rivers	Flagtail	<i>Kuhlia marainata</i>
Saku	Estuaries, lagoons	Long tom	<i>Tylosurus crocodilus</i>
Salala	Estuaries, lagoons	Chub mackerel	<i>Rastrelliger brachysoma</i>
Salala ni cakau	Estuaries, lagoons	Chub mackerel	<i>Rastrelliger kanagurta</i>
Salalanitoga	Coral reefs, cakau	Finny scad	<i>Megalaspis cordyla</i>
Salalanitoga	Pelagic	Scad	<i>Grammatorcynus bicarinatus</i>
Saqadrau	Coral reefs, cakau	Fringe fin trevally	<i>Carangoides hedlandensis</i>
Saqaleka	Coral reefs, cakau	Great trevally	<i>Caranx ignobilis</i>
Saqaloa	Deep bottom	Black trevally	<i>Caranx lugubris</i>

FIJIAN NAME	GROUP	ENGLISH NAME	SCIENTIFIC NAME
Saqanivatu	Coral reefs, cakau	Bluefin trevally	<i>Caranx melampygus</i>
Saqavatoga	Deep bottom	Amber jack	<i>Seriola rivoliana</i>
Senikawakawa	Coral reefs, cakau	Honey comb rockcod	<i>Epinephelus merra</i>
Sevaseva	Coral reefs, cakau	Harlequin sweetlip	<i>Plectorhynchus chaetodonoides</i>
Sewidri	Deep bottom	Red jobfish	<i>Aphareus rutilans</i>
Silasila	Coral reefs, cakau	Fosters seapike	<i>Sphyraena forsteri</i>
Sirisiriwai	Coral reefs, cakau	Topsail drummer	<i>Kyphosus cinerescens</i>
Soisoi	Estuaries, lagoons	Orange spotted cod	<i>Epinephelus malabaricus</i>
Sokisoki	Coral reefs, cakau	Porcupine fish	<i>Diodon hystrix</i>
<b>T</b>			
Ta	Coral reefs, cakau	Yellowfin surgeon fish	<i>Naso unicornis</i>
Tabacenitoga	Coral reefs, cakau	Surf surgeon fish	<i>Acanthurus guttatus</i>
Tanabe	Coral reefs, cakau	Red tail snapper	<i>Lutjanus fulvus</i>
Tovisi	Estuaries, lagoons	Hair tail	<i>Trichiurus haumela</i>
Tunatuna	Estuaries, lagoons	Conger eel	<i>Conger cinereus</i>
<b>U</b>			
Uculuka	Estuaries, lagoons	Threadfin	<i>Polydactylus plebeius</i>
Ulavi	Coral reefs, cakau	Bicolor parrotfish	<i>Cetoscarus bicolor</i>
Ulavi	Coral reefs, cakau	Five-banded parrotfish	<i>Scarus ghobban</i>
Uluqa	Deep bottom	Kusakars snapper	<i>Paracaesio kusakarii</i>
Utouto	Coral reefs, cakau	Green jobfish	<i>Aprion virescens</i>
<b>V</b>			
Vaidina	Estuaries, lagoons	Bluspotted ray	<i>Amphotistius kuhlii</i>
Varavaranitoga	Coral reefs, cakau	Lunar-tailed cod	<i>Variola albomarginata</i>
Varivoce	Coral reefs, cakau	Hump-headed maoriwrasse	<i>Cheilinus undulatus</i>
Vatunitoga	Pelagic	Dogtooth tuna	<i>Gymnosarda unicolor</i>
Vetakau	Estuaries, lagoons	Spotted scat	<i>Scatophagus argus</i>
Vilu	Coral reefs, cakau	Golden trevally	<i>Gnathanodon speciosus</i>
Voivoi	Estuaries, lagoons	Wolf herring	<i>Chirocentrus dorab</i>
Vosevose	Estuaries, lagoons	Fiji sardine	<i>Sardinella fijiense</i>
Votonimoli	Coral reefs, cakau	Queen fish leatherskin	<i>Scomberoides lysan</i>
votoqaninubu	Deep bottom	Snakeskin cod	<i>Epinephelus morthua</i>
Vunavuna	Estuaries, lagoons	Batfish	<i>Platax orbicularius</i>
<b>W</b>			
Walu	Pelagic	Spanish mackerel	<i>Scomberomorus commerson</i>
Wau	Pelagic	Wahoo	<i>Acanthocybium solandri</i>
<b>Y</b>			
Yalayala	Deep bottom	Flower snapper	<i>Pristipomoides zonatus</i>
Yatu	Pelagic	Mackerel tuna	<i>Euthynnus affinis</i>
Yatu	Pelagic	Skipjack	<i>Katsuwonus pelamis</i>
Yatulele	Coral reefs, cakau	Bigeye scad	<i>Selar crumenophthalmus</i>
Yatunitoga	Pelagic	Yellowfin tuna	<i>Thunnus albacares</i>
Yavula	Rivers	Oxeye herring	<i>Megalops cyprinoides</i>
Yawa	Estuaries, lagoons	Milkfish	<i>Chanos chanos</i>
Yawakio	Estuaries, lagoons	Bone fish	<i>Albula neoguinaica</i>

