STATISTICS

SIERRA LEONE

Consumption Aggregates and Poverty Estimates

Sierra Leone Integrated Household Survey

This report presents some of the first results using the full 12-month data set from the Sierra Leone Integrated Household Survey. These should not be interpreted as definitive until the report has undergone broad consultation with the appropriate stakeholders. This report is divided into the following sections:

A. Methodology
B. Poverty Indices (Strata and District) and Inequality
C. A brief section on food security
D. Auxiliary Tables

Some context is provided however this is limited due to the on going process of interpreting the results.

The expenditure aggregate forms the basis for computing a poverty line. The definition of the poverty line, that is the threshold that defines the level of expenditure (or welfare) above which a person is not poor, can be set in various fashions. If the assumptions behind the definition are explicit and understood, different methodologies will provide slightly different information to the policy maker. Regardless of the poverty line selected, the computation of the household aggregate is required in order to rank the acquisitive power of a household and thus quantify the welfare of a household. The household expenditure aggregate is defined as the categorical computation of expenditure of a household. Welfare is defined as those expenditures that can be said improve the general well being of a household.

Methodology

A. Computation of the Expenditure Aggregate

In calculating the aggregate, information taken from the questionnaire must be extracted and appropriately annualized. Prior to this extraction, the data are subjected to rigorous control for quality and this includes an examination of outlying values that can substantially distort results. Any values that exceed reasonable limits are replaced with a value that is considered acceptable. The methodology used in treating the SLIHS was a rigorous examination of the median value. Limits were established using resistant fences.[1] If a value exceeded an upper or lower limit, replacement of the value was done through the process of dynamic imputation (i.e. hot decking). For more information, refer to the SLIHS Process Manual. Once the data were subjected to these controls, consumption values were extracted and appropriately annualized.[2] The Standardized Aggregate Template provided by the Africa Data Group at the World Bank defined the primary headings for the aggregate. The headings are as follows:

- Household composition
  Adjusts household members by age and sex to compute an equivalent adult.
- Purchased food expenditures
  Provides the headings for all purchases of food by food groups.
- Self-produced food consumption
  Provides the headings for all self-produced foods by food groups.
- Education expenditures
  - Tuition
  - Books
  - Uniforms
  - Extra curricular activities
  - Room and board
  - Transport
  - Informal fees
  - Other education expenses
- Health care expenditures
  - Consultation fees
  - Medication expenditure
  - Medical procedures
  - Hospitalization
  - Transportation
  - Insurance
  - Other health related expenditure

[1] See: Katherine Jenny Thompson, RATIO EDIT TOLERANCE DEVELOPMENT USING VARIATIONS OF EXPLORATORY DATA ANALYSIS (EDA) RESISTANT FENCES METHODS by Katherine Jenny Thompson, Economic Statistical Methods and Programming Division, United States Bureau of the Census.

[2] See: Guidelines for Constructing

(Expenditure aggregate continued)

- Other frequent non-food expenditures
  - Tobacco (alcohol was included under food to account for caloric values)
  - Utilities
  - Clothing
  - Household maintenance
  - Transportation
  - Communication
  - Recreation
  - Non-farm self-produced (computed but not included in aggregate as it was felt these were already counted under their specific product).
  - Rent (imputed or actual)
  - Other non food expenditures
- Total infrequent non-food expenditures
  - Appliances
  - Use value of large items less than five years old.
  - Ceremonial expenses (computed but not included in the aggregate)
  - Transfer in whether cash or in-kind were excluded since double counting would occur as were transfers out since they do not add to household welfare.

B. Computation of Equivalent Adults

Part of the procedure for computing a food-energy intake poverty line requires the adjustment of the household members to equivalent adults. An equivalent adult scale essentially assigns a proportion of "adulthood" to a household member depending on age and sex. This will account for the fact that an infant will not consume as much as a healthy adult. The equivalence scale is listed in the table below. These figures were taken from those used in the Ghana household survey conducted in 1998. As can be seen from the scale below

Category	Age (years)	Average energy allowance per day (kcal)	Equivalence scale
Infants	0 - 0.5	650	0.22
	0.5 - 1.0	850	0.29
Children	1 – 3	1300	0.45
	4 – 6	1800	0.62
	7 – 10	2000	0.69
Males	11 – 14	2500	0.86
	15 – 18	2750	1.03
	19 – 25	2700	1.00
	25 - 50	2700	1.00
	51+	2300	0.79
Females	11 - 14	2200	0.76
	15 - 18	2200	0.76
	19 - 25	2200	0.76
	25 - 50	2200	0.76
	51+	1900	0.66

C. Selecting a basket of goods

In order to compute the food poverty line, a basket of food products was selected. In order for the basket to be representative of the poorest, household food consumption was computed per adult equivalent and then ranked from lowest to highest. A basket of food items was selected from the bottom 20% as it felt this was representative of the consumption habits of the poor. The top 20 products of the basket are illustrated below.

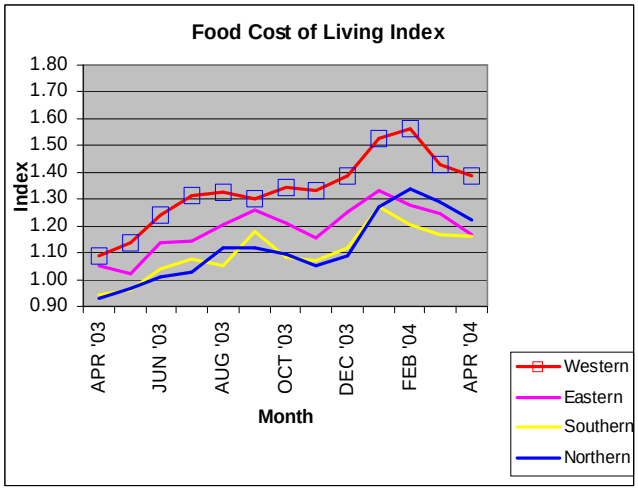
Food consumption basket of the poorest 20% of the population

Rice (Paddy Grain) Local	30.45%	Chicken	2.24%
Palm Oil	12.32%	Cookry	1.36%
Dried Fish	8.31%	Sugar	1.32%
Fresh Fish	4.24%	Bread and Buns	1.29%
Ground Nuts (roasted or raw)	3.40%	Fresh Pepper	1.18%
Salt	3.35%	Kola Nut	1.07%
Pepper (Dried)	3.24%	Broad beans	1.04%
Other vegetables	3.11%	Cassava (Other Forms)	0.98%
Cassava Roots	2.89%	Palm Wine	0.97%
Smoked Fish	2.58%	Cowpeas (Small)	0.69%

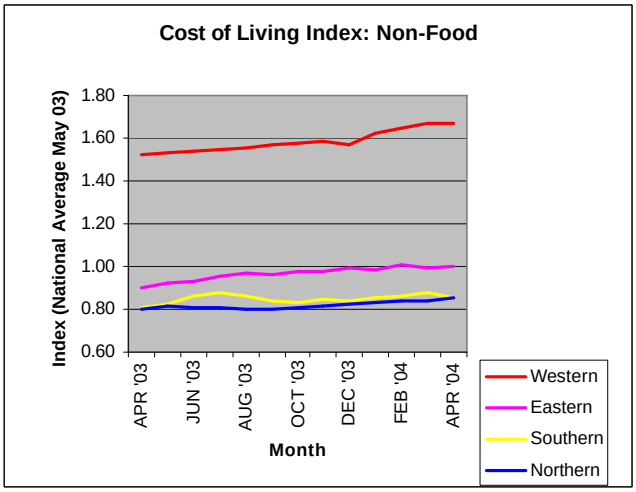
Non-Food consumption (welfare) of the bottom 20%.

