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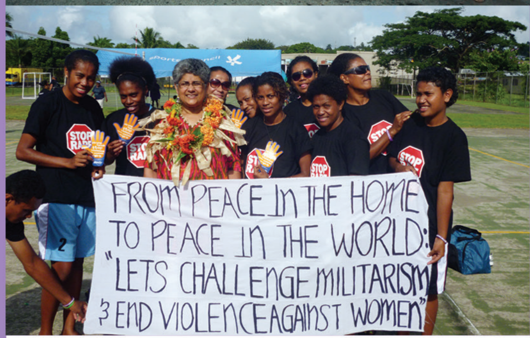
Annex 4: Method For Developing An Index Of Socio-Economic Clusters[34]



1. INTRODUCTION

The Fiji violence against women (VAW) survey collected information on a number of individual variables reflecting different dimensions of household socioeconomic status (SES). This report describes the method used to develop a single measure or index of SES using this information. A key issue in deriving a single measure index of SES using different indicators is how to assign weights to the individual variables. Principal components analysis (PCA) is a commonly used approach of statistically deriving weights for SES indices. PCA is a multivariate statistical technique that reduces the number of variables in a data set into a smaller number of components. Each component is a weighted combination of the original variables. The higher the degree of correlation among the original variables in the data, the fewer components required to capture the common information. An important property of the components derived is that they are uncorrelated, therefore each component captures a dimension in the data. The next section details the steps taken to derive a PCA-based SES index.

2. METHOD

Guided by Vyas and Kumaranayake (2006) this study undertook three steps to derive a PCA-based SES index: first, a descriptive analysis; second, the construction of the PCA-based SES index; and third, the classification of households into SES groups. The analysis was conducted using STATA version 10.00 statistical software.

2.1 Descriptive analysis

The first step was to conduct descriptive analysis which involved establishing the overall sample size, the frequency of each variable, and patterns of missing data for individual variables. This descriptive analysis was essential exploratory work to ensure data quality, and appropriate data coding and recoding for further analysis.

Overall sample size

From a total of 3538 households visited, a household selection form and questionnaire was administered and completed in 3362 (1581 urban; 1781 rural). The household questionnaire gathered information on different SES indicators, and the household selection form identified whether or not a woman eligible for a subsequent woman's questionnaire was present. A woman's questionnaire was administered and completed in 3193 households (1496 urban; 1697 rural). The SES index was constructed using data from all 3362 households where full SES data were collected.

Frequency analysis

The purpose of the frequency analysis was to establish the extent to which the variables are distributed across the households and to inform subsequent coding of the variables. An issue with PCA is that it works best when asset variables are correlated, but also when the distribution of variables varies across households. It is the assets that are more unequally distributed between households that are given more weight in PCA. For example, an asset which all households own or which no households own would exhibit no variation between households and would carry a weight close to zero from a PCA. A second issue with PCA is that data in categorical form are not suitable for inclusion in the analysis. This is because the categories are converted into a quantitative scale which does not have any meaning. To avoid this, qualitative categorical variables are recoded into binary variables.

The Fiji survey data gathered information on source of drinking water, type of toilet facility, wall material, main source of energy for lighting, ownership of a range of household durable items, land ownership, and the number of rooms in the house for sleeping and the total number of people in the household. A description and frequency distribution of the variables for the total sample (urban and rural combined) and for the urban sample and the rural sample separately is shown in Table 1.

The findings reveal that, across the total sample, for main source of drinking water and for sanitation facility the vast majority of households use one of two options. Drinking water from either a tap (metered) or a communal standpipe accounts for 83.6% of households, and a flush toilet or a sealed water toilet accounts for 92.0% of all households. Three options dominate main material used for walls (concrete/brick/cement; wooden walls; and tin/corrugated iron) accounting for 97.8% of all households, and energy used for lighting (electricity; rudimentary sources – either kerosene or benzene; and 'other') accounting for 96.9% of all households. However, while this pattern is mirrored when considering the rural sample, in the urban sample virtually all households obtain their source of water from a tap (98.6%), have a flush toilet (92.9%), and use electricity for their source of lighting (96.6%). In the urban sample, there is variation across the households in the material used for walls with over half of households (55.9%) having walls made of concrete/brick/cement and the remaining split between wooden walls (26.3%) and tin/corrugated iron (17.1%).

