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URBAN FOOD CONSUMPTION PATTERNS AND
NATIONAL FOOD POLICY IN LIBERIA

Report 2, Part 1
Results of the Household Survey

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by

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
List of Tables	i
Executive Summary	vi
I. Introduction	1
II. Demographic Patterns in Urban Areas	3
A. Household Size and Distribution	3
B. Characteristics of Household Heads	5
C. Households Making Farm	12
III. Expenditure and Price Patterns in Liberia	14
A. Expenditure and Consumption Relationships	14
1. Total All Expenditures	14
2. Total Food Expenditures	17
3. Rice Consumption and Expenditures	20
4. Cassava Expenditures	25
5. Other Starch Foods	26
6. Animal Products	27
7. Vegetable Products	28
8. Miscellaneous Foods	30
9. Nonfoods	31
B. Price Relationships	33
1. Rice Prices	33
2. Other Food Prices	35
IV. Methodology	37
A. Household Sample Selection and Size	37
B. Household Data Cleaning and Editing Procedures	39
C. Data Weighting and Tabulation	40
D. Market Price Data Collection	44
V. Literature Cited	46
VI. Appendix Tables	47
VII. Appendix A	101

List of Tables

<u>No.</u>		<u>Page</u>
Table A.	Average Household Sizes, by Monthly Income Level, Urban Areas in Liberia, March 1986 . . . . .	.4
Table B.	Distribution of Households by Household Size, Urban Areas in Liberia, March 1986 . . . . .	.4
Table C.	Distribution of Households by Level of Household Income, Urban Areas in Liberia, March 1986 . . . . .	.6
Table D.	Sex, Marital Status, and Age of Household Heads, Urban Areas in Liberia, March 1986 . . . . .	.7
Table E.	Education, Occupation, and Urbanization of Household Heads and Spouses, Urban Areas in Liberia, March 1986 . . . . .	.10
Table F.	Ethnicity of Household Heads, Urban Areas in Liberia, March 1986 . . . . .	.11
Table G.	Household Making Farm, Urban Areas in Liberia, March 1986 . . . . .	.13
Table H.	Mean Income of Households by Level of Household Income, Urban Areas in Liberia, March 1986 . . . . .	.15

Appendix & Tables

Table 1.	Weekly Household Rice Expenditures by Type and Source of Rice, and Number and Frequency of Households Purchasing, Urban Areas in Liberia, March 1986 . . . . .	.48
Table 2.	Household Rice Expenditures on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986	49
Table 3.	Household Expenditures for Other Cereals on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.	50
Table 4.	Household Expenditures for Cassava Products on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.	51
Table 5.	Household Expenditures for Pulses on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986	51
Table 6.	Household Expenditures for Other Starchy Foods on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.	52

Table 7.	Household Expenditures for Meat and Fish on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.	53
Table 8.	Household Expenditures for Poultry, Milk and Oils on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.	54
Table 9.	Household Expenditures for Vegetables on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.	55
Table 10.	Household Expenditures for Fruit on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986	57
Table 11.	Household Expenditures for Other Food at Home on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.	58
Table 12.	Household Expenditures for Food Away From Home on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.	59
Table 13.	Household Expenditures for Alcoholic Beverages on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986	60
Table 14.	Total Household Food Expenditures on a Monthly Basis, Urban Areas in Liberia, March 1986	61
Table 15.	Household Expenditures for Fuel on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986	62
Table 16.	Household Expenditures for Housing on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986	63
Table 17.	Household Expenditures for Clothing on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986	63
Table 18.	Household Expenditures for Transportation on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.	64
Table 19.	Household Expenditures for Health and Education on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.	64
Table 20.	Household Expenditures for Other Nonfoods on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.	65

Table 21. Household Gifts and Tax and Interest Payments on a Monthly Basis, Number and Frequency of Payments, Urban Areas in Liberia, March 1986.	66
Table 22. Total Household Expenditures for all Items on a Monthly Basis, Urban Areas in Liberia, March 1986	67
Table 23. Per Capita Rice Expenditures or Use on a Monthly Basis, Urban Areas in Liberia, March 1986.	68
Table 24. Per Capita Expenditures for Other Cereals on a Monthly Basis, Urban Areas in Liberia, March 1986	68
Table 25. Per Capita Expenditures for Cassava Products on a Monthly Basis, Urban Areas in Liberia, March 1986 .68	
Table 26. Per Capita Expenditures for Other Starchy Foods on a Monthly Basis, Urban Areas in Liberia, March 1986 .69	
Table 27. Per Capita Expenditures for Pulses on a Monthly Basis, Urban Areas in Liberia, March 1986.	69
Table 28. Per Capita Expenditures for Meat and Fish on a Monthly Basis, Urban Areas in Liberia, March 1986	69
Table 29. Per Capita Expenditures for Poultry, Milk, and Oil Products on a Monthly Basis, Urban Areas in Liberia, March 1986.	70
Table 30. Per Capita Expenditures for Vegetables on a Monthly Basis, Urban Areas in Liberia, March 1986	70
Table 31. Per Capita Expenditures for Fruits on a Monthly Basis, Urban Areas in Liberia, March 1986.	71
Table 32. Per Capita Expenditures for Other Food at Home on a Monthly Basis, Urban Areas in Liberia, March 1986 .71	
Table 33. Per Capita Expenditures for Food Away From Home on a Monthly Basis, Urban Areas in Liberia, March 1986 .71	
Table 34. Per Capita Food Expenditures for Alcoholic Beverages on a Monthly Basis, Urban Areas in Liberia, March 1986	72
Table 35. Total Per Capita Food Expenditures on a Monthly Basis, Urban Areas in Liberia, March 1986	73
Table 36. Per Capita Expenditures for Fuel on a Monthly Basis, Urban Areas in Liberia, March 1986.	74
Table 37. Per Capita Expenditures for Housing on a Monthly Basis, Urban Areas in Liberia, March 1986.	74

Table 38.	Per Capita Expenditures for Clothing on a Monthly Basis, Urban Areas in Liberia, March 1986 . . . . .	.75
Table 39.	Per Capita Expenditures for Transportation on a Monthly Basis, Urban Areas in Liberia, March 1986 . . . . .	.75
Table 40.	Per Capita Expenditures for Health and Education on a Monthly Basis, Urban Areas in Liberia, March 1986 . . . . .	.75
Table 41.	Per Capita Personal Contributions and Tax and Interest Payments on a Monthly Basis, Urban Areas in Liberia, March 1986. . . . .	.76
Table 42.	Per Capita Expenditures for Other Nonfoods on a Monthly Basis, Urban Areas in Liberia, March 1986 . . . . .	.76
Table 43.	Total Per Capita Expenditures for All Items on a Monthly Basis, Urban Areas in Liberia, March 1986 . . . . .	.77
Table 44.	Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Monrovia, March 1986 . . . . .	.78
Table 45.	Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Buchanan, March 1986 . . . . .	.79
Table 46.	Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Gbarnga, March 1986. . . . .	.80
Table 47.	Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Ganta, March 1986. . . . .	.81
Table 48.	Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Sanniquellie, March 1986. . . . .	.82
Table 49.	Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Zorzor, March 1986 . . . . .	.83
Table 50.	Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Voinjama, March 1986 . . . . .	.84
Table 51.	Monthly Per Capita Expenditures for Rice and for Food Groups, by Age of Household Head, by Urban Area in Liberia, March 1986 . . . . .	.85
Table 52.	Monthly Per Capita Expenditures for Rice, Food Groups and Nonfood Groups, by Education of Household Head, Monrovia, March 1986. . . . .	.87
Table 53.	Budget Shares of Expenditures for Rice, Other Food Groups, and Nonfoods, Urban Areas in Liberia, March 1986. . . . .	.88
Table 54.	Budget Shares of Expenditures for Food and Nonfood Groups, by Income Group, Monrovia, March 1986 . . . . .	.89

- Table 55. Budget Shares of Expenditures for Food and Nonfood Groups, by Household Income Group, Average for All Urban Areas Other Than Monrovia, March 198690
- Table 56. Share of Income Spent for Food, by Food Group, Urban Areas in Liberia, March 1986.91
- Table 57. Share of Income Spent for Food, by Food Group and by Level of Household Income, Monrovia, March 1986 . .92
- Table 58. Share of Income Spent for Food, by Food Group and by Level of Household Income, Average All Urban Areas Other Than Monrovia, March 198693
- Table 59. Market Prices for Food Products, by Urban Area, Liberia, March 198694
- Table 60. Quantities of Household Rice Purchase or Use on a Monthly Basis, March 198695
- Table 61. Quantities of Rice Purchased or Used Per Capita on a Monthly Basis, March 198696
- Table 62. Implied Quantities of Selected Food Products Purchased Per Capita on a Monthly Basis, Urban Areas in Liberia, March 198697
- Table 63. Percentages of Households Purchasing or Using Individual Food Items During the Survey Period, Weighted for Structure Size, Urban Areas in Liberia, March 1986 .98
- Table 64. Percentages of Households Purchasing Individual Non-food Items During the Survey Period, Weighted for Structure Size, Urban Areas in Liberia, March 1986 .100

EXECUTIVE SUMMARY

A household survey was conducted in seven urban areas of Liberia in March 1986 for the purpose of determining food consumption and expenditures patterns for rice and other food products. Nonfood expenditures were also measured, mainly for the purpose of developing a proxy for total income against which to assess food spending patterns. Retail prices were collected in local markets for the purpose of deriving quantities of food purchased from household expenditures, and if possible, to derive price elasticity estimates.

Findings

Total household expenditures for all items averaged \$429 per month or \$5,153 at an annual rate, with no adjustment for seasonality. This figure varied from a high of \$5,675 annual rate in Monrovia to only \$2,303 in Zorzor. On a per capita basis, total expenditures averaged \$829 annual rate for all urban areas. For Monrovia, per capita expenditures totaled \$924 compared with the average for the other six urban areas of \$557. One can compare these figures with average per capita gross domestic product for all of Liberia reported at \$497 per year in 1984, according to the Ministry of Planning. But, of course, the concepts of gross domestic product and household expenditures

differ considerably, the survey data relate only to urban areas, and the time periods differ by one year.

Food and beverage expenditures averaged \$173 per household per month or \$27.81 per capita. These items accounted for 38.5 percent of total spending in Monrovia, and they ranged upward in other urban areas to a peak of 55 percent in Zorzor. As expected, the percentage of income spent for food was found to decrease sharply over increasing income levels. In Monrovia, food spending declined from 57 percent of income, for households with average incomes below \$100 per month, down to 20 percent for households with average monthly income of \$1,500 or more. For the remaining six urban areas, food spending as a percentage of income declined from 72 percent for the average of all households with monthly incomes below \$100 per month, down to 31 percent for the highest income group averaging \$900 or more.

Per capita rice consumption was reported at 21.0 pounds per month in Monrovia, or 252 pounds per year. This amounts to 129 pounds per household per month. Voinjama led all areas in rice consumption at 28.4 pounds per capita or 339 pounds per year. The average of all six areas other than Monrovia averaged 21.2 pounds per capita per month or 255 pounds per year. These consumption levels somewhat exceed the average per capita level as reported by the Ministry of Agriculture.

The Ministry reported per capita consumption of rice at 244 pounds per year in 1984 for all of Liberia, when measured on a disappearance

basis. The 1976-78 household survey had reported an equivalent annual average of 218 pounds, as reported in Report 1. That survey reported 222 pounds consumed in rural areas and 213 pounds in urban areas.

Of all rice used, according to the survey, 81 percent was imported, 18 percent was from the "country", and 1 percent was from "concessions." These proportions contrast sharply with national totals which include rural as well as urban data. In 1985, total imports amounted to 71.7 million metric tons. If rice production stayed the same in 1985 as in 1984 (not yet reported), imports accounted for only 19.4 percent of total production plus imports for 1985.

If one computes total use for imported rice reported in urban areas, it is found that about 100 million pounds is accounted for on an annual basis. This amount is 63 percent of total imports of imported rice in Liberia in 1985, which totaled 158 million pounds. The remaining one-third of total imports presumably was used in rural areas and small villages.

Households in Monrovia reported 39 percent of all rice purchased by the cup or kenke on a daily or weekly basis, 60 percent purchased in bags on a less frequent basis, and 1 percent from other sources. Some areas, such as Voinjama, reported as much as 70 percent purchased in bags.

Over 90 percent of all households surveyed had purchased or used some rice during the survey week. But, households buy many foods other than rice. Rice accounted for 7 cents out of each dollar of the total household budget in Monrovia, according to the survey. Almost as much--6 cents of each dollar--was spent for cassava, other cereals, and other starchy foods. Three-fourths of all households in Monrovia purchased bread products during the survey period.

Even starchy foods as a group may not be as important as one might have thought. The total spending of 13 cents for all starchy foods was less than the 15 cents of the budget spent for meat, fish, poultry, and dairy products. The budget composition for Monrovia, however, was much different from some other urban areas; Zorzor, for example, spent relatively much more for rice. Zorzor had the highest budget share spent for rice at 25 percent.

In terms of the percentage of total food spending (rather than the entire budget) going for rice, in Monrovia, rice accounted for 17 percent of the total compared with 22 percent in Ganta and a high of 36 percent in Zorzor. All starchy foods accounted for 32 percent of total food spending in Monrovia.

Per capita spending for rice actually declined substantially over income levels in most urban areas. In Monrovia, the decline was from \$7.60 per month for the lowest income level to \$4.26 at the highest income level. But, spending increased significantly over income for

other cereals, meat and certain other products. Spending for cassava was more stable over income levels than for rice. These income associations may have significant long-term implications for rice policy in Liberia, which will be examined in subsequent reports on this project.

Prices paid for rice were reported to be lower in Monrovia than in the other urban areas, both for country rice and for imported rice, when sold by the bag. The average price advantage was 2.6 cents for country rice and 2.4 cents for imported rice. The prices paid for rice purchased by the bag were usually lower for country rice than for imported rice in areas outside of Monrovia, as one would expect. Also country rice sold in Monrovia was slightly higher than imported rice when sold by the bag.

However, these price relationships did not hold the same for rice prices reported from the market surveys. These prices were reported by the cup or kenke. Market price data showed country rice prices higher than imported rice in most areas. On the average, country rice prices exceeded imported rice prices by 1.2 cents per pound.

Rice is almost unique in selling more cheaply in Monrovia than in other urban areas. Perhaps this relationship is due to the price controls on rice which may be more closely monitored in Monrovia than in outlying areas. Out of the 20 other food items for which price

comparisons could be made, 17 of them had higher prices in Monrovia, and often the price differences were substantial.

Household Characteristics

Average household size ranged from a low of 6.15 persons in Monrovia to 6.65 persons in Gbarnga. This average, however, is quite skewed because of a sizable number of very large households. The most common household size ranged from 3 to 5 persons in most areas. There was a wide range in household sizes over income groups. Households with less than \$100 monthly income usually averaged only 2 or 3 persons in size compared with 10 or more persons in households averaging \$1,000 or more in monthly income.

About 30 percent of the household heads surveyed in Monrovia, Ganta, and Sanniquellie were female headed and 70 percent were male. Other areas ranged down to only 12 percent female headed in Gbarnga. A similar number--around 30 percent of all households--were headed by single persons, in terms of marital status, in all areas except Voinjama.

Nearly one-fourth of the household heads had no formal education, and this share increased to over one-half in two urban areas. A rather large share of the sample was comprised of government workers in Gbarnga, Sanniquellie and Voinjama; one-fourth of the total. Only 9

percent of the respondents were not employed in Voinjama, compared with 19 percent in Monrovia.

Methodology

The household sample was drawn on the basis of number of housing structures within an urban area. A single household was interviewed within a sample structure. Since many structures have multiple households, the resulting data were weighted on the basis of the number of households within structures. The number of households per structure averaged between 1.3 and 2.1 among the urban areas.

Food expenditures were adjusted for meals eaten away from home and those served to guests, so the data would reflect meals served at home to the household. This adjustment resulted in changes up to 4 percent in spending among urban areas. Data for the various urban areas were weighted together into an all-urban total using weights based on population data from the preliminary 1984 Census of Population. Monrovia accounted for 74 percent of the total population weight.

A very high response rate was obtained from the households surveyed. Data related to only 16 households out of the sample of 942 were not usable due to either nonresponse, incomplete questionnaires, or not serving a sufficient number of meals at home to qualify. This gave a 98 percent rate of completion from the original sample selected.

URBAN FOOD CONSUMPTION AND EXPENDITURE PATTERNS

IN LIBERIA, MARCH 1986

Part 1: RESULTS OF THE SURVEY

I. INTRODUCTION

The Ministry of Agriculture (MOA) conducted a household survey in Monrovia and six other urban areas in Liberia in the second half of March 1986. The other urban areas included Buchanan, Gbarnga, Ganta, Sanniquellie, Zorzor, and Voinjama. Market price data were collected in six of the seven urban areas during the first week of April, and in the seventh area during the first week of May. Prices were collected on approximately the same food items for which expenditure data were obtained from the households.

The purpose of this survey was to provide the Ministry of Agriculture with a baseline of food demand information upon which to develop policies with respect to food and agriculture. This information is designed to support earlier information gathered regarding agricultural production and farm marketing. An earlier household survey had been conducted in 1976 - 78 but those data had not been verified.

Many developments have taken place since that initial effort to raise questions about the consumption and marketing patterns of rice and how they relate to other foods. Special interest focused on the relationships between rice and other food consumption and expenditures relative to household income levels. Underlying these interests is a fundamental

concern for information bearing on the question of rice self-sufficiency in Liberia.

The Marketing Division of MOA was responsible for planning and overall direction of the study. The Statistics Division of MOA collected the survey data using interviewers experienced in conducting Liberia's agricultural surveys. These surveys result in publication of annual agricultural production estimates for Liberia. The Marketing Division of MOA assisted in the data collection by providing several field supervisors and price surveyors. The Agricultural Sector Analysis and Planning Project (ASAPP) assisted in planning and survey selection and design. AID/Liberia provided overall support and encouragement for the project.

The Purdue team travelled to Liberia three times during the conduct of the study. The purpose of the first trip in February 1986 was to assist in study design, questionnaire development, and supervisor training. The second trip in March provided on-site quality assessments of data collection at all seven survey sites during the second week of the household data collection. The data were tabulated and analyzed at Purdue University in the Restaurant, Hotel and Institutional Management Department of the Consumer and Family Science School. A representative from MOA/Liberia assisted in this effort during the early stages of this effort. The third trip to Liberia, in August 1986, allowed discussion of the preliminary findings with the Ministry and AID/Liberia.

II. DEMOGRAPHIC PATTERNS IN URBAN AREAS

A. Household Size and Distribution

The overall average household size for all urban areas was 6.25 persons. This average is weighted by size of population in the various areas so Monrovia figured heavily in the average. Average household sizes did not vary much among the urban areas, as noted in Table A. Ganta, Gbarnga, and Voinjama had the largest average household size, at 6.6 persons, while Monrovia had the smallest with 6.15 persons.

The household size distribution was quite skewed around the average. Since the very large households contain a lot of people, the mean size is larger than the modal size in most areas. The largest percentage of households had 3 to 5 members in all areas except Sanniquellie (table B). The largest single household encountered in the sample contained 58 persons (verified correct), and there were about 15 households with 20 persons or more.

Household sizes varied substantially by income group within each urban area. Households with average incomes per month of less than \$100 usually averaged only 2 or 3 persons in size whereas households with average incomes exceeding \$1,000 per month usually averaged 10 or more persons (table A). For this reason, one income cross-tabulation table giving budget shares of expenditures was presented on the basis of per capita income (in terms of income deciles), however trends in budget shares over income were not greatly affected for most categories of expenditures (table 55).

Table A. Average Household Sizes, by Monthly Income Level, Urban Areas in Liberia, March 1986.

Income Group*	Monrovia	Buchanan	Gbarnga	Ganta	Sanni- quellie	Zorzor	Voinjama
	(number of persons)						
\$0-100	1.94	3.66	2.17	3.00	3.00	3.95	3.71
100-199	3.83	5.34	5.58	4.98	5.11	5.83	4.22
200-299	4.47	6.82	6.68	5.50	6.36	8.84	6.10
300-399	6.83	7.26	6.71	7.80	6.94	7.80	7.13
400-499	7.47	9.50	9.83	10.05	7.86	6.75	7.28
500-599	9.31						
600-699	7.53	8.50	9.22	10.06	10.29	15.50	11.00
700-899	5.92						
900-1,099	10.79	12.33	16.40	10.63	11.11		11.75
1,100-1,499	7.53						
1,500+	12.25						
Average	6.15	6.26	6.62	6.65	6.50	6.34	6.59

* Income groups are compressed for all areas other than Monrovia; for 5 areas, the upper income groups are as follows: \$400-599; 600-899; 900+; for Zorzor, the upper income group is \$600+.

Table B. Distribution of Households by Household Size, Urban Areas in Liberia, March 1986.

Household Size	Monrovia	Buchanan	Gbarnga	Ganta	Sanni- quellie	Zorzor	Voinjama
	(percent)						
1	8.4	6.2	7.5	5.4	.0	9.2	.0
2	7.4	5.7	6.4	4.8	7.8	7.0	5.3
3	13.3	11.4	15.6	12.2	9.9	7.7	15.2
4	12.6	10.4	14.5	15.0	10.6	12.0	16.7
5	13.8	12.3	8.7	9.5	14.2	14.1	9.8
6	8.9	11.8	9.2	10.9	19.1	10.6	9.1
7	9.5	9.0	6.9	10.9	6.4	11.3	8.3
8	5.6	8.1	7.5	4.1	9.2	4.2	6.8
9	3.9	7.6	6.9	1.4	5.7	2.8	7.6
10	3.9	7.6	3.5	6.1	2.8	4.2	6.1
11	3.0	4.3	2.3	6.8	4.3	4.9	2.3
12	1.9	.9	3.5	2.7	3.5	5.6	3.0
13	.9	.9	1.2	3.4	3.5	.0	4.5
14	.7	2.8	1.2	1.4	.0	2.1	.8
15	1.8	.5	1.2	2.7	2.8	2.8	3.8
16	.5	.0	.6	.7	.0	.0	.0
17	.0	.0	.0	.7	.0	.0	.0
18	1.9	.0	.0	.7	.0	.0	.0
19	.4	.0	.0	.0	.0	.0	.0
20+	1.8	.5	3.6	.7	.0	1.4	.8

The distribution of households was also quite skewed on the basis of income, as one would expect (table C). The largest concentration of households had monthly incomes of \$100 - \$299, even in Monrovia. However, Monrovia had a much larger proportion of relatively high income households. Cumulative distributions show that in Monrovia more than one-fourth of the households had income above \$600 per month, whereas only 3 percent of the households in Zorzor and only 8 - 11 percent in all other urban areas had income this high. For this reason, income tabulations in urban areas outside of Monrovia had to be enlarged for analytical purposes in order to have a sufficient number of observations to avoid individual disclosure and to provide meaningful averages.

B. Characteristics of Household Heads

About 30 percent of the households surveyed in Monrovia were female-headed and 70 percent male (table D). There were fewer female-headed households in three of the remaining urban areas, Voinjama, Buchanan, and Gbarnga, but the other three areas were similar to Monrovia.

A surprising number of household heads were single; approximately 30 percent of household heads were single in most urban areas. Voinjama was the major exception with only 9 percent.

In all areas except one, one-half to two thirds of the household heads were aged 35 - 64. There were only 3 - 4 percent of the household heads above age 65 in several of the areas. Ganta was the most atypical in age

age 65 in several of the areas. Ganta was the most atypical in age distribution among household heads. It had relatively many more household heads in both the youngest age group and the oldest age group compared with other areas. As a result, Ganta had relatively few household heads in the age 35 - 64 group (table D).

Household heads were better educated in Monrovia than elsewhere, as one would expect in the capital city. Even so, nearly one-fourth of them had no formal education (table E). This share compares with more than one-half in Buchanan and Voinjama. Over one-half of the household heads in Monrovia had attended either senior high school or college. Spouses of the household heads were not as well educated as their mates. In Monrovia, nearly one-half of the spouses had no formal education. The data in the demographic tables omit households for which no data were available. Thus, only households with spouses, and only those for which data are available, were reported in table E.

Voinjama reported a much higher level of employment than did any other urban area, including Monrovia. Only 9 percent of the household heads were not employed in Voinjama, compared with 19 percent in Monrovia and a peak of 27 percent in Gbarnga. Merchants accounted for 23 percent of the household heads in Monrovia and 21 percent were listed as working at skilled labor. Ten percent were government workers in Monrovia whereas 25 percent of the sample consisted of government workers in Gbarnga, Sanniquellie, and Voinjama. In each of these areas, government workers represented the largest single employment group. Farmers constituted the

largest occupation group in Zorzor, with 22 percent of the total. Ganta also had a sizable number of farmers in the sample.

Spouses were largely either merchants (includes "market women") or were not employed outside the home. However, a sizable number were Government workers in Ganta and Sanniquellie.

Households were asked whether they had lived in an urban area for more or less than one year. The expectation was that people recently moving from a rural area may have quite different eating patterns from long-term urban residents. Only in Gbarnga and Ganta had 10 percent or more households lived in an urban area for less than one year (table E).

Ethnicity was quite variable in all urban areas outside of Monrovia. The largest two ethnic groups in Monrovia were Kru and Bassa, but neither accounted for more than 20 percent of all household heads in the sample (table F). On the other hand, Bassa accounted for two-thirds of the sample in Buchanan, Kpelle constituted 60 percent of the total in Gbarnga, and Lorma accounted for 60 percent of the total number of household heads in Zorzor. Mano was the most common ethnic group in both Ganta and Sanniquellie. Mandingos were the largest group in the survey in Voinjama, but a second group, Lorma, was also quite common.

One should use care in generalizing from these sample data to implications of ethnic composition for the entire urban areas of which they are a part. It should be remembered that only three local areas were sampled in each area outside of Monrovia. Since people tend to live in clusters by ethnic

group, this sampling procedure may not have giving entirely representative results.

C. Households Making Farm

Households "making farm" by growing rice constituted over one-half of the survey population in Voinjama (table G). This number much exceeded the 17 percent of the household heads there that classified themselves as farmers. Obviously, there were a large number of households that were only part-time farmers. Zorzor also had a large number of households making farm; 41 percent of the total grew rice, and the same percentage of spouses in Zorzor classified themselves as farmers. Only 4 percent of the households grew some of their own rice in Monrovia.

Growing their own cassava was more common than growing their own rice in four of the urban areas outside of Monrovia. The major exception was Voinjama where relatively little cassava is consumed. Zorzor grew a lot of both crops.

III. EXPENDITURE AND PRICE PATTERNS IN LIBERIA

A. Expenditure and Consumption Relationships

1. Total All Expenditures

Total expenditures for all items, which is used as a proxy for income in this report, amounted to an average of \$429 per month for all urban areas (table 22). This level is equivalent to \$5,153 at an annual rate. In Monrovia, expenditures totaled \$473 per month, for an annual rate of \$5,675. Expenditures in the remaining six urban areas averaged much lower than in Monrovia--\$296 per month or \$3,555 at an annual rate. It is assumed that the respondents were reporting expenditures in Liberian dollars, which at the time of the survey were officially exchanged at par with American dollars.

The distribution of households by expenditure groups, used as a proxy for income, was heavily weighted toward the lower income groups, as noted earlier (table C). In Monrovia, the largest percentage of households was in the \$200 - 299 per month income group, for a mean income of \$241 in that group compared with the overall mean income of \$477 per month (table H).

School fees and school supplies (termed education costs in the tables) accounted for the largest single category of nonfood spending during the survey period, because the new semester was just getting underway at the time of the survey. If one assumes that spending for school fees and school supplies were unusually high during the survey period--for purposes of estimating annual totals of income, an adjustment could be made to count these costs only twice during the year (for the two semesters). On this

Table H. Mean Income of Households by Level of Household Income, Urban Areas in Liberia, March 1986.

Income Group*	Monrovia	Buchanan	Gbarnga	Ganata	Sanni- quellie	Zorzor	Voinjama
\$ 0 - 99	\$81.25	\$65.89	\$74.80	\$81.82	\$68.20	\$74.14	\$97.68
100 - 199	157.19	149.71	137.55	154.97	151.44	141.26	176.24
200 - 299	241.47	255.59	240.07	247.51	257.60	241.64	253.44
300 - 399	349.07	338.28	355.60	344.06	357.17	352.32	359.98
400 - 499	452.48	504.06	516.84	500.19	468.07	467.93	488.66
500 - 599	553.30						
600 - 699	650.57	654.19	734.16	727.80	750.12	927.04	767.13
700 - 899	806.82						
900 - 1,099	987.20	1,516.73	1,362.38	1,554.61	1,383.73		1,144.97
1,100 - 1,499	1,270.07						
1,500 +	2,171.35						
Average	\$476.83	\$267.36	\$291.84	\$370.97	\$356.94	\$191.56	\$369.63

* Income groups are compressed for all areas other than Monrovia; for 5 areas, the upper income groups are as follows: \$400-599; \$600-899; \$900+; for Zorzor, the upper group is \$600+.

basis, annual average income for all urban areas would be \$4,339 and for Monrovia, \$4,771.

This procedure, however, likely overstates the adjustment to the extent that education costs are paid from savings and to the extent that miscellaneous educational supplies would be purchased at other times of the school year. This overstatement is likely to be relatively small; more likely, spending for education at the time when tuition payments are due results in reduced spending for food and other consumer goods. Nevertheless, estimates of annual incomes adjusted for education costs were made for the purpose of giving perspective to a possible overstatement of incomes based on actual spending during the survey period. Estimates for the various urban areas are as follows:

<u>Urban Area</u>	<u>Estimated Annual Income</u>
Monrovia	\$4,771
Buchanan	2,848
Gbarnga	2,920
Ganta	3,662
Sanniquellie	3,266
Zorzor	1,911
Voinjama	3,662
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Average	\$4,339

On a per capita basis, total expenditures averaged \$69 per month for the entire country, or \$829 at an annual rate (with no adjustment for education costs) (table 43). For Monrovia, which accounts for 74 percent of the

total population in the urban areas studied, per capita expenditures averaged \$77, or \$924 per annum. Average per capita expenditures for the remaining six areas was \$557 per annum.