Rent or shelter (imputed)	14.56%
Health	13.68%
Education	12.78%
Kerosene and other liquid fuel	6.58%
Goods for Personal Care eg. Razor Blades Cosmetics Powder	5.75%
Tobacco	3.85%
Soap and Washing Powder	3.85%
Road Transport	2.95%
Cotton cloth	2.53%
Clothes: Trousers, shirts and blouses	2.08%
Firewood and Other Solid fuel	1.89%
Transistor Batteries / Films & Other Non-Durable Photo Items	1.43%
Bed sheets Bed Cover Blanket Curtains	1.43%
Tailoring Charges	1.38%
Men’s Shoes	1.28%
Ladies Slippers	1.10%
Suit / Safari Suit	1.08%
Underwear (Incl.Vests and Underpants)	0.99%
Dress (ladies/girls)	0.97%

D. Computing a standard of living measure



Regional and monthly price variations require the adjustment of expenditures to reflect these changes. In order to express all expenditures to a reference time and place, the CPI data was used at the regional level. A Lespeyer cost of living measure was established for both food and non-food expenditure based on the relevant basket of the poorest 20%. As opposed to using a singular reference location such as Freetown, prices were weighed by the proportion of the population sampled in the region. This provided a regionally weighted national average. The month selected was the beginning of the survey, or May 2003. Where required, all expenditures are therefore specified as a national average based in May 2003. Two graphic depictions of the cost-of-living indices are presented. One is for food items and the other for non-food. An upward trend in cost-of-living is apparent across all regions with the highest regional prices found in Freetown (western Region). Greater variations are seen in the food cost-of-living. This has implications for the poorest since more of their budget is allocated to food expenditure.



E. Calculating a poverty line

Once the appropriate basket of food items and deflator has been defined, then a poverty line can be computed. This poverty line values the basket at the reference prices. The selection of a minimum caloric level is required to compute the theoretical expenditure required to attain that minimum nutritional requirement. This level of expenditure represents a core and extreme poverty line. If a household is unable to provide this level of expenditure, it implies that even if all a household's expenditure were dedicated to food, the household would be unable to minimally feed itself.

ITEM	SHARE	Price	Standard	Cals/100g	2200	2500	2700	3000
Rice (Paddy Grain) Local	30.45%	94	100g	353	256.37	291.33	314.63	349.59
Palm Oil	12.32%	151	100ml	875	103.75	117.90	127.33	141.48
Dried Fish	8.31%	425	100g	269	69.96	79.50	85.87	95.41
Fresh Fish	4.24%	331	100g	101	35.66	40.52	43.77	48.63
Ground Nuts (roasted or raw)	3.40%	194	100g	549	28.64	32.55	35.15	39.06
Salt	3.35%	140	100g	0	28.20	32.04	34.60	38.45
Pepper (Dried)	3.24%	4,010	100g	346	27.30	31.03	33.51	37.23
Other vegetables	3.11%	27	100g	70	26.19	29.76	32.14	35.71
Cassava Roots	2.89%	47	100g	149	24.36	27.68	29.90	33.22
Smoked Fish	2.58%	305	100g	171	21.71	24.67	26.64	29.60
Chicken	2.24%	658	100g	72	18.89	21.47	23.19	25.76
Cookry	1.36%	168	100g	943	11.48	13.05	14.09	15.66
Sugar	1.32%	131	100g	380	11.10	12.61	13.62	15.13
Bread and Buns	1.29%	176	100g	261	10.87	12.35	13.34	14.83
Fresh Pepper	1.18%	2,528	100g	48	9.91	11.26	12.16	13.51
Kola Nut	1.07%	271	100g	148	8.98	10.20	11.02	12.24
Broad beans	1.04%	116	100g	344	8.72	9.91	10.71	11.90
Palm Wine	0.97%	53	100ml	42	8.18	9.30	10.04	11.16
Okra	0.64%	143	100g	36	5.40	6.14	6.63	7.36
Cassava Gari	0.63%	15	100g	351	5.30	6.02	6.50	7.22
Paw paw	0.51%	45	100g	32	4.29	4.87	5.26	5.85
Gardens eggs cucumbers	0.44%	85	100g	47	3.71	4.22	4.56	5.06
Fried Fish	0.43%	425	100g	516	3.62	4.12	4.45	4.94
Coffee	0.43%	80	100g	4	3.59	4.08	4.41	4.90
Mangoes	0.40%	31	100g	61	3.39	3.85	4.16	4.62
Bananas	0.39%	44	100g	88	3.27	3.72	4.01	4.46
Yams	0.38%	102	100g	112	3.24	3.68	3.98	4.42
Softdrinks	0.36%	172	100ml	30	3.07	3.49	3.77	4.19
Maize-Cob (fresh)	0.31%	166	100g	364	2.63	2.99	3.23	3.58
Oranges Tangerine	0.30%	49	100g	49	2.49	2.83	3.06	3.40
Sweet Potato	0.30%	248	100g	121	2.48	2.82	3.05	3.39
Milk Powder	0.29%	633	100g	79	2.42	2.75	2.97	3.30
Tea	0.28%	1,388	100g	4	2.33	2.65	2.86	3.18
Groundnut oil	0.24%	256	100ml	875	2.06	2.34	2.53	2.81
Biscuits	0.24%	790	100g	371	2.00	2.27	2.45	2.72
Pineapples	0.18%	76	100g	47	1.51	1.71	1.85	2.05
Shell Fish	0.15%	347	100g	102	1.29	1.47	1.58	1.76
Omole and local spirits	0.15%	215	100ml	42	1.28	1.45	1.57	1.74
Onions	0.15%	207	100g	41	1.23	1.40	1.51	1.68
Tomatoes	0.15%	102	100g	21	1.23	1.40	1.51	1.68
Eggs	0.09%	15,174	100g	140	0.78	0.89	0.96	1.07
Other vegetable oil/fats	0.09%	272	100ml	875	0.75	0.85	0.92	1.02
Gin/Sassman	0.09%	159	100ml	42	0.74	0.85	0.91	1.01
Fresh Cow meat (no bone)	0.08%	768	100g	237	0.67	0.76	0.82	0.91
Coconuts	0.07%	78	100g	388	0.61	0.69	0.75	0.83
Milk	0.07%	372	100g	79	0.60	0.68	0.74	0.82
Margarine	0.06%	1,119	100g	875	0.50	0.57	0.61	0.68
Canned Fish	0.06%	1,002	100g	143	0.48	0.55	0.59	0.65
Ice cream lollipop	0.05%	714	100g	380	0.39	0.45	0.48	0.54
Chocolate	0.04%	1,529	100g	351	0.34	0.39	0.42	0.47
Pork	0.01%	521	100g	418	0.10	0.11	0.12	0.14
Cabbage/Lettuce	0.01%	239	100g	26	0.09	0.10	0.11	0.12
TOTAL BASKET	**92.42%**				**778.16**	**884.27**	**955.01**	**1061.13**
	Weighted to 100%				**842**	**957**	**1033**	**1148**
	Annual Expenditures				307,330	349,305	**377,045**	419,020

In order to attain the minimum requirement at the 2700 calorie level, approximately 1033 Leones would have to be spent per day per equivalent adult in May 2003 national prices.