## Fijian Names of Non-Fish Groups

FIJIAN NAME	GROUP	ENGLISH NAME	SCIENTIFIC NAME
?			
?	Prawns	Giant Malaysian freshwater prawn	<i>Macrobrachium rosenbergii</i>
<b>B</b>			
Bakera	Crabs	Green mangrove crab	<i>Scylla paramamosain</i>
Boro	Bivalves	Mangrove mussel	<i>Modiolus agripetus</i>
Bu	Bivalves	Jewelbox shell	<i>Chama sp.</i>
<b>C</b>			
Cawaki	Echinoderms	Sea urchin	<i>Tripneustes gratilla</i>
Cega	Bivalves	Fluted giant clam	<i>Tridacna squamosa</i>
Civa	Bivalves	Blacklip pearlshell	<i>Pinctada margaritifera</i>
Civaciva	Bivalves	Pigmy pearlshell	<i>Pinctada martensi</i>
Civare	Bivalves	Pigmy pearlshell	<i>Pinctada martensi</i>
<b>D</b>			
Dairo	Echinoderms	Sandfish	<i>Metriatyla scabra</i>
Dioniveitiri	Bivalves	Mangrove oyster	<i>Crassostrea mordax</i>
Dova	Miscellaneous	Lamp shell	<i>Lingula unguis</i>
Drevula	Gastropods	Moon sail	<i>Polinices flemingiana</i>
Drose	Miscellaneous	Upsidedown jelly	<i>Cassiopea sp</i>
Durulevu	Gastropods	Horn shell	<i>Cerithium nodulosum</i>
<b>E</b>			
Ega	Gastropods	Spider shell	<i>Lambis lambis</i>
<b>G</b>			
Gera	Gastropods	Stromb	<i>Strombus gibberulus</i>
Golea	Gastropods	Stromb	<i>Strombus gibberulus</i>
Gwaca	Echinoderms	Sea urchin	<i>Tripneustes gratilla</i>
Gwerativi	Gastropods	Red-lipped stromb	<i>Strombus luhuanus</i>
<b>I</b>			
Ikadina	Turtles	Green turtle	<i>Chelonia mydas</i>
Ivibila	Lobsters	Slipper lobster	<i>Paribacus caledonicus</i>
Ivoce	Miscellaneous	Lamp shell	<i>Lingula unguis</i>
<b>K</b>			
Kadikadi	Prawns	River prawn	<i>Macrobrachium equidens</i>
Kai	Bivalves	Freshwater clam	<i>Batissa violacea</i>
Kaibakoko	Bivalves	Hardshell clam	<i>Periglypta puerpera</i>
Kaidawa	Bivalves	Hardshell clam	<i>Periglypta puerpera</i>
Kaikoso	Bivalves	Ark shell	<i>Anadara comea</i>
Kaininiu	Bivalves	Coconutscraper cockle	<i>Vasticardium sp.</i>
Kaitakadiri	Bivalves	Venus shell	<i>Gafrarium tumidum</i>
Kaivadra	Bivalves	Littleneck clam	<i>Tapes literata</i>
Katavatu	Bivalves	Rugose giant clam	<i>Tridacna maxima</i>
Kativatu	Bivalves	Rugose giant clam	<i>Tridacna maxima</i>
Kavika	Crabs	Three-spot reef crab	<i>Carpilius maculatus</i>
Kolakola	Bivalves	Thorny oyster	<i>Spondylus ducalis</i>
Kotia	Miscellaneous	Green seahare	<i>Dolabella auricularia</i>

FIJIAN NAME	GROUP	ENGLISH NAME	SCIENTIFIC NAME
Kotiaika	Miscellaneous	Black seahare	<i>Dolabella sp.</i>
Kuita	Miscellaneous	Octopus	<i>Octopus sp</i>
Kuitanu	Miscellaneous	Big reef squid	<i>Sepioteuthis lessoniana</i>
Kukadamu	Crabs	Red-clawed crab	<i>Sesarma erythroductyla</i>
Kukadra	Crabs	Red-clawed crab	<i>Sesarma erythroductyla</i>
Kukaloa	Crabs	Black mangrove crab	<i>Metopograpsus messor</i>
Kukavulu	Crabs	Black mangrove crab	<i>Metopograpsus messor</i>
Kuku	Bivalves	Mangrove mussel	<i>Modiolus agripetus</i>
<b><u>L</u></b>			
Lairo	Crabs	Land crab	<i>Cardisoma carnifex</i>
Leru	Gastropods	Trochus shell	<i>Trochus niloticus</i>
Loaloa	Echinoderms	Black teatfish	<i>Microthele nobillis</i>
Lolo	Echinoderms	Black teatfish	<i>Microthele nobillis</i>
Lumicevata	Seaweeds	Maiden hair	<i>Hypnea nidifica</i>
Lumitamana	Seaweeds	Goldenweed	<i>Solieria sp.</i>
Lumiwawa	Seaweeds	Glassweed	<i>Gracilaria verrucosa</i>
Lumiyabia	Seaweeds	Maiden hair	<i>Hypnea nidifica</i>
Lumiyara	Seaweeds	Glassweed	<i>Gracilaria verrucosa</i>
<b><u>M</u></b>			
Madrali	Gastropods	Polished nerite	<i>Nerita polita</i>
Mana	Lobsters	Mud lobster	<i>Thalassina anomala</i>
Matau	Bivalves	Smooth giant clam	<i>Tridacna derasa</i>
Midro	Echinoderms	Sea cucumber	<i>Stichopus sp.</i>
Moci	Prawns	Mangrove prawn	<i>Palaemon concinnus</i>
Motoqi	Crabs	Redeye crab	<i>Eriphia sebana</i>
Mudra	Echinoderms	Sea cucumber	<i>Stichopus sp.</i>
<b><u>N</u></b>			
Na	Seaweeds	Sea grapes	<i>Caulerpa racemosa</i>
Nama	Seaweeds	Sea grapes	<i>Caulerpa racemosa</i>
Namadrauniivi	Seaweeds	Sea grapes	<i>Caulerpa sp.</i>
Namakeibelo	Seaweeds	Sea grapes	<i>Caulerpa sp.</i>
<b><u>Q</u></b>			
Qaqa	Bivalves	Venus shell	<i>Gafrarium tumidum</i>
Qari	Crabs	Green mangrove crab	<i>Scylla paramamosain</i>
Qarivatu	Crabs	Swimmer crab	<i>Thalamita crenata</i>
Qeqe	Bivalves	Ark shell	<i>Anadara comea</i>
<b><u>S</u></b>			
Sagati	Seaweeds	Codium	<i>Codium geppii</i>
Sasakadi	Prawns	River prawn	<i>Macrobrachium equidens</i>
Saulaki	Bivalves	Thorny oyster	<i>Spondylus ducalis</i>
Sici	Gastropods	Trochus shell	<i>Trochus niloticus</i>
Siciyarayara	Gastropods	Horn shell	<i>Cerithium nodulosum</i>
Sigawale	Bivalves	Surf clam	<i>Atactodea striata</i>
Silawale	Bivalves	Surf clam	<i>Atactodea striata</i>
Sobu	Bivalves	Jewelbox shell	<i>Chama sp.</i>