For the total sample, ownership of durable assets varied across the households ranging from 2.6% (water pump) to 91.4% (telephone/mobile). While this pattern was generally mirrored in the separated urban and rural samples, in the urban sample slightly fewer households possessed a water pump (1.5%) and virtually all households owned a telephone/mobile (97.3%). Almost 60% of all households owned land and this was split 55.5% urban sample and 63.7% rural sample. The number of rooms for sleeping ranged from 0-8 and the average across all households was 2.55. The number of people in the household ranged from 1-24 (mean=5.17).

Table 1: Description and frequency of SES variables

Variable long (short) name / *Variable type*	Variable Label	Total sample %/ Mean *(Std. dev.)* (N=3362)	Urban sample %/ Mean *(Std. dev.)* (N=1581)	Rural sample %/ Mean *(Std. dev.)* (N=1781)
Drinking water (q01) *Categorical*	Tap (metered)	69.3	98.6	43.6
	Communal standpipe	14.3	0.3	26.8
	Roof tank	3.3	0.4	6.0
	Borehole	6.5	0.1	12.2
	Well	2.3	0.2	4.1
	River/creek	2.6	0.1	4.8
	Other	1.7	0.4	2.9
Toilet facility (q02) *Categorical*	Own flush toilet	78.5	92.9	65.7
	Own water sealed toilet	13.5	3.9	22.0
	Shared with others	0.8	0.4	1.1
	Pit latrine	7.1	2.7	11.1
	River/canal/sea	0.1	0.0	0.1
	Bush/field	0.1	0.0	0.1
Wall materials (q03) *Categorical*	Concrete/brick/cement	43.0	55.9	31.6
	Wooden	31.7	26.3	36.6
	Tin/corrugated iron	23.1	17.1	28.5
	Traditional bure	1.6	0.2	2.8
	Makeshift/improvised	0.5	0.5	0.5
	Other	0.1	0.1	0.1
Lighting energy source (q04) *Categorical*	Electricity	75.5	96.6	56.7
	Kerosene lamp	9.2	2.3	15.3
	Benzene lamp	1.5	0.3	2.5
	Solar power unit	3.2	0.1	6.0
	Other	10.7	0.7	19.5
Household appliances (q05a-m) *Categorical*	Car	19.7	28.7	11.8
	Carrier/truck	6.4	5.8	7.0
	Refrigerator	62.9	85.1	43.2
	Computer	20.4	33.0	9.2
	Internet access	11.6	20.1	4.1
	Video/TV	77.9	92.2	65.1
	Radio	79.2	88.9	70.6
	Washing machine	52.4	72.2	34.9
	Gas/electric stove	79.3	91.1	68.9
	Telephone/mobile	91.4	97.3	86.2
	Outboard motor	4.3	2.6	5.8
	Water pump	2.6	1.5	3.5
	Brush cutter	31.4	28.5	34.1
Land owner in household (q06) *Categorical*		59.9	55.5	63.7
Rooms for sleeping (q07) *Continuous*		2.55 *(3.06)*	2.82 *(4.30)*	2.29 *(1.08)*
Total in household (tothh) *Continuous*		5.17 *(2.43)*	5.22 *(2.56)*	5.12 *(2.30)*

2.2 Analytical approach
Given the differences in distribution of the SES indicators by urban and rural split three PCA analyses were run: for the total sample, for the urban sample and for the rural sample. The purpose of this was to assess whether an index created using the total sample masked the variation in household SES in the urban and the rural samples.