This expenditure level constitutes the core poverty line of 377,045 Leones per year. Since it is not realistic that a household will dedicate every expense solely to food, the addition of basic such as health and education need to be added to this core. A shortcut method was used where an examination of the expenditures of households grouped around the poverty line (i.e. plus of minus 10%) and the average expenditure on basic needs calculated and added to this core. The average non-food expenditures per adult equivalent around the poverty line was 393,633 Leones for a total of 770,678 Leones per year or approximately 2111 Leones per day (which is very close to the nominal $1 average exchange rate for the Leone over the course of the survey of 2145 Leones).

Average Exchange rate

1-May '04	2450
1-Apr	2650
1-Mar	2450
1-Feb	2450
1-Jan	2450
1-Dec	1930
1-Nov	1930
1-Oct	1930
1-Sep	1930
1-Aug	1930
1-Jul	1930
1-Jun	1930
1-May '03	1930
	2145.385

A relevant check to assure that the food to non-food consumption values are reasonable is to examine the averages share attributable to each across the quintiles. The table below provides this information. As expected, the share dedicated to non-food items increases the higher the quintile so much so that the percentage shares are opposite in the fifth quintile. This is reflective of the higher rent payments in Freetown.

Table: Shares of food and non food.

	% of total allocated	
Quintiles	**% Food**	**% Non food**
1	63%	37%
2	63%	37%
3	61%	39%
4	57%	43%
5	36%	64%

Excluded from the aggregate were the following expenses

A. Ceremonial expenditures (such as weddings and funerals)
B. Transfers
C. Consumption of non-farm produce.

Aggregate expenditures

Household expenditure by district

	Total annual monetary value of own produce in current local prices	Annual total monetary value of purchased foods, in current local prices	Rental imputed or actual	Annual total frequent non-food expenditures, in current local prices, excluding rent	Annual total infrequent non-food	Annual health care expenditures	Annual education Expenditures	Household Size	Country Equivalent Adult
District									
Bo	715,118	995,232	152,211	804,294	27,057	1,259,609	144,326	6.23	4.73
Bonthe	379,453	910,517	83,134	435,652	13,399	623,615	86,039	6.56	4.88
Moyamba	693,217	1,183,441	134,253	597,559	11,362	621,524	84,431	6.11	4.49
Pujehun	988,413	956,562	204,221	560,316	8,852	243,150	57,844	5.09	3.82
Kailahun	554,446	713,654	116,170	532,916	18,899	142,605	34,947	6.00	4.41
Kenema	307,047	829,861	115,781	504,140	17,569	294,093	47,288	5.27	3.93
Kono	825,458	1,133,343	134,499	656,056	20,316	786,728	179,773	6.22	4.78
Bombali	496,880	744,451	121,132	384,606	6,803	384,232	80,336	6.57	4.94
Kambia	668,281	1,529,847	181,206	1,693,922	19,921	320,727	87,728	7.04	5.34
Koinadugu	962,337	909,429	149,929	431,376	10,267	362,838	68,123	6.51	4.91
Porto Loko	566,595	1,282,879	95,749	765,706	13,822	395,952	90,890	6.72	5.06
Tonkolili	885,010	799,715	62,525	485,309	18,068	227,281	70,041	6.04	4.49
Western Urban	2,985	2,773,500	564,937	2,693,231	117,444	1,293,705	709,894	5.98	4.73
Western Rural	138,215	2,132,890	492,375	1,710,771	86,822	818,545	378,838	6.78	5.15
Total	576,900	1,208,987	180,771	878,273	28,024	589,564	160,901	6.16	4.66

Household expenditure by quintile

	Total annual monetary value of own produce in current local prices	Annual total monetary value of purchased foods, in current local prices	Rental imputed or actual	Annual total frequent non-food expenditures, in current local prices, excluding rent	Annual total infrequent non-food	Annual health care expenditures	Annual education Expenditures	Household Size	Country Equivalent Adult
Quintile									
1	343,515	584,332	108,734	279,243	7,992	111,348	57,628	7.15	5.39
2	499,827	891,295	123,682	433,020	13,032	191,249	75,606	6.75	5.05
3	590,764	1,108,196	132,442	566,611	15,713	293,089	91,217	6.35	4.77
4	745,826	1,226,550	145,982	728,337	21,061	436,340	118,893	5.48	4.14
5	637,204	2,010,722	357,859	2,111,047	72,893	1,682,571	410,085	5.45	4.19
Total	576,900	1,208,987	180,771	878,273	28,024	589,564	160,901	6.16	4.66

Survey Methodology and Data Processing

The sampling frame used for the SLIHS was based on the 1985 population census. Although the frame used is outdated (given the demographic changes caused by the violent period of lawlessness in Sierra Leone) it was the same frame used for the UNICEF MICS survey conducted in Nov./Dec. 2000. Although the census cartographic operations were taking place concurrent with the survey, the results were not available to modify the sample frame.

The sampling methodology used was to systematically select a sample of 226 enumeration areas (EA) from the list of census enumerator areas. This selection was done from the ordered list (ordered by region, district and urban/rural). The sample was implicitly stratified in that a proportion of urban EA s were selected according to proportion of estimated population to be living in the urban areas. Although each of the urban EAs contained 20 households and the rural contained 15 households, the sample maintained the estimated population proportions of the populations. The sample was therefore a self-weighted sample with no over sampling done in the urban areas. In this case, the strata were the same as a survey domain.

Once the EA was selected a listing of households was done in the selected EA. It was from this list that a random selection of households was taken (15 in the case of rural household and 20 in the case of urban households).

The survey took place over a 12 month period (April 24,2003 to April 26, 2004) in order to capture any seasonal variations. The data was captured using a data entry system designed in IMPS. Some of edits to check for consistency were designed in CONCOR. Further edits and the procedure for preparing the data and imputing data were designed in CSPro. Further information is available in the SLIHS Process Manual.