FIJIAN NAME	GROUP	ENGLISH NAME	SCIENTIFIC NAME
Su	Bivalves	Jewelbox shell	<i>Chama sp.</i>
Sucuwalu	Echinoderms	White teatfish	<i>Microthele fuscogilva</i>
Sulua	Miscellaneous	Octopus	<i>Octopus sp</i>
Suluau	Miscellaneous	Big reef squid	<i>Sepioteuthis lessoniana</i>
<b><u>I</u></b>			
Tadruku	Miscellaneous	Chiton	<i>Acanthozostera gemmata</i>
Taku	Turtles	Hawksbill turtle	<i>Eretmochelys imbricata</i>
Taqalito	Crabs	Redeye crab	<i>Eriphia sebana</i>
Tarase	Echinoderms	Surf redfish	<i>Actinopyga mauritania</i>
Tave	Bivalves	Freshwater clam	<i>Batissa violacea</i>
Tavutolu	Crabs	Three-spot reef crab	<i>Carpilius maculatus</i>
Tero	Echinoderms	Sandfish	<i>Metriatyla scabra</i>
Tivikea	Gastropods	Red-lipped stromb	<i>Strombus luhuanus</i>
Tola	Lobsters	Mud lobster	<i>Thalassina anomala</i>
Totoyava	Seaweeds	Codium	<i>Codium geppii</i>
Tovu	Gastropods	Top shell	<i>Trochus pyramis</i>
Tuba	Crabs	Land crab	<i>Cardisoma carnifex</i>
<b><u>U</u></b>			
Ugavule	Crabs	Coconut crab	<i>Birgus latro</i>
Uradina	Prawns	Freshwater prawn	<i>Macrobrachium lar</i>
Urakeirasaqa	Prawns	Giant tiger prawn	<i>Penaeus monodon</i>
Uranicakau	Prawns	Witch prawn	<i>Penaeus canaliculatus</i>
Urata	Lobsters	Banded prawn killer	<i>Lysiosquilla maculata</i>
Uraubola	Lobsters	Ornate rock lobster	<i>Panulirus ornatus</i>
Uraudina	Lobsters	Painted rock lobster	<i>Panulirus versicolor</i>
Uraukula	Lobsters	Golden rock lobster	<i>Panulirus penicillatus</i>
Uraura	Prawns	Mangrove prawn	<i>Palaemon concinnus</i>
Urautamata	Lobsters	Ornate rock lobster	<i>Panulirus ornatus</i>
Urauvatuvatu	Lobsters	Golden rock lobster	<i>Panulirus penicillatus</i>
<b><u>V</u></b>			
Vale	Prawns	Giant tiger prawn	<i>Penaeus monodon</i>
Vasuadina	Bivalves	Smooth giant clam	<i>Tridacna derasa</i>
Vavaba	Lobsters	Slipper lobster	<i>Parribacus caledonicus</i>
Veata	Miscellaneous	Green seahare	<i>Dolabella auricularia</i>
Veataika	Miscellaneous	Black seahare	<i>Dolabella</i>
Vetuna	Miscellaneous	Peanut worm	<i>Spinculus sp</i>
Voce	Miscellaneous	Lamp shell	<i>Lingula unguis</i>
Vonudina	Turtles	Green turtle	<i>Chelonia mydas</i>
Vula	Echinoderms	Brown sandfish	<i>Bohadschia marmorata</i>
<b><u>Y</u></b>			
Yaga	Gastropods	Spider shell	<i>Lambis lambis</i>
Yalove	Miscellaneous	Upsidedown jelly	<i>Cassiopea sp</i>

# Attachment B

**List of villages and settlements randomly selected to be interviewed, giving details of political location, stratum (STR), the population (POP) and number of households (HH) recorded in the 1986 census and the number of interviews actually carried out at each site (N).**