Coding of variables
Table 2 describes the coding for each SES indicator. Based on the characteristics of each type of drinking water source three separate variables were created: tap (metered)/roof tank; communal standpipe/borehole/well; and river. Respondents who reported 'other' source of water were asked to specify and in most cases specified either a dam, spring or rain water –
these were subsequently included in the variable 'river'. Other specified sources of water were bottled water, tank and FSC? that were included as 'tap'; neighbours and other home that were included as 'communal'. Three separate binary variables were created for toilet facility: flush toilet/ own water sealed toilet; shared toilet; and pit latrine/no facility that was combined because there were too few counts of no facility to include as a separate variable. Four variables were created for type of wall materials: concrete/brick/cement; wood, tin/corrugated iron; and traditional bure/ makeshift materials. There were two cases of 'other' type of wall material – cement board that was coded as concrete/brick/cement, and drum tin that was coded as tin/corrugated iron. Three variables were created for source of energy for lighting: electricity grid (it was assumed that the option 'electricity' meant electricity from the grid); generator that was created from combining solar power with counts of generator from the 'other' option; and rudimentary that combined kerosene and benzene fuel lamp. In addition to generator, the option 'other' included low counts of plant and hydro-power and these were included as 'grid', and candle that was included as 'rudimentary'. All household appliances and land ownership were considered as binary variables. A 'crowding' index was created as the ratio between the number of people in the household and the number of rooms in the house for sleeping.

Inclusion of variables in PCA analyses
Based on the frequency distribution for the total sample (urban and rural combined) and for the rural only sample all variables were considered for inclusion in the PCA analysis. When considering the urban sample, the variables source of drinking water, toilet facility and energy used for lighting were excluded from the urban sample analysis – all three infrastructure variables were dominated by one 'type' and would therefore exhibit virtually zero variation. All the SES indicators were considered for the rural analysis.

Table 2: Description of SES variables used in PCA analysis

Variable description	Type of variable	Value labels
Tap (metered)/Other - tank/bottled	Binary	No=0 Yes=1
Communal standpipe/borehole/well/Other - another home/neighbours	Binary	No=0 Yes=1
River/Creek/Other - spring/rain/dam/reservoir	Binary	No=0 Yes=1
Own flush/water sealed toilet	Binary	No=0 Yes=1

Variable description	Type of variable	Value labels
Shared facility with others	Binary	No=0 Yes=1
Pit latrine/No facility/Bush	Binary	No=0 Yes=1
Concrete/brick/cement	Binary	No=0 Yes=1
Wood	Binary	No=0 Yes=1
Tin/corrugated iron	Binary	No=0 Yes=1
Bure/Makeshift materials	Binary	No=0 Yes=1
Electricity - Grid	Binary	No=0 Yes=1
Generator/Solar power	Binary	No=0 Yes=1
Fuel lamp (kerosene/benzene)/Other - candle/ battery	Binary	No=0 Yes=1
Car	Binary	No=0 Yes=1
Carrier/truck	Binary	No=0 Yes=1
Refrigerator	Binary	No=0 Yes=1
Computer	Binary	No=0 Yes=1
Internet access	Binary	No=0 Yes=1
Video/TV	Binary	No=0 Yes=1
Radio	Binary	No=0 Yes=1
Washing machine	Binary	No=0 Yes=1

Variable description	Type of variable	Value labels
Gas/electric stove	Binary	No=0 Yes=1
Telephone/mobile	Binary	No=0 Yes=1
Outboard motor	Binary	No=0 Yes=1
Water pump	Binary	No=0 Yes=1
Brush cutter	Binary	No=0 Yes=1
Land ownership	Binary	No=0 Yes=1
Crowd *(No. people in household/No. of rooms for sleeping)*	Continuous	0.02-15.00

Missing values

Another data issue is that of missing values and two options exist to deal with this. The first is to exclude households with at least one missing value from the analysis, and the second is to replace missing values with the mean value for that variable. Exclusion of households based on missing socioeconomic data could significantly lower sample sizes and the statistical power of study results. However, attributing mean scores for missing values reduces variation among households. Though in both situations, the limitation is more pronounced with high numbers of missing values.

In the Fiji survey, five of the household durable assets, land ownership and household crowding have cases of missing data. However, missing values accounted for less than 0.01% of the sample. Therefore, in cases of urban households missing values were recoded to the mean from the urban sample of that variable, and in cases of rural households missing values were recoded to the mean from the rural sample of that variable. It is expected inclusion or exclusion of these households would have little impact on the distribution of SES.