Poverty Indices and Ratios

	Sample Share	P_0 Extreme[1]	P_0 Food[2]	P_0 Full[3]	P_1 Depth	P_2 Severity	C_0 Con[4]	P_1/P_0[5]	Gini	P_{1X}[6]	P_{1X}/P_{1P}[7]	Mon[8]
Strata												
Freetown	10.39%	0.02	0.38	0.15	0.04	0.04	2.2%	0.27	0.32	1.16	29.00	0.84
Rural	64.47%	0.33	0.69	0.79	0.34	0.19	72.8%	0.43	0.36	0.14	0.41	0.53
Other Urban	25.14%	0.20	0.75	0.70	0.26	0.14	25.1%	0.37	0.33	0.18	0.69	0.71
District												
Bo	8.81%	0.25	0.69	0.64	0.27	0.16	8.1%	0.42	0.22	0.42	1.56	0.70
Bonthe	5.57%	0.35	0.89	0.85	0.37	0.20	6.8%	0.44	0.31	0.08	0.22	0.68
Moyamba	7.83%	0.16	0.60	0.68	0.24	0.13	7.6%	0.35	0.31	0.16	0.67	0.56
Pujehun	4.23%	0.14	0.38	0.59	0.18	0.09	3.6%	0.31	0.28	0.23	1.28	0.42
Kailahun	6.43%	0.45	0.88	0.92	0.42	0.23	8.5%	0.46	0.25	0.03	0.07	0.51
Kenema	8.86%	0.38	0.88	0.88	0.38	0.21	11.1%	0.43	0.29	0.05	0.13	0.63
Kono	9.62%	0.22	0.64	0.66	0.25	0.15	9.1%	0.38	0.36	0.19	0.76	0.59
Bombali	7.62%	0.63	0.88	0.89	0.50	0.32	9.7%	0.56	0.35	0.06	0.12	0.55
Kambia	5.82%	0.09	0.56	0.69	0.21	0.09	5.7%	0.30	0.35	0.24	1.14	0.69
Koinadugu	7.26%	0.29	0.66	0.77	0.33	0.19	8.0%	0.43	0.29	0.07	0.21	0.42
Port Loko	9.82%	0.20	0.71	0.82	0.31	0.15	11.5%	0.38	0.30	0.11	0.35	0.65
Tonkolili	5.81%	0.32	0.63	0.84	0.35	0.20	7.0%	0.42	0.29	0.05	0.14	0.44
Western Urban	10.39%	0.02	0.38	0.15	0.04	0.04	2.2%	0.27	0.32	1.16	29.00	0.84
Western Rural	1.90%	0.15	0.70	0.45	0.16	0.09	1.2%	0.36	0.37	0.58	3.63	0.63
National	100%	0.26	0.68	0.70	0.29	0.16	100.0%	0.41	0.39	0.25	0.86	0.65

[1] The extreme poverty measure is a measure of the incidence of total deflated consumption falling below the poverty line of 377,045 Leones
or **Total per equivalent adult expenditure/Food Poverty**.

[2] The "food" poverty line is provided as a measure of nutritional intake, or the proportion of food expenditure falling below the food poverty line. This was done to capture seasonality. **Per equivalent adult food expenditure/Food Poverty**

[3] The full poverty line adds a measure of basic needs and measures total deflated consumption against the full poverty line of 770,678 Leones.
Total per equivalent adult expenditure/Full Poverty.

[4] This is a measure of the contribution to total poverty.

[5] This is the income gap ratio.

[6] This is a measure of the level of average consumption above the poverty line.

[7] This is provides an index of self-sufficiency

[8] This provides a ratio of the monetarized expenditures

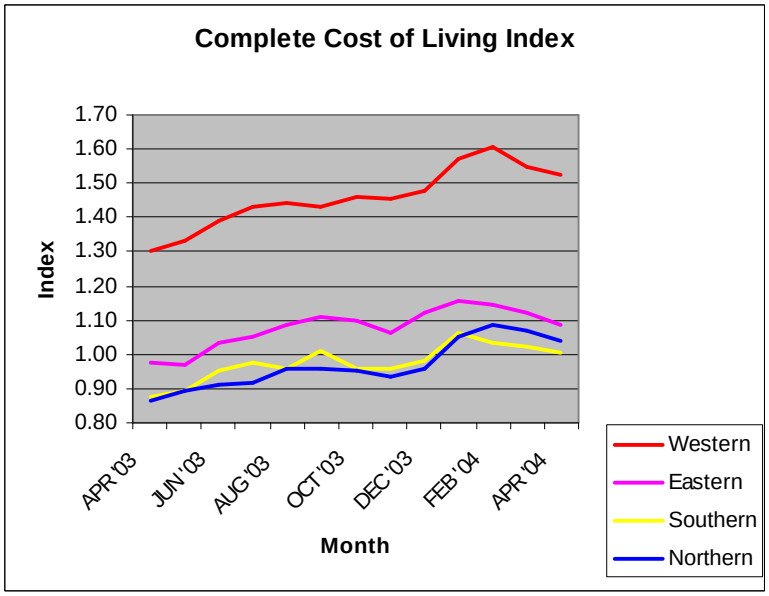
B. Poverty Indices

A separate page providing the primary poverty indices is provided. This page should be used as a reference when evaluating poverty by district and strata.

Strata

One salient characteristic of poverty in Sierra Leone, is the higher incidence of food (nutritional) poverty in urban areas compared with overall poverty. Food poverty is understood as the expenditures of a household dedicated to food such that each member of the household (treated in terms of adult equivalence) receives the minimum caloric requirement, in this case, 2700 calories. The stratum with the highest food poverty unexpectedly indicates that urban areas outside of Freetown are not eating enough. The incidence of food poverty in "other urban" is 75% meaning that 3 out of 4 people in the urban zones outside of Freetown are not attaining the minimum caloric levels. Adding a component for basic needs to the consumption, the full poverty line indicates that poverty actually decreases in the urban strata and expectedly increases in the rural area (from 69% to 79%). This trend is particularly noticeable in Freetown where disturbingly 38% of the people are not eating enough though only 15% of the population falls below the basic-needs poverty line. There are several interpretations possible.

Urban areas tend to be monetarized, that is, there is currency available. Imputed values assign a level of welfare to a household although the value is not actually monetary. This is the case for owner imputed rent and consumption of own produce. Sierra Leone has undergone a period of rapid inflation over the course of the survey. Urban areas are unable to cope with rising food prices by eating their own produce. Expenditures on food items will tend to be in cash. Likewise, renting homes is more prevalent in urban areas as is the need to use public transport. A table is provided in the annexes which detail the share of monetarized expenditures per strata. As expected, 84% of the expenditures reported in the survey in urban areas can be attributed to cash expenditures, followed by 71% in the rural areas and the lowest as expected is the rural area where roughly 53% of consumption is monetary.