PROVINCE	TIKINA	STR	VILLAGE	POP	HH	N
BA	BA	10	SASA VILLAGE	238	43	20
BA	BA	10	VOTUA VILLAGE	544	73	20
BA	BA	20	LAVUCI	430	79	20
BA	BA	20	VAROKO	643	108	20
BA	BA	20	WAILAILAI	929	177	21
BA	BA	30	NAVATU	656	112	21
BA	BA	30	VATYAKA	905	150	20
BA	BA	30	VUTUNI CREEK	547	94	19
BA	BA	40	CHINAKOTI	403	73	15
BA	BA	40	KUBUKUBU	305	49	20
BA	BA	40	MAURURU	168	28	20
BA	BA	40	NACICI	397	66	21
BA	BA	40	NAKAVIKA	121	27	20
BA	BA	40	NAMADA	775	125	20
BA	BA	40	NUKULO	824	132	20
BA	BA	40	QARA	183	29	16
BA	BA	40	RARAWAI RURAL	1282	218	19
BA	BA	40	TAUVEGAVEGA	618	117	20
BA	BA	40	VARADULI	292	50	21
BA	BA	40	VATUSOI	571	93	20
BA	MAGODRO	40	NUKULO	384	64	19
BA	MAGODRO	40	TABATABA	617	110	20
BA	MAGODRO	40	TABUQUTO VILLAGE	66	8	12
BA	NADI	10	NASOSO	881	183	20
BA	NADI	20	KOROVUTO VILLAGE	164	30	19
BA	NADI	20	NABUTE	138	23	0
BA	NADI	30	AROLEVU	202	33	0
BA	NADI	30	DRATABU	447	82	0
BA	NADI	30	LAVUSA	301	48	21
BA	NADI	30	MAQANIA	1009	174	19
BA	NADI	30	QELELOA	577	113	19
BA	NADI	30	VUNAYASI	1459	248	15
BA	NADI	40	NACOVU	651	114	20
BA	NADI	40	SOLOVI	482	84	20
BA	NADI	40	TOGO	439	79	21
BA	NADI	40	VOTUAEVU	3640	641	20
BA	NAWAKA	40	NAWAKA	1004	194	20
BA	NAWAKA	40	NAMULOMULO VILLAGE	62	13	9
BA	NAWAKA	40	TOGO	141	29	0
BA	NAWAKA	40	TUBENASOLO VILLAGE	14	2	0
BA	TAVUA	10	VATUTAVUI VILLAGE	157	26	16
BA	TAVUA	20	ASIASI	994	160	20
BA	TAVUA	40	BALATA	478	81	21
BA	TAVUA	40	LAUSA	543	90	20
BA	TAVUA	30	LUBULUBU	415	73	20
BA	TAVUA	30	MALELE	1108	193	18
BA	TAVUA	40	DRAMASI	478	76	20
BA	TAVUA	40	KORO VILLAGE	98	13	11
BA	TAVUA	40	MATANAGATA	462	76	20
BA	TAVUA	40	NAGATAGATA VILLAGE	56	12	11
BA	VUDA	10	LAUWAKI VILLAGE	316	50	22
BA	VUDA	10	NAVYAGO VILLAGE	323	50	14
BA	VUDA	10	LOMOLOMO VILLAGE	188	31	21
BA	VUDA	10	TEIDAMU	413	75	20
BA	VUDA	20	DRASA VILA	389	69	0
BA	VUDA	20	LOVU	1759	308	13

PROVINCE	TIKINA	STR	VILLAGE	POP.	HH	N
BA	VUDA	20	RAVIRAVI	1878	346	20
BA	VUDA	20	DREKETI	700	135	20
BA	VUDA	30	KOROYACA VILLAGE	116	15	0
BA	VUDA	30	LOMOLOMO	1481	259	19
BA	VUDA	30	NAIKABULA	384	69	17
BA	VUDA	30	SAWENI	1642	321	19
BA	VUDA	30	VUDA BACKROAD	467	85	20
BA	VUDA	40	BOUTINI	543	110	20
BA	VUDA	40	BUABUA	728	133	19
BA	VUDA	40	KOROBEBE VILLAGE	203	29	20
BA	VUDA	40	SABETO	2674	452	19
BA	VUDA	40	SARU	820	140	20
BA	VUDA	40	VAKABULI	458	78	21
BA	VUDA	40	VAKABULI VILLAGE	365	62	19
NADROGA	BARAVI	10	NAMATAKULA VILLAGE	200	27	20
NADROGA	BARAVI	20	SOVI BAY	154	24	16
NADROGA	BARAVI	30	BIAUSEVU VILLAGE	141	21	0
NADROGA	BARAVI	40	KAVANAGASAU	373	61	20
NADROGA	BARAVI	40	NAWAMAGI VILLAGE	178	30	0
NADROGA	BARAVI	40	YALAVA	575	105	21
NADROGA	CUVU	10	CUVU VILLAGE	236	31	21
NADROGA	CUVU	20	NEWTOWN	465	95	20
NADROGA	CUVU	30	NAVOVO	259	43	22
NADROGA	CUVU	40	NADROUMAI VILLAGE	204	33	9
NADROGA	MALOMALO	10	LOMAWAI VILLAGE	230	38	20
NADROGA	MALOMALO	10	NABILA VILLAGE	208	38	0
NADROGA	MALOMALO	20	NAMATA	739	129	21
NADROGA	MALOMALO	20	TIVIRIKI	113	22	19
NADROGA	MALOMALO	20	YAKO VILLAGE	176	29	11
NADROGA	MALOMALO	30	MOMI	188	26	21
NADROGA	MALOMALO	30	NABILA	389	68	19
NADROGA	MALOMALO	30	TOGABULA VILLAGE	108	20	19
NADROGA	MALOMALO	40	KABISI VILLAGE	47	7	6
NADROGA	MALOMALO	40	NAWAICOBA	1513	247	19
NADROGA	SIGATOKA	20	KULUKULU	1094	200	20
NADROGA	SIGATOKA	20	OLASARA	911	167	23
NADROGA	SIGATOKA	30	OLOLO	488	91	21
NADROGA	SIGATOKA	40	NAKALAVO VILLAGE	120	20	12
NADROGA	SIGATOKA	40	TILIVALEVU VILLAGE	49	11	8
NADROGA	NAVOSA	40	DRAIBA VILLAGE	138	19	15
NADROGA	NAVOSA	40	NAMOLI VILLAGE	200	35	8
NADROGA	NAVOSA	40	SAWENE	156	27	0
NADROGA	RUWAILEVU	40	NAWAIRABE VILLAGE	127	21	8
NADROGA	RUWAILEVU	40	TUVU VILLAGE	90	17	10
NADROGA	RUWAILEVU	40	VOLINAGERUA VILLAGE	23	4	0
NAITASIRI	LOMAIVUNA	40	DELAIWAIMALE VILLAGE	42	5	0
NAITASIRI	LOMAIVUNA	40	IN OTHER LOCALITIES	1176	200	0
NAITASIRI	LOMAIVUNA	40	NATAVEA VILLAGE	100	17	0
NAITASIRI	MATAILOBA	40	VUISIGA VILLAGE	201	34	0
NAITASIRI	MATAILOBA	40	VUNIDAWA	184	29	0
NAITASIRI	NAITASIRI	40	DELADAMANU VILLAGE	131	26	0
NAITASIRI	NAITASIRI	40	IN OTHER LOCALITIES	1411	255	0
NAITASIRI	NAITASIRI	40	NAKINI VILLAGE	130	22	0
NAITASIRI	NAITASIRI	40	NAVUSO	232	38	0
NAITASIRI	NAITASIRI	40	NAVUSO VILLAGE	202	31	0
NAITASIRI	NAITASIRI	40	SAWANI	1267	206	0
NAITASIRI	NAITASIRI	40	ULUIBEKA	135	23	0
NAITASIRI	WAIMARO	40	NASEUVOU VILLAGE	159	23	0
NAITASIRI	WAIMARO	40	NAVUREVURE VILLAGE	221	39	0
NAITASIRI	WAINIMALA	40	KOROVOU VILLAGE	160	26	0
NAITASIRI	WAINIMALA	40	ROMA VILLAGE	38	7	0
NAMOSI	NAMOSI	40	VUNINIUSAWA VILLAGE	16	2	0
NAMOSI	VEIVATULOA	10	NAQARIBUTA VILLAGE	16	3	0
NAMOSI	VEIVATULO	20	NAMELIMELI VILLAGE	58	10	0
NAMOSI	VEIVATULO	30	LOBAU VILLAGE	152	29	0
NAMOSI	VEIVATULO	40	NAKAVU VILLAGE	271	48	0
NAMOSI	WAINIKORO	40	WAINIMAKUTU VILLAGE	196	34	0