These survey data exceed national data for gross domestic product on a per capita basis at \$497 in 1984, according to Ministry of Planning and Economic Affairs' data (Stanley and Gallagher, 1985). The World Bank reported \$470 per capita for 1984 in its World Development Report (1986). These data suggest that the above adjustment for education costs may be warranted. However, these figures are averages which include both rural and urban areas, one year difference in time, and the concepts of consumer expenditures and gross domestic product are quite different.

If one ignores these differences in concepts, and compares the Planning Ministry's figure of \$497 per capita for the nation with the \$829 urban area average, the data imply expenditures of \$392 per capita for the population living outside of the urban areas.

2. Total Food Expenditures

In March 1986, household expenditures for food and beverages averaged \$173 per household on a monthly basis, according to data from the urban household survey (table 14). This amounts to \$2,081 at an annual rate, assuming no variation in seasonality. Expenditures were somewhat higher than this level in Monrovia, \$182 per month, but spending was less in the other urban areas. Spending ranged from a low of \$105 per month in Zorzor to \$169 in Voinjama.

The terms "expenditures" and "spending" are often used interchangeably in this report; they include the value of food from other sources (home produced, or received as a gift or as pay) as well as that purchased, when referring to food. Only that share of bagged rice used in the survey period was included in rice expenditures. Data reported for the period of a week were adjusted to a monthly equivalent basis. Total food (sometimes referred to as food and beverages) is defined to include alcoholic beverages.

On a per capita basis, total food spending averaged \$27.81 per month for all urban areas (table 35). Per capita spending ranged from \$16.55 in Zorzor to \$25.28 in Voinjama and \$29.65 in Monrovia. Food spending only for food used at home averaged \$25.81 per person. Spending for meals and other food away from home plus alcoholic beverages accounted for the balance of \$2.00 per person. There was a wide range among urban areas in spending for both of these categories of food. The quality of these data appears to be less than for food at home due to the nature of these products.

The food expenditure data reported in this survey are much higher than the numbers derived from the Pay-Bayee, Tun, and Yetley report (1983) related to the 1976-78 household survey. Total household expenditures according to that report was at about the level of per capita spending in the current survey, after making due allowance for price changes during the interim. Household spending for food averaged about \$24.30 per month or \$292 per year in 1976-78. Using an estimated price adjustment of 47 percent, to put

the data in 1986 dollars, yields estimates of \$35.72 per month and \$429 per year for total households.

Food accounts for the largest single product group purchased by consumers in Liberia. Households in Monrovia as a group spent 38 cents out of each dollar for food in March 1986 (table 53). The median or average household spent somewhat more than this, however, because households as a group include high income households which spent a smaller share of their income for food. Households in other urban areas as a group ranged up to 55 cents out of each dollar going for food, as noted below:

<u>Urban Area</u>	<u>Percent of Income Spent for Food</u>
Monrovia	38.5
Buchanan	53.1
Gbarnga	47.0
Ganta	45.3
Sanniquellie	43.1
Zorzor	54.7
Voinjama	47.3

Average	40.4

The average percentage of income spent for food in this survey, at 40.4 percent, is lower than the number reported in the Pay-Bayee, Tun, and Yetley report for 1976-78. At that time 53.5 percent of income was reported being spent for food in urban areas.

The percentages in this survey would be raised by 8 to 12 percentage points if income were adjusted downward for school costs, as discussed above. The percent of income spent for food on this basis would average 48.0 percent and range from a low of 45.7 percent in Monrovia to 66.0 percent in Zorzor.

There is a large variation in the percentages of income spent for food by income group. In Monrovia, the average of 38 percent spent for food ranges from 57 percent for households with monthly income below \$100 down to only 20 percent for households with income above \$1,500 monthly (table 54). The dollars of food spending increase with income but not at the same rate. Obviously, food receives a high priority in food spending at very low incomes and additional income results in less than proportionate increases in food spending. This relationship has long been universally observed and is termed the Engel function.

A contributing factor to this relationship with income, when observing household rather than per capita data, is the substantial increase in household size as income increases. Table A showed earlier that in Monrovia average household size increases from less than 2 persons for households with less than \$100 monthly income to 12 persons for households with \$1,500 or more in monthly income.

3. Rice Consumption and Expenditures

Voinjama led all other areas in terms of quantities of total rice reported purchased or used. A total of nearly 190 pounds of rice per household was reported when converting weekly reported data to a monthly equivalent

(table 60). This total compares with a low of 122 pounds for Buchanan and 129 pounds for Monrovia. These data amount to 28.4 pounds per capita per month for Voinjama, 19.5 pounds for Buchanan, and 21.0 pounds for Monrovia (table 61). The rule of thumb of 1 pound per capita per day appears to be an upper limit to rice consumption in urban areas of Liberia.

For perspective on these rice purchases, one can calculate the total quantities of rice that would be purchased in all urban areas for a year, assuming there is no seasonality, and comparing the results with total supply available from local production and imports. These calculations suggest that these seven urban areas would utilize a total of 120.8 million pounds of rice annually. This amount is 24 percent of the total rice supply available for consumption reported at 508 million pounds (231 m.m.t.) for 1984, the latest data available (Ministry of Agriculture, 1985, table 3.1). The population in these urban areas comprises 23 percent of the total population in Liberia. As a result, these purchase levels would imply that they are consistent with somewhat larger than average consumption levels for rice in the balance of the country. Note, however, that these calculations assume that the survey data are representative of average consumption levels for the year.

Rice is the most important single food product consumed in Liberia. Over 95 percent of the households surveyed in Monrovia reported buying imported rice during the survey period and 3 percent purchased country rice, but these numbers may overlap with some households buying both kinds of rice. These percentages are based on the frequency of sample households actually reporting purchases (table 2). If one weights the household frequency data

to allow for structure size, shown in table 63, 92 percent of the households purchased imported rice and 4 percent purchased country rice in Monrovia.

Despite the heavy use of rice, rice purchases do not dominate the total household budget as much as one might think. In Monrovia, only 7 cents out of each dollar of total spending was spent for rice, according to the survey data (table 53). Almost as much--6 cents--was spent for the total of cassava, other cereals, and starchy foods. This 13 cents spent for all starchy foods is actually less than the 15 cents spent for animal products--meat, fish, poultry, and dairy products.

Zorzor represents the other extreme from Monrovia in terms of high budget share spent for rice. In that urban area, 20 cents out of each dollar was spent for rice, and rice was clearly the dominant starchy food. Only 4 more cents was spent for all other starchy foods combined. Zorzor spent about 13 cents out of each dollar for meat, fish, poultry, and dairy products. Zorzor is the smallest and probably the most rural of the areas surveyed.

Voinjama had the highest preference for rice relative to other starchy foods, even exceeding Zorzor. Virtually no other cereals were consumed in Voinjama and spending for cassava was the lowest of any urban area.

Table 56 shows comparable data in terms of percentages of income spent for food rather than percentages of the entire household budget. Total starchy foods account for 32 percent of total spending for food in Monrovia,

compared with a high of 43 percent in Zorzor. Rice alone accounted for 17 percent in Monrovia and 36 percent in Zorzor.

On a per capita basis, there was a substantial decline in spending for rice as income levels increase. This was particularly evident in Monrovia, but it was also true in Gbarnga and Ganta (tables 44, 46, and 47). The reverse appeared to be the case in the remaining urban areas (tables 45, 48, 49 and 50). In Ganta, the decline in per capita spending for rice over income levels was due mainly to a decline in purchase of country rice rather than imported rice. In Gbarnga, spending declined for both kinds of rice. In both Voinjama and Sanniquellie, there was also a decline in per capita spending for country rice, but there was a sharp increase in spending for imported rice as income increased. Zorzor showed a reverse trend: an increase in per capita spending for country rice and actually a decline for imported rice over income levels (table 49).

Only about 3 percent of the rice purchased in Monrovia was from the "country," another 3 percent was from "concessions" and the remaining 94 percent was imported, according to data computed from table 1. Buchanan also received most of its rice from imports, as expected. Gbarnga and Zorzor purchased a surprisingly large amount--about one-half--of their rice from imports. On the average for all areas, only 18 percent of the rice either purchased or used came from the country, 1 percent from concessions, and 81 percent from imports. Obviously, these proportions reflected the season of the year, and they reflected rice consumed in urban areas only.

If one multiplies the per capita consumption levels of only imported rice reported in the survey, by urban area, times the population in each area, to get an estimate of total implied purchase, a total of 100 million pounds is obtained on an annual rate basis. This amount is 63 percent of the 158 million pounds of rice that was imported into Liberia in 1985. This comparison suggests that about one-third of all imported rice is used in small villages and towns.

The sources of rice vary considerably among the various urban areas in terms of purchase on a daily or weekly basis (usually in terms of cup or kenke), purchase less often than weekly (usually in terms of bags), or obtained from other sources (home produced, gift or pay). The following tabulation, computed from table 61, shows that Voinjama and Monrovia lead in purchase of rice by the bag whereas Buchanan and Sanniquellie lead in buying by the cup or kenke. Sanniquellie reported the largest share of its rice from other sources, and Monrovia reported the smallest share. The figure for Monrovia was expected to be low, but it appears unreasonably low. Similarly, the 2.6 percent for Voinjama appears quite low, for an area that likely produces some rice for home consumption.

<u>Urban Area</u>	<u>Purchase Daily or Weekly</u>	<u>Purchase Less Than Weekly</u>	<u>Other Sources</u>
	(percent of total purchase or use)		
Monrovia	38.9	60.4	0.7
Buchanan	60.5	30.6	8.9
Gbarnga	36.9	54.7	8.4
Ganta	52.6	34.7	2.8
Sanniquellie	52.6	34.7	12.7
Zorzor	53.0	41.2	5.8
Voinjama	27.1	70.3	2.6

4. Cassava Expenditures

There is a lot of variation among urban areas in terms of expenditures for other starchy foods. There is relatively little purchase of cassava in Lofa County, and relatively more in Nimba County and other urban areas surveyed. One-half or more of the households surveyed in all areas except Voinjama and Zorzor purchased cassava tubers but only 6 percent of the households in Voinjama bought them. Buchanan purchases the most fufu, followed by Monrovia. Relatively little fufu is purchased in most other areas. Farina (gari) was the most popular in Buchanan where about one-half of the households purchased it. Even so, the amounts purchased were relatively low.

Per capita expenditures for cassava did not trend downward over income levels as in the case of rice in many areas. In fact, in Nimba County, per capita expenditures actually increased over income levels.

5. Other Starch Foods

Bread and flour purchases were surprisingly high in Monrovia, Ganta, and Buchanan. About three-fourths of all households surveyed in these areas bought wheat bread or flour (table 3). More money was spent on this category (other cereals) in Monrovia than was spent on all cassava products. However, the popularity of wheat products does not extend to Lofa County. Only 1 percent of the households in Voinjama bought bread products.

There was a very high association of per capita purchase of these products (other cereals) with increases in income level (table 44). This association was shown in all urban areas other than Zorzor and Voinjama. This high income association is in marked contrast to the negative association shown for rice in most areas.

There was also an increase in per capita spending on "other starchy" foods as income increased, in most urban areas. Expenditure levels were usually about as high or higher than for cassava. Plantains and eddoes were the two most common foods in this group. Sweet potatoes were purchased in volume in Sannequellie, but nowhere else. It is interesting to note that about twice as much is spent on sweet potato leaves as on the tubers. Yams and white potatoes were purchased at about the same relatively low rate as sweet potatoes. Plantains were commonly purchased in all areas, but Ganta led all other areas in purchases both of plantains and eddoes.

Expenditures for pulses were not found to be very important food groups in most urban areas surveyed, despite their high nutritional content. Voinjama reported the highest level of expenditures for these products, which consist of dry beans, groundnuts and beniseed. Even in Voinjama they comprised only 2.5 percent of income spent for food, which was somewhat less than spending for "other starchy" foods.

6. Animal Products

More money was spent on fish than on all other meats combined (table 7). This was true in Monrovia, but the prevalence of fish outside of Monrovia was even greater. About 90 percent or more of the households surveyed in all areas reported buying or using fish during the survey period. Perhaps for this reason, there was not much change in per capita fish purchases over income groups in most urban areas, including Monrovia.

On a per capita basis, meat purchases were relatively much larger in Monrovia than other areas (table 28). There was also a substantial increase in purchase of meat as income increased (table 44). Pork and pig feet was the most popular meat product group purchased, particularly in Monrovia where two-thirds of the households reported purchasing it (table 7). Only about one-half as much beef was purchased. In terms of spending, bush meat was the most important meat product in most of the interior urban areas. Lamb and goat purchases were quite small in all areas except for Ganta and Sanniquellie.

Milk products were purchased by more than one-half of the households surveyed in Monrovia and around one-third of those in all other urban areas

other than those in Lofa County (table 8). Average spending per household in Monrovia averaged \$5.71 per month for all milk products. This exceeds the \$3.12 spent for eggs and the \$3.56 spent for poultry meat.

Eggs were purchased by about one-third of the households in Monrovia, which is about double the number that bought poultry meat. However, poultry meat purchases were likely less common than normal during the survey period. Imports of day-old chicks had been interrupted a few months earlier and, therefore, production levels had not regained previous levels. The share of income spent for the entire poultry and milk group was about 6 percent. While average spending was relatively low by some standards, the group showed a high correlation between increased per capita purchases and increases in household income, in almost all urban areas, suggesting that a relatively high demand exists for these products.

7. Vegetable Products

Cooking oils represent a staple food product group that is widely used in Liberia, because of its use in preparing rice and other common foods. In total, 9 - 11 percent of total food spending is spent on oils. Over 90 percent of all households in each urban area reported buying palm oil during the survey period (table 8). Voinjama led other areas in use of palm oil. Vegetable oils were also quite commonly used, particularly in Monrovia and Sanniquellie, but not in Voinjama. There was relatively little change in dollars spent for oils over increasing income levels, but the budget share declined over income levels.

Vegetables represent an important food group in all urban areas of Liberia, much more so than fruits. In total, vegetables account for 10 - 12 percent of total food spending. Peppers are the most important single vegetable product purchased, and onions are second. About 90 percent of all households surveyed in each urban reported buying or using peppers (table 9). Cassava leaves and potato greens, if taken together, also are quite important.

Maggi cubes, added to the vegetable group because of their large share of vegetable product ingredients, are another major item. Vegetables that were purchased in very small amounts included cucumbers and pumpkin. However, Monrovia reported purchase of a sizable amount of pumpkin or squash, and households in Ganta purchased relatively more cucumbers. There was little change in per capita vegetable purchases over increasing levels of income in Monrovia, but some increases are noted in other urban areas.

As a group, fruits did not account for a large share of consumer food spending—less than 2 percent of the total in all urban areas (table 56). Citrus exceeded bananas as the fruit group on which most money was spent in Monrovia, but bananas were more important in all other urban areas. Even though bananas appear to be an important food product, their price is quite low and many are home produced, which may account for the low dollar spending. Bananas may have been under-reported in the survey in terms of the value from "other" sources. Voinjama reported the highest value of banana purchases. Many other fruits were out of season at the time of the survey. Despite the low level of fruit purchases, there was a sizable

increase in per capita purchases associated with increasing income level of households.

8. Miscellaneous Foods

Purchases of other foods such as sugar, salt, and nonalcoholic beverages are also very common. As a group, they accounted for 7 percent of the total food budget in Monrovia. On a per capita basis, Monrovia leads all other areas in purchase of sugar and soft drinks, but there is little difference among urban areas in purchase of salt. As a group, per capita spending increased over income groups in most areas.

Coffee or tea were purchased by about one-half of the households surveyed in Monrovia--about at the same proportion as for soft drinks. But, these beverages are less important in other urban areas; few households in Zorzor purchased coffee or tea.

Among alcoholic beverages, which are classified in this study as foods, beer is the favorite beverage in Monrovia. Cane juice was most heavily purchased in Sanniquellie and palm wine was reported as being purchased most commonly in Zorzor and Voinjama. As a group, they accounted for about 4 percent of total food spending. Per capita spending generally increased over income groups in all urban areas.

Expenditures for food away from home appeared to be erratically reported in the survey. Expenditures were relatively low in all areas, including Monrovia, accounting for less than 4 percent of total food spending in all

areas. Reported data showed a decline in per capita spending over income levels in Monrovia, which is difficult to understand.

9. Nonfoods

Nonfood purchases accounted for over 60 percent of total spending reported in the survey in Monrovia. Only in Zorzor did nonfood spending drop below 50 percent of the total (table 53). By income, nonfood spending rises rapidly over income level as money is freed up by decreases in food spending.

As noted earlier, school supplies and school fees represented a large budget item; they accounted for 14 to 27 percent of total expenditures among the various cities (table 53). Buchanan reported the smallest percentage and Sanniquellie the largest. In Monrovia, education costs amounted to 19 percent of total spending. While one can debate that this large budget item may represent a distortion for purposes of measuring total income, the fact remains that a high proportion of spending during the survey period went for education purposes. This fact provides a basis for the need for further surveys during other parts of the year to get a better picture of typical spending patterns. One wonders, for example, what people don't buy when school fees are payable. Likely, people defer spending for durable products and perhaps rent payments rather than change their spending patterns much for food.

Rent and housing payments (including water and electricity) were low in Liberia, relative to food expenditures, representing about 11 percent of the total budget in Monrovia and only 2 to 8 percent in the other urban

areas. Housing costs decline over income groups in Monrovia, but show little change in other areas (table 55). Costs for fuel account for about 3 percent of the total budget in Monrovia but somewhat larger shares in other areas because dollar costs are quite similar and average incomes are lower.

Detailed expenditure data are provided in the various tables on a household and per capita basis for each nonfood item for which data were collected. However, each item will not be discussed in detail because the central focus of this study is concern with food consumption and expenditures.

B. Price Relationships

1. Rice Prices

Price data were collected in the local markets for all of the major food products for which household expenditures were obtained. In terms of rice, the prices relate to purchases in the form of either cups or kenkes. These data are reported for all products, by urban area (table 59). In addition, rice prices were obtained indirectly in the household survey for rice purchased in the form of bags.

The market price data show prices for country rice slightly higher on the average than for imported rice, 27.7 cents per pound compared with 26.8 cents in Monrovia and 30.4 cents average for the other 6 urban areas compared with 29.2 cents. However, there was a lot of variation in prices paid among the various urban areas, as noted below:

<u>Urban Area</u>	<u>Country Rice</u>	<u>Imported Rice</u>	<u>Imported Minus Country</u>
	(cents per pound)		
Monrovia	27.7	26.8	-.9
Buchanan	32.4	31.6	-.8
Gbarnga	27.9	32.4	4.5
Ganta	24.5	25.8	1.3
Sanniquellie	28.3	27.0	-1.3
Zorzor	35.4	29.5	-5.9
Voinjama	33.8	28.8	-5.0
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6-City Ave.	30.4	29.2	-1.2

The prices paid for rice purchased by the bag, however, were usually lower for country rice than for imported rice in areas outside of Monrovia, as one would expect, 26.1 cents compared with 26.5 for the 6-city average. Following are the average prices paid for rice by the bag among the various urban areas:

<u>Urban Area</u>	<u>Country Rice</u>	<u>Imported Rice</u>	<u>Imported Minus Country</u>
	(cents per pound)		
Monrovia	23.5	23.1	-.4
Buchanan	24.5	24.7	.2
Gbarnga	24.7	25.1	.4
Ganta	26.8	27.6	.8
Sanniquellie	26.8	27.0	.2
Zorzor	25.6	26.9	1.3
Voinjama	27.9	27.7	-.2
	-----	-----	----
6-City Average	26.1	26.5	.4

Prices paid for rice were typically cheaper in Monrovia than in the other urban areas, both for country rice and for imported rice. The average price advantage was 2.6 cents for country rice and 3.4 cents for imported rice when purchased by the bag. When purchased in the market, the average price advantage was 2.7 cents for country and 2.4 cents for imported rice. It seems rather peculiar that country rice would be cheaper in Monrovia than in country areas near where it is produced. Perhaps the reason is that retail prices are more closely regulated in Monrovia. It is understandable that little country rice is sold in Monrovia in view of these price

relationships.

Prices for imported bagged rice were higher in Voinjama, Sanniquellie and Ganta than in other urban areas, which is logical in view of transportation differentials that must be paid. These same urban areas also reflected similar differentials for country rice; that is, Voinjama had the highest price for country rice even though it is in the middle of the producing area and their per capita expenditures for rice are the highest among the urban areas. These relatively high prices for country rice probably reflect the relative shortage of rice that had developed at about the time of the survey. These same price relationships would not be expected to occur during the harvest period.

The price relationships among urban areas for bagged rice appear more reasonable than for prices obtained in the markets for cups and kenkes. Market price data show imported prices highest in Gbarnga and Buchanan and lowest in Ganta. Country rice prices in the markets are not consistent with imported rice prices in Gbarnga and Voinjama.

2. Other Food Prices

Rice is almost unique in selling more cheaply in Monrovia than in other urban areas. Out of the 20 other food items for which price comparisons could be made, 17 of them had higher prices in Monrovia and often the price differences were substantial (table 59). The exceptions were pork, vegetable oil, and okra. Price comparisons were made for any product for which prices were available for at least 3 other urban areas.

While the above generalizations appear to be warranted, a study of prices reported in table 59 raise many questions about comparability of data among different urban areas. In preparing the table, prices were screened to compare prices for products with similar specifications to the extent possible. This usually allowed separating prices for dried from green peppers, dried from fresh fish, and dried from green beans. However, often precise specifications were not recorded. For example, size of bitterballs and type of meat is quite important in pricing. But, such information was often not recorded.

Three price quotations were usually obtained for each product, and the three prices often were quite different. These differences probably reflected more differences in specifications than true differences in price of the same type of product. Nevertheless, the prices were averaged (simple averages) in deriving a single price for the product in a given city. Fortunately, prices were collected in four markets in Monrovia so when prices were averaged for the four markets they tended to overcome some extreme price variations. This was not possible in the other urban areas because prices were only obtained from a single market in each case.

For this reason, the average prices for the six urban areas compared with the averages for Monrovia appear to be the most usable data. However, use only of these averages would preclude developing quantities of food purchase for each urban area and would preclude the development of price elasticities because such computations require variability in prices among areas.

IV. METHODOLOGY

A. Household Sample Selection and Size

The seven cities selected for the survey represent the bulk of the urban population of Liberia. They represent a total population of 474,670, based on preliminary data from Liberia's 1984 Census of Population (Ministry of Planning and Economic Affairs, 1986). Urban areas vary considerably in size, as noted below:

<u>Urban Area</u>	<u>Population</u>
Monrovia	350,000
Buchanan	40,480
Gbarnga	25,700
Ganta	16,990
Sanniquellie	13,060
Zorzor	8,500
Voinjama	19,940
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Total	474,670

Monrovia and Buchanan represent the important coastal rice-deficit areas, whereas the other five urban areas represent the important rice-producing counties of Nimba, Lofa and Bong. Not represented in the sample are some sparsely populated counties in the Southeast and Northwest parts of the country. Liberia had a total population of about 2,081,000 in 1984 (Ministry of Agriculture, 1986). Of that number, nearly one-half (971,000) represents the agricultural population. The balance of about one-half

million people includes a sizable population of people living in small towns and villages--people that can be classified as rural nonfarmers.

Households were selected within urban areas on an area probability basis. Local maps were drawn of the urban areas (other than for Monrovia) by the surveyors and sub-areas were identified by roads, paths or streets. Three sub-areas were selected at random in each city (six in Monrovia), one for each interviewer. The housing structures in each area were counted, numbered, and chosen at random for the survey. A total of 111 structures were selected in each city other than Monrovia (37 per interviewer). In Monrovia, 276 structures were selected (46 per interviewer), for a survey total of 942 structures.

Many housing structures contain more than one household (defined as people eating out of a common food pot). In such cases, a single household was selected to represent the structure by predetermined alphabetical selection based on the first names of the household heads.

The intent was to not replace selected households that could not be located, refused to cooperate, or failed to meet the test of a housekeeping household. A 10 percent additional sample was drawn initially to cover these eventualities. In fact, however, a few households that could not be located in one city were replaced by other households that were chosen at random from the original sample. A housekeeping household is defined as one that prepared at least one-half of its meals for use at home for its own consumption during the survey period. That is, the number of meals

consumed away from home less the number of meals served to guests could not exceed 50 percent of all meals eaten.

B. Household Data Cleaning and Editing Procedures

A set of instructions were prepared for use by the interviewers and supervisors to "hand-edit" the questionnaires in the field. This involved reviewing for completion of the questionnaire, filling in zeros where applicable, and keying responses that were not applicable. It also involved rudimentary checks for consistency of the data and assessment of the data to be within broad ranges of feasibility, especially for rice consumption and spending. After the quality assessments on site, callbacks were made in many survey cities to clarify certain information and to ensure uniformity in interpretation of the questions.

At Purdue University, all data were entered into the computer independently by two operators. The computer files were matched and differences were listed for personal verification. Then, a computer program was developed to edit the data for consistency and ranges of feasibility. The MOA's representative at Purdue, Mr. Tarnue Koiwou, assisted in developing the tolerance ranges for expenditures and consumption of each product. A few extreme values were found and adjusted when there was a basis for adjustment. A total of five households were eliminated from the sample when no basis for adjustment could be found and the recorded data were judged to be not plausible. A total of eight households were eliminated for not being housekeeping households. Two other households were omitted for purposes of statistical analysis, due to extremely small spending for

food relative to nonfood. Only three households in the entire sample were not willing to provide the necessary data requested.

The final number of usable questionnaires by city are as follows:

<u>Urban Area</u>	<u>Sample</u>	<u>Usable</u>	<u>Percent</u>
Monrovia	276	273	99
Buchanan	111	111	100
Gbarnga	111	111	100
Ganta	111	109	98
Sanniquellie	111	109	98
Zorzor	111	110	99
Voinjama	111	103	93
-----	-----	-----	-----
Total	942	926	98

An amazingly high final response rate of 98 percent of the originally-drawn sample was obtained. This high rate of response is a tribute to the good work of the interviewers and the cooperative spirit of the people of Liberia. This rate of response should allow a reduction in sample size in future surveys of this type.

C. Data Weighting and Tabulation

Final expenditure data were all adjusted to reflect two factors: (1) number of households in a structure and (2) meals either eaten away from home or served to guests. Some of the expenditure data were weighted further for (3) per capita averages and (4) urban averages.

1. Structure Size

Recall that the sampling procedure was based on the number of structures rather than households. Since households were sampled within structures, data for the households selected were multiplied by the number of households in the structure to allow for the missing households. The average numbers of households per structure were as follows, by urban area:

<u>Urban Area</u>	<u>Households per Structure</u>
Monrovia	2.09
Buchanan	1.90
Gbarnga	1.56
Ganta	1.35
Sanniquellie	1.29
Zorzor	1.29
Voinjama	1.28

Food expenditures per household after adjustment for structure size were somewhat lower than prior to the adjustment. The adjustment amounted to \$1 to \$15 per household per month, with the greatest impact in Monrovia where the average number of households per structure is the largest. The structure size adjustment was more important for nonfood expenditures than for food. Apparently, households within multi-household structures have a significantly lower average income than single-household structures. The adjustment lowered average nonfood spending by \$73 per month in Monrovia, but the adjustment was only \$4 in Zorzor and \$3 in Voinjama.

2. 14-Meal-Equivalent

The adjustment for meals at home assumed that a meal served to a guest and a meal eaten away from home each represents food for one-half day. This process results in so-called 14-meal-equivalent data for food at home. It is based on the assumption that the typical Liberian eats two meals per day. Later surveys should verify this assumption. The current survey collected data on the number of times per day that each food was eaten but not the total number of meals eaten per day or per week. The 14-meal-equivalent adjustment resulted in the following adjustment factors by city:

<u>Urban Area</u>	<u>Factor</u>
Monrovia	1.01
Buchanan	1.04
Gbarnga	1.01
Ganta	1.02
Sanniquellie	.99
Zorzor	1.02
Voinjama	.97

Voinjama had the most net meals away from home compared with meals served to guests, so the adjustment to food purchased for use at home was negative by 3 percent. Buchanan had the largest share of guest meals relative to meals eaten away from home, giving a positive adjustment of 4 percent. For each individual household's expenditure data, the adjustment is calculated as follows:

Expenditures divided by $1 + [(number\ of\ guest\ meals - meals\ away\ from\ home) / (household\ size \times 14)]$.

3. Per Capita Data

Most data were tabulated both on a household and per capita basis. While per capita adjustments allow for the most important difference in food consumption among households of different sizes, they do not allow for differences in food use associated with sex and age differences among individuals, nor do they allow for possible economies of scale over household size. The statistical models will measure the importance of such differences. The expenditure data have not been tabulated on the basis of differing household sizes or sex of the household heads. However, tabulations of expenditures were made for differing age and education groups of household heads (tables 51 and 52).

4. City Weights

A final weighting factor was used in certain tables when average consumption or expenditures was reported for all urban areas combined. In computing these averages, the populations of the various areas, cited earlier, were used as the basis for the weights. The total population for the seven urban areas represents the 100 percent level and each urban area

was given a factor representing its share of the all-urban total. These factors are as follows:

<u>Urban Area</u>	<u>Factor</u>
Monrovia	73.74
Buchanan	8.53
Gbarnga	5.41
Ganta	3.58
Sanniquellie	2.75
Zorzor	1.79
Voinjama	4.20

Total	100.00

D. Market Price Data Collection

Retail food prices were collected on April 3, 4, or 5 in local markets in each of the survey cities except for Buchanan where prices were collected on May 7. The purpose of the price data collection was to be able to develop estimates of quantities of food purchased or used from the food expenditure data provided by the households.

Food prices were collected on a single day in each market. Detailed food product groups were patterned after the classifications used in the household questionnaire. The data were more detailed than the regular retail price data previously collected in Monrovia and selected rural areas. Three observations were obtained on each food product. Sampling procedures followed the same procedures used in previous price surveys.