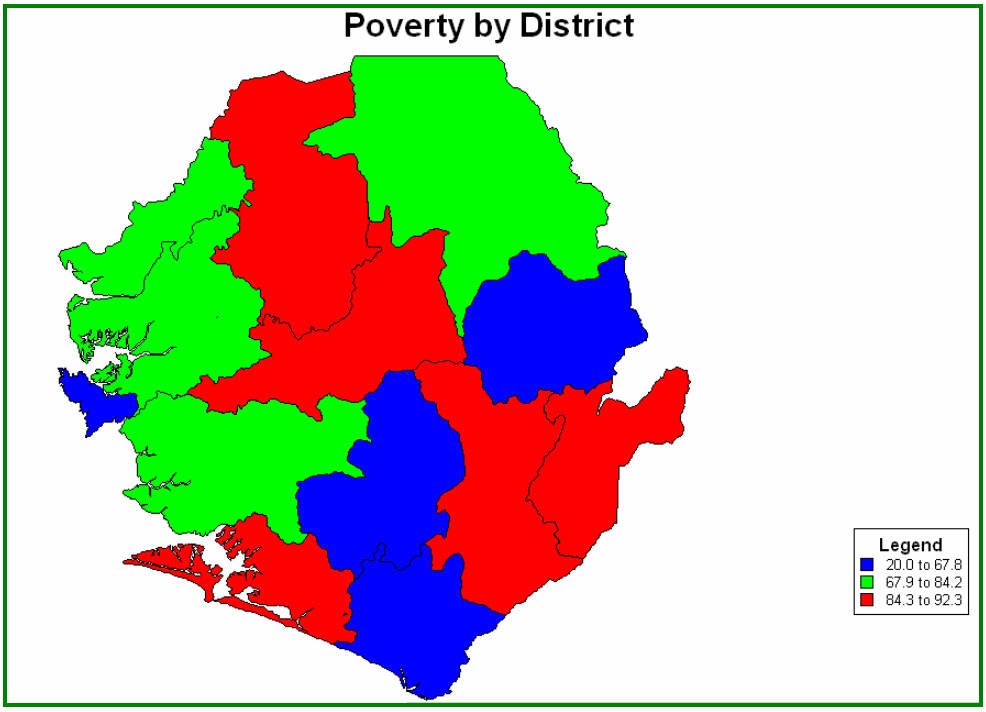
The graph to the left shows the increase in prices over the course of the survey. It is based on a national basket of goods, both food and non-food representative of the poorest 20%. With unstable prices, and wages that may not be increasing proportionally, people living in urban areas may be sacrificing food consumption in order to pay for fixed cost items such as rent and transport to and from work. Such price instability and erosion of purchasing power translates into less food consumption in areas of high population concentration.

Another issues cited as possibly causing some distortion involves the technicality of the sample selection. Although the sample was stratified, it was done so implicitly. There were more urban households interviewed during a cycle than in rural areas (i.e. 20 instead of 15). This is usually done to over-sample

areas identified as having more diverse characteristics and over-sampling will capture these characteristics. However, the total household count still respected the proportion of populations estimated to live in the strata. Explicitly stratified sample would have selected households from separate lists and treat the selection of each differently (appropriately weighting the sample in the final analysis).

Districts

The survey data can be used to evaluate the poverty situation at the district level. The map below graphically presents the incidence of poverty at the district level. Those districts in red have the highest incidence of poverty and those in blue, the lowest.



The following observations at the district level are offered.

Kailahun:

Appears to be one of the worst off districts with 92% of the population living under the full poverty line. Likewise, the poverty appears to be relatively deep and the level of monetary expenditure low.

Bombali:

Bombali is an area where the incidence of extreme poverty is the highest at 63%. This figure appears to bedisproportionately high.

Western Rural:

The Western Rural area shows interesting characteristics due to its proximity to the capital. Furthermore, an evaluation of the EAs surveyed in the area may show that there is an encroachment of the urban zone. These areas, although classified as rural may in fact require reclassification.

Pujehun:

Higher proportions of imputed consumption than other areas. Lower average household sizes and the sample may be too rural (lower than other areas at 21.1% urban). Imputed rent is higher, this could be due to a bias in the enumerators and own produce is high.

Western Urban:

Shows that there is a low level of extreme hunger although 38% are going to bed hungry and 15% fall below the basic needs. When Western Rural is factored in it increases to 20%. Furthermore, from the excess consumption ratio, it is the only place in the country that appears to have a large consumption base and is likewise highly monetarized.

Bo:

Shows a pattern similar to urban area poverty and is one of the more monetarized districts. This is probably due to Bo town and it's effect at the district level.

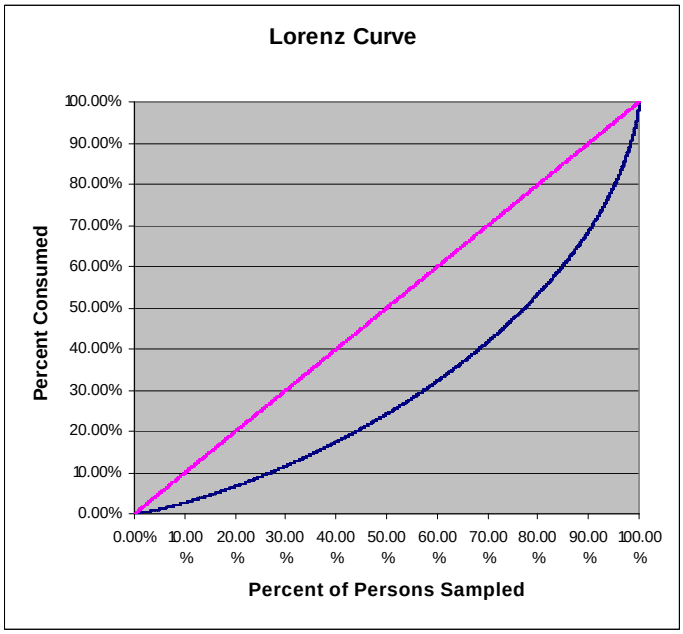
Kono:

Shows mid level poverty but has the highest Gini coefficient implying that there is a high level of inequality.