3. PRINCIPAL COMPONENTS ANALYSIS

The first principal component is considered a measure of SES and is therefore retained. The output from a PCA is a table of factor scores or weights for each variable. Generally, a variable with a positive factor score is associated with higher SES, and conversely a variable with a negative factor score is associated with lower SES. PCA was conducted using all the original SES variables described in Table 2.[9] The results from the final PCA models (total sample; urban and rural) are shown in Table 3.[10]

When considering results for the total sample, a household that obtains water from a tap, has a flush/water sealed toilet, has walls made of concrete/brick/cement, and obtains energy from the electricity grid would attain a higher SES score. All other household infrastructure variables were associated with lower SES. Households with more durable assets, except for ownership of an outboard motor, and ownership of land would attain a higher SES score. The variables refrigerator, washing machine, video/TV, grid electricity and tap water source displayed the highest weights. Households that had higher levels crowding was associated with lower SES.

When considering the weights derived from the urban and rural sample separately, for both sets of analyses and with the exception of outboard motor, the sign of the weights were similar to that derived from the total sample analysis. In both the urban and the rural samples the weight associated with ownership of an outboard motor is now marginally positive – reflecting the fact that it is an indicator of SES but that it is more prevalent in rural areas. The magnitude of all the weights is larger in the urban sample when compared with those in the total urban and rural combined sample.

9 In STATA, when specifying PCA, the user is given the choice of deriving eigenvectors (weights) from either the correlation matrix or the co-variance matrix of the data. If the raw data has been standardized, then PCA should use the co-variance matrix. As the data was not standardized, and they are therefore not expressed in the same units, the analysis specified the correlation matrix to ensure that all data have equal weight. For example, crowding is a quantitative variable and has greater variance than the other binary variables, and would therefore dominate the first principal component if the co-variance matrix was used.

10 A PCA model using source of water was included, however, the results for these variables were not easy to interpret. The weights were very low for all three sources of water indicators. In addition, piped water carried a marginally negative weight – a source of water that is assumed to be a characteristic of higher SES households. Therefore, sources of water was excluded from the final PCA model.

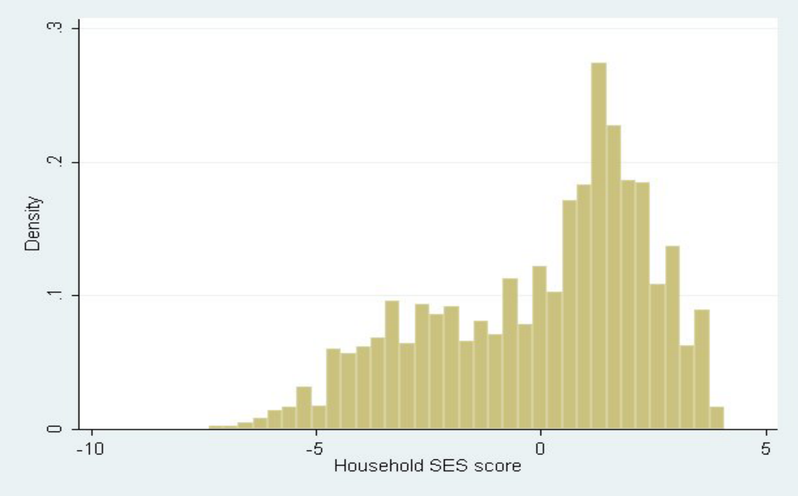
Table 3: Results from principal components analysis