Surveyors were not given detailed specifications for the food items on which to obtain prices, but they were asked to provide specifications for the items selected. They selected products that were selling in large volume, but unfortunately, there was significant variation in the specifications of the products priced for many foods. In addition, there appeared to be some significant variations in prices among urban areas (in the range of 100 percent or more in some cases) that could not be identified but likely was due to sampling variability or differences in specifications rather than true price differences. Furthermore, prices for several foods were not collected in all areas, probably because those foods were not available in the particular area on the day of the survey.

V. LITERATURE CITED

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APPENDIX TABLES

Table 1. Weekly Household Rice Expenditures by Type and Source of Rice, and Number and Frequency of Households Purchasing, Urban Areas in Liberia, March 1986.

Urban Areas	When Purchasing Daily or Weekly*			Purchasing Less Often Than Weekly**				
	Country Imported	Concess.	Total	Country Imported	Concess.	Total		
Monrovia	\$.116	\$3.014	\$.000	\$3.130	\$.022	\$3.944	\$.180	\$4.146
Buchanan	.691	4.749	.000	5.440	.059	2.027	.036	2.122
Gbarnga	1.682	1.729	.000	3.411	1.199	3.023	.000	4.222
Ganta	3.867	.835	.042	4.744	2.529	1.110	.068	3.707
Sanniquel	5.001	.491	.000	5.492	1.534	1.952	.000	3.486
Zorzor	3.097	2.057	.000	5.154	.981	2.182	.000	3.163
Voinjama	3.804	.195	.000	3.999	6.570	2.080	.000	8.650
	Freq.	Freq.	Freq.	Freq.	Freq.	Freq.		
Monrovia	.018	.414	.000	.007	.535	.018		
Buchanan	.180	.604	.000	.018	.252	.009		
Gbarnga	.189	.234	.000	.153	.378	.000		
Ganta	.477	.138	.009	.257	.119	.009		
Sanniquel	.468	.064	.000	.165	.174	.000		
Zorzor	.391	.291	.000	.118	.200	.000		
Voinjama	.340	.019	.000	.427	.155	.000		
Urban Areas	Other Sources***			Total, All Sources				
	Country Imported	Concess.	Total	Country Imported	Concess.	Total		
Monrovia	\$.011	\$.042	\$.000	\$.053	\$.149	\$7.000	\$.180	\$7.329
Buchanan	.765	.053	.000	.818	1.515	6.829	.036	8.380
Gbarnga	.651	.078	.000	.729	3.532	4.830	.000	8.362
Ganta	.180	.059	.000	.239	6.576	2.004	.110	8.690
Sanniquel	1.220	.106	.000	1.326	7.755	2.549	.000	10.304
Zorzor	.496	.054	.000	.550	4.574	4.293	.000	8.867
Voinjama	.360	.015	.000	.375	10.734	2.290	.000	13.024
	Freq.	Freq.	Freq.					
Monrovia	.011	.026	.000					
Buchanan	.063	.018	.000					
Gbarnga	.081	.018	.000					
Ganta	.055	.009	.000					
Sanniquel	.183	.009	.000					
Zorzor	.191	.045	.000					
Voinjama	.087	.010	.000					

* Actual purchases during the 7 days prior to the survey; usually purchasing by the cup or kenke.

** Value of rice used during the previous 7 days from rice purchased by the bag.

*** Home produced or received as a gift or as payment for services.

Note: Frequencies indicate the share of households actually surveyed during the week that purchased or used each type of rice. Similar data weighted by structure size are reported in table 63.

Table 2. Household Rice Expenditures on a Monthly Basis, with Number and Frequency of Households Purchasing, Urban Areas in Liberia, March 1986.

Urban Areas	:	Country	Imported	Concession	:	Total Rice
Monrovia	:	\$0.638	\$30.098	\$0.772	:	\$31.508
Buchanan	:	6.517	29.368	0.154	:	36.039
Gbarnga	:	15.191	20.772	0	:	35.963
Ganta	:	28.275	8.618	0.473	:	37.366
Sanniquellie	:	33.347	10.964	0	:	44.311
Zorzor	:	19.670	18.460	0	:	38.130
Voinjama	:	46.155	9.850	0	:	56.005
Average	:	\$6.070	\$27.176	\$0.599	:	\$33.845

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	9	.033	260	.952	5	.018
Buchanan	26	.234	95	.856	1	.009
Gbarnga	45	.405	68	.613	0	0
Sanniquellie	80	.734	28	.257	2	.018
Ganta	84	.771	26	.239	0	0
Zorzor	66	.600	57	.518	0	0
Voinjama	79	.767	18	.175	0	0

Note: Numbers and frequencies indicate the numbers of households surveyed in the survey week and the percentages of those households buying or using each product. Similar data weighted by structure size are reported in table 63.

Table 3. Household Expenditures for Other Cereals on a Monthly basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	Corn Meal	Noodles, Pasta	Bread, Flour
Monrovia	\$1.842	\$0.455	\$8.423
Buchanan	1.308	0.012	4.567
Gbarnga	0.824	0.387	3.388
Ganta	0.626	0.263	5.149
Sanniquellie	0.465	0.359	2.521
Zorzor	0.297	0.027	1.358
Voinjama	0.114	0	0.057
Average	\$1.560	\$0.377	\$7.064

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	47	.172	27	.099	220	.806
Buchanan	25	.225	2	.018	81	.730
Gbarnga	12	.108	7	.063	61	.550
Ganta	10	.092	11	.101	82	.752
Sanniquellie	7	.064	17	.156	51	.468
Zorzor	9	.082	2	.018	55	.500
Voinjama	3	.029	0	0	1	.010

Urban Areas	Miscellaneous Cereals	Total Other Cereals
Monrovia	\$0.981	\$11.701
Buchanan	0.485	6.371
Gbarnga	0.126	4.725
Ganta	0.371	6.409
Sanniquellie	0.700	4.046
Zorzor	0.259	1.941
Voinjama	0	0.171
Average	\$0.809	\$9.810

	No.	Freq.
Monrovia	17	.062
Buchanan	6	.054
Gbarnga	2	.018
Ganta	4	.037
Sanniquellie	3	.028
Zorzor	1	.009
Voinjama	0	0

Table 4. Household Expenditures for Cassava Products on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	Cassava Tubers	Fufu	Farina (Gari)	Total Cassava
Monrovia	\$4.602	\$2.630	\$1.110	\$8.342
Buchanan	3.511	3.916	1.432	8.859
Gbarnga	4.132	1.743	0.248	6.123
Ganta	5.328	1.089	0.496	6.913
Sanniquellie	4.358	0.246	0.337	4.941
Zorzor	1.249	0.205	0.062	1.517
Voinjama	0.577	0.303	0	0.880
Average	\$4.274	\$2.430	\$0.982	\$7.686

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	159	.582	131	.480	86	.315
Buchanan	56	.505	73	.658	57	.514
Gbarnga	61	.550	35	.315	8	.072
Ganta	70	.642	19	.174	8	.073
Sanniquellie	71	.651	7	.064	10	.092
Zorzor	31	.282	9	.082	5	.045
Voinjama	6	.058	7	.068	0	0

Table 5. Household Expenditures for Pulses on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	Beans	Groundnuts, Beniseed	Total Pulses
Monrovia	\$1.114	\$1.586	\$2.700
Buchanan	0.394	1.150	1.544
Gbarnga	1.121	0.541	1.656
Ganta	0.617	1.512	2.129
Sanniquellie	0.285	2.575	2.859
Zorzor	1.108	0.698	1.798
Voinjama	2.731	1.569	4.301
Average	\$1.080	\$1.500	\$2.580

	No.	Freq.	No.	Freq.
Monrovia	51	.187	97	.355
Buchanan	11	.099	61	.550
Gbarnga	32	.288	34	.306
Ganta	7	.064	39	.358
Sanniquellie	7	.064	50	.459
Zorzor	61	.555	41	.373
Voinjama	60	.583	36	.350

Table 6. Household Expenditures for Other Starchy Foods on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	Sweet Potatoes	Yams	Eddoes
Monrovia	\$0.930	\$0.891	\$1.654
Buchanan	0.590	0.293	3.034
Gbarnga	0.417	0.580	3.420
Ganta	0.739	0.509	4.101
Sanniquellie	3.298	0.828	2.784
Zorzor	0.243	0.135	1.310
Voinjama	0.199	0.394	2.703
Average	\$0.888	\$0.773	\$2.024

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	25	.092	25	.092	84	.308
Buchanan	16	.144	6	.054	32	.288
Gbarnga	5	.045	7	.063	45	.405
Ganta	16	.147	16	.092	44	.404
Sanniquellie	11	.101	9	.083	47	.431
Zorzor	13	.118	5	.045	41	.373
Voinjama	4	.039	5	.049	36	.350

Urban Areas	White Potatoes	Plantains	Total Starchy
Monrovia	\$0.911	\$2.920	\$7.306
Buchanan	0.439	1.986	6.343
Gbarnga	0.040	1.920	6.376
Ganta	0.569	4.070	9.987
Sanniquellie	0.403	2.331	9.597
Zorzor	0.029	1.906	3.622
Voinjama	0.047	1.576	4.919
Average	\$0.745	\$2.737	\$7.166

	No.	Freq.	No.	Freq.
Monrovia	46	.169	98	.359
Buchanan	8	.072	48	.432
Gbarnga	1	.009	30	.270
Ganta	5	.046	51	.468
Sanniquellie	12	.110	52	.477
Zorzor	1	.009	57	.518
Voinjama	1	.010	23	.223

Table 7. Household Expenditures for Meat and Fish on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	:	Beef	:	Pork, Pig Feet	:	Lamb, Goat
Monrovia	:	\$4.507	:	\$7.454	:	\$0.230
Buchanan	:	2.686	:	3.044	:	0.178
Gbarnga	:	1.291	:	4.278	:	0.409
Ganta	:	1.202	:	2.509	:	2.041
Sanniquellie	:	1.279	:	2.950	:	1.475
Zorzor	:	1.656	:	0.802	:	0.079
Voinjama	:	0.065	:	1.318	:	0
Average	:	\$3.733	:	\$6.228	:	\$0.322

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	63	.231	187	.685	6	.022
Buchanan	17	.153	57	.514	1	.009
Gbarnga	2	.018	55	.495	5	.045
Ganta	7	.064	30	.275	6	.055
Sanniquellie	8	.073	36	.330	3	.028
Zorzor	7	.064	15	.136	1	.009
Voinjama	1	.010	17	.165	0	0

Urban Areas	:	Bush Meat	:	Total Meat	:	Fish
Monrovia	:	\$6.289	:	\$18.480	:	\$23.811
Buchanan	:	3.180	:	9.089	:	22.234
Gbarnga	:	6.253	:	12.231	:	18.386
Ganta	:	11.505	:	17.256	:	20.989
Sanniquellie	:	4.668	:	10.372	:	17.302
Zorzor	:	6.301	:	8.837	:	13.356
Voinjama	:	8.465	:	9.848	:	21.470
Average	:	\$6.255	:	\$17.023	:	\$22.817

	No.	Freq.	No.	Freq.
Monrovia	88	.322	261	.956
Buchanan	29	.261	106	.955
Gbarnga	50	.450	102	.919
Ganta	58	.532	97	.890
Sanniquellie	29	.266	100	.917
Zorzor	55	.500	102	.927
Voinjama	49	.476	101	.981

Table 8. Household Expenditures for Poultry, Milk and Oils on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March, 1986.

Urban Areas	:	Poultry	Eggs	Milk	:	Total	
Monrovia		\$3.561	\$3.118	\$5.708		\$12.387	
Buchanan		4.047	1.758	3.066		8.871	
Gbarnga		4.069	1.337	3.287		8.693	
Ganta		8.661	2.313	2.647		13.621	
Sanniquellie		5.998	1.363	4.556		11.918	
Zorzor		1.642	0.881	0.746		3.269	
Voinjama		4.855	1.414	3.976		10.245	
Average		\$3.900	\$2.717	\$5.048		\$11.665	
		No.	Freq.	No.	Freq.	No.	Freq.
Monrovia		45	.165	92	.337	157	.575
Buchanan		29	.261	27	.243	39	.351
Gbarnga		18	.162	17	.153	35	.315
Ganta		24	.220	21	.193	36	.330
Sanniquellie		20	.183	18	.165	35	.321
Zorzor		12	.109	12	.109	11	.100
Voinjama		19	.184	17	.165	25	.243
Urban Areas	:	Palm Oil	Vegetable Oils	:	Total Oils		
Monrovia		\$11.933	\$4.196		\$16.128		
Buchanan		10.224	1.350		11.574		
Gbarnga		13.683	1.178		14.861		
Ganta		15.058	2.106		17.164		
Sanniquellie		11.927	3.115		15.042		
Zorzor		9.815	0.715		10.530		
Voinjama		19.232	0.441		19.673		
Average		\$12.262	\$3.465		\$15.727		
		No.	Freq.	No.	Freq.		
Monrovia		246	.901	167	.612		
Buchanan		106	.955	24	.216		
Gbarnga		109	.982	30	.270		
Ganta		101	.927	20	.183		
Sanniquellie		107	.982	32	.294		
Zorzor		102	.927	11	.100		
Voinjama		102	.990	4	.039		

Table 9. Household Expenditures for Vegetables on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	Onions	Pumpkin	Bitter-balls
Monrovia	\$2.689	\$0.535	\$1.839
Buchanan	1.630	0.178	1.581
Gbarnga	2.210	0.135	2.195
Ganta	2.300	0.107	3.537
Sanniquellie	2.536	0.136	2.211
Zorzor	1.514	0.081	2.394
Voinjama	3.151	0.245	1.334
Average	\$2.553	\$0.436	\$1.896

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	244	.894	27	.099	184	.674
Buchanan	95	.856	9	.081	63	.568
Gbarnga	93	.838	5	.045	68	.613
Ganta	84	.771	5	.046	73	.670
Sanniquellie	92	.844	4	.037	67	.615
Zorzor	79	.718	6	.055	84	.764
Voinjama	98	.951	2	.019	51	.495

Urban Areas	Cassava Leaves	Potato Greens	Lettuce, Cabbage
Monrovia	\$1.405	\$2.013	\$0.378
Buchanan	0.947	1.548	0.247
Gbarnga	1.041	2.005	0.290
Ganta	0.819	1.726	0.568
Sanniquellie	2.048	1.325	0.333
Zorzor	0.855	0.933	0
Voinjama	1.842	2.098	0.019
Average	\$1.352	\$1.928	\$0.345

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	132	.484	188	.689	19	.070
Buchanan	54	.486	73	.658	4	.036
Gbarnga	86	.775	90	.811	8	.072
Ganta	78	.716	78	.716	16	.147
Sanniquellie	83	.761	79	.725	9	.083
Zorzor	99	.900	82	.745	0	0
Voinjama	89	.864	93	.903	1	.010

Continued

Table 9—Continued (household purchases of vegetables)

Urban Areas	:	Okra	Tomatoes	Cucumbers			
Monrovia		\$1.181	\$1.822	\$0.063			
Buchanan		1.176	1.158	0.059			
Gbarnga		0.898	0.945	0.054			
Ganta		0.651	0.941	0.289			
Sanniquellie		0.748	0.644	0.039			
Zorzor		0.365	0.287	0.003			
Voinjama		0.203	1.940	0.186			
Average		\$1.079	\$1.631	\$0.073			
		No.	Freq.	No.	Freq.	No.	Freq.
Monrovia		137	.502	179	.656	6	.022
Buchanan		54	.486	64	.577	2	.018
Gbarnga		33	.297	45	.405	2	.018
Ganta		43	.394	56	.514	11	.101
Sanniquellie		31	.284	47	.431	4	.037
Zorzor		30	.273	19	.173	1	.009
Voinjama		9	.087	71	.689	3	.029
Urban Areas	:	Peppers	Maggi Cubes	:	Total Vegetables		
Monrovia		\$4.516	\$2.761		\$19.201		
Buchanan		3.642	1.994		14.160		
Gbarnga		3.854	2.283		15.910		
Ganta		3.662	2.806		17.405		
Sanniquellie		3.921	2.880		16.821		
Zorzor		3.854	2.635		12.920		
Voinjama		5.719	4.076		20.813		
Average		\$4.397	\$2.727		\$18.418		
		No.	Freq.	No.	Freq.		
Monrovia		261	.956	257	.941		
Buchanan		99	.892	105	.946		
Gbarnga		108	.973	103	.928		
Ganta		101	.927	104	.954		
Sanniquellie		106	.972	100	.917		
Zorzor		107	.973	106	.964		
Voinjama		100	.971	99	.961		

Table 10. Household Expenditures for Fruit on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	:	Citrus		Pineapples Paw Paw, Plums		Avocado	
Monrovia		\$1.193		\$0.590		\$0.047	
Buchanan		0.534		0.534		0.047	
Gbarnga		0.410		0.226		0.004	
Ganta		0.483		0.097		0.079	
Sanniquellie		0.348		0.142		0.455	
Zorzor		0.224		0.099		0.076	
Voinjama		0.348		0.361		0.063	
Average		\$0.993		\$0.517		\$0.058	
		No.	Freq.	No.	Freq.	No.	Freq.
Monrovia		96	.352	34	.125	10	.037
Buchanan		28	.252	33	.297	5	.045
Gbarnga		15	.135	10	.090	1	.009
Ganta		8	.073	7	.064	9	.083
Sanniquellie		13	.119	13	.119	9	.083
Zorzor		28	.255	9	.082	7	.064
Voinjama		12	.117	8	.078	1	.010
Urban Areas	:	Bananas				Total Fruit	
Monrovia		\$1.092				\$2.921	
Buchanan		1.008				2.122	
Gbarnga		0.759				1.399	
Ganta		0.746				1.405	
Sanniquellie		0.788				1.733	
Zorzor		0.471				0.869	
Voinjama		1.914				2.687	
Average		\$1.069				\$2.376	
		No.	Freq.				
Monrovia		96	.352				
Buchanan		35	.315				
Gbarnga		37	.333				
Ganta		40	.367				
Sanniquellie		35	.321				
Zorzor		39	.355				
Voinjama		39	.379				

Table 11. Household Expenditures for Other Food at Home on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	Sugar	Salt	Coffee, Tea
Monrovia	\$2.763	\$1.092	\$2.751
Buchanan	2.025	1.501	2.190
Gbarnga	1.113	1.686	1.016
Ganta	1.381	0.886	1.145
Sanniquellie	1.362	0.943	1.573
Zorzor	0.725	1.053	0.254
Voinjama	1.873	1.382	2.043
Average	\$2.449	\$1.159	\$2.445

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	188	.689	199	.729	152	.557
Buchanan	66	.595	83	.748	40	.360
Gbarnga	45	.405	101	.910	30	.270
Ganta	40	.367	73	.670	26	.239
Sanniquellie	45	.413	76	.697	30	.275
Zorzor	35	.318	78	.709	10	.091
Voinjama	38	.369	77	.748	29	.282

Urban Areas	Soft Drinks	Miscellaneous Foods	Total Other Foods
Monrovia	\$4.831	\$1.982	\$13.420
Buchanan	2.641	0.260	8.618
Gbarnga	1.678	0	5.493
Ganta	3.424	0.185	7.021
Sanniquellie	1.153	0	5.030
Zorzor	0.411	0.675	3.117
Voinjama	3.209	0	8.506
Average	\$4.175	\$1.502	\$11.731

	No.	Freq.	No.	Freq.
Monrovia	155	.568	38	.139
Buchanan	37	.333	1	.009
Gbarnga	26	.234	0	0
Ganta	48	.440	3	.028
Sanniquellie	25	.229	0	0
Zorzor	14	.127	13	.118
Voinjama	31	.301	0	0

Table 12. Household Expenditures for Food Away From Home on a Monthly Basis,
With Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	:	Prepared Food	:	Meals at Work	:	Total Food Away
Monrovia		\$2.676		\$4.027		\$6.703
Buchanan		2.440		2.012		4.453
Gbarnga		0.671		0.075		0.746
Ganta		3.433		2.671		6.104
Sanniquellie		0.383		0.816		1.199
Zorzor		0.167		0.182		0.348
Voinjama		0.513		0		0.513
Average		\$2.376		\$3.267		\$5.642
		No.	Freq.	No.	Freq.	
Monrovia		26	.103	58	.212	
Buchanan		10	.090	19	.171	
Gbarnga		8	.072	2	.018	
Ganta		28	.257	16	.147	
Sanniquellie		8	.073	5	.046	
Zorzor		3	.027	2	.018	
Voinjama		2	.019	0	0	

Table 13. Household Expenditures for Alcoholic Beverages on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	Cane Juice	Palm Wine	Beer	Total Alcoholic Beverages
Monrovia	\$1.961	\$.449	\$5.314	\$7.723
Buchanan	1.043	.193	1.295	2.531
Gbarnga	1.043	.470	1.942	3.455
Ganta	2.151	.433	1.774	4.358
Sanniquellie	2.351	1.402	1.896	5.650
Zorzor	.334	2.826	1.626	4.786
Voinjama	1.146	3.799	4.623	9.568
Average	\$1.787	\$.637	\$4.473	\$6.897

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	47	.172	16	.059	67	.245
Buchanan	18	.162	9	.081	10	.09
Gbarnga	13	.117	13	.117	9	.081
Ganta	22	.202	14	.128	10	.092
Sanniquellie	10	.092	15	.138	8	.073
Zorzor	9	.082	41	.373	8	.073
Voinjama	10	.097	27	.262	12	.117

Table 14. Total Household Food and Beverage Expenditures on a Monthly Basis, Areas in Liberia, March 1986.

Urban Areas	Rice	Other Cereals	Cassava	Other Starchy	Total Starchy
Monrovia	\$31.508	\$11.701	\$8.342	\$7.306	\$58.857
Buchanan	36.039	6.371	8.859	6.343	57.612
Gbarnga	35.963	4.725	6.123	6.376	53.187
Ganta	37.366	6.409	6.913	9.987	60.675
Sanniquellie	44.311	4.046	4.941	9.597	62.895
Zorzor	38.130	1.941	1.517	3.622	45.210
Voinjama	56.005	.171	.880	4.919	61.975
Average	\$33.845	\$9.810	\$7.686	\$7.166	\$58.507

Urban Areas	Pulses	Meat	Fish	Poultry, Milk	Oils	Vegetables
Monrovia	\$2.700	\$18.480	\$23.811	\$12.387	\$16.128	\$19.201
Buchanan	1.544	9.089	22.234	8.871	11.574	14.16
Gbarnga	1.656	12.231	18.386	8.693	14.861	15.91
Ganta	2.129	17.256	20.989	13.621	17.164	17.405
Sanniquellie	2.859	10.372	17.302	11.918	15.042	16.821
Zorzor	1.798	8.837	13.356	3.269	10.53	12.92
Voinjama	4.301	9.848	21.47	10.245	19.673	20.813
Average	\$2.580	\$17.023	\$22.817	\$11.665	\$15.727	\$18.418

Urban Areas	Fruit	Other Food	Total at Home	Total Food	Alcoholic Beverages	Total Food & Bev.
Monrovia	\$2.921	\$13.420	\$167.367	\$6.703	\$7.723	\$181.793
Buchanan	2.122	8.618	135.904	4.453	2.531	142.888
Gbarnga	1.399	5.493	131.793	.746	3.455	135.994
Ganta	1.405	7.021	157.086	6.104	4.358	167.548
Sanniquellie	1.733	5.030	144.030	1.199	5.650	150.879
Zorzor	.869	3.117	99.907	.348	4.786	105.041
Voinjama	2.687	8.506	159.366	.513	9.568	169.447
Average	\$2.376	\$11.731	\$160.844	\$5.642	\$6.897	\$173.383

Table 15. Household Expenditures for Fuel on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	:	Kerosene	:	Wood	:	Candles, Batteries
Monrovia	:	\$2.677	:	\$1.431	:	\$2.680
Buchanan	:	2.909	:	1.334	:	1.811
Gbarnga	:	3.973	:	2.241	:	4.976
Ganta	:	5.962	:	4.204	:	4.095
Sanniquellie	:	5.834	:	3.938	:	2.834
Zorzor	:	4.231	:	2.753	:	3.106
Voinjama	:	6.468	:	5.742	:	4.626
Average	:	\$3.158	:	\$1.840	:	\$2.875

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	145	.531	30	.110	193	.707
Buchanan	93	.838	32	.288	59	.532
Gbarnga	97	.874	43	.387	59	.532
Ganta	104	.954	74	.679	77	.706
Sanniquellie	102	.936	51	.468	64	.587
Zorzor	108	.982	70	.636	72	.655
Voinjama	102	.990	80	.777	91	.883

Urban Areas	:	Charcoal, Cooking Gas	:	Total Fuel
Monrovia	:	\$9.357	:	\$16.145
Buchanan	:	3.879	:	9.933
Gbarnga	:	3.940	:	15.130
Ganta	:	1.922	:	16.184
Sanniquellie	:	3.009	:	15.615
Zorzor	:	.147	:	10.238
Voinjama	:	.078	:	16.914
Average	:	\$7.601	:	\$15.473

	No.	Freq.
Monrovia	242	.886
Buchanan	82	.739
Gbarnga	66	.595
Ganta	36	.330
Sanniquellie	52	.477
Zorzor	9	.082
Voinjama	2	.019

Table 16. Household Expenditures for Housing on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	:	Water	:	Electricity	:	Rent, Payments	:	Total Housing
Monrovia		\$6.934		\$22.214		\$23.928		\$53.076
Buchanan		.461		7.989		5.448		13.898
Gbarnga		3.388		10.205		11.078		24.671
Ganta		.077		1.585		7.605		9.267
Sanniquellie		2.420		8.906		6.234		17.560
Zorzor		.061		0		4.254		4.315
Voinjama		2.907		5.477		9.326		17.710
Average		\$5.528		\$18.143		\$19.620		\$43.293
		No.	Freq.	No.	Freq.	No.	Freq.	
Monrovia		131	.480	110	.403	118	.432	
Buchanan		6	.054	41	.369	24	.216	
Gbarnga		29	.261	44	.396	35	.315	
Ganta		3	.028	5	.046	17	.156	
Sanniquellie		25	.229	41	.376	26	.239	
Zorzor		2	.018	0	0	31	.282	
Voinjama		35	.340	35	.340	34	.330	

Table 17. Household Expenditures for Clothing on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	:	Men's	:	Women's	:	Children'	:	Total Clothing
Monrovia		\$7.221		\$9.801		\$7.270		\$24.291
Buchanan		5.370		4.536		4.960		14.865
Gbarnga		2.906		2.744		3.315		8.965
Ganta		6.075		7.721		15.716		29.512
Sanniquellie		7.037		6.780		4.234		18.052
Zorzor		.613		3.306		3.021		6.940
Voinjama		7.081		10.057		6.602		23.741
Average		\$6.659		\$8.706		\$6.973		\$22.339
		No.	Freq.	No.	Freq.	No.	Freq.	
Monrovia		64	.234	75	.275	84	.308	
Buchanan		24	.216	26	.234	36	.324	
Gbarnga		16	.144	23	.207	28	.252	
Ganta		30	.275	40	.367	44	.404	
Sanniquellie		24	.220	26	.239	26	.239	
Zorzor		8	.073	17	.155	24	.218	
Voinjama		37	.359	45	.437	58	.563	

Table 18. Household Expenditures for Transportation on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	Gasoline, Diesel	Vehicles, Repair	Bus, Taxi	Total Transport
Monrovia	\$4.507	\$2.699	\$22.546	\$29.751
Buchanan	2.559	3.714	10.245	16.518
Gbarnga	5.661	1.827	7.003	14.491
Ganta	3.224	.704	13.119	17.047
Sanniquellie	9.213	1.112	6.581	16.906
Zorzor	.051	1.651	2.38	4.083
Voinjama	2.256	4.565	20.591	27.412
Average	\$4.312	\$2.683	\$19.435	\$26.430

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	27	.099	15	.055	238	.634
Buchanan	2	.018	5	.045	68	.613
Gbarnga	16	.144	2	.018	52	.387
Ganta	7	.064	3	.028	53	.578
Sanniquellie	12	.11	4	.037	65	.716
Zorzor	2	.018	6	.055	22	.536
Voinjama	10	.097	12	.117	75	.709

Table 19. Household Expenditures for Health and Education on a Monthly Basis, With Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	School Supplies*	School Fees	Total Education:	Medicine
Monrovia	\$36.087	\$53.941	\$90.028	\$15.486
Buchanan	14.101	24.149	38.25	6.212
Gbarnga	12.075	43.291	55.366	6.836
Ganta	19.518	58.791	78.309	10.116
Sanniquellie	27.754	65.924	93.678	9.04
Zorzor	15.887	23.407	39.294	7.63
Voinjama	36.091	27.956	64.047	17.107
Average	\$31.728	\$49.689	\$81.417	\$13.785

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	173	.634	153	.56	194	.711
Buchanan	68	.613	46	.414	86	.775
Gbarnga	43	.387	47	.423	86	.775
Ganta	63	.578	61	.56	64	.587
Sanniquellie	78	.716	77	.706	95	.872
Zorzor	59	.536	66	.6	86	.782
Voinjama	73	.709	29	.282	97	.942

*Includes school uniforms

Table 20. Household Expenditures for Other Nonfoods on a Monthly Basis, with Number and Frequency of Purchase, Urban Areas in Liberia, March 1986.