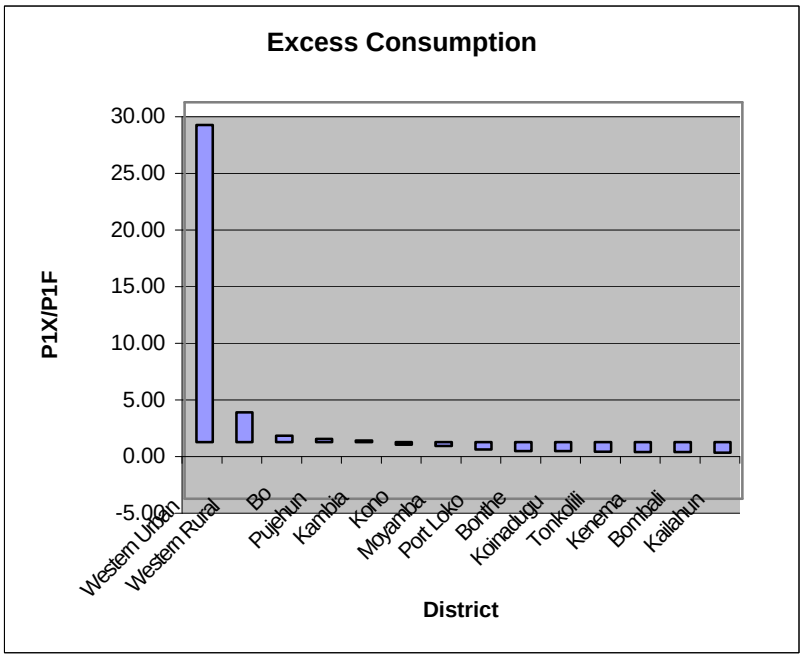
Port Loko

Shows the highest contribution to poverty at 11.5%

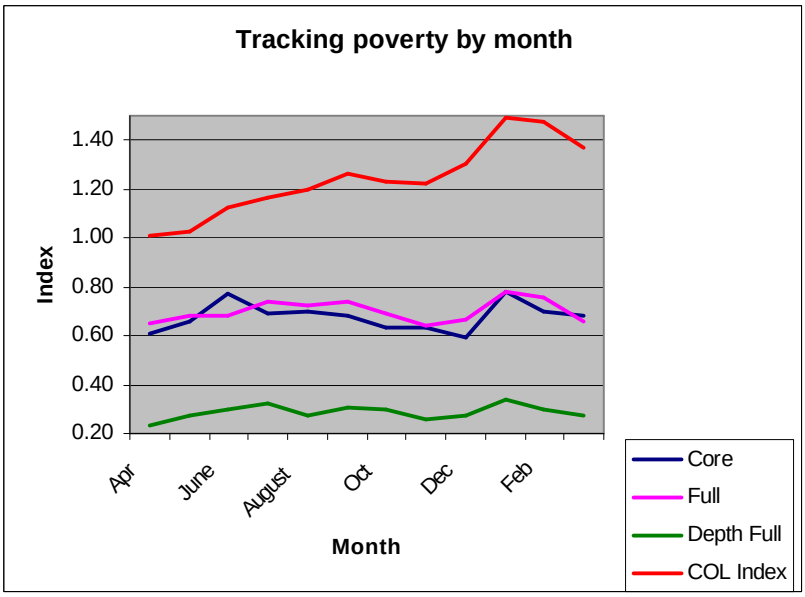
Inequality Measures



The Lorenz curve portrayed here is a graphical depiction of inequality based on the distribution of total household consumption. The curve plots consumption of people ranked for lowest to highest against the percentage of consumption they represent. The closer the curve lies to the 45 degree line, the greater equality of distribution. In the case of Sierra Leone, this graph shows that the top 20% of the population are responsible for about 47% of consumption, whereas the bottom 20% are responsible for about 6.65% of consumption. A common numerical indicator used to convey the Lorenz Curve is called the Gini Coefficient. The Gini Coefficient essentially calculate the area under the idealized curve and subtracts the area under the actual curve. The closer the actual curve is to the idealized curve, the closer the Gini coefficient approaches unity. The more pronounced the inequality the less the Gini coefficient with a theoretical minimum of 0. In the case of Sierra Leone the Gini coefficient relative to this Lorenz Curve is 0.39. A specific evaluation of the Gini coefficient will be dealt with in greater detail in the sections dedicated to the specific provinces.



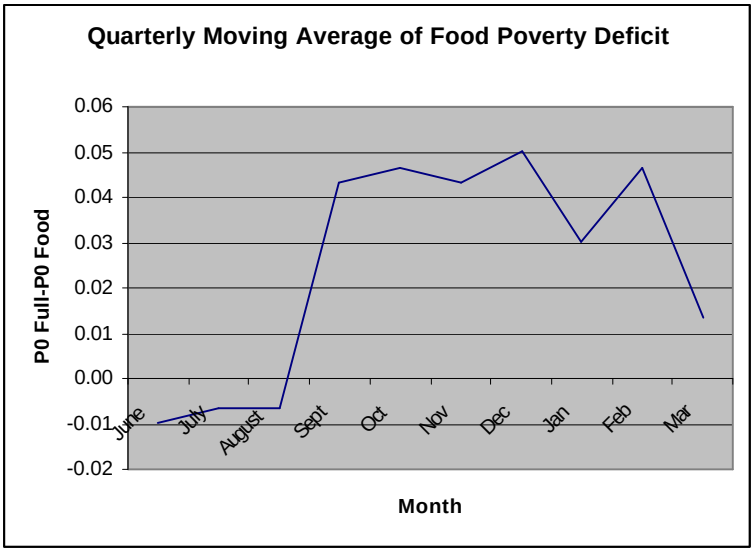
Another interesting analysis was done on the depth of excess consumption. This applies the same calculation used for those below the poverty line to those above the poverty line. By examining the ratio of the depth of the excess consumption over the depth of the food poor, any number below 1 implies that all the excess consumption could not fill the want of the country, any ratio above unity effectively an indicator for self-sufficiency. In Sierra Leone, this ratio is 0.86 meaning that if all the excess consumption were redistributed among the poor, this would succeed in making everyone poor.

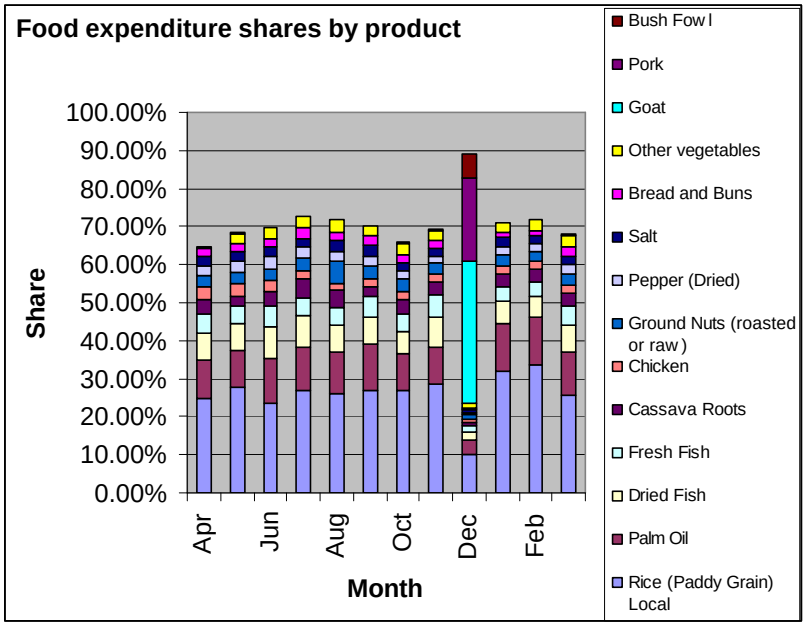


Food Security

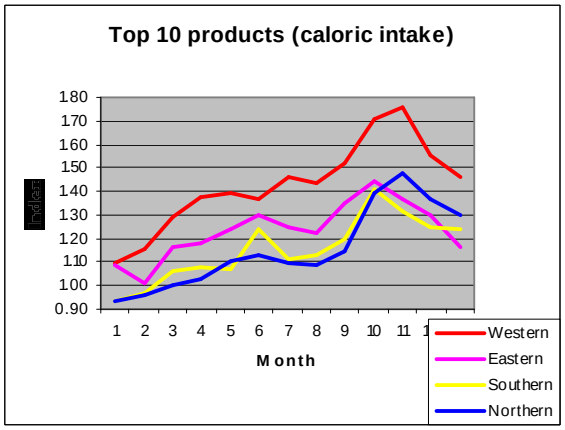
Because of the recent price increases seen throughout the country and certain characteristics of urban poverty, a section of food security is submitted. This section evaluates poverty on a monthly basis over the course of the survey and tries to capture seasonal issues. The graph below charts the average price index across all regions and plots food poverty, basic needs poverty and the depth of poverty on a national level. A few characteristics are noteworthy. It is clearly evident that the full poverty line closely tracks the national COL index. This is not surprising since expenditures are deflated by the index. However, given that it tracks relatively closely, it can be assumed that expenditures in fact have remained at the same level through the survey. Had expenditures risen to meet the high cost of living, the poverty line would have flattened. Another characteristic worth noting is the charting of the food poverty line. The line shows a peak in June probably due to seasonality issues as this month traditionally marks the beginning of the hungry season. The line shows a downward trend around the month of October, with a minimum reached in December (which could likewise reflect spending during the holiday season). What is disconcerting is the abrupt rise in food poverty in January which corresponds with a period of high price increases. The end of the curve, in March, is much higher than the beginning meaning that as another hungry season begins, there is little excess available. Should the trend be the same, it may be that there will be an increase in the incidence of food poverty over the next six months which is greater than the previous year.