SES indicator	Total sample (N=3358)			Urban sample (N=1579)			Rural sample (N=1779)		
	Mean	Std. dev	PC score	Mean	Std. dev	PC score	Mean	Std. dev	PC score
Tap (metered)/Other	0.728	0.445	0.257				0.958	0.500	0.192
Communal standpipe/borehole/well/Other	0.231	0.422	-0.232				0.431	0.495	-0.169
River/Creek/Other	0.040	0.196	-0.083				0.073	0.260	-0.048
Own flush/water sealed toilet	0.920	0.272	0.172				0.876	0.329	0.157
Shared facility with others	0.008	0.088	-0.063				0.011	0.103	-0.082
Pit latrine/No facility/Bush	0.073	0.259	-0.159				0.113	0.317	-0.137
Concrete/brick/cement	0.431	0.495	0.196	0.560	0.497	0.262	0.316	0.465	0.179
Wood	0.317	0.465	-0.080	0.262	0.440	-0.122	0.366	0.482	-0.062
Tin/corrugated iron	0.232	0.422	-0.109	0.171	0.376	-0.185	0.286	0.452	-0.074
Bure/Makeshift materials	0.021	0.142	-0.100	0.007	0.083	-0.079	0.033	0.178	-0.114
Electricity - Grid	0.755	0.430	0.315				0.568	0.495	0.309
Generator/Solar power	0.137	0.344	-0.184				0.252	0.434	-0.140
Rudimentary	0.108	0.310	-0.233				0.180	0.384	-0.241
Car	0.198	0.398	0.199	0.287	0.452	0.271	0.118	0.323	0.234
Carrier/truck	0.064	0.245	0.068	0.058	0.234	0.091	0.070	0.255	0.132
Refrigerator	0.630	0.483	0.326	0.852	0.355	0.346	0.433	0.496	0.342
Computer	0.204	0.403	0.221	0.330	0.470	0.319	0.092	0.289	0.230
Internet access	0.116	0.321	0.184	0.201	0.401	0.295	0.041	0.198	0.180
Video/TV	0.779	0.415	0.282	0.923	0.267	0.317	0.652	0.477	0.292
Radio	0.793	0.405	0.218	0.890	0.313	0.293	0.707	0.455	0.219
Washing machine	0.525	0.499	0.287	0.722	0.448	0.332	0.349	0.477	0.302
Gas/electric stove	0.794	0.404	0.225	0.920	0.283	0.251	0.690	0.462	0.228
Telephone/mobile	0.915	0.279	0.172	0.933	0.161	0.170	0.863	0.344	0.177
Outboard motor	0.043	0.203	-0.018	0.026	0.159	0.036	0.058	0.235	0.008
Water pump	0.026	0.158	0.037	0.015	0.120	0.063	0.035	0.185	0.097
Brush cutter	0.315	0.464	0.082	0.285	0.451	0.146	0.341	0.474	0.170
Land ownership	0.602	0.488	0.014	0.560	0.495	0.167	0.640	0.479	0.014
Household crowding	2.470	1.577	-0.169	2.200	1.261	-0.208	2.712	1.779	-0.186

1.2 Classification of households into SES group

Classification of households into SES group – total sample (urban and rural combined)
Using the factor scores from the first principal component as weights, a dependent variable can then be constructed for each household which has a mean equal to zero, and a standard deviation equal to one. This dependent variable can be regarded as the household's SES score, and the higher the household SES score, the higher the implied SES of that household. A histogram of the household SES scores using the total sample data is shown in Figure 1. The figure reveals that the distribution of the household SES score is slightly left skewed towards 'higher' SES.

Figure 1: Distribution of household SES score – total sample



To differentiate households into broad SES categories studies have used cut-off points – most commonly an arbitrarily defined disaggregation e.g. quintiles. Another method is to use a data driven approach – cluster analysis – to derive SES categories. Cluster analysis was used in the WHO multi-country study on domestic violence and women's health to derive 'low', 'medium' and 'high' SES categories.

For this study both methods to classify households into SES groups were explored using the total sample. First households were ranked according to their SES score and were then split into three equal sized groups or terciles. K-means cluster analysis was then used to group households into three clusters. The mean SES score for each SES category, derived using both methods, is shown in Table 4. When considering the SES classification using terciles, the difference in the mean SES score is much higher between the low and medium SES group than for the medium and high SES group (3.514 and 1.820 respectively).

This compares with a difference of 3.158, between the low and medium SES group, and 2.449, between the medium and high SES group. Using the cluster method almost one-half of households (48.5%) is classified in the high SES group, 28.2% is classified as medium SES and slightly under one-quarter (23.3%) is classified as low SES.

Table 4: Mean socioeconomic scores by SES group (N=3356)

	Terciles (N=3358)			Cluster analysis (N=3358)		
Total sample	Low (N=1120)	Medium (N=1119)	High (N=1118)	Low (N=783)	Medium (N=946)	High (N=1629)
%	33.4	33.3	33.3	23.3	28.2	48.5
Mean SES score	-2.948	0.565	2.385	-3.609	-0.452	1.997
Std. Dev	1.374	0.641	0.652	1.089	0.836	0.794
Min	-7.400	-0.772	1.446	-7.400	-2.030	0.773
Max	-0.773	1.446	4.076	-2.040	0.768	4.076

Internal coherence compares the mean value for each asset variable by SES group to assess whether ownership differs by group. Table 5 show the mean ownership levels of the SES indicator variables by both the tercile and cluster derived SES groups. The findings reveal that for most indicators both methods similarly differentiate household SES, however, for the variables flush/own sealed toilet; pit latrine/no facility; electricity-grid; video/TV; and phone, the cluster method differentiates medium and high SES better than the tercile method. Therefore, the findings from Tables 4 and 5 suggest that the cluster approach is slightly better at differentiating all three SES groups.