Urban Areas	:	Soap		Tobacco, Matches		Cooking Utensils		
Monrovia		\$9.773		\$4.509		\$1.143		
Buchanan		5.363		1.738		1.373		
Gbarnga		6.394		2.795		.855		
Ganta		5.458		3.222		.594		
Sanniquellie		7.733		.877		1.779		
Zorzor		3.185		1.916		1.310		
Voinjama		6.589		2.381		0		
Average		\$8.752		\$3.898		\$1.100		
		No.	Freq.	No.	Freq.	No.	Freq.	
Monrovia		271	.993	234	.857	28	.103	
Buchanan		110	.991	95	.856	17	.153	
Gbarnga		111	1.000	55	.495	11	.099	
Ganta		109	1.000	72	.661	9	.083	
Sanniquellie		109	1.000	49	.450	20	.183	
Zorzor		109	.991	77	.700	9	.082	
Voinjama		103	1.000	89	.864	0	0	
Urban Areas	:	Furniture		Social Expenses		Misc. Items	:	Total Other
Monrovia		\$3.442		\$7.164		\$14.835		\$40.865
Buchanan		1.697		3.541		4.807		18.519
Gbarnga		1.908		7.434		2.994		22.380
Ganta		2.634		7.367		6.624		25.900
Sanniquellie		.637		2.028		8.495		21.549
Zorzor		.097		1.264		0		7.772
Voinjama		.879		1.670		4.455		15.974
Average		\$2.936		\$6.399		\$12.169		\$35.253
		No.	Freq.	No.	Freq.	No.	Freq.	
Monrovia		15	.055	65	.238	48	.176	
Buchanan		6	.054	27	.243	16	.144	
Gbarnga		4	.036	15	.135	3	.027	
Ganta		7	.064	23	.211	41	.376	
Sanniquellie		5	.046	6	.055	8	.073	
Zorzor		3	.027	14	.127	0	0	
Voinjama		3	.029	10	.097	32	.311	

Table 21. Household Gifts and Tax and Interest Payments on a Monthly Basis, Number and Frequency of Payments, Urban Areas in Liberia, March 1986.

Urban Areas	Church, Charity	Licenses, Taxes	Interest Payments	Total Payments
Monrovia	\$6.149	\$11.353	\$4.018	\$21.521
Buchanan	4.322	3.200	.587	8.109
Gbarnga	2.747	2.863	0	5.609
Ganta	4.020	8.095	4.456	16.571
Sanniquellie	2.373	.496	4.085	6.955
Zorzor	.511	6.064	.030	6.605
Voinjama	1.852	4.323	0	6.175
Average	\$5.348	\$9.393	\$3.285	\$18.026

	No.	Freq.	No.	Freq.	No.	Freq.
Monrovia	151	.553	70	.256	33	.121
Buchanan	68	.613	9	.081	11	.099
Gbarnga	30	.270	4	.036	0	0
Ganta	41	.376	15	.138	10	.092
Sanniquellie	51	.468	1	.009	16	.147
Zorzor	19	.173	9	.082	2	.018
Voinjama	87	.845	5	.049	0	0

Table 22. Total Household Expenditures for all Items on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Fuel	Housing	Clothing	Trans- portation	Education	Medicine
Monrovia	\$16.145	\$53.076	\$24.291	\$29.751	\$90.028	\$15.486
Buchanan	9.933	13.898	14.865	16.518	38.250	6.212
Gbarnga	15.130	24.671	8.965	14.491	55.366	6.836
Ganta	16.184	9.267	29.512	17.047	78.309	10.116
Sanniquellie	15.615	17.560	18.052	16.906	93.678	9.040
Zorzor	10.238	4.315	6.940	4.083	39.294	7.630
Voinjama	16.914	17.710	23.741	27.412	64.047	17.107
Average	\$15.473	\$43.293	\$22.339	\$26.430	\$81.417	\$13.785

Urban Areas	Other Nonfoods	Gifts, Payments	Total Nonfood	Total Food, Bev	Total Expenditures
Monrovia	\$40.865	\$21.521	\$291.163	\$181.793	\$472.956
Buchanan	18.519	8.109	126.304	142.888	269.192
Gbarnga	22.380	5.609	153.448	135.994	289.442
Ganta	25.900	16.571	202.906	167.548	370.454
Sanniquellie	21.549	6.955	199.355	150.879	350.234
Zorzor	7.772	6.605	86.877	105.041	191.918
Voinjama	15.974	6.175	189.080	169.447	358.527
Average	\$35.253	\$18.026	\$256.016	\$173.383	\$429.399

Table 23. Per Capita Rice Expenditures or Use on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	:	Country	Imported	Concession	:	Total Rice
Monrovia	:	\$.104	\$4.898	\$.126	:	\$5.127
Buchanan	:	1.042	4.694	.025	:	5.761
Gbarnga	:	2.295	3.138	.000	:	5.434
Ganta	:	4.207	1.282	.070	:	5.560
Sanniquellie	:	5.133	1.688	.000	:	6.821
Zorzor	:	3.103	2.913	.000	:	6.016
Voinjama	:	6.876	1.468	.000	:	8.344
Average	:	\$.926	\$4.388	\$.097	:	\$5.411

Table 24. Per Capita Expenditures for Other Cereals on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	:	Cornmeal	Noodles,	Bread,	Other	:	Total Other Cereals
	:		Pasta	Flour	Cereals	:	
Monrovia	:	\$.300	\$.074	\$1.371	\$.160	:	\$1.904
Buchanan	:	.209	.002	.730	.078	:	1.018
Gbarnga	:	.125	.059	.512	.019	:	.714
Ganta	:	.093	.039	.766	.055	:	.954
Sanniquellie	:	.072	.055	.388	.108	:	.623
Zorzor	:	.047	.004	.214	.041	:	.306
Voinjama	:	.017	.000	.008	.000	:	.025
Average	:	\$.252	\$.061	\$1.143	\$.131	:	\$1.587

Table 25. Per Capita Expenditures for Cassava Products on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	:	Cassava Tubers	Fufu	Farina	:	Total Cassava
Monrovia	:	\$.749	\$.428	\$.181	:	\$1.357
Buchanan	:	.561	.626	.229	:	1.416
Gbarnga	:	.624	.263	.037	:	.925
Ganta	:	.793	.162	.074	:	1.029
Sanniquellie	:	.671	.038	.052	:	.761
Zorzor	:	.197	.032	.010	:	.239
Voinjama	:	.086	.045	.000	:	.131
Average	:	\$.688	\$.393	\$.159	:	\$1.239

Table 26. Per Capita Expenditures for Other Starchy Foods on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Sweet Potatoes	Yams	Eddoes	White Potatoes	Plantains	Total
Monrovia	\$.151	\$.145	\$.269	\$.148	\$.475	\$1.189
Buchanan	.094	.047	.485	.070	.318	1.014
Gbarnga	.063	.088	.517	.006	.290	.963
Ganta	.110	.076	.610	.085	.606	1.486
Sanniquellie	.509	.127	.429	.062	.359	1.477
Zorzor	.038	.021	.207	.005	.301	.571
Voinjama	.030	.059	.403	.007	.235	.733
Average	\$.143	\$.125	\$.322	\$.121	\$.440	\$1.150

Table 27. Per Capita Expenditures for Pulses on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Beans	Groundnuts, Beniseed	Total Pulses
Monrovia	\$.181	\$.258	\$.439
Buchanan	.063	.184	.247
Gbarnga	.170	.082	.250
Ganta	.092	.225	.317
Sanniquellie	.044	.396	.440
Zorzor	.174	.110	.284
Voinjama	.407	.234	.641
Average	\$.173	\$.241	\$.414

Table 28. Per Capita Expenditures for Meat and Fish on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Beef	Pork, Pig Feet	Lamb, Goat	Bush Meat	Total Meat	Fish
Monrovia	\$.733	\$1.213	\$.037	\$1.023	\$3.007	\$3.875
Buchanan	.429	.487	.029	.508	1.453	3.554
Gbarnga	.195	.646	.062	.945	1.848	2.778
Ganta	.179	.373	.304	1.712	2.567	3.123
Sanniquellie	.197	.454	.227	.719	1.597	2.663
Zorzor	.261	.127	.012	.994	1.394	2.107
Voinjama	.010	.196	.000	1.261	1.467	3.199
Average	\$.605	\$1.007	\$.051	\$1.001	\$2.664	\$3.668

Table 29. Per Capita Expenditures for Poultry, Milk, and Oil Products
on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Poultry	Eggs	Milk	Total	Palm Oil	Vegetable Oils	Total Oils
Monrovia	\$.579	\$.507	\$.929	\$2.016	\$1.942	\$.683	\$2.624
Buchanan	.647	.281	.490	1.418	1.634	.216	1.850
Gbarnga	.615	.202	.497	1.314	2.067	.178	2.245
Ganta	1.289	.344	.394	2.027	2.240	.313	2.554
Sanniquellie	.923	.210	.701	1.834	1.836	.480	2.315
Zorzor	.259	.139	.118	.516	1.549	.113	1.661
Voinjama	.723	.211	.592	1.526	2.865	.066	2.931
Average	\$.622	\$.438	\$.814	\$1.875	\$1.962	\$.561	\$2.523

Table 30. Per Capita Expenditures for Vegetables on a Monthly Basis,
Urban Areas in Liberia, March 1986.

Urban Areas	Onions	Pumpkin	Bitter-balls	Cassava Leaves	Potato Leaves	Lettuce, Cabbage	Total Vegetables
Monrovia	\$.438	\$.087	\$.299	\$.229	\$.328	\$.061	\$3.124
Buchanan	.261	.028	.253	.151	.247	.039	2.263
Gbarnga	.334	.020	.332	.157	.303	.044	2.404
Ganta	.342	.016	.526	.122	.257	.084	2.590
Sanniquellie	.390	.021	.340	.315	.204	.051	2.589
Zorzor	.239	.013	.378	.135	.147	.000	2.039
Voinjama	.469	.036	.199	.274	.313	.003	3.101
Average	\$.410	\$.071	\$.303	\$.217	\$.310	\$.056	\$2.958

Urban Areas	Okra	Tomatoes	Cucumber	Peppers	Maggi Cubes	Total Vegetables
Monrovia	\$.192	\$.296	\$.010	\$.735	\$.449	\$3.124
Buchanan	.188	.185	.009	.582	.319	2.263
Gbarnga	.136	.143	.008	.582	.345	2.404
Ganta	.097	.140	.043	.545	.417	2.590
Sanniquellie	.115	.099	.006	.604	.443	2.589
Zorzor	.058	.045	.000	.608	.416	2.039
Voinjama	.030	.289	.028	.852	.607	3.101
Average	\$.174	\$.263	\$.012	\$.706	\$.437	\$2.958

Table 31. Per Capita Expenditures for Fruit on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Citrus	Pine-apples*	Avocado	Bananas	Total Fruit
Monrovia	\$.194	\$.096	\$.008	\$.178	\$.475
Buchanan	.085	.085	.007	.161	.339
Gbarnga	.062	.034	.001	.115	.211
Ganta	.072	.014	.012	.111	.209
Sanniquellie	.054	.022	.070	.121	.267
Zorzor	.035	.016	.012	.074	.137
Voinjama	.052	.054	.009	.285	.400
Average	\$.161	\$.084	\$.009	\$.172	\$.425

* Includes paw paw and plums.

Table 32. Per Capita Expenditures for Other Food at Home on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Sugar	Salt	Coffee, Tea	Soft Drinks	Misc. Items	Total Other Food
Monrovia	\$.450	\$.178	\$.448	\$.786	\$.323	\$2.184
Buchanan	.324	.240	.350	.422	.042	1.378
Gbarnga	.168	.255	.154	.254	.000	.830
Ganta	.206	.132	.170	.509	.028	1.045
Sanniquellie	.210	.145	.242	.177	.000	.774
Zorzor	.114	.166	.040	.065	.106	.492
Voinjama	.279	.206	.304	.478	.000	1.267
Average	\$.395	\$.186	\$.395	\$.674	\$.244	\$1.893

Table 33. Per Capita Expenditures for Food Away From Home on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Prepared Food	Meals at Work	Total Food Away
Monrovia	.435	.655	1.091
Buchanan	.390	.322	.712
Gbarnga	.101	.011	.113
Ganta	.511	.397	.908
Sanniquellie	.059	.126	.184
Zorzor	.026	.029	.055
Voinjama	.076	.000	.076
Average	\$.383	\$.529	\$.913

Table 34. Per Capita Expenditures for Alcoholic Beverages on a Monthly Basis,
Urban Areas in Liberia, March 1986.

Urban Areas	:	Cane Juice	:	Palm Wine	:	Beer	:	Total Alc. Bev.
Monrovia		\$.316		\$.071		\$.855		\$1.242
Buchanan		.173		.039		.214		.426
Gbarnga		.159		.069		.293		.521
Ganta		.315		.065		.289		.670
Sanniquellie		.361		.213		.279		.854
Zorzor		.055		.443		.233		.731
Voinjama		.202		.541		.701		1.443
Average		\$.285		\$.098		\$.712		\$1.093

Table 35. Total Per Capita Food and Beverage Expenditures on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Rice	Other Cereals	Cassava	Other Starchy	Total Starchy
Monrovia	\$5.127	\$1.904	\$1.357	\$1.189	\$9.577
Buchanan	5.767	1.018	1.416	1.014	9.209
Gbarnga	5.434	.714	.925	.963	8.036
Ganta	5.560	.954	1.029	1.486	9.029
Sanniquellie	6.821	.623	.761	1.477	9.682
Zorzor	6.016	.306	.239	.571	7.132
Voinjama	8.344	.025	.131	.733	9.233
Average	\$5.411	\$1.587	\$1.239	\$1.150	\$9.387

Urban Areas	Pulses	Meat	Fish	Poultry, Milk	Oils	Vegetables
Monrovia	\$.439	\$3.007	\$3.875	\$2.016	\$2.624	\$3.124
Buchanan	.247	1.453	3.554	1.418	1.850	2.263
Gbarnga	.250	1.848	2.778	1.314	2.245	2.404
Ganta	.317	2.567	3.123	2.027	2.554	2.590
Sanniquellie	.440	1.597	2.663	1.834	2.315	2.589
Zorzor	.284	1.394	2.107	.516	1.661	2.039
Voinjama	.641	1.467	3.199	1.526	2.931	3.101
Average	\$.414	\$2.664	\$3.668	\$1.875	\$2.523	\$2.958

Urban Areas	Fruit	Other Food	Total : at Home	Total Away	Alcoholic Beverages	Total Food & Bev.
Monrovia	\$.475	\$2.184	\$27.321	1.091	\$1.242	\$29.654
Buchanan	.339	1.378	21.711	.712	.426	22.849
Gbarnga	.211	.830	19.916	.113	.521	20.550
Ganta	.209	1.045	23.461	.908	.670	25.039
Sanniquellie	.267	.774	22.161	.184	.854	23.199
Zorzor	.137	.492	15.762	.055	.731	16.548
Voinjama	.400	1.267	23.765	.076	1.443	25.284
Average	\$.425	\$1.893	\$25.807	\$.913	\$1.093	\$27.813

Table 36. Per Capita Expenditures for Fuel on a Monthly Basis,
Urban Areas in Liberia, March 1986.

Urban Areas	Kerosene	Wood	Candles, Charcoal Batteries	Total Fuel	
Monrovia	\$.436	\$.233	\$.436	\$1.523	\$2.627
Buchanan	.465	.213	.289	.620	1.588
Gbarnga	.600	.339	.752	.595	2.286
Ganta	.887	.626	.609	.286	2.408
Sanniquellie	.898	.606	.436	.463	2.404
Zorzor	.668	.434	.490	.023	1.615
Voinjama	.964	.856	.689	.012	2.520
Average	\$.502	\$.291	\$.459	\$1.232	\$2.483

Table 37. Per Capita Expenditures for Housing on a Monthly Basis,
Urban Areas in Liberia, March 1986.

Urban Areas	Water	Electricity	Rent	Total Housing
Monrovia	\$1.128	\$3.615	\$3.894	\$8.637
Buchanan	.074	1.277	.871	2.222
Gbarnga	.512	1.542	1.674	3.728
Ganta	.011	.236	1.132	1.379
Sanniquellie	.372	1.371	.960	2.703
Zorzor	.010	.000	.671	.681
Voinjama	.433	.816	1.389	2.639
Average	\$.895	\$2.938	\$3.173	\$7.006

Table 38. Per Capita Expenditures for Clothing on a Monthly Basis,
Urban Areas in Liberia, March 1986.

Urban Areas	Men's	Women's	Children'	Total Clothing
Monrovia	\$1.175	\$1.595	\$1.183	\$3.953
Buchanan	.858	.725	.793	2.376
Gbarnga	.439	.415	.501	1.355
Ganta	.904	1.149	2.338	4.391
Sanniquellie	1.083	1.044	.652	2.779
Zorzor	.097	.522	.477	1.095
Voinjama	1.055	1.498	.984	3.537
Average	\$1.072	\$1.402	\$1.118	\$3.592

Table 39. Per Capita Expenditures for Transportation on a Monthly Basis,
Urban Areas in Liberia, March 1986.

Urban Areas	Gasoline, Diesel	Vehicles, Repair	Bus, Taxi	Total Transport
Monrovia	\$.733	\$.439	\$3.669	\$4.841
Buchanan	.409	.594	1.638	2.640
Gbarnga	.855	.276	1.058	2.189
Ganta	.480	.105	1.952	2.536
Sanniquellie	1.418	.171	1.013	2.602
Zorzor	.008	.261	.376	.644
Voinjama	.336	.680	3.068	4.084
Average	\$.692	\$.431	\$3.135	\$4.259

Table 40. Per Capita Expenditures for Health and Education on a Monthly Basis,
Urban Areas in Liberia, March 1986.

Urban Areas	School Supplies*	School Fees	Total Education	Medicine
Monrovia	\$5.872	\$8.778	\$14.650	\$2.520
Buchanan	2.254	3.860	6.114	.993
Gbarnga	1.824	6.541	8.365	1.033
Ganta	2.904	8.747	11.651	1.505
Sanniquellie	4.272	10.148	14.420	1.392
Zorzor	2.507	3.693	6.200	1.204
Voinjama	5.377	4.165	9.542	2.549
Average	\$5.113	\$7.989	\$13.102	\$2.200

*Includes school uniforms.

Table 41. Per Capita Personal Contributions and Tax and Interest Payments on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Church, Charity	Licenses, Taxes	Interest Payments	Total
Monrovia	\$1.001	\$1.847	\$.654	\$3.502
Buchanan	.691	.511	.094	1.296
Gbarnga	.415	.433	.000	.848
Ganta	.598	1.204	.663	2.465
Sanniquellie	.365	.076	.629	1.071
Zorzor	.081	.957	.005	1.042
Voinjama	.276	.644	.000	.920
Average	\$.864	\$1.519	\$.531	\$2.914

Table 42. Per Capita Expenditures for Other Nonfoods on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Soap	Tobacco	Cooking Utensils	Furniture	Social Expenses	Misc. Items	Total Other
Monrovia	\$1.590	\$.734	\$.186	\$.560	\$1.166	\$2.414	\$6.650
Buchanan	.857	.278	.220	.271	.566	.768	2.960
Gbarnga	.966	.422	.129	.288	1.123	.452	3.381
Ganta	.812	.479	.088	.392	1.096	.986	3.853
Sanniquellie	1.190	.135	.274	.098	.312	1.308	3.317
Zorzor	.503	.302	.207	.015	.199	.000	1.226
Voinjama	.982	.355	.000	.131	.249	.664	2.380
Average	\$1.410	\$.629	\$.177	\$.474	\$1.030	\$1.969	\$5.690

Table 43. Total Per Capita Expenditures for All Items on a Monthly Basis,
Urban Areas in Liberia, March 1986.

Urban Areas	Fuel	Housing	Clothing	Trans- portation	Education	Medicine
Monrovia	\$2.627	\$8.637	\$3.953	\$4.841	\$14.650	\$2.520
Buchanan	1.588	2.222	2.376	2.640	6.114	.993
Gbarnga	2.286	3.728	1.355	2.189	8.365	1.033
Ganta	2.408	1.379	4.391	2.536	11.651	1.505
Sanniquellie	2.404	2.703	2.779	2.602	14.420	1.392
Zorzor	1.615	.681	1.095	.644	6.200	1.204
Voinjama	2.520	2.639	3.537	4.084	9.542	2.549
Average	\$2.483	\$7.006	\$3.592	\$4.259	\$13.102	\$2.200

Urban Areas	Other Nonfoods	Gifts Payments	Total : Nonfood	Total Food, Bev	Total : Expenditures
Monrovia	\$6.650	\$3.502	\$47.380	\$29.654	\$77.034
Buchanan	2.960	1.296	20.189	22.849	43.038
Gbarnga	3.381	.848	23.185	20.550	43.735
Ganta	3.853	2.465	30.188	25.039	55.227
Sanniquellie	3.317	1.071	30.688	23.199	53.887
Zorzor	1.226	1.042	13.707	16.548	30.255
Voinjama	2.380	.920	28.171	25.284	53.455
Average	\$5.690	\$2.914	\$41.246	\$27.813	\$69.059

Table 44. Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Monrovia, March 1986.

Income Group	No. : Obs	Country Rice	Imported Rice	All Rice	Other Cereals	Cassava	Other Starchy	Total Starchy
\$0-99	14	\$.000	\$7.605	\$7.605	\$.511	\$.613	\$.104	\$8.833
100-199	39	.119	5.440	5.559	.837	1.290	.640	8.326
200-299	48	.014	5.246	5.260	1.265	1.484	.662	8.671
300-399	41	.200	4.617	4.817	1.020	1.014	.853	7.704
400-499	21	.000	5.045	5.045	1.623	1.322	1.518	9.508
500-599	18	.048	5.049	5.097	1.631	2.229	.939	9.896
600-699	19	.012	5.623	5.635	3.762	1.367	1.418	12.182
700-899	24	.140	5.553	5.693	3.033	1.410	1.904	12.040
900-1099	19	.275	4.304	4.579	2.553	1.373	1.851	10.356
1100-1499	16	.205	4.545	4.750	4.024	.829	2.420	12.023
1500+	14	.000	4.257	4.257	2.861	1.238	1.527	9.883

Income Group	Pulses	Meat	Fish	Poultry, Milk	Oils	Vegetables	Fruit	Other Food
\$0-99	\$.311	\$1.047	\$4.113	\$1.422	\$2.149	\$3.963	\$.142	\$1.186
100-199	.194	2.025	4.523	.451	2.595	2.843	.257	1.302
200-299	.575	2.353	4.160	1.382	2.213	3.332	.217	2.232
300-399	.156	2.154	3.248	1.536	2.193	2.691	.325	1.812
400-499	.357	2.537	4.469	2.576	3.027	2.730	.468	1.777
500-599	.089	2.842	2.920	1.505	2.048	2.413	.393	.811
600-699	.411	3.228	3.795	2.193	2.904	4.087	.534	3.807
700-899	.442	4.713	3.833	3.084	3.680	3.402	1.030	3.194
900-1099	.933	3.933	3.542	2.012	2.716	2.788	.270	1.892
1100-1499	.733	6.274	5.141	7.139	3.721	5.344	1.596	4.917
1500+	.941	4.348	4.204	3.180	2.981	3.326	1.216	3.253

Income Group	Total :at Home	Food Away	Alcoholic Beverages	Total Education: Food, Bev Costs	Other Nonfoods	Total Nonfood	Total Expenditures
\$0-99	\$23.165	\$3.641	\$.035	\$26.841	\$.089	\$15.006	\$41.936
100-199	22.517	1.027	.572	24.116	1.590	15.354	41.060
200-299	25.134	1.065	1.138	27.337	3.810	22.849	53.996
300-399	21.816	1.204	.886	23.906	5.970	21.266	51.142
400-499	27.450	1.221	1.381	30.052	11.411	19.150	60.613
500-599	22.918	.262	.854	24.034	16.488	18.937	59.459
600-699	33.143	1.071	3.405	37.619	16.400	32.420	86.439
700-899	35.417	.767	1.781	37.965	28.318	69.933	136.216
900-1099	28.441	1.075	.458	29.974	21.423	40.100	91.497
1100-1499	46.888	2.236	2.225	51.349	47.439	69.962	168.750
1500+	33.331	.954	1.856	36.141	46.831	94.281	177.253

Table 45. Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Buchanan, March 1986.

Income Group	No. : : Obs	Country : : Rice	Imported : : Rice	All : : Rice	Other : : Cereals	Cassava	Other : : Starchy	Total : : Starchy
\$0-99	16	\$.455	\$5.001	\$5.456	\$.373	\$1.423	\$.925	\$8.177
100-199	40	1.024	4.237	5.261	.725	1.018	.435	7.439
200-299	20	1.210	4.826	6.036	.715	1.238	.450	8.439
300-399	13	1.476	4.036	5.512	.878	.969	1.329	8.688
400-599	9	.276	4.027	4.303	1.211	1.428	1.614	8.556
600-899	7	.721	8.802	9.523	2.558	4.513	2.676	19.270
900+	6	1.893	5.638	7.531	3.052	2.250	2.600	15.433
Income Group	Pulses	Meat	Fish	Poultry, Milk	Oils	Vege- tables	Fruit	Other Food
\$0-99	\$.147	\$.484	\$1.651	\$.000	\$1.718	\$1.391	\$.109	\$.414
100-199	.200	.514	3.589	1.079	1.807	2.076	.249	.933
200-299	.137	.677	4.031	1.402	1.361	2.000	.364	1.058
300-399	.251	1.364	3.206	1.200	1.174	2.293	.365	1.051
400-599	.265	1.816	3.137	1.496	2.613	1.924	.342	1.072
600-899	.519	5.082	4.984	2.979	3.158	4.605	.718	4.626
900+	.672	6.622	4.731	4.364	3.027	3.345	.638	4.363
Income Group	Total : : Food at Home	Food Away : : From Home	Alcoholic : : Beverages	Total Food : : and Beverages				
\$0-99	\$14.089	\$.284	\$.122	\$14.495				
100-199	17.886	.161	.314	18.361				
200-299	19.470	.510	.407	20.387				
300-399	19.591	.763	.460	20.814				
400-599	21.220	.702	.446	22.368				
600-899	45.939	4.604	.594	51.137				
900+	43.194	.808	1.293	45.295				
Income Group	Education : : Costs	Other : : Nonfoods	Total : : Nonfoods	Total : : Expenditures				
\$0-99	\$.115	\$3.416	\$3.531	\$18.026				
100-199	1.370	8.279	9.649	28.010				
200-299	5.683	11.387	17.070	37.457				
300-399	6.346	19.447	25.793	46.607				
400-599	12.354	18.337	30.691	53.059				
600-899	10.248	15.578	25.826	76.963				
900+	29.201	48.482	77.683	122.978				

Table 46. Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Gbarnga, March 1986.

Income Group	No. : Obs :	Country Rice	Imported Rice	All :Rice	Other Cereals	Cassava	Other : Starchy	Total : Starchy
\$0-99	9	\$1.737	\$6.949	\$8.686	\$.911	\$.983	\$1.312	\$11.892
100-199	38	2.273	3.254	5.527	.616	.639	.987	7.769
200-299	23	2.501	3.238	5.739	.432	1.227	.954	8.352
300-399	11	4.436	2.044	6.480	.700	1.123	.874	9.177
400-599	16	1.552	3.135	4.687	.732	.982	1.276	7.677
600-899	9	3.001	2.218	5.219	1.229	.584	.498	7.530
900+	5	.451	2.988	3.439	1.293	1.278	.447	6.457
Income Group	Pulses	Meat	Fish	Poultry, Milk	Oils	Vege- tables	Fruit	Other Food
\$0-99	\$.303	\$2.220	\$3.356	\$.000	\$3.649	\$2.363	\$.051	\$.825
100-199	.162	.949	2.484	.566	1.884	1.711	.151	.461
200-299	.273	1.467	3.509	.774	2.705	2.795	.078	.879
300-399	.185	1.654	2.606	1.749	2.036	2.934	.221	1.148
400-599	.348	2.445	3.018	1.115	1.962	2.560	.287	.711
600-899	.262	2.089	2.648	3.492	2.111	2.460	.485	1.785
900+	.372	5.201	1.528	4.576	3.165	3.278	.435	1.299
Income Group	Total Food at Home	Food Away From Home	Alcoholic Beverages	Total Food and Beverages				
\$0-99	\$24.666	\$.000	\$.110	\$24.776				
100-199	16.138	.080	.261	16.479				
200-299	20.833	.028	.391	21.252				
300-399	21.710	.264	.670	22.644				
400-599	20.123	.100	.154	20.377				
600-899	22.865	.155	1.754	24.774				
900+	26.311	.328	1.822	28.461				
Income Group	Education Costs	Other Nonfoods	Total Nonfoods	Total Expenditures				
\$0-99	\$.000	\$9.749	\$9.749	\$34.525				
100-199	1.065	7.098	8.163	24.642				
200-299	2.759	11.947	14.706	35.958				
300-399	14.742	15.642	30.384	53.028				
400-599	13.071	19.151	32.222	52.599				
600-899	31.702	23.132	54.834	79.608				
900+	15.707	38.904	54.611	83.072				

Table 47. Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Ganta, Spring 1986.

Income Group	No. : Obs :	Country Rice	Imported Rice	All : :Rice	Other Cereals	Cassava	Other : Starchy	Total : Starchy
\$0-99	9	\$5.373	\$.925	\$6.298	\$.549	\$.654	\$.437	\$7.938
100-199	32	3.432	2.285	5.717	.559	.996	1.019	8.291
200-299	19	4.031	1.461	5.492	.904	.685	1.613	8.694
300-399	12	5.645	.683	6.328	.912	1.496	.835	9.571
400-599	19	4.398	1.114	5.512	1.089	.721	1.416	8.738
600-899	10	4.305	.795	5.100	.894	.938	1.490	8.422
900+	8	3.266	1.562	4.828	2.108	2.233	4.024	13.193

Income Group	Pulses	Meat	Fish	Poultry, Milk	Oils	Vege- tables	Fruit	Other Food
\$0-99	\$.010	\$.383	\$1.873	\$.000	\$3.097	\$2.956	\$.045	\$.901
100-199	.047	1.251	2.947	.442	2.192	2.482	.122	.499
200-299	.054	2.036	3.313	.566	3.085	2.715	.157	1.314
300-399	.474	2.042	2.623	.210	1.572	2.391	.125	.767
400-599	.704	3.178	3.832	1.944	2.717	2.388	.275	1.161
600-899	.360	5.086	3.455	2.369	2.354	2.221	.235	1.243
900+	.456	2.578	2.240	11.971	3.489	3.873	.526	1.704

Income Group	Total Food at Home	Food Away From Home	Alcoholic Beverages	Total Food and Beverages
\$0-99	\$17.205	\$.549	\$.287	\$18.041
100-199	18.273	.412	.420	19.105
200-299	21.933	1.774	.261	23.968
300-399	19.775	1.371	.882	22.028
400-599	24.936	.481	1.262	26.679
600-899	25.745	.908	.267	26.920
900+	40.029	1.040	1.366	42.435

Income Group	Education Costs	Other Nonfoods	Total Nonfoods	Total Expenditures
\$0-99	\$.367	\$8.866	\$9.233	\$27.274
100-199	3.743	8.291	12.034	31.139
200-299	7.082	13.952	21.034	45.002
300-399	11.128	10.955	22.083	44.111
400-599	9.289	13.802	23.091	49.770
600-899	14.191	31.217	45.408	72.328
900+	47.903	55.979	103.882	146.317

Table 48. Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Sanniquellie, March 1986.