PROVINCE	TIKINA	STR	VILLAGE	POP.	HH	N
RA	NAKOROTUBU	10	NACOBAN VILLAGE	78	18	14
RA	NAKOROTUBU	30	NAKOROVU VILLAGE	142	22	15
RA	NAKOROTUBU	40	TOBU VILLAGE	118	19	20
RA	NALAWA	30	MATAWAILEVU VILLAGE	108	21	19
RA	NALAWA	40	NAMARA VILLAGE	172	32	0
RA	NALAWA	40	ROKOVUAKA VILLAGE	235	43	20
RA	RAKIRAKI	10	NAMUAIMADA VILLAGE	219	33	20
RA	RAKIRAKI	20	BALATA	325	62	19
RA	RAKIRAKI	20	KAVULI	449	78	22
RA	RAKIRAKI	20	RABULU VILLAGE	115	20	0
RA	RAKIRAKI	30	GALLAU	652	114	18
RA	RAKIRAKI	30	MULLAU	470	72	18
RA	RAKIRAKI	40	WAIMARI	455	64	14
RA	SAIVOU	10	NANUKULOVA VILLAGE	203	43	15
RA	SAIVOU	20	MADHIVANI	239	36	20
RA	SAIVOU	30	BAROTU VILLAGE	123	16	16
RA	SAIVOU	40	ROKOROKO VILLAGE	87	13	5
REWA	NOCO	10	NAROCANE VILLAGE	99	130	
REWA	NOCO	20	NALASE VILLAGE	42	6	0
REWA	NOCO	30	NABULI VILLAGE	33	3	0
REWA	NOCO	40	BUREBASAGA VILLAGE	162	22	0
REWA	REWA	10	MUANAIRA VILLAGE	168	32	0
REWA	REWA	20	WALSALULU VILLAGE	44	7	0
REWA	REWA	30	NASILAI VILLAGE	83	15	0
REWA	REWA	40	NAKAIKOGO	813	153	24
REWA	SUVA	10	MUAIVUSO VILLAGE	127	23	0
REWA	SUVA	20	TOGALEVU VILLAGE	79	11	0
REWA	SUVA	30	NABORO	274	42	0
SERUA	NUKU	10	WAINIYABIA VILLAGE	135	22	0
SERUA	NUKU	20	NAKOROVU VILLAGE	135	26	0
SERUA	NUKU	40	MASI VILLAGE	80	13	0
SERUA	SERUA	10	NABOTINI VILLAGE	276	38	7
SERUA	SERUA	10	VUNIBAU	266	54	23
SERUA	SERUA	20	KOROVISILOU VILLAGE	352	62	9
SERUA	SERUA	20	NAITATA	-	-	20
SERUA	SERUA	30	SAUNIVEIUTO VILLAGE	119	23	0
SERUA	SERUA	30	WADRADRA	444	75	23
SERUA	SERUA	40	SABATA VILLAGE	41	5	0
TAILEVU	BAU	10	VIWA VILLAGE	105	18	12
TAILEVU	BAU	10	WAICOKA VILLAGE	111	15	16
TAILEVU	BAU	30	BAU TIKINA ROAD	186	32	0
TAILEVU	BAU	30	NAMATA VILLAGE	171	34	0
TAILEVU	BAU	40	NAILA VILLAGE	157	24	0
TAILEVU	BAU	40	RARALEVU	1174	185	25
TAILEVU	BAU	40	VERATA	377	88	21
TAILEVU	NAKELO	10	VADRAI VILLAGE	26	6	0
TAILEVU	NAKELO	30	NAIMALAVAU VILLAGE	210	36	0
TAILEVU	NAKELO	30	NAKAILE VILLAGE	180	31	0
TAILEVU	NAKELO	40	NATOGAUDRAVU	426	74	19
TAILEVU	NAKELO	40	TUMAVIA	287	52	19
TAILEVU	NAKELO	40	VISAMA	588	104	22
TAILEVU	SAWAKASA	10	SAWAKASA VILLAGE	215	38	14
TAILEVU	SAWAKASA	20	DELEIKUKU VILLAGE	63	11	5
TAILEVU	SAWAKASA	30	DELAKADO VILLAGE	201	35	18
TAILEVU	VERATA	10	UCUNIVANUA VILLAGE	238	49	15
TAILEVU	VERATA	20	VEINUQA VILLAGE	168	33	17
TAILEVU	VERATA	30	NATOBUNIQIO VILLAGE	103	18	8
TAILEVU	VERATA	30	WADALICE	402	59	18
TAILEVU	VERATA	40	SOTE VILLAGE	256	47	20
TAILEVU	WAINIBUKA	40	NAQIA VILLAGE	183	43	10
TAILEVU	WAINIBUKA	40	NAYAVU	111	21	16