An examination of the moving averages of the difference between the full poverty and the food poverty clearly shows a deficit during the months of June, July and August which accordingly are the three months termed the "hungry" months. Once again, in March there is a strong move downward probably due to the price increases leaving some room for concern as the country moves again into a hungry period.





Another interesting seasonality issue captured in the survey is the variation of the basket of food consumption during the holiday season. Evident from the shares allocated to different food products is the dedication of the budget to meat during the month of December. Also of interest is the upward trend in the expenditures of rice and palm oil. This could be reflective of the increase in prices and the inelastic qualities these products have, that is the quantities consume remain the same despite price increases.



Because of the high relative amount of inflation, an analysis was done of how price increases affects the poorest consumption bundle. The top 10 products were selected in terms of caloric contribution to the diet. These products are the following:

- Rice
- Palm Oil
- Garri
- Groundnuts
- Cassava
- Potato or cassava leaf
- Dried fish
- Sugar

A separate price index was computed for these products. As can be seen from this price index, the price increases for these primary goods are much more pronounced than the ordinary price index.

The impoverished existence of the poor may be best illustrated by a balance sheet of the average food poor person. This budget set computes expenditures on food and then adjusts to calculate the final monetary remainder for allocation to other sources. The average daily consumption of the average food poor is approximately 408 Leones .

Extreme poverty budget

Product	Daily Consumption (Leones)	Grams or ml consumed	Calories
Rice	126	134	474
Cassava Root	12	25	38
Cassava Gari	3	23	81
Palm Oil	51	34	296
Broad Beans	2	2	7
Potato or Casava Leaf	13	48	33
Sugar	6	5	18
Dried Fish	34	8	22
Peanuts	14	7	40
Totals	262		1009
Adjust for own produce 37%	97		
Cash expenditure on food	165		
Approximate daily cash outlay	574		
Daily budget net of food	409		

Budget for the food poor based on food outlays of the top 10 products.

Product	Daily Consumption (Leones)	Grams or ml consumed	Calories
Rice	196	209	737
Cassava Root	19	40	59
Cassava Gari	4	28	97
Palm Oil	79	53	460
Broad Beans	7	6	20
Potato or Casava Leaf	20	74	52
Sugar	8	6	25
Dried Fish	53	13	34
Peanuts	22	11	62
Totals	408		1545
Adjust for own produce 36%	147		
Cash expenditure on food	261		
Approximate daily cash outlay	675		
Daily budget net of food	414		

Budget for the non-food poor based on outlays for the top 10 products of the poor food basket.

Product	Daily Consumption	Grams or ml consumed	Calories
Rice	323	344	1216
Cassava Root	45	97	144
Cassava Gari	13	86	303
Palm Oil	151	100	879
Broad Beans	9	8	27
Potato or Cassava Leaf	5	19	13
Sugar	24	18	68
Dried Fish	130	31	83
Peanuts	53	27	149
Totals	753		2882
Adjust for own produce 24%	181		
Cash expenditure on food	572		
Approximate daily cash outlay	2030		
Daily budget net of food	1458		

Analysis by quintile

A standard practice used for evaluating the characteristics of the poor is to tabulate key variable against welfare (consumption). This is done by grouping the population into quintiles (groups of 20%) ranked in terms of purchasing power; the first quintile being the poorest and the fifth being the highest. The table below shows the ranges of consumption used to classify the population into their respective quintiles.

Adult Equivalent Consumption Ranges (Quintile) in regionally deflated prices

Quintile	Minimum	Maximum	Mean	Median
1	54,030	335,438	247,556	261,104
2	335,605	470,111	402,826	403,306
3	470,527	635,860	546,796	542,788
4	635,961	948,436	778,776	772,378
5	948,647	13,996,645	1,711,177	1,338,153
Total	54,030	13,996,645	778,241	581,483

All of the first three quintiles and part of the fourth are below the poverty line of 770,678 Leones. A summary table of the characteristics is provided below. The details are attached as tables in the annexes.

	Poor	**Non Poor**
Household size	7.06 persons per household	5.5 persons per household
Mean adult equivalent consumption	247,556 per year	1,711,177 Leones per year
Own to rent ratio	8.66	2.55
Owning goats	8.51%	15.83%
Median credit accounts	50,000 Leones	72,500 Leones
% households owning radio	27.29%	57.78%
% Own a sewing machine	1.44%	7.99%
% of time caring for children	15.6%	25.23%
Time spent on disposing garbage	Spend 1.28 times the average	Spend 0.85 times the average
Income from wages	8.15%	43.47%
Income from self	25.82 %	15.23 %
Marital Status	79% polygamous are poor	66% of unmarried are non poor
Education status	73% with no education are poor	86% with university degree are non poor or 58% with senior level
Activity Status	76% in agricultural sector are poor	66% of professionals are non poor
Age and sex (26-35 years old)	69% of female headed households are poor.	59% of male headed households are poor

Tables

Table: Average non-monetary vs. monetary consumption by stratum

Stratum	Imputed	Monetary	Total	M ratio
Freetown	225,342	1,157,499	1,382,841	0.84
Rural	219,064	247,129	466,193	0.53
Other Urban	154,373	374,387	528,759	0.71
Total	203,712	376,699	580,411	0.65

Table: Non-monetary vs. monetary consumption

	Imputed consumption			Monetary		
District	Rent	Other Imputed	Total non-monetary	Total Monetary	Total	M ratio
Bo	38,577	188,210	226,787	518,046	744,833	0.70
Bonthe	20,883	101,985	122,868	255,681	378,549	0.68
Moyamba	33,605	184,000	217,605	277,138	494,743	0.56
Pujehun	60,239	312,813	373,053	265,443	638,497	0.42
Kailahun	29,294	141,433	170,727	178,029	348,757	0.51
Kenema	35,845	103,886	139,731	237,307	377,038	0.63
Kono	31,518	188,108	219,626	321,740	541,366	0.59
Bombali	23,286	131,059	154,345	191,216	345,561	0.55
Kambia	36,658	155,373	192,030	428,912	620,943	0.69
Koinadugu	32,910	228,452	261,362	186,387	447,750	0.42
Porto Loko	19,288	127,711	146,999	278,807	425,806	0.65
Tonkolili	15,114	215,115	230,229	178,116	408,346	0.44
Western Urban	112,439	112,903	225,342	1,157,499	1,382,842	0.84
Western Rural	125,467	142,771	268,238	456,588	724,826	0.63
Total	**41,500**	**162,213**	**203,712**	**376,699**	**580,411**	**0.65**