Income Group	No. : Obs :	Country Rice	Imported Rice	All : :Rice	Other Cereals	Cassava	Other : Starchy :	Total : Starchy
\$0-99	9	\$6.063	\$.000	\$6.063	\$.446	\$.498	\$.531	\$7.538
100-199	32	5.224	.903	6.127	.383	.883	.741	8.134
200-299	20	4.591	1.708	6.299	.298	.704	1.059	8.420
300-399	15	4.857	1.345	6.202	.344	.586	4.324	11.456
400-599	17	6.942	1.268	8.210	1.195	.513	.713	10.631
600-899	7	2.950	3.237	6.187	.458	.919	2.850	10.414
900+	9	4.365	4.093	8.458	1.300	1.086	1.041	11.885

Income Group	Pulses	Meat	Fish	Poultry, Milk	Oils	Vege- tables	Fruit	Other Food
\$0-99	\$.169	\$.000	\$2.004	\$.570	\$1.964	\$1.593	\$.150	\$.900
100-199	.281	.373	2.133	1.089	1.966	2.018	.137	.885
200-299	.150	1.218	3.012	.867	2.259	1.886	.160	.598
300-399	1.403	1.412	2.591	.295	2.042	2.320	.214	.691
400-599	.503	1.840	2.949	1.845	2.730	4.368	.357	.538
600-899	.332	2.912	2.589	6.669	3.353	2.584	.876	.618
900+	.185	4.535	3.155	4.150	2.228	2.775	.273	1.413

Income Group	Total Food at Home	Food Away From Home	Alcoholic Beverages	Total Food and Beverages
\$0-99	\$14.888	\$.065	\$.274	\$15.227
100-199	17.016	.051	.995	18.062
200-299	18.570	.024	.046	18.640
300-399	22.425	.017	.344	22.786
400-599	25.761	.155	1.805	27.721
600-899	30.346	.000	.090	30.436
900+	30.598	1.215	1.694	33.507

Income Group	Education Costs	Other Nonfoods	Total Nonfoods	Total Expenditures
\$0-99	\$.106	\$7.402	\$7.508	\$22.735
100-199	3.434	8.147	11.581	29.643
200-299	9.711	12.170	21.881	40.521
300-399	17.333	11.314	28.647	51.433
400-599	14.217	17.585	31.802	59.523
600-899	20.858	21.634	42.492	72.928
900+	45.417	45.612	91.029	124.536

Table 49. Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Zorzor, March 1986.

Income Group	No. : Obs :	Country Rice	Imported Rice	All :Rice	Other Cereals	Cassava	Other Starchy	Total : Starchy
\$0-99	30	\$3.079	\$2.645	\$5.724	\$.218	\$.088	\$.261	\$6.291
100-199	42	3.581	2.614	6.195	.289	.257	.377	7.118
200-299	24	1.966	3.971	5.937	.213	.181	.574	6.905
300-399	5	3.224	3.212	6.436	.537	.278	.599	7.850
400-599	5	4.099	1.702	5.801	1.268	.359	1.898	9.326
600+	4	4.870	1.289	6.159	.052	.675	1.171	8.057
Income Group	Pulses	Meat	Fish	Poultry, Milk	Oils	Vege- tables	Fruit	Other Food
\$0-99	\$.183	\$.534	\$2.058	\$.178	\$1.377	\$1.546	\$.062	\$.508
100-199	.331	1.012	1.931	.296	1.416	2.013	.102	.304
200-299	.262	1.317	1.769	.393	1.602	1.695	.221	.660
300-399	.362	2.236	3.171	.817	2.376	2.476	.050	.676
400-599	.452	3.637	3.448	3.388	2.868	3.683	.330	.815
600+	.209	3.408	2.772	.342	2.390	3.267	.024	.243
Income Group	Total Food at Home	Food Away From Home	Alcoholic Beverages	Total Food and Beverages				
\$0-99	\$12.738	\$.080	\$.617	\$13.435				
100-199	14.524	.000	.600	15.124				
200-299	14.822	.094	.621	15.537				
300-399	20.014	.110	.744	20.868				
400-599	27.948	.000	.657	28.605				
600+	20.713	.104	2.219	23.036				
Income Group	Education Costs	Other Nonfoods	Total Nonfoods	Total Expenditures				
\$0-99	\$1.524	\$3.805	\$5.329	\$18.764				
100-199	2.900	6.204	9.104	24.228				
200-299	6.230	5.572	11.802	27.339				
300-399	13.942	10.359	24.301	45.169				
400-599	15.667	25.051	40.718	69.323				
600+	21.613	15.160	36.773	59.809				

Table 50. Per Capita Food and Nonfood Expenditures on a Monthly Basis, by Level of Income, Voinjama, March 1986.

Income Group	No. : : Obs	Country : Rice	Imported : Rice	All : Rice	Other : Cereals	Cassava	Other : Starchy	Total : Starchy
\$0-99	4	\$6.725	\$.000	\$6.725	\$.000	\$.000	\$.989	\$7.714
100-199	18	9.364	.331	9.695	.000	.280	.423	10.398
200-299	33	7.108	.355	7.463	.016	.086	.404	7.969
300-399	17	8.644	.630	9.274	.064	.086	.970	10.394
400-599	20	5.694	2.876	8.570	.035	.230	1.160	9.995
600-899	7	4.071	3.434	7.505	.000	.055	.338	7.898
900+	4	5.136	3.223	8.359	.000	.000	.826	9.185

Income Group	Pulses	Meat	Fish	Poultry, Milk	Oils	Vege- tables	Fruit	Other Food
\$0-99	\$.498	\$.387	\$2.236	\$.000	\$2.482	\$2.122	\$.000	\$.478
100-199	.628	.972	3.217	.432	3.188	3.861	.047	.880
200-299	.588	1.235	2.730	1.070	2.417	2.756	.329	.826
300-399	.830	.936	3.603	2.410	2.828	3.131	.559	1.836
400-599	.725	2.139	3.300	1.685	2.983	3.226	.349	1.321
600-899	.291	1.864	3.772	1.437	3.184	2.843	.494	1.536
900+	.589	2.324	3.151	3.082	5.049	3.758	1.154	1.948

Income Group	Total : Food at Home	Food Away : From Home	Alcoholic : Beverages	Total Food : and Beverages
\$0-99	\$15.916	\$.000	\$1.290	\$17.206
100-199	23.624	.000	.671	24.295
200-299	19.921	.182	.613	20.716
300-399	26.529	.000	.715	27.244
400-599	25.722	.000	2.344	28.066
600-899	23.319	.000	2.447	25.766
900+	30.240	.480	4.035	34.755

Income Group	Education : Costs	Other : Nonfoods	Total : Nonfoods	Total : Expenditures
\$0-99	\$.000	\$6.236	\$6.236	\$23.442
100-199	2.016	16.296	18.312	42.607
200-299	4.851	15.310	20.161	40.877
300-399	7.282	15.998	23.280	50.524
400-599	12.755	24.484	37.239	65.305
600-899	21.039	14.918	35.957	61.723
900+	26.048	36.642	62.690	97.445

Table 51. Monthly Per Capita Expenditures for Rice, other Food Groups, and Nonfoods, by Age of Household Head, by Urban Area in Liberia, March 1986.

Area and Age Group	Country Rice	Imported Rice	All Rice	Other Cereals	Cassava	Other Starchy	Total Starchy
Monrovia							
34 and Under	\$.169	\$5.101	\$5.270	\$1.863	\$1.414	\$1.386	\$9.933
35 - 64	.084	4.959	5.043	1.959	1.344	1.137	9.483
65 and Over	.000	5.721	5.721	1.100	1.188	.714	8.723
Buchanan							
34 and Under	.665	6.232	6.897	1.515	1.967	1.380	11.759
35 - 64	.975	4.298	5.273	.877	1.290	.920	8.360
65 and Over	3.286	4.211	7.497	.892	.889	.793	10.071
Gbarnga							
34 and Under	3.920	3.314	7.234	1.218	1.620	1.271	11.343
35 - 64	1.998	3.088	5.086	.590	.799	.897	7.372
65 and Over	1.989	3.692	5.681	1.635	.779	1.220	9.315
Ganta							
34 and Under	4.219	1.829	6.048	1.199	1.106	1.717	10.070
35 - 64	4.150	1.377	5.522	.754	.656	1.559	8.491
65 and Over	4.303	.367	4.670	.882	1.649	.856	8.057
Sanniquellie							
34 and Under	4.922	1.448	6.370	.328	.863	.797	8.358
35 - 64	5.056	2.148	7.204	.873	.728	2.078	10.883
65 and Over	6.041	.302	6.343	.313	.530	.653	7.939
Zorzor							
34 and Under	3.386	3.226	6.612	.574	.375	.782	8.343
35 - 64	2.974	2.789	5.763	.184	.188	.493	6.628
65 and Over	3.285	2.598	5.883	.452	.043	.236	6.614
Voinjama							
34 and Under	7.484	1.873	9.357	.047	.410	.351	10.165
35 - 64	6.982	1.497	8.479	.024	.088	.857	9.448
65 and Over	4.596	.354	4.950	.000	.000	.253	5.203
Area and Age Group	Pulses	Meat	Fish	Poultry, Milk	Oils	Vegetables	Fruit
Monrovia							
34 and Under	\$.914	\$4.109	\$4.415	\$3.033	\$3.338	\$4.453	\$.676
35 - 64	.275	2.593	3.548	1.666	2.392	2.627	.399
65 and Over	.113	2.904	4.294	1.265	1.833	2.950	.476
Buchanan							
34 and Under	.391	1.762	3.249	1.570	2.374	2.676	.275
35 - 64	.203	1.374	3.665	1.393	1.755	2.171	.342
65 and Over	.242	1.260	3.333	1.147	1.051	1.853	.549
Gbarnga							
34 and Under	.319	2.697	3.880	2.468	3.100	3.176	.304
35 - 64	.213	1.654	2.564	1.056	2.087	2.242	.199
65 and Over	1.040	2.953	2.980	2.595	2.166	2.927	.059
Ganta							
34 and Under	.314	1.899	3.440	1.587	3.142	2.977	.225
35 - 64	.216	2.802	3.046	2.874	2.346	2.518	.222
65 and Over	.533	3.239	2.654	1.134	1.819	1.970	.151

(continued)

Table 51—Continued (per capita expenditures by age group)

Area and Age Group	Pulses	Meat	Fish	Poultry, Milk	Oils	Vegetables	Fruit
Sanniquellie							
34 and Under	\$.374	\$.720	\$2.849	\$2.339	\$1.996	\$3.187	\$.147
35 - 64	.579	2.220	2.626	1.821	2.655	2.502	.353
65 and Over	.004	1.200	2.327	.538	1.674	1.367	.210
Zorzor							
34 and Under	.328	1.721	2.294	.816	1.989	2.577	.099
35 - 64	.267	1.287	2.054	.390	1.532	1.821	.157
65 and Over	.226	.526	1.394	.414	1.334	1.626	.060
Voinjama							
34 and Under	.361	1.544	3.097	1.177	2.848	3.181	.224
35 - 64	.690	1.355	3.254	1.749	3.036	3.184	.403
65 and Over	.708	2.432	2.854	.000	2.044	2.106	.727
Area and Age Group	Other Food	Food at Home	Food Away	Alcoholic Beverages	Food & Beverage	Total Nonfood	Total Expenditures
Monrovia							
34 and Under	\$3.574	\$34.447	\$1.599	\$1.671	\$37.717	\$53.666	\$91.383
35 - 64	1.691	24.774	.947	1.125	26.846	46.370	73.216
65 and Over	1.455	24.014	.097	.308	24.419	19.552	43.971
Buchanan							
34 and Under	1.681	25.736	1.917	.905	28.558	18.094	46.652
35 - 64	1.270	20.533	.401	.277	21.211	20.602	41.813
65 and Over	1.563	21.068	.000	.458	21.526	23.018	44.544
Gbarnga							
34 and Under	1.820	29.106	.170	1.013	30.289	44.398	74.687
35 - 64	.641	18.029	.105	.432	18.566	18.882	37.448
65 and Over	.913	24.949	.000	.408	25.357	33.029	58.386
Ganta							
34 and Under	1.153	24.807	1.051	1.049	26.907	30.854	57.761
35 - 64	.918	23.512	1.081	.630	25.223	29.686	54.909
65 and Over	1.093	20.670	.265	.000	20.935	29.918	50.853
Sanniquellie							
34 and Under	1.033	21.004	.100	1.127	22.231	24.438	46.669
35 - 64	.744	24.382	.237	.855	25.474	36.358	61.832
65 and Over	.212	15.470	.181	.114	15.765	22.452	38.217
Zorzor							
34 and Under	.488	18.655	.049	1.160	19.864	15.480	35.344
35 - 64	.483	14.619	.060	.573	15.252	13.245	28.497
65 and Over	.761	12.955	.000	.000	12.955	5.892	18.847
Voinjama							
34 and Under	.638	23.237	.000	2.024	25.261	39.630	64.891
35 - 64	1.424	24.544	.099	1.397	26.040	26.786	52.826
65 and Over	.971	17.045	.000	.740	17.785	18.939	36.724

Table 52. Monthly Per Capita Expenditures for Rice, Other Food Groups, and Nonfoods, by Education of Household Head, Monrovia, March 1986.

Education Level	Country Rice	Imported Rice	Total Rice	Other Cereals	Cassava	Other Starchy	Total Starchy
No Formal Educ.	\$.086	\$4.946	\$5.032	\$1.480	\$1.330	\$.768	\$8.610
Attend Elementary	.286	4.893	5.179	.874	1.727	.696	8.476
Attend Jr. High	.000	5.876	5.876	1.696	.867	.811	9.250
Attend Sr. High	.165	4.809	4.974	2.576	1.428	1.603	10.581
Attend College	.000	5.215	5.215	2.485	1.217	1.834	10.751

Education Level	Pulses	Meat	Fish	Poultry, Milk	Oils	Vegetables	Fruits
No Formal Educ.	\$.290	\$2.039	\$3.224	\$1.072	\$2.304	\$2.518	\$.361
Attend Elementary	.719	3.217	3.472	2.084	2.220	2.941	.271
Attend Jr. High	.463	2.998	4.697	2.320	2.789	4.222	.443
Attend Sr. High	.592	3.650	4.473	2.665	3.419	3.673	.639
Attend College	.468	5.337	4.123	4.093	2.889	3.436	.987

Education Level	Other Food	Food at Home	Food Alcoholic Beverages	Food & Beverages
No Formal Educ.	\$1.799	\$22.217	\$.531	\$23.529
Attend Elementary	2.007	25.407	.845	27.157
Attend Jr. High	2.190	29.373	2.453	33.251
Attend Sr. High	2.915	32.607	1.336	35.961
Attend College	2.713	34.797	.903	37.559

Education Level	Education Costs	Other Nonfoods	Total Nonfoods	Total Expenditures
No Formal Educ.	\$11.436	\$24.295	\$35.731	\$59.260
Attend Elementary	18.996	36.726	55.722	82.879
Attend Jr. High	9.949	26.640	36.589	69.840
Attend Sr. High	16.420	36.611	53.031	88.992
Attend College	30.979	59.271	90.250	127.809

Education Level	Number of Observations
No Formal Educ.	70
Attend Elementary	25
Attend Jr. High	21
Attend Sr. High	86
Attend College	46

Table 53. Budget Shares of Expenditures for Rice, Other Food Groups, and Nonfoods, Urban Areas in Liberia, March 1986.

Urban Areas	Country Rice	Imported Rice	Total Rice	Other Cereals	Cassava	Other Starchy	Total Starchy
(percent of total expenditures)							
Monrovia	.13	6.52	6.65	2.47	1.76	1.54	12.42
Buchanan	2.42	10.96	13.38	2.37	3.29	2.36	21.40
Gbarnga	5.25	7.18	12.43	1.63	2.12	2.20	18.38
Ganta	7.62	2.45	10.07	1.73	1.86	2.69	16.35
Sanniquellie	9.53	3.13	12.66	1.16	1.41	2.74	17.97
Zorzor	10.26	9.63	19.89	1.01	.79	1.89	23.58
Voinjama	12.86	2.75	15.61	.05	.25	1.37	17.28
Urban Areas	Pulses	Meat	Fish	Poultry, Milk	Oils	Vegetables	Fruits
(percent of total expenditures)							
Monrovia	.57	3.90	5.03	2.62	3.41	4.06	.62
Buchanan	.57	3.38	8.26	3.29	4.30	5.26	.79
Gbarnga	.57	4.23	6.35	3.00	5.13	5.50	.48
Ganta	.57	4.65	5.65	3.67	4.62	4.69	.38
Sanniquellie	.82	2.96	4.94	3.40	4.30	4.80	.50
Zorzor	.94	4.61	6.96	1.71	5.49	6.74	.45
Voinjama	1.20	2.74	5.98	2.86	5.48	5.80	.75
Urban Areas	Other Food	Food at Home	Food Away	Alcoholic Beverages	Food & Beverages		
(percent of total expenditures)							
Monrovia	2.83	35.47	1.42	1.61	38.50		
Buchanan	3.20	50.45	1.65	.99	53.09		
Gbarnga	1.90	45.54	.26	1.19	46.99		
Ganta	1.89	42.48	1.64	1.21	45.33		
Sanniquellie	1.44	41.13	.34	1.58	43.05		
Zorzor	1.63	52.10	.18	2.42	54.70		
Voinjama	2.37	44.46	.14	2.70	47.30		
Urban Areas	Education Costs	Housing	Fuel	Other Nonfoods	Total Nonfoods	Total Expenditures	
(percent of total expenditures)							
Monrovia	19.02	11.21	3.41	27.86	61.50	100.00	
Buchanan	14.21	5.16	3.69	23.85	46.91	100.00	
Gbarnga	19.13	8.52	5.23	20.13	53.01	100.00	
Ganta	21.10	2.50	4.36	26.71	54.67	100.00	
Sanniquellie	26.76	5.02	4.46	20.71	56.95	100.00	
Zorzor	20.49	2.25	5.34	17.22	45.30	100.00	
Voinjama	17.85	4.94	4.71	25.20	52.70	100.00	

Table 54. Budget Shares of Expenditures for Food and Nonfood Groups,
by Household Income Group, Monrovia, March 1986.

Income Group :	Rice	Other Cereals	Cassava	Other Starchy :	Total Starchy :	Pulses	Meat	Fish
(percent of total expenditures)								
\$0-100	18.13	1.22	1.46	.25	21.06	.74	2.50	9.81
100-199	13.54	2.04	3.14	1.56	20.28	.47	4.93	11.02
200-299	9.74	2.34	2.75	1.23	16.06	1.07	4.36	7.70
300-399	9.42	1.99	1.98	1.67	15.06	.31	4.21	6.35
400-499	8.32	2.68	2.18	2.50	15.68	.59	4.19	7.37
500-599	8.57	2.74	3.75	1.58	16.64	.15	4.78	4.91
600-699	6.52	4.35	1.58	1.64	14.09	.48	3.73	4.39
700-899	4.18	2.23	1.04	1.40	8.85	.32	3.46	2.81
900-1,099	5.01	2.79	1.50	2.02	11.32	1.02	4.30	3.87
1,100-1,4	2.81	2.38	.49	1.43	7.11	.43	3.72	3.05
1,500+	2.40	1.61	.70	.86	5.57	.53	2.45	2.37
Income Group :	Poultry, Milk	Oils	Vegetables	Fruit	Other Food	Food at home	Food Away	Alcoholic Beverages
(percent of total expenditures)								
\$0-100	3.39	5.12	9.45	.34	2.83	55.24	8.68	.08
100-199	1.10	6.32	6.92	.63	3.17	54.84	2.50	1.39
200-299	2.56	4.10	6.17	.40	4.13	46.55	1.97	2.11
300-399	3.00	4.29	5.26	.64	3.54	42.67	2.35	1.73
400-499	4.25	4.99	4.50	.77	2.93	45.29	2.01	2.28
500-599	2.53	3.45	4.06	.66	1.36	38.54	.44	1.44
600-699	2.54	3.36	4.73	.62	4.40	38.34	1.24	3.94
700-899	2.26	2.70	2.50	.76	2.34	26.00	.56	1.31
900-1,099	2.20	2.97	3.05	.29	2.07	31.09	1.17	.50
1,100-1,4	4.23	2.20	3.17	.95	2.91	27.79	1.32	1.32
1,500+	1.79	1.68	1.88	.69	1.84	10.80	.54	1.05
Income Group :	Food & Beverage	Education Costs	Housing	Fuel	Other Nonfoods	Total Nonfoods	Total Expenditures	
(percent of total expenditures)								
\$0-100	64.00	.21	17.69	6.00	12.10	36.00	100.00	
100-199	58.73	3.87	11.04	5.17	21.19	41.27	100.00	
200-299	50.63	7.06	12.38	5.87	24.06	49.37	100.00	
300-399	46.75	11.67	8.70	4.16	28.72	53.25	100.00	
400-499	49.58	18.83	8.30	2.85	20.44	50.42	100.00	
500-599	40.42	27.73	6.87	3.70	21.28	59.58	100.00	
600-699	43.52	18.97	11.52	2.49	23.50	56.48	100.00	
700-899	27.87	20.79	15.72	3.60	32.02	72.13	100.00	
900-1,099	32.76	23.41	13.88	2.64	27.31	67.24	100.00	
1,100-1,4	30.43	28.11	12.97	2.52	25.97	69.57	100.00	
1,500+	20.39	26.42	7.66	1.72	43.81	79.61	100.00	

Table 55. Budget Shares of Expenditures for Food and Nonfood Groups, by Household Income Group, Average for All Urban areas Other Than Monrovia, March 1986.

Income Group	Rice	Other Cereals	Cassava	Other Starchy	Total Starchy	Pulses	Meat	Fish
(percent of total expenditures)								
\$0-100	28.17	1.69	2.81	2.86	35.53	.85	2.84	9.54
100-199	21.11	1.83	2.62	2.37	27.93	.82	2.86	9.78
200-299	16.71	1.08	1.80	2.10	21.69	.71	3.48	8.10
300-399	13.84	1.19	1.61	3.18	19.82	1.21	3.01	6.20
400-599	11.08	1.45	1.25	2.21	15.99	.92	4.22	5.74
600-899	8.96	1.32	1.84	2.11	14.23	.46	5.18	4.76
900+	5.66	1.37	1.22	1.57	9.82	.38	3.74	2.60
Income Group	Poultry, Milk	Oils	Vegetables	Fruit	Other Food	Food at Home	Food Away	Alcoholic Beverages
(percent of total expenditures)								
\$0-100	.54	9.18	8.22	.35	2.71	69.78	.79	1.93
100-199	2.53	6.78	7.59	.56	2.32	61.19	.43	1.72
200-299	2.28	5.86	6.17	.61	2.35	51.25	1.00	1.13
300-399	2.53	3.92	5.33	.64	2.29	44.95	.96	1.24
400-599	2.99	4.57	5.19	.56	1.68	41.86	.42	2.11
600-899	4.04	3.80	4.11	.65	2.47	39.70	1.47	1.57
900+	4.93	2.77	2.86	.45	1.73	29.28	.68	1.54
Income Group	Food & Beverage	Education Costs	Housing	Fuel	Other Nonfoods	Total Nonfoods	Total Expenditures	
(percent of total expenditures)								
\$0-100	72.50	3.15	3.69	7.92	12.74	27.50	100.00	
100-199	63.34	7.88	5.22	6.46	17.10	36.66	100.00	
200-299	53.38	15.78	4.68	5.49	20.67	46.62	100.00	
300-399	47.15	21.72	4.00	4.45	22.68	52.85	100.00	
400-599	44.39	21.93	5.97	4.57	23.14	55.61	100.00	
600-899	42.74	25.75	5.52	3.10	22.89	57.26	100.00	
900+	31.50	30.01	3.97	2.21	32.31	68.50	100.00	

Table 56. Share of Income Spent for Food, by Food Group, Urban Areas in Liberia, March 1986.

Urban Areas	Country Rice	Imported Rice	Total Rice	Other Cereals	Cassava	Other Starchy	Total Starchy
(percent of total)							
Monrovia	.35	16.94	17.29	6.42	4.58	4.01	32.30
Buchanan	4.56	20.65	25.21	4.46	6.20	4.44	40.31
Gbarnga	11.17	15.27	26.44	3.47	4.50	4.69	39.10
Ganta	16.80	5.40	22.20	3.81	4.11	5.94	36.06
Sanniquellie	22.13	7.27	29.40	2.68	3.28	6.37	41.73
Zorzor	18.75	17.60	36.35	1.85	1.45	3.45	43.10
Voinjama	27.19	5.80	32.99	.10	.52	2.90	36.51

Urban Areas	Pulses	Meat	Fish	Poultry, Milk	Oils	Vegetables	Fruits
(percent)							
Monrovia	1.48	10.14	13.07	6.08	8.85	10.54	1.60
Buchanan	1.08	6.36	15.55	6.21	8.10	9.91	1.48
Gbarnga	1.22	8.99	13.52	6.39	10.93	11.70	1.03
Ganta	1.27	10.25	12.47	8.09	10.20	10.34	.83
Sanniquellie	1.90	6.88	11.48	7.91	9.98	11.16	1.15
Zorzor	1.71	8.43	12.73	3.12	10.04	12.32	.83
Voinjama	2.53	5.80	12.65	6.04	11.59	12.26	1.58

Urban Areas	Other Food	Food at Home	Food Away	Alcoholic Beverages	Food & Beverages
(percent of total)					
Monrovia	7.36	92.13	3.68	4.19	100.00
Buchanan	6.03	95.02	3.12	1.86	100.00
Gbarnga	4.04	96.91	.55	2.54	100.00
Ganta	4.17	93.69	3.63	2.68	100.00
Sanniquellie	3.34	95.52	.80	3.68	100.00
Zorzor	2.97	95.25	.33	4.42	100.00
Voinjama	5.01	93.99	.30	5.71	100.00

Table 57. Share of Income Spent for Food, by Food Group and by Level of Household Income, Monrovia, March 1986.

Urban Areas	Country Rice	Imported Rice	Total Rice	Other Cereals	Cassava	Other Starchy	Total Starchy
(percent of total)							
\$0-100	.00	28.33	28.33	1.90	2.28	.39	32.90
100-199	.49	22.56	23.05	3.47	5.35	2.65	34.52
200-299	.05	19.19	19.24	4.63	5.43	2.42	31.72
300-399	.84	19.31	20.15	4.27	4.24	3.57	32.23
400-499	.00	16.79	16.79	5.40	4.40	5.05	31.64
500-599	.20	21.01	21.21	6.79	9.27	3.91	41.18
600-699	.03	14.95	14.98	10.00	3.63	3.77	32.38
700-899	.37	14.63	15.00	7.99	3.72	5.02	31.73
900-1,099	.92	14.36	15.28	8.52	4.58	6.17	34.55
1,100-1,499	.40	8.85	9.25	7.84	1.61	4.71	23.41
1,500+	.00	11.78	11.78	7.92	3.42	4.23	27.35
Urban Areas	Pulses	Meat	Fish	Poultry, Milk	Oils	Vegetables	Fruits
(percent)							
\$0-100	1.16	3.90	15.32	5.30	8.01	14.76	.53
100-199	.81	8.40	18.76	1.87	10.76	11.79	1.07
200-299	2.10	8.61	15.22	5.06	8.10	12.19	.79
300-399	.66	9.01	13.58	6.42	9.17	11.26	1.35
400-499	1.19	8.44	14.87	8.57	10.07	9.08	1.56
500-599	.37	11.82	12.15	6.26	8.52	10.04	1.64
600-699	1.09	8.58	10.09	5.83	7.72	10.86	1.42
700-899	1.16	12.41	10.10	8.12	9.69	8.96	2.71
900-1,099	3.11	13.12	11.82	6.71	9.06	9.30	.90
1,100-1,499	1.43	12.22	10.01	13.90	7.25	10.41	3.11
1,500+	2.60	12.03	11.63	8.80	8.25	9.20	3.36
Urban Areas	Other Food	Food at Home	Food Away	Alcoholic Beverages	Food & Beverages		
(percent of total)							
\$0-100	4.42	86.30	13.57	.13		100.00	
100-199	5.40	93.37	4.26	2.37		100.00	
200-299	8.16	91.94	3.90	4.16		100.00	
300-399	7.58	91.27	5.03	3.70		100.00	
400-499	5.91	91.34	4.06	4.60		100.00	
500-599	3.37	95.36	1.09	3.55		100.00	
600-699	10.12	88.10	2.85	9.05		100.00	
700-899	8.41	93.29	2.02	4.69		100.00	
900-1,099	6.31	94.88	3.59	1.53		100.00	
1,100-1,499	9.58	91.32	4.35	4.33		100.00	
1,500+	9.00	92.22	2.64	5.14		100.00	

Table 58. Share of Income Spent for Food, by Food Group and by Level of Household Income, Average All Urban Areas Other Than Monrovia, March 1986.