# Attachment D

## FISH CONSUMPTION FORM

KORO:							
SIGA 1	LEWE VICA E VAKAITAVI?	IKA BULABULA E LAUKANA?	MATAQALI IKA CAVA?	KENA I WILIWILI?	KENA BALAVU?	TINI IKA E LAUKANA?	KENA I WILIWILI?
TIKI NI SIGA?		10 SE SIGA			CM.	10 SE SIGA	
KATALAU							
VAKASIGALEVU							
VAKAYAKAVI							

SIGA 2	LEWE VICA E VAKAITAVI?	IKA BULABULA E LAUKANA?	MATAQALI IKA CAVA?	KENA I WILIWILI?	KENA BALAVU?	TINI IKA E LAUKANA?	KENA I WILIWILI?
TIKI NI SIGA?		10 SE SIGA			CM.	10 SE SIGA	
KATALAU							
VAKASIGALEVU							
VAKAYAKAVI							

SIGA 3	LEWE VICA E VAKAITAVI?	IKA BULABULA E LAUKANA?	MATAQALI IKA CAVA?	KENA I WILIWILI?	KENA BALAVU?	TINI IKA E LAUKANA?	KENA I WILIWILI?
TIKI NI SIGA?		10 SE SIGA			CM.	10 SE SIGA	
KATALAU							
VAKASIGALEVU							
VAKAYAKAVI							

SIGA 4	LEWE VICA E VAKAITAVI?	IKA BULABULA E LAUKANA?	MATAQALI IKA CAVA?	KENA I WILIWILI?	KENA BALAVU?	TINI IKA E LAUKANA?	KENA I WILIWILI?
TIKI NI SIGA?		10 SE SIGA			CM.	10 SE SIGA	
KATALAU							
VAKASIGALEVU							
VAKAYAKAVI							

SIGA 5	LEWE VICA E VAKAITAVI?	IKA BULABULA E LAUKANA?	MATAQALI IKA CAVA?	KENA I WILIWILI?	KENA BALAVU?	TINI IKA E LAUKANA?	KENA I WILIWILI?
TIKI NI SIGA?		10 SE SIGA			CM.	10 SE SIGA	
KATALAU							
VAKASIGALEVU							
VAKAYAKAVI							

SIGA 6	LEWE VICA E VAKAITAVI?	IKA BULABULA E LAUKANA?	MATAQALI IKA CAVA?	KENA I WILIWILI?	KENA BALAVU?	TINI IKA E LAUKANA?	KENA I WILIWILI?
TIKI NI SIGA?		10 SE SIGA			CM.	10 SE SIGA	
KATALAU							
VAKASIGALEVU							
VAKAYAKAVI							

SIGA 7	LEWE VICA E VAKAITAVI?	IKA BULABULA E LAUKANA?	MATAQALI IKA CAVA?	KENA I WILIWILI?	KENA BALAVU?	TINI IKA E LAUKANA?	KENA I WILIWILI?
TIKI NI SIGA?		10 SE SIGA			CM.	10 SE SIGA	
KATALAU							
VAKASIGALEVU							
VAKAYAKAVI							