Table 5: Mean ownership of SES variables by SES group (N=3362)

SES indicator	Tercile Low	Tercile Medium	Tercile High	Cluster Low	Cluster Medium	Cluster High
Tap (metered)/Other (tank/bottled)	36.2	85.1	97.3	28.7	70.0	95.7
Communal standpipe/borehole/well/ Other (another home/neighbours)	54.3	12.7	2.1	60.7	25.6	3.7
River/Creek/Other (spring/rain/dam/reservoir)	9.6	2.2	0.3	10.6	4.4	0.6
Own flush/water sealed toilet	78.6	97.4	99.9	76.4	91.4	99.8
Shared facility with others	2.1	0.3	0.0	2.3	0.7	0.0
Pit latrine/No facility/Bush	19.4	2.3	0.1	21.3	7.8	0.2
Concrete/brick/cement	17.9	34.1	77.2	14.9	28.4	65.0
Wood	41.7	38.3	15.2	41.5	40.1	22.2
Tin/corrugated iron	35.2	26.9	7.5	36.8	29.9	12.8
Bure/Makeshift materials	5.3	0.8	0.0	6.8	1.6	0.0
Electricity – Grid	31.3	95.4	99.8	15.6	83.7	99.7
Generator/Solar power	36.9	4.1	0.2	41.1	14.2	0.3
Fuel lamp (kerosene/benzene)/Other (candle/battery)	31.8	0.5	0.0	43.6	2.1	0.0
Car	1.3	7.9	50.0	0.6	4.5	38.0
Carrier/truck	2.3	5.2	11.8	1.5	4.7	9.8
Refrigerator	11.0	78.8	99.2	2.9	53.7	97.2
Computer	0.7	5.8	54.7	0.4	2.9	40.2
Internet access	0.0	1.3	33.4	0.1	0.4	23.7
Video/TV	41.3	92.9	99.6	30.4	80.3	99.3
Radio	52.2	87.2	98.4	46.6	76.0	96.9
Washing machine	10.5	52.4	94.5	4.0	33.2	87.0
Gas/electric stove	53.9	86.5	98.9	46.7	74.6	98.0
Telephone/mobile	77.7	97.1	99.7	72.7	93.1	99.5
Outboard motor	6.3	3.3	3.3	5.7	4.9	3.3
Water pump	0.9	2.6	4.1	0.6	2.0	3.7
Brush cutter	23.1	30.2	41.0	19.8	27.9	39.1
Land ownership	61.0	53.0	64.6	60.8	57.2	61.7
Household crowding	3.2	2.3	1.8	3.5	2.6	2.0

Classification of households into SES group – urban and rural samples

When assessing the distribution of household SES by urban and rural location, the vast majority of households in the urban sample are classified as high SES (74.8%) and very few are classified as low SES (3.6%) (Table 6). The distribution of household SES in the rural sample is more varied.

Table 6: Distribution of household SES by urban and rural location (total sample analysis; urban sample analysis and rural sample analysis)

	Total sample		Urban sample	Rural sample
	Urban % N=(1579)	Rural % (N=1779)	% (N=1579)	% (N=1779)
Low	3.6	40.9	13.81	33.05
Medium	21.7	34.0	47.37	35.75
High	74.8	25.2	38.82	31.2

Using cluster analysis on the SES scores derived from the urban and the rural samples the distribution of households SES, shown in Table 6, reveals that greater variation in the distribution of households SES in the rural sample. The distribution of households SES using the results from the rural sample are similar to that derived from the total sample analysis. While the vast majority of rural households (86.2%) were similarly classified (comparing total sample analysis and rural sample analysis), this figure was just over one-half (53.5%) for the urban households.