Urban Areas	:	Country Rice	Imported Rice	:Total :Rice	Other Cereals	Cassava	Other Starchy	: Total Starchy
(percent of total)								
\$0-100		19.07	19.79	38.86	2.33	3.88	3.95	49.02
100-199		17.54	15.80	33.34	2.90	4.14	3.74	44.12
200-299		17.67	13.64	31.31	2.02	3.38	3.94	40.65
300-399		20.42	8.93	29.35	2.53	3.41	6.75	42.04
400-599		15.49	9.47	24.96	3.26	2.82	4.99	36.03
600-899		10.63	10.33	20.96	3.09	4.30	4.94	33.29
900+		8.74	9.23	17.97	4.36	3.88	4.97	31.18
Urban Areas	:	Pulses	Meat	Fish	Poultry, Milk	Oils	Vegetables	Fruits
(percent of total)								
\$0-100		1.18	3.91	13.16	.74	12.67	11.34	.48
100-199		1.30	4.51	15.44	3.99	10.71	11.98	.89
200-299		1.32	6.52	15.16	4.28	10.98	11.56	1.14
300-399		2.56	6.38	13.15	5.37	8.32	11.30	1.36
400-599		2.06	9.50	12.93	6.74	10.29	11.70	1.26
600-899		1.07	12.12	11.14	9.45	8.89	9.62	1.52
900+		1.21	11.88	8.25	15.64	8.78	9.07	1.42
Urban Areas	:	Other Food	:	Food at Home	Food Away	Alcoholic Beverages	:	Food & Beverages
(percent of total)								
\$0-100		3.74		96.24	1.09	2.67		100.00
100-199		3.66		96.59	.69	2.72		100.00
200-299		4.40		96.00	1.88	2.12		100.00
300-399		4.87		95.34	2.03	2.63		100.00
400-599		3.78		94.31	.94	4.75		100.00
600-899		5.78		92.88	3.44	3.68		100.00
900+		5.50		92.93	2.17	4.90		100.00

Table 59. Market Prices for Food Products, by Urban Area, Liberia, March 1986.

Food Product:	Monrovia	Buchanan	Gbarnga	Ganta	Sanni- quellie	Zorzor	Voinjama	Six-City : Average*
	(cents per pound)							
Ctry Rice	27.7	32.4	27.9	24.5	28.3	35.4	33.8	30.4
Impt Rice	26.8	31.6	32.4	25.8	27.0	29.5	28.8	29.2
Corn meal								
Pasta								
Bread								
Other cer								
Groundnuts								
Beans, dry	50.0		24.5		24.6	71.6	41.0	40.4
Cassava	11.3	10.1	5.6	3.8	6.2	7.1	10.0	7.1
Fufu	30.9	36.4	25.0	22.9	25.0	44.4		30.7
Farina	50.0	80.0						
Sweet pot	29.0	12.2	13.0	9.2	10.0			11.1
Yams								
Eddoes	18.9	18.8	7.5	15.8	15.2	16.0	14.8	14.7
White pot								
Plantains	26.6	14.8		5.0	8.3	12.1		10.1
Beef	151.9	145.5	150.0		100.0	123.5		129.8
Pork	48.6	54.0	61.5	70.2	81.8	80.0		69.5
Lamb, goat								
Bush meat	169.9	200.0		98.4	160.0		142.2	150.2
Fish	66.7	43.8	64.2	39.6	57.1			51.2
Poultry								
Eggs								
Milk								
Palm oil	56.7	66.7	48.0	56.0	48.0			54.7
Vege oil	66.4	94.5	62.0	96.0	88.0			85.1
Onions								
Pumpkin	29.6							
Bitterbal	23.2	24.2	10.1	8.5		30.0	14.1	17.4
Cassava l	10.6	3.3	5.0	3.2	3.3	2.9	4.2	3.7
Pot green	10.1	12.3	5.3	3.6	3.9	4.3	4.1	5.6
Lettuce	41.2							
Okra	29.4		22.6	40.0	24.0	40.0	30.0	31.3
Tomatoes	46.7		27.9	10.0	40.0		24.0	25.5
Cucumbers								
Peppers	93.1	71.1	24.5	28.0	88.9	80.0	48.0	56.8
Maggi cub								
Oranges	21.6	8.3						
Pineapple	25.6	16.6	22.6		14.0	6.7	16.9	15.4
Avocados								
Bananas	21.7	11.7	13.3		12.5	5.3	11.4	10.8

* Excludes Monrovia; computed only when prices available for 3 or more areas.

Table 60. Quantities of Household Rice Purchase or Use on a Monthly Basis, March 1986.

Urban	:When Purchasing Daily or Weekly*			: Purchasing Less Often Than Weekly**		
	:Country Imported	Concess.	: Total	:Country Imported	Concess.	: Total
(pounds per household)						
Monrovia	1.80	48.35	.00	50.15	.39	73.66
Buchanan	9.18	64.62	.00	73.80	1.04	35.29
Gbarnga	25.92	22.95	.00	48.87	20.68	51.73
Ganta	67.87	13.92	1.50	83.29	41.55	17.02
Sanniquel	75.98	7.83	.00	83.81	24.57	30.74
Zorzor	37.62	29.98	.00	67.60	16.44	36.10
Voinjama	48.39	2.91	.00	51.30	101.10	32.23
(pounds per household)						
Urban	: Other Sources***			: Total, All Sources		
Areas	:Country Imported	Concess.	: Total	:Country Imported	Concess.	: Total
(pounds per household)						
Monrovia	.17	.74	.00	.91	2.36	122.75
Buchanan	10.15	.73	.00	10.88	20.37	100.64
Gbarnga	10.04	1.04	.00	11.08	56.64	75.72
Ganta	3.15	.98	.00	4.13	112.57	31.92
Sanniquel	18.57	1.69	.00	20.26	119.12	40.26
Zorzor	6.58	.79	.00	7.37	60.64	66.87
Voinjama	4.70	.25	.00	4.95	154.19	35.39

* Usually purchasing by the cup or kenke.

** Usually purchasing by the bag.

*** Home produced or received as a gift or as payment for services.

Table 61. Quantities of Rice Purchased or Used Per Capita on a Monthly Basis, March 198

Urban		:When Purchasing Daily or Weekly*			: Purchasing Less Often Than Weekly**		
Areas		:Country Imported	Concess.	: Total	:Country Imported	Concess.	: Total
(pounds per person)							
Monrovia	.29	7.87	.00	8.16	.06	11.99	.60 12.65
Buchanan	1.47	10.33	.00	11.80	.17	5.64	.16 5.97
Gbarnga	3.92	3.47	.00	7.39	3.12	7.82	.00 10.94
Ganta	10.10	2.07	.22	12.39	6.18	2.53	.16 8.87
Sanniquel	11.70	1.20	.00	12.90	3.78	4.73	.00 8.51
Zorzor	5.94	4.73	.00	10.67	2.59	5.70	.00 8.29
Voinjama	7.21	.43	.00	7.64	15.06	4.80	.00 19.86
Urban		: Other Sources***			: Total, All Sources		
Areas		:Country Imported	Concess.	: Total	:Country Imported	Concess.	: Total
(pounds per person)							
Monrovia	.03	.12	.00	.15	.38	19.98	.60 20.96
Buchanan	1.62	.12	.00	1.74	3.26	16.09	.16 19.51
Gbarnga	1.52	.16	.00	1.68	8.56	11.45	.00 20.01
Ganta	.47	.15	.00	.62	16.75	4.75	.38 21.88
Sanniquel	2.86	.26	.00	3.12	18.34	6.19	.00 24.53
Zorzor	1.04	.12	.00	1.16	9.57	10.55	.00 20.12
Voinjama	.70	.04	.00	.74	22.97	5.27	.00 28.24

* Usually purchasing by the cup or kenke.

** Usually purchasing by the bag.

*** Home produced or received as a gift or as payment for services.

Table 62. Implied Quantities of Selected Food Products Purchased Per Capita on a Monthly Basis, Urban Areas in Liberia, March 1986.

Urban Areas	Country Rice	Imported Rice	Concess. Rice	Total Rice	Cassava Tubers	Fufu	Farina
(pounds per capita)							
Monrovia	.38	19.98	.60	20.96	6.63	1.38	.36
Buchanan	3.26	16.09	.16	19.51	5.56	1.72	.29
Gbarnga	8.56	11.45	.00	20.01	11.15	1.05	
Ganta	16.75	4.75	.38	21.88	20.86	.71	
Sanniquellie	18.34	6.19	.00	24.53	10.82	.15	
Zorzor	9.57	10.55	.00	20.12	2.78	.07	
Voinjama	22.97	5.27	.00	28.24	.86	.15	
Urban Areas	Sweet Potatoes	Eddoes	Plantains	Beans, Dry	Beef	Pork, Pig Feet	Bush Meat
(pounds per capita)							
Monrovia	.52	1.42	1.79	.36	.48	2.50	.60
Buchanan	.77	2.58	2.15	.13	.30	.90	.25
Gbarnga	.48	6.89	2.87	.69	.13	1.05	.63
Ganta	1.19	3.86	12.11	.61	.14	.53	1.74
Sanniquellie	5.09	2.82	4.32	.18	.20	.56	.45
Zorzor	.34	1.29	2.48	.24	.21	.16	.66
Voinjama	.27	2.72	2.32	.83	.01	.28	.89
Urban Areas	Fish	Palm Oil, Kernal	Vege. Oil	Pumpkin	Bitter-balls	Cassava Leaves	Potato Leaves
(pounds per capita)							
Monrovia	5.81	3.42	1.03	.29	1.29	2.16	3.24
Buchanan	3.35	2.45	.23		1.04	4.59	2.01
Gbarnga	4.33	4.31	.29		3.28	3.15	5.71
Ganta	7.89	4.00	.33		6.19	3.81	7.13
Sanniquellie	4.66	3.82	.54		1.96	9.56	5.23
Zorzor	4.12	2.83	.13		1.26	4.65	3.42
Voinjama	6.25	5.24	.08		1.41	6.53	7.62
Urban Areas	Lettuce, Cabbage	Okra	Tomatoes	Peppers	Citrus Fruit	Pine-apples*	Bananas
(pounds per capita)							
Monrovia	.15	.65	.63	.79	.90	.38	.82
Buchanan		.22	.73	.82	1.03	.51	1.38
Gbarnga		.60	.51	2.38		.15	.86
Ganta		.24	1.40	1.95		.09	1.03
Sanniquellie		.48	.25	.68		.16	.97
Zorzor		.14	.18	.76		.23	1.40
Voinjama		.10	1.20	1.78		.32	2.50

Note: blanks indicate that no information was available on prices.

*Includes paw paw and plums.

Table 63. Percentages of Households Purchasing or Using Individual Food Items During the Survey Period, Weighted for Structure Size, Urban Areas in Liberia, March 1986.*

Urban Areas	Country Rice	Imported Rice	Concess. Rice	Cassava Tubers	Fufu	Farina	Corn meal
Monrovia	4.2	91.9	3.3	58.8	46.6	31.2	17.7
Buchanan	18.0	89.1	1.0	50.7	62.6	52.1	27.5
Gbarnga	43.9	59.5	.0	57.2	30.6	8.7	8.7
Ganta	74.2	25.2	1.4	61.9	15.6	8.8	9.5
Sanniquellie	79.4	21.3	.0	60.3	5.0	4.1	7.1
Zorzor	58.4	52.1	.0	33.1	7.8	3.5	7.0
Voinjama	79.6	15.9	.0	6.8	6.8	.0	3.0

Urban Areas	Noodles, Pasta	Bread, Flour	Misc. Cereals	Beans, Dry	Groundnut Beniseed	Sweet Potatoes	Yams
Monrovia	8.6	81.8	5.8	22.1	39.4	9.5	10.7
Buchanan	1.9	75.4	3.8	10.0	53.6	16.6	5.2
Gbarnga	6.4	53.8	1.2	24.3	26.6	6.4	5.8
Ganta	11.6	74.2	3.4	6.1	33.3	15.0	8.2
Sanniquellie	18.4	46.1	2.1	6.4	50.4	14.2	8.5
Zorzor	2.8	50.0	2.1	49.3	35.9	11.3	7.0
Voinjama	.0	.8	.0	59.1	37.1	3.0	6.1

Urban Areas	Eddoes	Potatoes White	Plantains	Beef	Pork, Pig Feet	Lamb, Goat	Bush Meat
Monrovia	30.8	15.8	39.2	23.3	70.6	1.8	32.4
Buchanan	25.6	7.1	41.7	11.8	50.2	1.4	25.6
Gbarnga	43.9	.6	28.3	2.3	52.0	2.9	44.5
Ganta	42.2	5.4	46.3	7.5	27.2	6.8	51.7
Sanniquellie	41.8	9.2	46.1	6.4	31.9	2.1	23.4
Zorzor	39.4	.7	50.0	10.6	14.8	.7	49.3
Voinjama	34.1	.8	23.5	.8	17.4	.0	46.2

Urban Areas	Fish	Poultry	Eggs	Milk	Palm Oil, Kernal	Vege. Oils	Onions
Monrovia	94.9	15.4	33.6	58.7	89.5	60.8	89.5
Buchanan	95.3	21.3	21.8	36.0	96.2	18.0	85.3
Gbarnga	91.3	15.6	14.4	27.8	98.8	23.1	82.7
Ganta	87.8	17.7	18.4	34.0	93.2	21.1	79.6
Sanniquellie	88.6	19.2	14.9	31.2	98.6	27.7	85.1
Zorzor	90.1	11.3	12.7	11.3	93.7	12.7	72.5
Voinjama	98.5	18.9	14.4	23.5	99.2	3.0	96.2

* These percentages differ slightly from the frequencies reported in the household tables, numbers 1 - 13, because the frequency ratios are not weighted for structure size (number of households per structure).

(continued)

Table 63--Continued (percentages of households purchasing food)

Urban Areas	Pumpkin	Bitter-balls	Cassava Leaves	Potato Greens	Lettuce, Cabbage	Okra	Tomatoes
Monrovia	12.1	69.9	43.1	65.3	7.0	48.3	63.0
Buchanan	5.2	55.0	48.3	69.2	2.8	48.3	59.2
Gbarnga	3.5	63.0	76.3	82.1	4.6	29.5	37.0
Ganta	3.4	68.7	68.7	70.1	15.0	36.7	53.1
Sanniquellie	2.8	61.0	75.2	70.2	9.2	31.9	39.7
Zorzor	5.6	71.8	89.4	70.4	.0	24.6	20.4
Voinjama	1.5	50.8	86.4	90.2	.8	9.1	70.4

Urban Areas	Cucumber	Peppers	Maggi Cubes	Citrus	Pine-apples**	Avocado	Bananas
Monrovia	2.4	95.8	94.2	34.7	11.6	2.6	31.5
Buchanan	2.4	92.4	96.7	24.2	32.2	4.7	35.1
Gbarnga	1.2	97.7	90.2	11.0	8.1	.6	35.3
Ganta	12.2	93.9	96.6	8.8	4.8	6.8	36.1
Sanniquellie	2.8	97.9	93.6	12.8	9.9	7.8	32.6
Zorzor	.7	96.5	93.0	26.1	7.8	7.0	36.6
Voinjama	3.0	97.7	95.4	9.8	6.8	.8	38.6

Urban Areas	Sugar	Salt	Coffee, Tea	Soft Drinks	Misc. Foods	Prepared Foods	Meals at Work
Monrovia	71.1	71.3	55.3	58.3	13.0	12.4	25.2
Buchanan	66.4	81.5	41.7	37.0	.5	13.3	17.5
Gbarnga	41.6	91.9	23.1	22.0	.0	6.4	1.2
Ganta	33.3	67.4	20.4	44.2	2.0	25.8	14.3
Sanniquellie	43.3	68.1	22.6	23.4	.0	6.4	4.3
Zorzor	33.8	73.2	11.3	13.4	13.4	2.1	2.1
Voinjama	31.1	72.0	23.5	28.8	.0	1.5	.0

Urban Areas	Cane Juice	Palm Wine	Beer
Monrovia	17.2	5.1	21.7
Buchanan	13.3	10.0	11.8
Gbarnga	8.7	11.0	5.2
Ganta	17.0	9.5	6.8
Sanniquellie	13.5	20.0	7.8
Zorzor	10.6	38.7	7.0
Voinjama	10.0	28.8	12.1

* These percentages differ slightly from the frequencies reported in the household tables, numbers 1 - 13, because the frequency ratios are not adjusted for structure size (number of households per structure).

** Includes paw paw and plums.

Table 64. Percentages of Households Purchasing Individual Nonfood Items During the Survey Period, Weighted for Structure Size, Urban Areas in Liberia, March 1986.*

Urban Areas	Kerosene	Wood	Candles, Batteries	Charcoal, Gas	Water	Electric, Phone	Rent, Housing
Monrovia	53.1	8.6	71.8	89.1	46.1	36.6	56.6
Buchanan	80.6	25.6	57.4	76.3	3.8	40.8	25.6
Gbarnga	89.0	37.6	52.6	61.8	23.1	31.8	38.7
Ganta	95.9	68.7	71.4	33.3	2.0	3.4	23.1
Sanniquellie	94.3	43.3	62.4	53.2	20.6	33.3	29.8
Zorzor	98.6	64.1	68.3	7.8	1.4	.0	37.3
Voinjama	97.7	76.5	90.2	1.5	33.3	32.6	36.4

Urban Areas	Men's Clothing	Women's Clothing	Children's Clothing	Gasoline Diesel	Vehicles & Repair	Bus, Taxi	Medicine
Monrovia	26.6	28.6	33.8	6.3	2.8	91.4	73.6
Buchanan	24.6	24.6	39.8	1.0	4.7	66.8	80.1
Gbarnga	16.8	18.5	21.4	11.6	1.2	49.7	79.8
Ganta	29.2	36.0	41.5	5.4	2.0	46.9	58.5
Sanniquellie	23.4	23.4	29.8	9.2	2.8	57.4	87.9
Zorzor	7.0	17.6	21.1	1.4	4.9	18.3	81.0
Voinjama	40.2	42.4	53.8	10.6	12.1	76.5	93.9

Urban Areas	School Supplies*	School Fees	Soap	Tobacco, Matches	Cooking Utensils	Furniture	Social Expenses
Monrovia	59.9	48.5	99.5	85.1	12.1	5.2	22.6
Buchanan	51.2	30.3	98.6	89.1	18.0	4.7	23.7
Gbarnga	34.7	39.9	100.0	48.0	10.4	2.9	16.8
Ganta	49.0	54.4	100.0	65.3	10.9	8.8	21.1
Sanniquellie	64.5	64.5	100.0	49.6	19.2	3.6	7.1
Zorzor	52.1	57.0	97.9	73.2	9.2	2.8	11.3
Voinjama	68.2	28.0	100.0	88.6	.0	2.3	11.4

Urban Areas	Misc. Products	Church, Charity	Licenses, Taxes	Interest Payments
Monrovia	13.7	52.4	25.6	11.6
Buchanan	13.7	55.0	8.0	7.6
Gbarnga	4.6	28.3	2.9	.0
Ganta	32.6	44.2	17.0	6.8
Sanniquellie	6.4	45.4	1.4	17.0
Zorzor	.0	16.2	7.0	1.4
Voinjama	32.6	83.3	3.8	.0

* These percentages differ slightly from the frequencies reported in the household tables, numbers 15 - 21, because the frequency ratios are not weighted for structure size (number of households per structure).

** Includes school uniforms.

URBAN HOUSEHOLD FOOD CONSUMPTION SURVEY IN LIBERIA

Introduction

Household Number _ _ _

Date of Information _ _ / _ _ /86

"Hello, my name is _____. I am from the Ministry of Agriculture. We are collecting information on what people in (city or town) eat. We want to know if people are getting all the food they need to eat and where that food comes from."

We have notified the City Superintendent of our study and he has agreed to let us conduct the survey. We have a few questions we would like to ask you about the kinds of food you and your household eat.

"How many households live in this structure? _____. We are defining a household as the people eating out of the same cooking pot."

If the answer is more than one, ask "can you give me the first names of each of the household heads and the number of people in each household?"

Record below.

<u>Number</u>	<u>Household Size</u>	<u>Name of HOH</u>	<u>Name Selected</u>
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____

"I would like to talk to _____ or his wife. Is he/she at home?" yes __, no __. If not: "When could I speak to him/her if I return later?"

If the proper person is available, proceed to questionnaire A

Household Selection Table

Fill in the following table using information from the Instruction Sheet

Order of Selection

Number of Households Per Structure

	2	3	4	5	6	7	8
1	||	|		||			
2	|			||			
3				|			
4				|			
5				|			
6							
7							
8							

CODE SHEET FOR SECTION A: DEMOGRAPHIC SURVEY

NOTE: HOH = Head of Household

City Code

1. Monrovia
2. Buchanan
3. Gbarnga
4. Ganta
5. Saniquellie
6. Zorzor
7. Voinjama

1. Head of HOH

1. Male
2. Female

2. Marital Status

1. Single
2. Married or living together

3. Age of HOH

1. 34 or under
2. 35 - 64
3. 65 +

4. Urbanization

1. 1 year or less
2. More than 1 year

5. Age - Sex Composition

The Number of persons in the household in each age-sex category

6. Profession/Occupation

1. Farmer, fisherman
2. Market woman, merchant, trader
3. Clerk, unskilled laborer
4. Professional, skilled laborer
5. Government worker
6. Other employment
7. Unemployed, not employed, retired, housewife

7. Education

- 0 = No formal education
1 = Attended elementary school
2 = Completed elementary school
3 = Attended junior high
4 = Attended senior high
5 = Attended college or above

8. Ethnic Group

1. Lorma
2. Kpelle
3. Gbandi
4. Kissi
5. Mande
6. Mandingo
7. Belle
8. Gola
9. Vai
10. Bassa
11. Kru
12. Krahn
13. Grebo
14. Gio
15. Mano
16. Sarpo
17. Other Liberians
18. Other Africans
19. Lebanese
20. Other nationalities

9. Notes

Record date of initial attempt to visit household and date of each callback up to Number 5.

CODE SHEET FOR SECTION B., CONSUMPTION SHEET

1. Product CodeFood Products

- | | |
|--|--|
| 01. Country rice | 40. Paw paw, plums, pineapples |
| 02. Imported rice | 41. Avocado (butter pear) |
| 03. Concession rice | 42. Bananas |
| 04. Cassava (tubers, dumboy, G.B.) | 43. Sugar |
| 05. Fufu | 44. Salt |
| 06. Farina (garı) | 45. Coffee, tea |
| 07. Sweet potatoes | 46. Soft drinks |
| 08. Yams | 47. Cane juice |
| 09. Eddoes (cocoa yams) | 48. Palm wine |
| 10. Potatoes (Irish) | 49. Beer, other alcoholic drinks |
| 11. Plantains | 50. Other food for use at home |
| 12. Corn meal | 51. Prepared food from cook shops, restaurants, street vendors, snacks |
| 13. Beans (Cowpeas, broad beans, limas) | 52. Meals at work, school |
| 14. Noodles, macaronı, spaghetti | |
| 15. Wheat bread, flour | <u>Nonfood Product</u> |
| 16. Other cereal products (dry cereal, cream of wheat) | 53. Soap |
| 17. Beef, ground beef | 54. Gasoline, diesel |
| 18. Pork (ham, bacon, pig feet) | 55. Kerosene |
| 19. Lamb, goat | 56. Wood |
| 20. Bush meat | 57. Water |
| 21. Poultry | 58. Medicines, drugs, traditional medicines |
| 22. Fish (fresh, canned, dried) | 59. Tobacco, cigarettes, matches |
| 23. Eggs (chicken, other) | 60. Batteries, flashlights, candles |
| 24. Milk, evaporated milk, condensed milk, powdered | 61. Rent, house payments |
| 25. Palm oil, palm kernel, coconut oil, palm nuts | 62. Rent, due but not paid |
| 26. Vegetable oils (imported) margarine, butter | 63. Electricity, telephone |
| 27. Peanuts (groundnuts), beniseed, other seeds | 64. Charcoal, gas for cooking |
| 28. Onions, garlic | 65. Cooking utensils |
| 29. Pumpkin, squash | 66. Furniture |
| 30. Bitterballs, eggplant | 67. Men's clothing, shoes |
| 31. Cassava leaves | 68. Women's clothing, shoes |
| 32. potato greens and other leaves | 69. Children's clothing, shoes |
| 33. Lettuce, cabbage | 70. Vehicles, bicycles, motor-bikes, vehicle repair |
| 34. Okra | 71. School supplies, uniforms |
| 35. Tomatoes | 72. School fees |
| 36. Cucumbers | 73. Social expenses, entertainment, family celebrations |
| 37. Peppers (hot, sweet, other) | 74. Contributions to church, charity |
| 38. Oranges, grapefruit lemons, limes, juice | 75. Licenses, inspections, taxes |
| 39. Maggi cubes | 76. Interest expense |
| | 77. Bus, taxi fare |
| | 78. Other nonfoods |

3 Units of Measure

1. Cup
2. Kenke (bowl)
3. Bucket
4. Bag

2. Frequency of Purchase

1. Daily, every other day
2. Every 3 to 7 days
3. 8 days or more

PA 111 111

FINAL

**URBAN FOOD CONSUMPTION PATTERNS AND
NATIONAL FOOD POLICY IN LIBERIA**

Report 2, Part 2
Statistical Analysis

October 1986

by

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and
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for

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U.S. Department of Agriculture

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
List of Tables	ii
Executive Summary.	iii
I. Introduction	1
II. Economic Model	1
A. The Basic AIDS Model	3
B. Household AIDS Model	5
III. Data and Method of Estimation	7
A. Definition of Variables	7
B. Data Problems	11
C. Estimation Procedures	13
IV. Analysis of Results	14
A. Interpretation of the Coefficients	14
B. Income Elasticities	27
C. Marginal and Average Budget Shares	32
D. Validity of Results.	36
References Cited	38
Appendix A	40

LIST OF TABLES

<u>No.</u>		<u>Page</u>
Table 1.	Multiple Regression Analysis of Budget Shares, Almost Ideal Demand System Model, Urban Areas in Liberia, March 1986	15
Table 2.	Income Elasticity of Demand for Food and Nonfood Groups, by Income Group, Based on AIDS Model, Urban Areas in Liberia, March 1986	28
Table 3.	Marginal Budget Shares for Food and Nonfood Groups, by Income Group, Based on AIDS Model, Urban Areas in Liberia, March 1986	33
Table 4.	Average Budget Shares for Food and Nonfood Groups, by Income Group, Urban Areas in Liberia, March 1986 . .	34
Appendix Table A.	Results of Test for Economies of Scale, Almost Ideal Demand System	42

EXECUTIVE SUMMARY

The household and price data presented in tabular form in Part 1 of this study are analyzed statistically in this report. For this purpose, a multiple regression model is formulated and fit to the data.

The model selected for this purpose is the almost ideal demand system (AIDS). This model was selected because of its desirable properties; it is flexible, allowing for the representation of wide ranges of consumer behavior. The AIDS model relates the portion of total expenditure accruing to a particular commodity to prices, income, and relevant household demographic characteristics.

The model was initially specified to include a matrix of prices obtained from the market survey, in conjunction with total expenditure (a proxy for income), and household demographic data obtained from the household survey. In pooling the data from the seven cities surveyed, urban dummy variables were added to allow for geographical shifts. A problem of multicollinearity arose, where every price term was a linear combination of the geographic dummies and the intercept.

Based on the weakness of the price data (lack of regional variability), and the relevance of the urban dummy variables in a cross sectional analysis, prices were dropped from the final model estimated here. The expenditure data were grouped into 15

composite groups (13 food and 2 nonfood groups) for the statistical analysis. These groups included 6 starchy food groups (country rice, imported rice, cassava tubers, processed cassava, other cereals, and other starchy foods). The remaining food groups included fish, other animal products, oils, fruits, vegetables, miscellaneous food at home, and food away from home and alcoholic beverages. The nonfood groups included educational expenses, and other nonfoods.

The dependent variables for each group were derived by dividing the expenditure on the group by total household expenditure. For food eaten at home, expenditures were adjusted to reflect meals eaten outside or served to guests. Three extra models were also estimated, for aggregate rice (country plus imported), aggregate cassava (tubers plus processed), and total food at home.

The rice models fit the data quite well. The F values were significant above the 99 percent level of confidence, and the R^2 values ranged from .32 for imported rice, to .36 for country rice, and .55 for total rice. The goodness of fit for the remaining equations was considerably lower than for rice, although the explanatory variables as a group were statistically significant in explaining these equations.

Income was a significant variable in all equations except fruit, other cereals, other starchy foods, other food at home, and food away from home. The coefficients of the regional binary variables suggested differences between Monrovia and each of the other urban areas, as expected. Such differences were more

apparent for the rice models; households in Monrovia tended to allocate more money on imported rice than households in the other urban areas.

The income elasticity of demand for total rice was quite low at .16. However, the elasticity was high at low income levels (0.7) and declined as income increased to -1.8 at the highest income category. Thus, an income redistribution is likely to have significant impacts on the consumption of rice.

The income elasticities of country rice and imported rice were similar at low income levels, but differed at high income levels. An income change at the high income levels would have more dramatic (negative) impacts on country rice than on imported rice.

The income elasticity for processed cassava appeared higher than for raw cassava, as expected. Both products' elasticities declined generally with income. The elasticity for raw cassava became strongly negative for households with incomes greater than \$1,100 per month. But, for processed products, the elasticity remains positive over all income groups. The analysis of total cassava shows generally declining elasticities, and they become negative at the upper two income groups.

The remaining income elasticities were generally consistent with expectations. Individual food products with greater than unit elasticities included animal products (meat, poultry, dairy), fruit, other cereals, starchy, and other food at home. In contrast with animal products, fish had less than unit income

elasticities, eventually becoming negative at high income levels. Oils, vegetables, and food away from home, also had less than unit elasticities. The elasticity value of .67 for total food, at the sample mean, declined from .80, for the lower income households, to .40, for the higher income households. All elasticities declined with income, except for the nearly constant values for fruit, other starchy foods, and other cereals.

The budget share actually spent on food by the average household was 43 cents out of every dollar spent. However, for each additional dollar, the household would allocate only 29 cents to food, as indicated by an analysis of the patterns of marginal budget shares. For rice, the average budget share for all urban areas was 10 cents, but the marginal budget share was only 2 cents. The 43-cent average for total food compares with a range of 38 cents in Monrovia to 53 cents in Buchanan and 55 cents in Zorzor, as reported in Report 2, Part 1.