15 cm

10 cm

5 cm

0 cm

# Attachment E

## LIST OF SPECIES REPORTED IN CATCHES WITH FIJIAN NAMES

Scientific name	Fijian/local name	Family/group
<i>Acanthocybium solandri</i>	WAHOO	Scombridae
<i>Acanthurus</i> sp.	BALAGI	Acanthuridae
<i>Acanthurus</i> sp.	IKALOLO	Acanthuridae
<i>Acanthurus</i> sp.	KALO	Acanthuridae
<i>Acanthurus</i> sp.	KALOA	Acanthuridae
<i>Acanthurus</i> sp.	NAIKALOA	Acanthuridae
<i>Anadara cornea</i>	KAIKOSO	Shells
<i>Anadara cornea</i>	QEQE	Shells
<i>Anguilla marmorata</i>	DUNA	Anguillidae
<i>Aphareus rutilans</i>	SILVER FISH	Lutjanidae
<i>Aprion virescens</i>	UTO	Lutjanidae
<i>Aprion virescens</i>	UTOUTO	Lutjanidae
<i>Arothron immaculatus</i>	SUMUSUMU	Tetraodontidae
<i>Arothron immaculatus</i>	HEKEHEKE	Tetraodontidae
Atherinids	SARA	Atherinidae
<i>Batissa violacea</i>	KAI	Shells
<i>Batissa violacea</i>	TAVE	Shells
<i>Bolbometapon muricatus</i>	KALIA	Scaridae
<i>Bothus</i> sp.	DAVILAI	Bothidae
Carangids	SAQA	Carangidae
Carangids	VILU	Carangidae
Carangids	KODRO	Carangidae
Carangids	KODROKODRO	Carangidae
<i>Carangoides</i> sp.	DOLE	Carangidae
<i>Caranx lugubris</i>	SAQALOA	Carangidae
<i>Carcharhinus</i> sp.	QIO	Carcharinidae
<i>Cardisoma carnifex</i>	LAIRO	Sea Cucumber
<i>Caulerpa racemosa</i>	NAMA	Sea weed
<i>Cephalopholis argus</i>	TEKILO	Serranidae
<i>Chaetodon</i> sp.	TIVITIVI	Chaetodontidae
<i>Chanos chanos</i>	YAWA	Chandidae
<i>Cheilinus</i> sp.	DRADRAVI	Labridae
<i>Cheilinus</i> sp.	DRANIKURA	Labridae
<i>Cheilinus</i> sp.	KURAKURA	Labridae
<i>Cheilinus trilobatus</i>	DRAUNIKURA	Labridae
<i>Chirocentrus dorab</i>	VOIVOI	Chirocentridae
<i>Conger cinereus</i>	BAKU	Congridae
Crab	KUKA	Crab
<i>Ctenochaetus striatus</i>	GURU	Acanthuridae
<i>Ctenochaetus</i> sp.	DRIDRI	Acanthuridae
<i>Ctenochaetus</i> sp.	IKALOA	Acanthuridae
<i>Ctenochaetus</i> sp.	METO	Acanthuridae
<i>Ctenopharyngodon idella</i>	IKASUSU	Cyprinidae
<i>Ctenopharyngodon idella</i>	PARALUMI	Cyprinidae
<i>Dasyatis</i> sp.	VAI	Dasyatidae
<i>Diodon hystrix</i>	SOKISOKI	Diodontidae
<i>Eleotris melanosoma</i>	KULUKOTO	Eleotridae
<i>Eleotris melanosoma</i>	KURUKOTO	Eleotridae
<i>Eleotris melanosoma</i>	KURUKOTO(VO)	Eleotridae
<i>Eleotris melanosoma</i>	VO	Eleotridae
<i>Epinephelus lanceolatus</i>	KAVU	Serranidae
<i>Epinephelus merra</i>	SENIKAWAKAWA	Serranidae
<i>Epinephelus</i> sp.	KASALA	Serranidae
<i>Epinephelus</i> sp.	KAWAKAWA	Serranidae
<i>Epinephelus</i> sp.	SONI	Serranidae
<i>Epinephelus</i> sp.	SONISONI	Serranidae
<i>Gerres</i> sp.	MATU	Gerreidae

<i>Gerres</i> sp.	MATUMATU	Gerreidae
<i>Gerres</i> sp.	MOTUMOTU	Gerreidae
<i>Gymnocranius lethrinoides</i>	MAMANINUBU	Lethrinidae
<i>Gymnocranius robinsoni</i>	MAMA	Lethrinidae
<i>Gymnothorax fimbriatus</i>	DABEA	Muraenidae
<i>Hemirhamphus far</i>	BUSA	Hemirhamphidae
<i>Herklotsichthys quadrimaculatus</i>	DANIVA	Clupeidae
<i>Herklotsichthys quadrimaculatus</i>	TANIVE	Clupeidae
<i>Hypnea nidifica</i>	LUMI	Sea weed
<i>Hyporhamphus dussumieri</i>	BUSE	Hemiramphidae
Juvenile eleotrids	CIGANA	Eleotridae
Juvenile eleotrids	CIQANA	Eleotridae
Juvenile eleotrids	DIQANA	Eleotridae
Juvenile mullets	MALISA	Mugilidae
Juvenile mullets	MOLISA	Mugilidae
<i>Katsuwonus pelamis</i>	YATU	Scombridae
<i>Kuhlia marginata</i>	SAKELO	Kuhliidae
<i>Kuhlia marginata</i>	DRAVA	Kuhliidae
<i>Kuhlia rupestris</i>	IKADROKA	Kuhliidae
<i>Kyphosus</i> sp.	SIRISIRI	Kyphosidae
<i>Lambis lambis</i>	EGA	Shells
<i>Lambis lambis</i>	YAGA	Shells
<i>Leiognathus equulus</i>	CEBE	Leiognathidae
<i>Leiognathus equulus</i>	KAIKAI	Leiognathidae
<i>Lethrinus harak</i>	KABATIA	Lethrinidae
<i>Lethrinus mahsena</i>	SABUTU	Lethrinidae
<i>Lethrinus nebulosus</i>	KAWAGO	Lethrinidae
<i>Lethrinus olivaceus</i>	DOKONIVUDI	Lethrinidae
<i>Lethrinus xanthochilus</i>	GUSULA	Lethrinidae
<i>Lethrinus xanthochilus</i>	KACIKA	Lethrinidae
<i>Liza vaigiensis</i>	KAVA	Mugilidae
<i>Lutjanus argentimaculatus</i>	DAMU	Lutjanidae
<i>Lutjanus bohar</i>	BATI	Lutjanidae
<i>Lutjanus gibbus</i>	BO	Lutjanidae
<i>Lutjanus gibbus</i>	YABO	Lutjanidae
<i>Lutjanus rivulatus</i>	REGUA	Lutjanidae
<i>Lutjanus rivulatus</i>	RENUA	Lutjanidae
<i>Lutjanus</i> sp.	KAKE	Lutjanidae
<i>Megalops cyprinoides</i>	VUVULA	Megalopidae
<i>Megalops cyprinoides</i>	YAVULA	Megalopidae
<i>Mesopristes kneri</i>	REVE	Terapontidae
<i>Mesopristes kneri</i>	URUURU	Terapontidae
<i>Metriatyla scabra</i>	DAIRO	Sea cucumber
<i>Microthele nobillis</i>	LOALOA	Sea cucumber
Molly fish	TIATIA	Cyprinidae
<i>Mugil cephalus</i>	KOTO	Mugilidae
<i>Mugil</i> sp.	KANACE	Mugilidae
Mullid	OSE	Mullidae
<i>Mulloides flavolineatus</i>	VULA	Mullidae
<i>Mulloides vanicolensis</i>	OSEKULA	Mullidae
<i>Muraenesox cinereus</i>	IKASA	Muraenidae
<i>Myripristis violaceus</i>	COROCORO	Holocentridae
<i>Naso unicornis</i>	TA	Acanthuridae
<i>Octopus</i> sp.	KUITA	Cephalapod
<i>Ophiocara porocephala</i>	BAU	Eleotridae
<i>Ophioeleotris aporos</i>	IKABAU	Eleotridae
<i>Palaemon concinnus</i>	MOCI	Prawn
<i>Paracaesio kusakari</i>	BEDFORD	Lutjanidae
<i>Paracanthurus hepatus</i>	JILA	Acanthuridae
<i>Parupeneus indicus</i>	MATAROKO	Mullidae
<i>Parupeneus indicus</i>	MATOROKO	Mullidae
<i>Parupeneus indicus</i>	MATROKO	Mullidae
<i>Penaeus monodon</i>	VALE	Prawns
<i>Platax orbicularius</i>	VUNAVUNA	Ephippidae
<i>Plectorhynchus chaetodontoides</i>	KOLEKOLE	Haemulidae