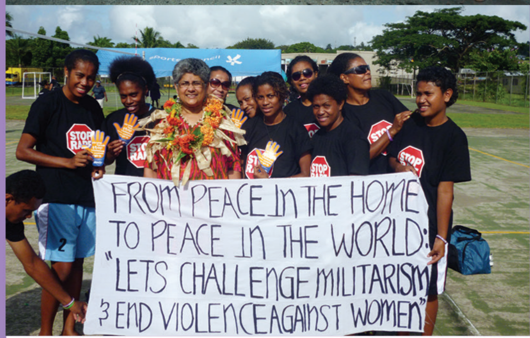
4. SUMMARY

This report describes how a PCA-based SES index was created using the Fiji VAW survey data. Three PCA-based indices were derived: total sample (urban and rural combined); urban sample; and rural sample. From the PCA analysis using the total sample households were classified into SES groups using terciles and cluster analysis approach. An assessment of the internal coherence concluded that while both methods performed reasonably well in disaggregating SES the cluster approach performed slightly better. However, when considering the distribution of household SES by urban and rural location (from the results using of the total sample analysis), there was little variation in households SES in the urban location. Therefore, separate PCA-based indices were run for the urban and the rural samples separately and it is recommended that this SES indicator is used if separate urban and rural analyses are to be conducted.

REFERENCE

Vyas S. and Kumaranayake L. 2006. "How to do (or not to do) . . .Constructing socio-economic status indices: how to use principal components analysis". Health Policy and Planning. 21(6): 459-468.

Annex 5:
Research Team



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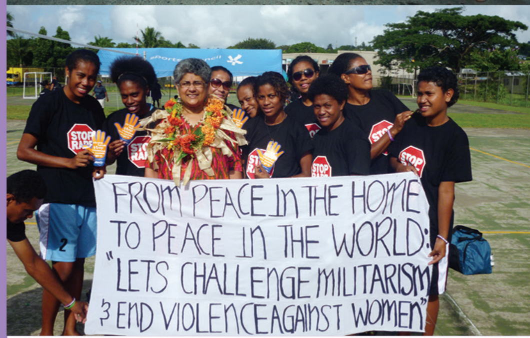

Annex 6:
Glossary of Statistical Terms

Statistical significance
In statistics, a result is statistically significant if it is unlikely to have occurred by chance or coincidence. Statistical significance is a measure of how strong the evidence is that findings from research are not due to chance, or to other unknown factors that might have arisen in the sampling process or in the process of carrying out the research (for example, in the selection of enumeration areas, the selection of households, the selection of respondents interviewed, any error due to the way the questionnaire was constructed, or any bias or errors by the interviewer).

The P value
A P value is a measure statistical significance. For example, it is a measure of how strong the association is between the experience of intimate partner violence and a particular variable. The lower the P value, the stronger the association, and the less possibility of error.

- A P value higher than 0.05 is usually regarded as not significant.
- The standard measure of significance is usually a P value of less than 0.05 (<0.05). This means that there is 5% likelihood (or one possibility in every 20) that the result from the survey is due to chance, or due to error, rather than being due to a real association.
- A P value of less than 0.001 (<0.001) is extremely significant. It means that there is only 0.1% likelihood (or one possibility in every thousand) that the result from the survey is due to chance, or due to error.

Odds ratio and confidence interval
The odds ratio for a variable gives an estimate of the likelihood that any woman who has that particular factor (or characteristic) will experience partner violence in her lifetime, compared to any other woman. Adjusted odds ratio just means that the odds have been adjusted to take into account all the other variables or factors that may be associated with violence – so the adjusted odds ratio gives us a stronger evidence base. A 95% confidence interval (CI) for the odds ratio gives us more evidence of how strong an association is between partner violence and any particular factor, because it gives us a range of error for the odds ratio; and it tells us that there is only once chance in 20 that our odds ratio will be wrong.

Univariable and mulitvariable analysis
These are methods of statistical analysis commonly used in medical and social science research to test a hypothesis (or assumption) about the association between an outcome and various other variables. In the FWCC survey, the outcome was women's experience of violence by a husband or intimate partner. This type of statistical analysis helps understand how likely it is that a woman will experience intimate partner violence, by considering the various factors in her background, or her husband's/partner's background (see Chapter 11).