Among the demographic variables, the sex-age composition, age, employment category, and marital status of the household head, were generally significant, particularly in the rice models. The education index suggested that households with high literacy rates tended to allocate less money on rice than do others. The education variables however had little impact on the models.

URBAN FOOD CONSUMPTION AND EXPENDITURE PATTERNS

IN LIBERIA, MARCH 1986

PART 2: STATISTICAL ANALYSIS

I. INTRODUCTION

This report analyzes statistically the data in Part 1 of the study which presents the primary tabulations of data from the initial household and market surveys in Liberia in March and April 1986. Readers are referred to Part 1 for description of the methodology used in collecting and tabulating the data (Hiemstra and Savadogo, 1986). Part 1 contains basic tabulations of the patterns of food consumption and expenditures in terms of both household and per capita amounts. These basic tabulations suggested correlation between expenditures and household income and some other characteristics. The objective of this present report is to investigate these relationships in a more systematic way.

II. ECONOMIC MODEL

The choice of a model closely depends on the objectives of the researcher. The objective here is to explain the process of allocation, by urban households, of their monthly budget among alternative commodities. In such a process, it is clear that the characteristics of each household, including monthly income, household size, sex-age composition, and prices, play an important role.

The objective of the modeling is to select an appropriate form of the known-to-exist relation between individual

expenditures on one hand, and household characteristics and prices, on the other hand. Many specifications are valid candidates. However, specifications that constrain the allocation process to a predetermined type may be excluded at the outset. For example, the double-logarithmic representation constrains household responses to income to remain constant over the entire income range.

A desirable specification must allow a flexible representation of household behavior. For example, when income rises, the response of the household regarding a typical commodity must be allowed to rise or fall. Given a set of specifications that meet this criterion, the one that fits the data the best is usually chosen. In this modeling effort, three such specifications were tested. The first is a modified version of the ratio semi-log inverse (RSLI), proposed by Leser (1963), and estimated by King and Byerlee (1977), using data from rural Sierra Leone. The second is the translog version estimated by Swamy and Binswanger (1983), using household data from India. The third, and the one finally chosen for this study, is the almost ideal demand system (AIDS), introduced and estimated by Deaton and Muellbauer (1981). Although the three models all allow for a flexible behavior of income elasticities, the AIDS was chosen because it fit the data best, yielding results most compatible with expectations.

Applications of the AIDS include Ray (1980, 1982) on Indian household budgets; Barewal and Goddard (1985) on Canadian households; Capps, Tedford and Havlicek (1985) on U.S. household data; and Savadogo (1986) on Burkinabe households. These studies

confirmed the power of AIDS as a modeling tool, for both time series data (Ray, Deaton and Muellbauer), and cross sectional data (Barewal and Goddard, Capps, Tedford and Havlicek, and Savadogo). The following briefly summarizes the specification of the basic model, and formulates its extension to the situation analyzed here.

A The Basic AIDS Model

The basic AIDS model hypothesizes that the portion of total expenditures that accrues to a particular commodity (or budget share) is related to prices and income in the following way:

$$(1) \quad w_i = a_i + b_i \log (M/P^*) + \sum_j c_{ij} \log p_j,$$

where w_i is the average budget share of commodity i , M is total (nominal) expenditure on all purchased goods, and p_j is the price paid for good j . a_i , b_i and c_{ij} are unknown parameters to be estimated, and P^* is a price index defined in logarithm form as:

$$(2) \quad \log P^* = a_0 + \sum_k a_k \log p_k + 1/2 \sum_k \sum_j c_{kj} \log p_k \log p_j$$

This complex form of the price index P^* allows the AIDS to be "flexible", i.e., to model wide ranges of consumer behavior.

That AIDS is indeed a flexible system can be seen in the implied formulas of price and income elasticities:

$$\text{Income} \quad : \quad e_{iy} = 1 + b_i / w_i$$

$$\text{Own Price} \quad : \quad e_{ii} = [c_{ii} - b_i(a_i + \sum_k c_{ik} \log p_k)] / w_i - 1$$

$$\text{Cross Price:} \quad e_{ij} = [c_{ij} - b_j(a_i + \sum_k c_{ik} \log p_k)] / w_i$$

An interpretation of the parameters in equation (1) can now be derived, given the elasticity formulas. b_i represents the effect on the expenditure share of good i of a 1 percent change in real income. When b_i is positive, the good is highly responsive to income changes, i.e., has an income elasticity greater than 1. This is the expectation for superior food products such as meat, and most nonfood products. When b_i is negative, the good is less sensitive to income changes, i.e., has an income elasticity less than 1. This is the expectation for most staple foods, for example cassava or rice.

The c_{ij} are similarly interpreted as the effect on the share of good i of a 1 percent change in the price of good j . The own price effect of a good is measured by c_{ii} . When c_{ii} is negative (positive), good i is likely to be price responsive (price inelastic) with a price elasticity greater (less) than 1 in absolute value. The cross-price effects are given by c_{ij} (for i not equal to j). When c_{ij} is positive (negative), the two goods are likely to be substitutes (complements) in price. For example, since cassava and rice are expected to be price substitutes, c_{ij} is expected to be positive for these two goods.

In actual estimation of the AIDS model, the price index P^* defined in (2) is usually replaced by the following geometric price index:

$$(3) \quad \log P = \sum_j w_j \log p_j$$

where w_j is the budget share of product j . This index is exactly determined by the data, and is not dependent on unknown

parameters, as is P^* , since w_j and p_j are known. Use of relation (3) instead of (2) clearly simplifies the identification of the parameters a_i , b_i and c_{ij} . Therefore, the index P is used in this study in lieu of P^* .

B. Household AIDS Model

The data used to estimate the model are a cross section of urban households in seven (7) urban areas of Liberia. In pooling the data to obtain the estimates of urban parameters, assumptions must be made on expected differences between cities. Differences among households must also be accounted for. Variables that cause households responses to differ include household size and its composition by age and sex. Likewise, the formal education of the household decision makers (head and spouse) may affect budget allocation among expenditure categories. Other relevant factors include the marital status, the age, the employment status and the degree of urbanization of the household decision makers.

For a given city and household, the model implied by (1) and (3) may be represented as:

$$(4) \quad w_{ihc} = a_{ihc} + b_{ic} \log m_{hc} + \sum_j c_{ij} \log p_{jc} + u_{ihc}$$

where $m_{hc} = M_{hc}/P_{hc}$ is nominal expenditure deflated by the price index and is a proxy for real income; u_{ihc} is a random variable representing the unexplained errors of budget allocation on product i by household h in city c .

Implicit assumptions in this representation are that households in the same city face the same price, that the income

parameter b is city and household independent, and that the constant term a is both city and household dependent. The income parameter could have been made city dependent; however the main objective of the modeling here is to show the reaction of the "average" urban household to changes in income. Differences in income response across cities are not considered.

A relevant hypothesis on the constant term a is that effects specific to households and not accounted for by income reflect differences in sociodemographic attributes. The term a_{ihc} can then be made dependent on such characteristics, resulting in:

$$(5) a_{ihc} = a^*_{ic} + \sum_r d_{ir} SD_{rhc}$$

where a^*_{ic} summarizes effects due to city, SD_{rhc} is the r th sociodemographic attribute of household h in city c , and d_{ir} is a parameter to be estimated. The term a^*_{ic} implies that each city has a specific effect on the constant term. This is a reasonable assumption that can be represented by the use of binary variables. Treating Monrovia as a reference point, dummy variables are introduced that represent the difference of other cities from Monrovia. Thus, let

$$(6) a^*_{ic} = a_{i0} + a_{i1}BUC + a_{i2}GBA + a_{i3}GAN \\ + a_{i4}SAN + a_{i5}ZOR + a_{i6}VOI,$$

where

$$BUC = 1 \text{ if the household is from Buchanan} \\ = 0 \text{ otherwise}$$

The other binary variables are defined in a similar way: GBA,

GAN, SAN, ZOR and VOI, respectively, assume the value 1 if the household is from Gbarnga, Ganta, Sanniquellie, Zorzor, or Voinjama. The parameter a_{i0} summarizes the effects specific to Monrovia, and a_{i1} through a_{i6} the differences of the other cities from Monrovia.

Now using the relations in (4) through (6), the household AIDS model is:

$$(7) \quad w_{ihc} = a_{i0} + a_{i1}BUC + a_{i2}GBA + a_{i3}GAN + a_{i4}SAN + a_{i5}ZOR \\ + a_{i6}VOI + \sum_r d_{ir} SD_{rhc} + b_i \log m_{hc} + \sum_j c_{ij} \log p_{jc} \\ + u_{ihc}$$

III. DATA AND METHOD OF ESTIMATION

A. Definition of Variables

The data used to estimate the model were constructed from the results of the household budget survey in seven urban areas of Liberia in March 1986. Pooling all data from the seven cities, a total of 926 observations were available for the estimation. The 78 food and nonfood products were collapsed down to 15 commodity groups, including 13 food groups and 2 nonfood groups. The groups were defined as follows, along with their mean budget shares in percentage terms:

- Group 1: Country rice--3.98
- Group 2: Imported rice--6.16
- Group 3: Cassava tubers--1.03
- Group 4: Processed cassava--.72
- Group 5: Other cereals(bread, wheat flour, corn meal)--1.92
- Group 6: Other starchy (other tubers, plantain)--1.91

- Group 7: Fish--5.71
- Group 8: Animal products (meat, poultry, dairy, eggs)--6.67
- Group 9: Oils--4.13
- Group 10: Fruit--.59
- Group 11: Vegetables--4.22
- Group 12: Other food at home--3.13
- Group 13: Alcohol and food consumed away from home--2.69
- Group 14: Education expenses--19.40
- Group 15: Other nonfood items--37.23

The budget shares used as dependent variables in model (8) were computed for these 15 groups. For each household they were derived by dividing the expenditure on the group by total household expenditure. For food eaten at home, expenditures were adjusted to reflect meals eaten outside or served to guests. Three extra models were also estimated, for aggregate rice (country plus imported), aggregate cassava (tubers plus processed), and total food at home (mean 40.68 percent).

Prices were defined as if households in the same city faced the same market. Prices of individual goods in each of the first 7 categories were computed using the results of the market price survey conducted in each city. The price index of each group was then calculated as a weighted average of the individual prices in the group. Goods for which price data were not available were not included in the weighting. It is to be noted that price data were not collected for goods in groups 13, 14, and 15; therefore, a price index was not available for these groups.

The proxy for household real income (m) was calculated by dividing total household expenditure by the general price index

defined in (3). This general price index was computed for each household using the price indexes for the 7 groups and their respective budget shares. Note that the general price index P varies by household since the budget shares vary by household.

The sociodemographic characteristics were defined to include 7 age-sex variables, 4 education categories, an education index that attempts to measure literacy rate, and various attributes of the household head including marital status, sex, age, employment status, and urbanization. The variables related to spouse were not included because of multiple missing observations.

To reflect the sociodemographic hypothesis, model (7) may now be specified as:

$$\begin{aligned}
 (8) \quad w_{ihc} = & a_{i0} + a_{i1}BUC + a_{i2}GBA + a_{i3}GAN + a_{i4}SAN + a_{i5}ZOR \\
 & + a_{i6}VOI + \sum_{r=1}^7 s_{ir}SEXAGE_{rhc} + \sum_{r=1}^4 e_{ir}EDUC_{rhc} \\
 & + e_iEDINDX_{hc} + g_{i1}AGE_{1hc} + g_{i2}AGE_{2hc} + k_{i1}SEX_{hc} \\
 & + k_{i2}MARIT_{hc} + k_{i3}GVTWKR_{hc} + k_{i4}OTHEMPL_{hc} \\
 & + k_{i5}URBAN_{hc} + b_i \log m_{hc} + \sum_j c_{ij} \log p_{jc} + u_{ihc} \\
 & i = 1, \dots, 15 \quad h = 1, \dots, 926 \quad c = 1, \dots, 7
 \end{aligned}$$

For each household, the demographic variables were defined as follows:

SEXAGE:

1 = number of children < 5 years

2 = number of children 6-12 years

3 = number of adult males 13-34 years

4 = number of adult males 35-64 years

5 = number of adult females 13-34 years

6 = number of adult females 35-64 years

7 = number of elderly 65 +

In order to test the hypothesis of the presence of economies of scale in food consumption, squared terms of the demographic composition may be added to the equations. This was done in the final form of the model, but the hypothesis was rejected. For more details on the test procedure and results, see Appendix A.

EDINDX: measures the literacy rate and is calculated as the proportion of household members who at least completed elementary school.

Each of the following variables is a binary (dummy) variable that takes on the value 0 or 1. The coefficient on each dummy variable measures the difference between the included level of the variable and the level that is not included.

EDUC₁ - EDUC₄: dummy variables that respectively take the value 1 if the household head attended or completed elementary, attended junior high, attended senior high, or attended college. The control group is thus the household heads with no formal education. Therefore, the coefficient of E₁, for example, tells whether elementary educated household heads allocate more or less income on a given product than do non-formally educated heads.

AGE₁, AGE₂: dummy variables taking the value 1, respectively, for young household heads (< 34) or middle age household heads (35-64). Thus, the control group is the elderly household heads.

SEX and MARIT are dummy variables, respectively, equal to 1 if the household head is male or single. The definition of the control groups aims to test the hypothesis that households with female heads or single heads exhibit expenditure patterns that are different from households with male heads or married heads.

URBAN is a binary variable representing the degree of urbanization of the household head, and takes the value 1 for heads with less than 1 year residency in an urban area. The inclusion of this variable is an attempt to test the hypothesis that newly arrived urban residents exhibit consumption patterns carried from a rural setting which may be different from those of a "highly" urbanized resident.

GVTWKR and OTHEMPL are binary variables representing the employment status of the head of household, taking the value 1 for government workers and other employment, respectively. The control group includes, thus, the unemployed and not employed (including retired people and housewives).

B. Data Problems

The first attempt to estimate the equations as specified in (8) was unsuccessful because of a severe multicollinearity problem. Multicollinearity arises when several explanatory variables in a model are interrelated in a way such that identification of their individual effects becomes impossible.

In the present case, all price terms included were each an exact linear combination of the urban dummy variables and the intercept. This was an indication of the insufficient variability in the price data. As may be recalled, prices were the same for all households in a given city; therefore, the only source of variability was the between city variability.

There are reasons to believe that the specification of the model with urban intercept shifters is theoretically valid, since we are pooling data from different cities. The contribution of prices as explanatory variables is dubious, however, given their apparent weakness. In such a case, "the 'treatment' [of perfect multicollinearity] is clear: remove the offending explanatory variables--namely those that can be expressed as linear combinations of the other explanatory variables--and estimate the model after such variables have been eliminated" (Intriligator, 1978, p. 151).

Following this prescription, prices were dropped from the final model. The latter model, therefore, collapses to a set of Engel functions with demographic variables as intercept shifters. Such a model was proposed by Working (1943), and estimated by Leser (1963). In his experimentation with alternative Engel forms, Leser chose this reduced AIDS form over competing models, including the linear (Allen and Bowley, 1935), and the double-log. The econometric properties of the model are now discussed, leading to the choice of an estimation procedure.

C. Estimation Procedure

With prices removed, the final model that was estimated is the following:

$$\begin{aligned}
 (9) \quad w_{ihc} = & a_{i0} + a_{i1}BUC + a_{i2}GBA + a_{i3}GAN + a_{i4}SAN \\
 & + a_{i5}ZOR + a_{i6}VOI + \sum_r s_{ir}SEXAGE_{rhc} \\
 & + \sum_r e_{ir}EDUC_{rhc} + e_i MDINDX_{hc} + g_{i1}AGE1_{hc} + g_{i2}AGE2_{hc} \\
 & + k_{i1}SEX_{hc} + k_{i2}MARIT_{hc} + k_{i3}GVTWKR_{hc} \\
 & + k_{i4}OTHEMPL_{hc} + k_{i5}URBAN_{hc} + b_i \log M_{hc} + u_{ihc}, \\
 & i = 1, \dots, 15 \quad h = 1, \dots, 926 \quad c = 1, \dots, 7
 \end{aligned}$$

Note in this specification that income is no longer deflated by the price index, since prices were judged irrelevant.

The household model is now completely specified (9). In order to get meaningful estimates of the parameters, relevant assumptions must be made on the error term u_{ihc} present in (10). It is assumed that the errors are uncorrelated across households, whether in or not in the same city.

The structure size data (see Hiemstra and Savadogo, 1986, Report II, Part 1) were used as weights for individual observations. The consequence of the weighting is to repeat each observation as many times as the number of households living in the structure from which the observation is taken. Weighted least squares are best linear unbiased estimators (BLUE) if the weights are proportional to the inverse of the variance of the observation. Using structure size as weights gives more weight to households living in multiple-household structures. The descriptive analysis in Part 1 of this report however suggests that such households tend to be low income households. Since low

income households are expected to exhibit lower expenditure variances than high income households, the weighting procedure is likely to improve the variance of the estimates.

A weighted least squares technique is therefore applied to the data. A single equation method is used and produces efficient estimates if the error terms are uncorrelated among households and among cities. Although the system in (9) is a set of error-related equations, system estimation would not improve upon single estimation because the same explanatory variables are used in each equation (Theil, 1971; Johnston, 1984).

IV. ANALYSIS OF RESULTS

The estimated parameters of the model are presented in table 1. To improve readability, the parameter estimates are multiplied by 100. Each coefficient in the table thus represents 100 times the effect of the independent variable on budget shares. Because income is in logarithmic terms, its coefficient is interpreted as 100 times the effect on budget shares of a one percent change in income.

A. Interpretation of the Coefficients

Overview -- Judging by both the coefficients of determination (R-Square) and the F values, the models applied in this analysis fit most of the data reasonably well. Thus, the R^2 for rice is 0.55, meaning that the independent variables in the model collectively explain about 55 percent of the between household variation in budget shares. Adjusted R^2 s were computed to measure the explanatory power of the model after adjustment

Table 1. Multiple Regression Analysis of Budget Shares, Almost Ideal Demand System Model, Urban Areas in Liberia, March 1986.

Independent Variables	Country Rice		Imported Rice		Total Rice	
	Parameter	T Value	Parameter	T Value	Parameter	T Value
Intercept	19.13	6.27	38.90	13.67	58.03	23.08
Buchanan	.74	.77	1.92	2.15	2.66	3.37
Gbarnga	6.05	5.81	-1.87	-1.92	4.18	4.88
Ganta	9.03	8.44	-6.54	-6.56	2.49	2.82
Sanniquellie	12.85	11.93	-7.90	-7.87	4.95	5.57
Zorzor	10.10	8.94	-2.24	-2.13	7.86	8.44
Voinjama	14.74	13.19	-8.23	-7.90	6.51	7.07
Income	-3.15	-6.46	-5.39	-11.85	-8.54	-21.25
Children < 5	.22	1.00	.53	2.54	.75	4.08
Children 6 - 12	.14	.60	.65	3.07	.79	4.19
Males 13 - 34	.24	.98	.10	.46	.34	1.72
Males 35 - 64	-.45	-.64	.41	.62	-.04	-.08
Females 13 - 34	.29	1.07	.78	3.12	1.07	4.83
Females 35 - 64	1.32	2.39	.40	.78	1.72	3.78
Elderly, 65+	-.04	-.04	1.22	1.58	1.19	1.74
Head, Elementary	-.61	-.61	-.27	-.29	-.89	-1.06
Head, Junior High	-1.15	-1.07	-.57	-.57	-1.73	-1.95
Head, Senior High	-1.68	-2.22	-.18	-.25	-1.85	-2.99
Head, College	.25	.20	-.46	-.39	-.21	-.20
Education Index	-.07	-.31	-.59	-2.85	-.66	-3.60
Government Worker	-1.39	-1.32	-.55	-.56	-1.94	-2.24
Other Employment	.18	.24	-1.63	-2.30	-1.45	-2.31
Head, Age < 35	-.77	-.50	.23	.16	-.53	-.42
Head, Age 35 - 64	-.81	-.53	.86	.61	.05	.04
Head, Single	-1.08	-1.30	-1.47	-1.90	-2.55	-3.73
Head, Female	-.33	-.38	.34	.43	.01	.02
Urbanization	-.24	-.19	-1.69	-1.45	-1.92	-1.86
R-Square	.36		.32		.55	
F Value	19.25		16.23		41.93	

Parameters are expressed as raw coefficients multiplied times 100.

Statistical significance of "t" values are approximately as follows:

Value above about 2.6 indicates significance with probability less than .01 that the coefficient is equal to zero.

Value of about 2.0-2.6 indicates significance with probability between .01 and .05.

(continued)

Table 1. Multiple Regression Analysis of Budget Shares, Almost Ideal Demand System Model, Urban Areas in Liberia, March 1986 (Continued).

Independent Variables	Cassava Tubers		Processed Cassava		Total Cassava	
	Parameter	T Value	Parameter	T Value	Parameter	T Value
Intercept	5.91	6.93	2.37	4.11	8.29	7.82
Buchanan	-.37	-1.38	1.24	6.87	.87	2.63
Gbarnga	.14	.50	-.35	-1.78	-.21	-.57
Ganta	.59	1.97	-.54	-2.69	.04	.12
Sanniquellie	.34	1.13	-.94	-4.59	-.59	-1.59
Zorzor	-1.40	-4.43	-1.09	-5.10	-2.49	-6.35
Voinjama	-1.39	-4.44	-.89	-4.22	-2.28	-5.88
Income	-.72	-5.29	-.31	-3.39	-1.03	-6.11
Children < 5	.06	.95	-.02	-.46	.04	.51
Children 6 - 12	.15	2.37	.00	-.05	.15	1.88
Males 13 - 34	.02	.27	.03	.75	.05	.62
Males 35 - 64	.17	.88	.13	.97	.30	1.24
Females 13 - 34	-.04	-.54	.05	.95	.00	.09
Females 35 - 64	-.04	-.28	.06	.54	.01	.06
Elderly, 65+	.12	.51	-.07	-.48	.04	.15
Head, Elementary	-.07	-.24	.26	1.34	.19	.54
Head, Junior High	-.36	-1.19	.00	.00	-.36	-.96
Head, Senior High	-.41	-1.94	.05	.34	-.36	-1.37
Head, College	-.64	-1.81	.15	.62	-.49	-1.12
Education Index	.06	1.00	.07	1.73	.13	1.75
Government Worker	.16	.55	-.03	-.16	.13	.36
Other Employment	.07	.35	.17	1.16	.24	.91
Head, Age < 35	-.45	-1.04	.00	.00	-.45	-.84
Head, Age 35 - 64	-.60	-1.41	.00	.00	-.60	-1.13
Head, Single	-.22	-.94	.12	.79	-.09	-.33
Head, Female	.26	1.10	.25	1.59	.52	1.75
Urbanization	-.95	-2.72	-.24	-1.01	-1.19	-2.74
R-Square	.11		.17		.16	
F Value	4.36		7.23		6.46	

Parameters are expressed as raw coefficients multiplied times 100.

Statistical significance of "t" values are approximately as follows:

Value above about 2.6 indicates significance with probability less than .01 that the coefficient is equal to zero.

Value of about 2.0-2.6 indicates significance with probability between .01 and .05
(continued)

Table 1. Multiple Regression Analysis of Budget Shares, Almost Ideal Demand System Model, Urban Areas in Liberia, March 1986 (Continued).

Independent Variables	Other Cereals		Other Starchy		Fish	
	Parameter	T Value	Parameter	T Value	Parameter	T Value
Intercept	1.25	1.39	.59	.48	23.53	12.41
Buchanan	-.08	-.30	.95	2.45	1.60	2.69
Gbarnga	-.39	-1.28	1.80	4.27	.49	.76
Ganta	-.44	-1.41	1.36	3.15	-.27	-.40
Sanniquellie	-1.12	-3.52	1.71	3.91	-1.36	-2.04
Zorzor	-1.01	-3.04	.38	.83	-1.24	-1.77
Voinjama	-2.25	-6.81	-.04	-.08	-1.01	-1.46
Income	.25	1.74	.19	.96	-2.91	-9.60
Children < 5	.11	1.66	.08	.92	.26	1.85
Children 6 - 12	-.03	-.40	-.10	-1.12	.11	.82
Males 13 - 34	.01	.16	-.07	-.70	.00	-.03
Males 35 - 64	-.12	-.59	.00	.00	-.51	-1.16
Females 13 - 34	-.05	-.61	-.07	-.68	.24	1.41
Females 35 - 64	.04	.22	.22	.96	.17	.50
Elderly, 65+	-.34	-1.40	-.26	-.79	-.14	-.28
Head, Elementary	-.60	-2.02	-1.02	-2.50	-.14	-.22
Head, Junior High	-.25	-.79	.27	.63	-1.10	-1.65
Head, Senior High	-.09	-.42	-.44	-1.45	-.13	-.28
Head, College	-.27	-.71	-.73	-1.41	-.56	-.71
Education Index	.12	1.91	.05	.58	-.16	-1.15
Government Worker	-.55	-1.77	-.72	-1.71	-.02	-.03
Other Employment	.03	.14	-.30	-.98	.23	.50
Head, Age < 35	-.30	-.67	.23	.38	-.74	-.78
Head, Age 35 - 64	-.29	-.65	.63	1.03	.17	.18
Head, Single	.71	2.89	-.10	-.30	-.99	-1.92
Head, Female	-.33	-1.31	.08	.23	1.11	2.11
Urbanization	.38	1.02	.62	1.21	-.27	-.35
R-Square	.10		.06		.17	
F Value	3.86		2.27		7.15	

Parameters are expressed as raw coefficients multiplied times 100.

Statistical significance of "t" values are approximately as follows:

Value above about 2.6 indicates significance with probability less than .01 that the coefficient is equal to zero.

Value of about 2.0-2.6 indicates significance with probability between .01 and .05.
(continued)

Table 1. Multiple Regression Analysis of Budget Shares, Almost Ideal Demand System Model, Urban Areas in Liberia, March 1986 (Continued).

Independent Variables	Animal Products		Oils		Fruits	
	Parameter	T Value	Parameter	T Value	Parameter	T Value
Intercept	-2.07	-1.00	14.18	11.43	.55	1.37
Buchanan	-.17	-.27	.06	.16	.37	2.99
Gbarnga	.72	1.01	1.57	3.71	-.08	-.62
Ganta	-.11	-.16	1.40	3.23	-.22	-1.57
Sanniquellie	-1.06	-1.44	.75	1.72	-.06	-.43
Zorzor	.08	.11	.55	1.20	-.02	-.12
Voinjama	-1.27	-1.67	1.44	3.17	.14	.95
Income	1.65	4.98	-1.84	-9.29	.05	.78
Children < 5	-.18	-1.19	.10	1.16	.03	1.11
Children 6 - 12	-.33	-2.11	.04	.41	-.03	-.90
Males 13 - 34	-.04	-.24	.13	1.37	.02	.51
Males 35 - 64	.92	1.91	.15	.51	.01	.12
Females 13 - 34	-.11	-.59	-.11	-.98	-.05	-1.37
Females 35 - 64	-.27	-.73	-.35	-1.57	-.04	-.63
Elderly, 65+	.35	.63	.04	.13	-.09	-.84
Head, Elementary	-.76	-1.10	.00	-.02	.10	.74
Head, Junior High	-.08	-.11	.08	.18	.40	2.84
Head, Senior High	-.26	-.51	.39	1.27	.10	1.02
Head, College	-.20	-.24	-.43	-.85	.32	1.95
Education Index	.11	.75	.00	-.01	.02	.59
Government Worker	1.19	1.67	-.16	-.38	.01	.12
Other Employment	.01	.02	.63	2.04	.07	.72
Head, Age < 35	.05	.05	.38	.61	-.40	-1.97
Head, Age 35 - 64	-1.35	-1.31	.37	.60	-.34	-1.70
Head, Single	.39	.69	.08	.25	-.15	-1.43
Head, Female	.97	1.69	-.47	-1.35	-.11	-.10
Urbanization	-.84	-.98	-.78	-1.53	.09	.56
R-Square	.06		.19		.04	
F Value	2.37		8.26		1.48	

Parameters are expressed as raw coefficients multiplied times 100.

Statistical significance of "t" values are approximately as follows:

Value above about 2.6 indicates significance with probability less than .01 that the coefficient is equal to zero.

Value of about 2.0-2.6 indicates significance with probability between .01 and .05.

(continued)

Table 1. Multiple Regression Analysis of Budget Shares, Almost Ideal Demand System Model, Urban Areas in Liberia, March 1986 (Continued).

Independent Variables	Vegetables		Other Food at Home		Food at Home	
	Parameter	T Value	Parameter	T Value	Parameter	T Value
Intercept	17.69	15.88	4.50	4.14	126.53	24.90
Buchanan	-.25	-.71	-.20	-.59	5.82	3.65
Gbarnga	.43	1.15	-.95	-2.56	7.57	4.37
Ganta	.35	.90	-1.56	-4.11	3.04	1.71
Sanniquellie	-.09	-.22	-.92	-2.40	2.21	1.23
Zorzor	.64	1.55	-.75	-1.86	4.00	2.13
Voinjama	.80	1.96	-.16	-.41	1.88	1.01
Income	-1.93	-10.87	.12	.71	-14.00	-17.23
Children < 5	.09	1.16	-.05	-.67	1.24	3.33
Children 6 - 12	.07	.83	-.11	-1.34	.56	1.49
Males 13 - 34	.07	.83	-.02	-.24	.49	1.23
Males 35 - 64	-.20	-.79	-.37	-1.45	.13	.11
Females 13 - 34	-.05	-.51	-.20	-2.09	.68	1.51
Females 35 - 64	-.14	-.71	-.17	-.88	1.17	1.27
Elderly, 65+	-.46	-1.51	-.56	-1.90	-.23	-.17
Head, Elementary	-.55	-1.48	-.60	-1.67	-4.28	-2.53
Head, Junior High	.36	.92	-.56	-1.46	-2.97	-1.66
Head, Senior High	-.65	-2.37	-.32	-1.19	-3.62	-2.89
Head, College	-1.02	-2.21	-.69	-1.53	-4.28	-2.03
Education Index	-.12	-1.50	.26	3.27	-.24	-.65
Government Worker	.06	.17	-.28	-.75	-2.27	-1.30
Other Employment	.00	.00	.91	3.33	.38	.30
Head, Age < 35	-.18	-.32	-.45	-.82	-2.39	-.93
Head, Age 35 - 64	-.61	-1.11	-1.11	-2.06	-3.08	-1.22
Head, Single	-1.20	-3.98	.46	1.57	-3.45	-2.50
Head, Female	.43	1.39	-1.01	-3.33	1.31	.93
Urbanization	-.85	-1.85	1.13	2.54	-3.63	-1.74
R-Square	.23		.14		.41	
F Value	10.55		5.49		24.32	

Parameters are expressed as raw coefficients multiplied times 100.