<i>Plectorhynchus chaetodontoides</i>	KOLELE	Haemulidae
<i>Plectorhynchus</i> sp.	DREKENI	Haemulidae
<i>Plectorhynchus</i> sp.	SEVA	Haemulidae
<i>Plectorhynchus</i> sp.	SEVASEVA	Haemulidae
<i>Plectropomus leopardus</i>	SALMON COD	Serranidae
<i>Plectropomus</i> sp.	DONU	Serranidae
<i>Plotosus lineatus</i>	KABO	Plotosidae
<i>Plotosus lineatus</i>	KABOA	Plotosidae
<i>Polydactylus plebeius</i>	UCULUKA	Polynemidae
Prawn	URA	Prawn
<i>Pristipomoides</i> sp.	PAKAPAKA	Lutjanidae
<i>Pseudobalistes flavimarginatus</i>	CUMU	Balistidae
<i>Pseudobalistes flavimarginatus</i>	CUMUDAMU	Balistidae
<i>Puntius gonionatus</i>	PUNTIUS	Unknown
<i>Rastrelliger kanagurta</i>	SALALA	Scombridae
<i>Sardinella fijiensis</i>	NIVA	Clupeidae
Scaridae Unid sp.	KARAKARAWA	Scaridae
Scaridae Unid sp.	ULAVI	Scaridae
<i>Scarus</i> sp.	RARA	Scaridae
<i>Scarus</i> sp.	RAWARAWA	Scaridae
<i>Scatophagus argus</i>	BABA	Scatophagidae
<i>Scatophagus argus</i>	VETAKAU	Scatophagidae
<i>Scomberoides</i> sp.	MOLI	Carangidae
<i>Scomberomorus commerson</i>	WALU	Scombridae
<i>Scorpaena</i> sp.	IKAVATU	Scorpaenidae
<i>Scylla paranamosain</i>	HEKA	Scyllidae
<i>Scylla serrata</i>	QARI	Scyllidae
<i>Selar crumenophthalmus</i>	VATULE	Carangidae
<i>Selar crumenophthalmus</i>	YATULE	Carangidae
Shark	BULUBULU	Carcharinidae
<i>Sicyopterus</i> sp.	BELETI	Sicydiaphiidae
Signidae Unid sp.	NUQA	Signidae
<i>Sphyraena flavicauda</i>	SASA	Sphyraenidae
<i>Sphyraena forsteri</i>	DULUTOGA	Sphyraenidae
<i>Sphyraena forsteri</i>	SILASILA	Sphyraenidae
<i>Sphyraena</i> sp.	OGO	Sphyraenidae
<i>Strombus gibberulus</i>	GERA	Shells
<i>Strombus gibberulus</i>	GOLEA	Shells
<i>Terapon jarbua</i>	QITAWA	Terapontidae
<i>Thryssa baelama</i>	VACA	Engraulidae
<i>Tilapia mossambica</i>	MALEYA	Cichlidae
<i>Trachinotus baillonii</i>	LALI	Carangidae
<i>Trichiurus haumela</i>	TOVISI	Trichiuridae
<i>Tridacna maxima</i>	KATAVATU	Tridacnidae
<i>Tridacna</i> sp.	VASUA	Tridacnidae
<i>Trochus niloticus</i>	SICI	Shells
<i>Tylosurus crocodilus</i>	SAKU	Belonidae
<i>Upeneus vittatus</i>	KI	Mullidae
<i>Valamugil seheli</i>	SEVOU	Mugilidae
<i>Variola albimarginata</i>	NITOGA	Serranidae