Table: Average non-monetary vs. monetary consumption by quintile

Quintile	Imputed	Monetary	Total	M ratio
Poorest 20%	88,886	209,541	298,427	0.70
Second	133,841	238,464	372,305	0.64
Third	171,229	291,374	462,603	0.63
Fourth	245,884	360,423	606,307	0.59
Fifth	365,854	741,031	1,106,884	0.67

Mean household size by quintile

	Mean
1	7.06
2	6.72
3	6.35
4	5.50
5	5.50
Total	6.16

Quintile Distribution by District

District	**Quintiles**				
	1	**2**	**3**	**4**	**5**
Bo	19.78	15.26	19.14	20.43	25.40
Bonthe	28.36	27.65	22.15	12.02	9.82
Moyamba	11.24	16.55	27.50	23.48	21.24
Pujehun	8.17	16.86	16.13	34.75	24.10
Kailahun	31.79	33.02	20.35	11.78	3.06
Kenema	29.76	24.96	21.21	16.96	7.12
Kono	18.75	11.83	23.67	26.63	19.12
Bombali	55.26	20.33	8.79	8.21	7.41
Kambia	7.22	18.12	27.74	32.41	14.51
Koinadugu	23.45	21.46	23.27	22.24	9.58
Porto Loko	11.32	33.84	27.42	18.72	8.69
Tonkolili	22.67	27.03	22.97	20.48	6.85
Western	1.05	3.07	5.43	18.28	72.16
Western Rural	7.37	16.36	13.59	20.05	42.63

Present occupancy status?	Quintiles					Total
	1	2	3	4	5	
Owning	66.72	62.50	61.56	58.80	42.34	57.75
Renting	7.70	10.59	11.84	15.30	34.06	16.60
House provided rent free	24.96	26.03	25.35	25.18	21.90	24.60
Other	0.62	0.88	1.25	0.72	1.70	1.05

Owneship of animal by household

QUINTILES		% owning
1	Goats and sheep	8.51
	Chickens	94.76
	Other	1.84
2	Goats and sheep	11.39
	Chickens	96.01
	Other	2.50
3	Goats and sheep	15.36
	Chickens	93.75
	Other	2.95
4	Goats and sheep	17.33
	Chickens	94.75
	Other	3.55
5	Goats and sheep	15.83
	Chickens	93.28
	Other	4.15

Median amount of credit obtained by quintile

Total amount of the original loan

Quintile	Median
1	50,000
2	60,000
3	50,000
4	50,000
5	72,500
Total	50,000

Gender of head of household by poverty

Percentage

	Poor	Non poor
Male	66.62	33.38
Female	66.33	33.66

Households owning at least one of the products by quintile

Product	**Quintiles**				
	1	**2**	**3**	**4**	**5**
Furniture	41.67	60.79	59.49	61.96	70.65
Sewing Machine	1.44	2.42	2.26	2.45	7.99
Stove	0.48	1.68	2.01	4.94	24.68
Refrigerator	0.00	0.91	0.71	1.60	16.73
Air Conditioner	0.00	0.00	0.00	0.00	0.51
Fan	0.48	1.22	1.57	5.17	22.55
Radio	27.29	35.55	40.91	41.27	57.78
Radio Cassette	12.04	21.24	23.12	33.54	46.68
Record Player	0.16	0.61	1.00	1.36	3.71
3_In_One Radio	0.48	0.31	0.29	1.36	9.00
Video Equipment	0.00	0.15	0.29	1.73	14.96
Washing Machine	0.00	0.00	0.00	0.00	0.26
T.V.	0.00	0.15	0.43	2.48	18.39
Camera	0.16	0.00	0.71	0.49	4.36
Iron(Electric)	0.81	0.61	0.85	1.72	16.43
Bicycle	3.05	5.96	5.55	5.04	5.42
Motor Cycle	0.32	0.15	0.72	0.62	1.68
Car	0.48	0.15	0.29	0.74	3.08

Hours spent on household chores by the household by quintile

Quintile	Hours per week fetching firewood	Hours per week fetching water	Hours per week ironing clothes	Hours per week taking care of children	Hours per week washing motor vehicles	Hours per week sweeping	Hours per week disposing of garbage	Hours per week preparing meals	Hours per week shopping	Hours per week running errands	Hours per week washing dishes	Hours per week other household activites	Total
1	7.59	7.03	8.01	17.23	4.03	6.87	6.24	12.58	10.56	12.36	6.73	11.21	110.43
2	6.10	5.88	6.47	18.48	3.85	5.61	4.93	11.90	9.79	10.83	5.62	9.37	98.84
3	6.80	5.50	5.67	19.34	3.81	5.07	4.45	11.78	8.21	10.02	5.34	8.15	94.14
4	6.33	5.82	5.02	21.41	3.53	4.99	4.34	12.61	8.69	9.20	5.07	8.01	95.03
5	6.99	5.54	4.36	24.25	7.82	4.45	4.17	12.03	8.03	7.75	4.63	6.10	96.12
Total	6.77	5.98	5.70	20.01	7.34	5.42	4.86	12.19	9.06	10.07	5.50	8.57	101.46

The third quintile value for hours spent washing motor vehicles was imputed.

Poverty by marital status	**% age**	
	Poor	Non poor
Married Monogamous	65.57	34.43
Married Polygamous	79.05	20.95
Informal/Loose Union	25.00	75.00
Divorced/Separated	58.56	41.44
Widowed	66.41	33.59
Never Married	34.41	65.59
Married polygamous with wives in separate households	57.89	42.11

Poverty by education

% age

	Poor	Non poor
None	73.11	26.89
Primary	61.15	38.85
Junior	52.88	47.12
Senior	41.99	58.01
University	13.64	86.36

Poverty by activity status

% age

	Poor	Non Poor
Economically Inactive	54.55	45.45
Professional or service related	33.74	66.26
Teaching related	51.24	48.76
Commercial or trade related	58.03	41.97
Agricultural	75.67	24.33
Construction or manufacturing	45.96	54.04
Mining	57.28	42.72

Poverty by age and sex (head of household)

Male	Poor	Non Poor
0-25 years	62.83	37.17
26-35 years	58.63	41.37
36-45 years	68.02	31.98
46-55 years	69.03	30.97
56-65 years	69.92	30.08
Greater than 65	74.31	25.69
Female		
0-25 years	60.00	40.00
26-35 years	68.69	31.31
36-45 years	64.91	35.09
46-55 years	71.29	28.71
56-65 years	68.46	31.54
Greater than 65	52.87	47.13

Flow of savings: OSUSU by quintile

	Median Values			
Quintile	Current value of savings	Amount added to the savings in last 12 months?	Amount withdrawn in the last 12 months?	Net Savings
1	90,000	20,000	50,000	-30,000
2	100,000	0	50,000	-50,000
3	75,000	0	35,000	-35,000
4	100,000	0	15,500	-15,500
5	240,000	30,000	30,000	0
Total	100,000	0	29,000	-29,000