Statistical significance of "t" values are approximately as follows:

Value above about 2.6 indicates significance with probability less than .01 that the coefficient is equal to zero.

Value of about 2.0-2.6 indicates significance with probability between .01 and .05.

(continued)

Table 1. Multiple Regression Analysis of Budget Shares, Almost Ideal Demand System Model, Urban Areas in Liberia, March 1986 (Continued).

Independent Variables	Beverage, Food Away		Education Costs		Other NonFoods	
	Parameter	T Value	Parameter	T Value	Parameter	T Value
Intercept	2.83	1.31	-45.37	-9.11	16.02	3.21
Buchanan	-2.00	-2.94	2.35	1.51	-6.17	-3.94
Gbarnga	-3.76	-5.08	2.84	1.67	-6.66	-3.91
Ganta	-.44	-.57	4.88	2.79	-7.48	-4.28
Sanniquellie	-1.95	-2.55	10.14	5.77	-10.40	-5.91
Zorzor	-1.76	-2.20	9.73	5.28	-11.97	-6.48
Voinjama	-1.15	-1.46	3.05	1.67	-3.78	-2.06
Income	-.20	-.58	8.96	11.26	5.24	6.57
Children < 5	-.05	-.34	-.47	-1.28	-.72	-1.97
Children 6 - 12	-.20	-1.23	1.22	3.29	-1.59	-4.27
Males 13 - 34	-.06	-.37	1.13	2.89	-1.56	-3.97
Males 35 - 64	.12	.24	1.46	1.26	-1.71	-1.48
Females 13 - 34	-.52	-2.71	-.46	-1.05	.30	.68
Females 35 - 64	.20	.51	.91	1.01	-2.28	-2.52
Elderly, 65+	.78	1.33	-1.86	-1.37	1.31	.96
Head, Elementary	.17	.23	4.25	2.57	-.14	-.09
Head, Junior High	1.21	1.59	3.49	1.99	-1.74	-.99
Head, Senior High	.73	1.37	2.08	1.70	.81	.66
Head, College	.41	.45	1.49	.72	2.38	1.15
Education Index	.01	.05	.31	.85	-.08	-.21
Government Worker	.77	1.04	-1.00	-.58	2.49	1.45
Other Employment	.76	1.41	-2.12	-1.70	.98	.78
Head, Age < 35	2.23	2.04	1.22	.49	-1.06	-.42
Head, Age 35 - 64	2.61	2.43	1.62	.66	-1.15	-.47
Head, Single	1.33	2.26	.79	.58	1.33	.98
Head, Female	-2.54	-4.22	5.62	4.05	-4.39	-3.16
Urbanization	4.34	4.88	-.76	-.37	.04	.02
R-Square	.11		.30		.22	
F Value	4.32		14.60		10.00	

Parameters are expressed as raw coefficients multiplied times 100.

Statistical significance of "t" values are approximately as follows:

Value above about 2.6 indicates significance with probability less than .01 that the coefficient is equal to zero.

Value of about 2.0-2.6 indicates significance with probability between .01 and .05.

for sample size. However, adjusted values are not reported in the tables because the sample size was sufficiently large that the adjustments usually were very small.

The F value, which measures the overall significance of the model, is 41.9 for the rice model. This value is significant at the level of probability less than 0.001. This measure is an alternative way of assessing the statistical significance of the entire model rather than individual coefficients.

The explanatory power of the model declines when rice is disaggregated in country versus imported rice. The R^2 values of 0.36 for country and 0.32 for imported rice are both lower than 0.55 for aggregate rice. Although the F values are also lower, they are still significant at the 1 percent level.

The equation for cassava provides less satisfactory results, in the sense that relatively little of the variation in budget shares is explained by the model. The R^2 of 0.16 and the F value of 6.5 are both much lower than the corresponding values for rice. The F value is however still statistically significant, at the 1 percent level. When cassava is disaggregated, the equation for processed cassava has a higher explanatory power than the equation for tubers. The coefficient of determination is 0.17 for processed cassava, versus 0.11 for tubers.

The F and R^2 values of the other food products are quite low, although the F value is significant at the 1 percent level for most equations. Fish has a relatively high R^2 of 0.17, compared with a lower value of 0.06 for the other animal products (meat, dairy, and poultry). This suggests that fish and other

meat should not be lumped together. Similarly, fruit and vegetables should be kept separate. The latter has a relatively high R^2 of 0.23, contrasted with the low value of 0.04 for fruit.

The generally low values of the coefficients of determination observed in some of these models is typical for cross sectional data, which often do not include all of the structural factors causing households to differ. The fact that the explanatory power of the rice equations is superior to any other group is however encouraging, since study of the demand for rice is the focus of this analysis.

Individual Coefficients -- The coefficients on income are negative and highly significant for country, imported and total rice, total cassava and individual cassava products, fish, oils, vegetables and total food at home. This means that additional spending on each of these products induced by an income increase is likely to be less than proportional to the income increase (see the theory section). In contrast, the income coefficients for animal products, education costs, and other nonfood are positive (as expected) and highly significant. Therefore, there is a high probability that additional spending on each of these products due to an income increase is likely to be more than proportional to the income increase. It is reassuring to note that the income term is significant in most equations, the exceptions being fruit, other cereals, other starchy foods, other food at home, and food away from home.

The dummy variables in the models allow for geographic differences in responses between Monrovia and the other urban areas, as noted earlier. The coefficients on rice reveal expected results. For country rice, they are all positive, suggesting that at the margin, households in other cities allocate higher proportions of their expenditures on country rice than in Monrovia, which is known to be true from the data means reported in Report 2, Part 1. For Buchanan, however, this coefficient is not significant. For imported rice, the patterns are reversed: the coefficients of the binary variables are negative and significant (except for Buchanan), suggesting that at the margin, cities in the interior of the country tend to allocate relatively less income on imported rice than in Monrovia. These results conform with expectations, as high transportation costs restrain the flow of the two types of rice to and from the interior cities. One notes that when the two types of rice are lumped together, all city variables are significant and positive, suggesting that the average household outside of Monrovia tends to allocate a relatively larger share of income on rice than in Monrovia, even after allowing for differences due to income.

The patterns of the urban binary variables are not as clearcut for cassava and other equations as for rice. For cassava, Voinjama and Zorzor have negative coefficients that are significant, meaning that the average household there allocates relatively less income on this product than in Monrovia. In Buchanan, households tend to allocate relatively more income on cassava (total and processed) than in Monrovia. One notes that

the differences from Monrovia are significant more often for processed cassava than for cassava tubers. Thus, lumping the two types of cassava together would hide these important differences.

Most of the demographic variables appear significant in the rice model. One notes that the coefficients associated with adult males are not significant but those associated with adult females are significantly different from zero, suggesting that sex composition plays an important role in household consumption of rice. One may also note the patterns of substitution among products as more members are added to the family. An additional child (< 5 years), everything else constant, increases the budget share of rice, cassava, other cereals, other starchy foods, fish, oils, and vegetables. Concomitantly, the shares of animal products, other food, education, and other nonfood products decrease. Thus, there seems to be some substitution away from more expensive items (meat, education), and toward relatively less expensive items (rice, cassava). Similar observations can be made for the other household composition variables.

Overall, the sex-age variables appear more significant in the rice equations than for other groups. For cassava, only the 6-12 age group has a significant coefficient. None of the sex-age variables is significant for other cereals, other starchy foods, or fish. An interesting result is that education expense is positively correlated with the number of children age 6-12 and the number of males 13-34. This reflects the fact that such expenses were incurred mainly for elementary school students and male high school students. The results also suggest that

education spending is negatively correlated with females age 13-34. The latter coefficient is not significantly different from zero, but the two coefficients together suggest some differences between boys and girls regarding educational opportunities.

The education variables for household heads show little impact in the models; most of them are not statistically different from zero. However, households with heads that have attended senior high school is a significant variable; such households tend to allocate less money on rice than do those with no education. Similarly, households with a high literacy rate tend to spend less money on rice, judging on the basis of the education index variable. Higher education is positively correlated with expenses on fruit; senior high or college level educated heads would increase their average budget share by, respectively, 0.10 and 0.32 percent. It may be better in future analysis to combine the education variables for household heads into fewer groups, as the four groups used here were less significant than expected.

The two employment binary variables refer to government workers and other type of employment; the control group is, thus, the unemployed or not employed household heads. The government workers variable is significant for rice, with a negative coefficient, and for "other food at home". That is, government workers tend to allocate relatively less money on rice on the average than the unemployed or not employed. Other employment categories also have a similar pattern of behavior, which suggests that rice is a relatively less expensive food accessible to low income households (likely to be unemployed).

The age of the household head is measured by two binary variables representing, respectively, young and middle age heads. Statistically, the coefficients of these variables measure differences from the missing age group, that is, the elderly. Both young and middle age heads tend to allocate more money on food away from home and alcoholic beverages than the elderly. This result is consistent with expectations.

The marital status of the household head is generally a significant variable. This binary variable measures the difference in consumption between single and non single (usually married) heads. Single heads tend to allocate a smaller share of income on rice (2.6 percent less) and vegetables but more on other cereals and more on food eaten away from home than do heads that are not single. This finding suggests that single people tend to eat more away from home, which is consistent with expectations.

Regarding the gender of the head of household, the results suggest that female heads allocate less income on food at restaurants than do male heads. This conclusion follows from the significant, negative coefficient for female head in the food-away-from-home model. This result supports the hypothesis that women are more likely than males to cook their own food, other things being constant, including income. Female heads also allocate less money on "other food at home" and more on fish than do male headed households.

Finally, the urbanization variable that attempts to measure the degree of urbanization of the household head suggests that the newly arrived people allocate less money on rice than persons

who have lived longer in the city. This is indicated by the negative and nearly significant coefficients for rice and imported rice. Newly arrived heads also allocate relatively less money on cassava and vegetables, but more on other food and food away from home.

B. Income Elasticities

Income elasticities, which constitute the fundamental results of the statistical analysis, are presented in table 2. Elasticities at the sample mean represent the responses of the typical household, irrespective of income level. To capture the change in behavior implied by a change in the income category, the table also presents elasticities at the means of 11 income groups. Elasticities are computed for the 15 basic food and nonfood categories, and also for combinations of these groups, including total rice, cassava, food at home, and total food.

The elasticity of total food is 0.67 at the sample mean, declining from 0.80 for the low income stratum to 0.40 for the highest income stratum. This is taken to mean that given a 10 percent raise in their income, low income families would increase their expenditure on food by 8 percent, as opposed to 4 percent for high income households. These less than unit elasticity values agree with the expectation that food is a necessity.

In contrast, the elasticities for education and the other nonfood items lie above 1 at all income levels. For education, there are considerable differences between low and high income families. A 10 percent increase in their income induces a 46 percent increase in education expenditure for the low income

Table 2. Income Elasticity of Demand for Food and Nonfood Groups, by Income Group, Based on AIDS Model, Urban Areas in Liberia, March 1986.

Income Group	:	Country Rice	Imported Rice	: Total Rice	Cassava Tuber	Processed Cassava	: Total Cassava
Mean		.21	.12	.16	.30	.56	.41
\$ 0 - 99		.70	.64	.67	.42	.75	.59
100 - 199		.63	.50	.56	.58	.69	.62
200 - 299		.46	.34	.39	.45	.63	.52
300 - 399		.43	.15	.28	.37	.50	.42
400 - 499		.31	.03	.16	.09	.53	.29
500 - 599		.12	.14	.13	.53	.67	.58
600 - 699		-1.27	.17	-.08	.25	.72	.51
700 - 899		-.43	-.46	-.45	-.07	.23	.04
900 - 1,099		-1.65	-.20	-.50	.24	.37	.29
1,100 - 1,499		-2.16	-.91	-1.24	-.72	.26	-.23
1,500 +		-2.93	-1.42	-1.82	-1.30	.32	-.33

Income Group	:	Other Cereal	Other Starchy	Fish	Animal Products	Oil	Fruit
Mean		1.13	1.10	.49	1.25	.55	1.08
\$ 0 - 99		1.16	1.08	.70	1.42	.78	1.14
100 - 199		1.13	1.09	.71	1.30	.72	1.09
200 - 299		1.16	1.11	.63	1.27	.64	1.09
300 - 399		1.16	1.08	.54	1.26	.55	1.08
400 - 499		1.12	1.07	.53	1.21	.58	1.08
500 - 599		1.14	1.11	.48	1.23	.59	1.08
600 - 699		1.07	1.10	.38	1.22	.45	1.08
700 - 899		1.15	1.12	.17	1.23	.44	1.07
900 - 1,099		1.11	1.10	.22	1.25	.40	1.11
1,100 - 1,499		1.12	1.11	.08	1.22	.25	1.07
1,500 +		1.17	1.21	-.43	1.24	.01	1.09

Income Group	:	Vegetable	Other Food	: Food at Home	Bev. + : Total Food, Bev	Educa- tion	Other Non Food
Mean		.59	1.04	.66	.93	.67	1.46
\$ 0 - 99		.77	1.03	.79	.95	.80	4.61
100 - 199		.74	1.04	.76	.92	.77	2.30
200 - 299		.69	1.03	.72	.93	.73	1.72
300 - 399		.63	1.03	.68	.93	.70	1.52
400 - 499		.59	1.04	.68	.94	.70	1.44
500 - 599		.61	1.06	.65	.89	.66	1.36
600 - 699		.58	1.03	.66	.96	.69	1.44
700 - 899		.38	1.05	.54	.90	.56	1.38
900 - 1,099		.36	1.04	.55	.91	.57	1.37
1,100 - 1,499		.34	1.04	.50	.90	.53	1.28
1,500 +		.14	1.06	.36	.88	.40	1.35

households, compared with 14 percent for the upper income households. The figures for the other nonfood items are nearly constant over income. Irrespective of their level of income, households in the sample would increase their expenditure on nonfood commodities proportionately to an income increase. This is indicated by the nearly unit elasticity of nonfood.

A look at the results related to individual commodities reveals interesting facts. The most significant finding for rice is that the income elasticity turns negative at the upper income households. On average, the response of rice expenditure to income changes is moderate, as a 10 percent increase in income entails only 2 percent increase in rice expenditure. However, lower income households would buy 7 percent more rice if their income were increased by 10 percent. As one moves up the income scale, the elasticity eventually becomes negative. Households earning \$600 or more per month would actually decrease their spending on rice if given additional income. Such negative reaction is stronger for the highest income stratum: a 10 percent increase in their income entails an 18 percent decrease in their spending on rice.

Contrasting country and imported rice, the data suggest that on average, the response of country rice to income (0.21) is higher than for imported rice (0.12). At the lower income level, any 10 percent increase in income entails a 7 percent increase in the purchase of country rice, versus 6 percent for imported rice. However, as one moves up the income scale, the responses of country rice become more quickly and strongly negative than for

imported rice. Thus, for the \$600-699 income group, a 10 percent increase in income would decrease country rice spending by 13 percent, but increase imported rice consumption by 2 percent. For the highest income group, the same 10 percent income increase would entail decreases in both types of rice; however, country rice would decline by 29 percent, versus 19 percent for imported rice.

These results on rice may be summarized as follows:

- (i) as income rises, rice tends to be purchased less, relative to other commodities.
- (ii) at low income levels, household responses are of similar magnitude for both country and imported rice. Differences appear at higher income levels, with more dramatic (negative) effects of an income change on country rice than on imported rice.

The policy implications of these results will be analyzed in a later report.

The disaggregation of cassava into tubers versus processed products also provides interesting results. As expected, the processed form of cassava faces a much stronger demand, at all income levels, than does raw cassava. While the income elasticities associated with both products decline with income, the decline is steeper for cassava tubers. Elasticities eventually become negative for cassava tubers, and more strongly so for the upper two income groups. The elasticity of processed cassava declines from 0.75 for low income households, to 0.32 for the highest income group, with a sample average of 0.56. It is to be noted that the elasticity of total cassava turns negative for the upper two income groups. The analysis of the separate cassava products shows that the negativity is caused by the

demand for tubers. This underscores the danger of treating as one commodity products that have different demand characteristics.

Among the other food products, the 'other cereal', 'other starchy', animal products, fruit, and 'other food' groups all have greater than unit income elasticities, suggesting that they are "luxury" goods. The results on animal products (meat, poultry and dairy) contrasts sharply with the results on fish. The income elasticity for fish is lower than 1.0, at all income levels, and decreases from low to high income groups, eventually becoming negative. For animal products, the elasticity assumes a high value of 1.4 for the low income households, and remains nearly constant at about 1.2 for the other groups. The fact that the elasticity associated with animal products is higher than for any starchy food is consistent with expectations.

The elasticities of oils, vegetables, and food away from home and beverages, are all less than 1.0. For vegetables, elasticities decline from 0.77 to 0.14 between low and high income households. This contrasts with a nearly unit-elasticity for fruit, at all income levels. Thus, in the case of Liberia, combining fruit and vegetables, as is usually done in household studies, is not recommended. The elasticity for oils also declines sharply from low income households (0.78), to high income households (0.01). The elasticity of food away from home was expected to exceed 1.0, because of the usually high demand for these foods.

Overall, the elasticities are theoretically consistent, and usable for policy inferences. This will be the subject of a

later report.

C. Marginal and Average Budget Shares

The marginal budget shares for the various food and nonfood groups show how an additional dollar of income would be expected to be spent (table 3). On the average, 29 cents out of each additional dollar of income would be expected to be spent on food and beverages. But, at the lowest income level, 56 cents would go for food compared with 9 cents at the highest income level. On the average, 2 cents out of each additional dollar would be expected to be spent on rice, and another 5 cents would be spent for cassava, other cereal, and other starchy foods. This compares with 11 cents that would go for fish and animal products. The marginal budget share for rice and cassava turns negative at high income levels. This implies that at such income levels, the portion of income allocated to either product decreases as additional income is made available.

In contrast to the marginal budget shares, the means of the dependent variables represent the average budget shares (table 4). Comparing the average budget shares with the marginal budget shares indicates how additional dollars of income will be spent in contrast with averages of current spending. For example, currently nearly 10 cents out of each current dollar is being spent for rice, but if average income were increased by one dollar, only 2 cents would go for rice. These comparisons are another way of assessing the strength of demand for various expenditure groups.

Table 3. Marginal Budget Shares for Food and Nonfood Groups, by Income Group, Based on AIDS Model, Urban Areas in Liberia, March 1986.

Income Group	Country Rice	Imported Rice	Total Rice	Cassava Tuber	Processed Cassava	Total Cassava
Mean	.8	.8	1.6	.3	.4	.7
\$ 0 - 99	7.5	9.8	17.4	.5	.9	1.5
100 - 199	5.3	5.4	10.7	1.0	.7	1.7
200 - 299	2.7	2.8	5.5	.6	.5	1.1
300 - 399	2.4	.9	3.4	.4	.3	.7
400 - 499	1.4	.2	1.6	.1	.3	.4
500 - 599	.4	.9	1.3	.8	.6	1.5
600 - 699	-1.8	1.1	-.6	.2	.8	1.1
700 - 899	-.9	-1.7	-2.7	.0	.1	.0
900 - 1,099	-2.0	-.9	-2.9	.2	.2	.4
1,100 - 1,499	-2.2	-2.6	-4.7	-.3	.1	-.2
1,500 +	-2.3	-3.2	-5.5	-.4	.1	-.3

Income Group	Other Cereal	Other Starchy	Fish	Animal Products	Oil	Fruit	Vegetables
Mean	2.2	2.1	2.8	8.3	2.3	.6	2.8
\$ 0 - 99	1.8	2.5	6.7	5.6	6.4	.4	6.6
100 - 199	2.1	2.4	7.2	7.2	4.8	.6	5.5
200 - 299	1.8	2.0	5.0	7.9	3.3	.6	4.2
300 - 399	1.8	2.7	3.4	7.9	2.2	.7	3.4
400 - 499	2.4	2.7	3.3	9.5	2.5	.7	2.7
500 - 599	2.0	1.9	2.7	8.7	2.6	.7	3.0
600 - 699	3.8	2.2	1.8	9.2	1.5	.7	2.6
700 - 899	1.9	1.8	.6	8.7	1.4	.8	1.2
900 - 1,099	2.6	2.0	.8	8.2	1.2	.5	1.1
1,100 - 1,499	2.4	2.0	.2	9.2	.6	.7	1.0
1,500 +	1.8	1.1	-.9	8.5	.0	.6	.3

Income Group	Other Fd Home	Total at Home	Bev, Food Away	Total Food	Education Costs	Other Nonfood	Total Expenditures
Mean	3.3	26.7	2.5	29.2	28.4	42.5	100.0
\$ 0 - 99	3.7	52.5	3.9	56.4	11.4	32.2	100.0
100 - 199	3.4	45.6	2.4	48.0	15.8	36.2	100.0
200 - 299	4.0	35.5	2.7	38.2	21.4	40.4	100.0
300 - 399	3.8	29.9	2.8	32.7	26.3	40.9	100.0
400 - 499	3.3	29.2	3.4	32.6	29.2	38.2	100.0
500 - 599	2.1	26.5	1.6	28.1	33.9	38.0	100.0
600 - 699	4.7	26.8	4.7	31.5	29.3	39.1	100.0
700 - 899	2.6	16.5	1.8	18.3	32.6	49.1	100.0
900 - 1,099	3.0	17.0	2.0	19.0	33.4	47.6	100.0
1,100 - 1,499	3.1	14.3	1.9	16.2	41.4	42.4	100.0
1,500 +	2.2	7.9	1.5	9.4	34.8	55.8	100.0

Note: Data are expressed in terms of percentages of total expenditures.

Table 4. Average Budget Shares for Food and Nonfood Groups, by income Group, Urban Areas in Liberia, March 1986.

Income Group	Country Rice	Imported Rice	Total Rice	Cassava Tubers	Processed Cassava	Total Cassava
Mean	3.98	6.16	10.14	1.03	.72	1.75
\$ 0 - 99	10.69	15.20	25.89	1.25	1.25	2.51
100 - 199	8.43	10.81	19.24	1.73	1.02	2.75
200 - 299	5.85	8.21	14.06	1.31	.85	2.16
300 - 399	5.58	6.32	11.90	1.14	.63	1.77
400 - 499	4.57	5.59	10.16	.79	.66	1.46
500 - 599	3.57	6.27	9.84	1.53	.95	2.48
600 - 699	1.39	6.50	7.89	.97	1.13	2.10
700 - 899	2.21	3.68	5.89	.67	.40	1.08
900 - 1,099	1.19	4.49	5.68	.96	.50	1.45
1,100 - 1,499	1.00	2.82	3.82	.42	.42	.84
1,500 +	.80	2.22	3.03	.31	.46	.78

Income Group	Other Cereals	Other Starchy	Fish	Animal Products	Oils	Fruit	Vegetables
Mean	1.92	1.91	5.71	6.67	4.13	.59	4.72
\$ 0 - 99	1.58	2.27	9.60	3.94	8.26	.34	8.50
100 - 199	1.88	2.17	10.09	5.55	6.67	.58	7.42
200 - 299	1.56	1.77	7.95	6.20	5.19	.53	6.17
300 - 399	1.54	2.52	6.27	6.27	4.08	.64	5.30
400 - 499	2.14	2.53	6.20	7.87	4.38	.62	4.68
500 - 599	1.77	1.73	5.58	7.05	4.46	.63	4.97
600 - 699	3.51	1.97	4.71	7.53	3.36	.63	4.57
700 - 899	1.65	1.59	3.52	7.09	3.28	.71	3.14
900 - 1,099	2.33	1.84	3.72	6.54	3.05	.45	3.04
1,100 - 1,499	2.11	1.79	3.15	7.52	2.45	.67	2.92
1,500 +	1.51	.92	2.03	6.81	1.86	.56	2.25

Income Group	Other Fd Home	Total :at Home	Bev, Food : Away	Total : Food	Education Costs	Other Nonfood	Total :Expenditures
Mean	3.13	40.68	2.69	43.37	19.40	37.23	100.00
\$ 0 - 99	3.57	66.48	4.09	70.57	2.48	26.94	100.00
100 - 199	3.27	59.61	2.59	62.20	6.89	30.91	100.00
200 - 299	3.87	49.46	2.87	52.33	12.46	35.20	100.00
300 - 399	3.65	43.95	3.02	46.97	17.32	35.71	100.00
400 - 499	3.15	43.18	3.59	46.77	20.26	32.97	100.00
500 - 599	1.93	40.46	1.85	42.31	24.91	32.78	100.00
600 - 699	4.56	40.83	4.93	45.76	20.36	33.88	100.00
700 - 899	2.50	30.47	2.00	32.47	23.69	43.85	100.00
900 - 1,099	2.90	31.02	2.18	33.20	24.46	42.34	100.00
1,100 - 1,499	3.01	28.29	2.11	30.40	32.40	37.20	100.00
1,500 +	2.10	21.85	1.73	23.58	25.84	50.58	100.00

Note: Data are expressed in terms of percentages of total expenditures.

The average budget share of 43 cents spent for all food compares with 29 cents spent at the margin from an additional dollar of income. The 43 cents also compares with household budget shares going for food among the various urban areas ranging from 38 cents in Monrovia to 53 cents in Buchanan and 55 in Zorzor (table 53 in Report 2, Part 1).

D. Validity of the Results

While prices appeared to be weak explanatory variables in the model, the results associated with income and household demographics seem plausible. The findings may be compared with previous studies. Tun and Yetley (1983) used the 1976-78 household survey in Liberia to estimate an income elasticity of 0.80 for rice in urban areas. This is considerably higher than the figure found here (.16), and suggests, ignoring possible data problems, that the average income elasticity went down over time. Tun and Yetley, however, did not compute elasticities at various income levels. Average elasticities, as highlighted by the results reached here (table 2), differ considerably among income groups. This table clearly suggests that income distribution has a potential impact on the demand for rice.

A study in rural Sierra Leone also provides income elasticity estimates that may be compared to the results reached here. King and Byerlee (1977) estimated an income elasticity of 0.95 for rice at the sample mean; this declined from 1.23 for low income households to 0.88 for upper income households. The two sets of results are not directly comparable, since one refers to urban, and the other to rural areas. One may note however

that the highest income elasticity implied by our sample (i.e., 0.67, corresponding to the lowest income stratum), is of similar magnitude to the lowest elasticity in rural Sierra Leone (i.e., 0.88, for the highest income stratum). These results are consistent with the general maintained hypothesis that rural income elasticities of staples are higher than urban. Finally, this study experimented with alternative specifications, including a modified ratio semi-log inverse (King and Byerlee, 1977), and the translog version of Swamy and Binswanger (1983). In the early phases of the model building effort, the AIDS model led to results that were theoretically more consistent than these alternative models. It was therefore decided to concentrate the modeling effort on AIDS, leading to the final specification estimated here.

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APPENDIX A

Test of Significance of
Squared Demographic Terms

The almost ideal demand system (AIDS) was estimated with demographic variables representing sex-age composition. Including squared terms of demographic variables allows the testing of the presence of economies of scale in food consumption associated with household composition.

The "extra sum of squares" test procedure was used to test the presence of economies of scale. Basically, this test compares the explanatory power of the model without squared terms and the one with squared terms added. If the latter contributes to increasing the explanatory power (measured in terms of R^2), then the squared elements are statistically significant as a group. The test procedure and the results are presented below.

Let k be the number of explanatory variables included in the model without squared terms (Model I). Let R^2_I measure the explanatory power of such model.

Let q and k be the number of explanatory variables in the model with squared terms (Model II). That is, q is the number of "extra" terms added to Model I. Let R^2_{II} measure the explanatory power associated with model II.

Finally, let n be the total number of observations used to estimate models I and II (here, $n = 926$). The test statistic is:

$$F = \frac{(R^2_{II} - R^2_I) / q}{(1 - R^2_{II}) / [n - (k + q)]}$$

which, under the null hypothesis that the squared terms are non-significant, has the F-distribution with 9 degrees of freedom in the numerator, and $n - (k + q)$ in the denominator. "Large" computed F values suggest the rejection of the null hypothesis; i.e., large F values suggest that the squared terms are jointly statistically significant.

The computed F values for each of the food models analyzed are presented in the table below, with $n = 926$, $q = 7$, and $k = 27$. Each value is compared with the theoretical F value at the 95 percent level of significance: $F(7,892; .95) = 2.01$. Thus, all computed values greater than 2.01 are statistically significant.

The table shows that among food products, only the imported rice and other food at home equations suggest the presence of economies of scale in consumption. The null hypothesis cannot be rejected for all other commodities at any reasonable level of significance. Therefore, the models were estimated without squared demographic terms in this study.

Table A: Results of Test for Economies of Scale, Almost Ideal Demand System

Model	R_I^2	R_{II}^2	$F = \frac{R_{II}^2 - R_I^2}{1 - R_{II}^2} * \frac{n - (k + q)}{q}$
Country Rice	.3576	.3629	1.06
Imported Rice	.3194	.3629	3.94*
Cassava, Tuber	.1120	.1160	0.58
Cassava, Processed	.1729	.1754	0.39
Other Cereal	.1004	.1044	0.57
Starchy Foods	.0616	.0691	1.03
Fish	.1713	.1793	1.24
Animal Products	.0641	.0719	1.07
Oil	.1929	.1969	0.63
Fruit	.0411	.0469	0.78
Other Food at Home	.1370	.1516	2.19*
Alc Bev & Food Away	.1110	.1205	1.38

I: Model without squared demographics, k = number of explanatory variables.

II: Model with squared demographics, k + q = # variables, k = 27 and q = 7.

F(7,892; .95) \approx 2.01