

PA-1162-236

101 10000

A RAPID APPRAISAL METHODOLOGY
FOR EXPENDITURE SURVEYS: AN
EVALUATION OF THE LIBERIA MODEL

by

Patricia Bonnard

A report prepared under
Purchase Order 40-319R-8-00225

for

Nutrition Economics Group
Technical Assistance Division
Office of International Cooperation and Development
United States Department of Agriculture

March 1988

EXECUTIVE SUMMARY

The intent of the study was to evaluate the rapid appraisal technique used to collect household expenditure data for the USDA "Urban Food Consumption Patterns and National Food Policy Project" in Liberia and to determine the appropriateness of the technique as a prototype for future food policy research in developing countries.

Interviewing procedures were simple and intensive. A small team of enumerators was assigned to each city. New samples were randomly drawn for each of the three phases and households were visited once. Recall periods were the previous week and month for food and non-food expenditures, respectively. Prices were collected concurrently from relevant local markets.

The results of the analyses were consistent between phases, among similar studies performed in other developing countries and with economic theory in general. Differences in budget shares and average prices could largely be explained by seasonal factors or changes in the ethnic composition of the samples.

Some problems with error and enumerator bias were identified. The report proposes recommendations highlighting the clarification of terms and improved enumerator training.

The inability to estimate significant price elasticities remains the central weakness of the technique. The lack of sufficient price variation was identified as the major cause. Nevertheless, given various modifications covered in this report, Phase Three analysis is expected to yield significant results.

It was concluded that the term "rapid appraisal" aptly describes each distinct phase of the survey which required two weeks of data collection and as little as four months data processing and analysis, including document preparation. The existence of seasonality, as was the case in Liberia, necessitates additional interviewing periods (i.e. phases), and therefore, extends the total project time schedule to just over one year. With few modifications, the methodology can be transferred to other developing country contexts.

TABLE OF CONTENTS

<u>Chapter</u>		<u>Page</u>
	Executive Summary	ii
	List of Tables	v
	Acknowledgements	vi
1	Introduction	1
	1.1 Intent of Study	1
	1.2 Background	2
	1.2.1 Brief Review of Nutrition, Consumption, and Expenditure Surveys	2
	1.2.2 Nutrition Economics Group's (NEG's) Experience	3
	1.3 The Need for a Rapid Appraisal Approach	3
	1.4 The Liberia Survey Model	4
	1.4.1 Agricultural Policy in Liberia	4
	1.4.2 Objectives of the Liberia Expenditure Survey	5
2	Survey Design	5
	2.1 Introduction	5
	2.1.1 Participants	5
	2.1.2 Timing of Survey Phases	6
	2.1.3 Cities Selected	7
	2.2 Discussion	7
	2.2.1 Using Local Expertise	7
	2.2.2 Interview Frequency	7
3	Sampling	8
	3.1 The Original Sampling Design	8
	3.2 Phase Two and Three Alterations	10
	3.3 Discussion	13
4	Questionnaire Design	14
	4.1 Introduction	14
	4.2 Demographics	14
	4.3 Expenditures	15
	4.3.1 Section on Rice	15
	4.3.2 Other Foods and Non-Foods Expenditures	16
	4.4 Price Questionnaire	16
	4.5 Discussion	17

<u>Chapter</u>	<u>Page</u>
4.5.1 Demographics	17
4.5.2 Expenditure Questionnaire	18
4.5.3 Price Questionnaire	20
5 Survey Implementation	20
5.1 Description of Survey Implementation	20
5.2 Discussion	21
6 Survey Analysis	23
6.1 Introduction	23
6.2 Phase One Data Processing and Analysis	23
6.3 Phase Two Data Processing and Analysis	24
7 Survey Results	25
7.1 Introduction	25
7.2 Demographic Variables	26
7.3 Expenditure Variables	27
7.3.1 Rice Expenditures	27
7.3.2 Budget Shares of Selected Expenditure Items	28
7.3.3 Income Elasticities of Selected Commodities	30
7.4. Price Variables	30
7.4.1 Average Prices	30
7.4.2 Price Elasticities	32
8 Conclusions and Recommendations	33
8.1 Conclusions	33
8.2 Recommendations	35
8.2.1 Survey Design	35
8.2.2 Sampling Design	35
8.2.3 Questionnaire Design	36
8.2.4 Survey Implementation	37
8.2.5 Presentation of Results	38
Appendix	
A Sample Expenditure Questionnaire	39
B Sample Price Questionnaire	46
Bibliography	48

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1 Interviewing Frequencies of Selected Consumption and Expenditure Surveys	9
2 Number of Sampled Enumeration Areas and Households Number of Enumerators Employed, Three Phases	12
3 Average Budget Shares (%) for Selected Commodities Comparison of Phase 1 and 2, With and Without Monrovia	29
4 Budget Shares (%) for Selected Commodities Country Comparisons	29
5 Average Income Elasticities for Selected Commodities Country Comparisons	31
6 Income Elasticities for Selected Commodities Over Income Groups	31

ACKNOWLEDGMENTS

All of the people who contributed to the conceptualization, implementation and evaluation of the Liberia Expenditure Survey are certainly too numerous to list here. Nevertheless, I feel that it is necessary to acknowledge the patience, serious effort and consistent hospitality of all my Liberian coworkers at the Ministry of Agriculture, both at the Central Office in Monrovia and "in the bush." James Yanquoi and Tarnue Koiwou, my counterparts, provided me with immeasurable instruction in Liberian culture, work habits and, more generally, "how to move." Mr. Koiwou also acted as the project coordinator and one of the analysts. For this report he contributed suggestions and his impressions of the whole survey process. USDA and USAID/Liberia provided considerable financial, technical and logistical support. Dr. Shirley Pryor of NEG, who was involved with the survey since its inception, initiated this evaluation study. Mr. John Hyslop, also of NEG, administered my contract and assisted in editing the final document. To all these people plus all those not individually mentioned: "I say, t'ank you yah!"

INTRODUCTION

1.1 Intent of Study

The study evaluates the rapid appraisal technique used to collect household expenditure data for the "Urban Food Consumption Patterns and National Food Policy" project in Liberia. It attempts to determine whether the pilot methodology utilized in Liberia is an appropriate prototype for future food policy research in developing countries. The technique is assessed in terms of:

- 1) quality of sampling methodology, questionnaire design, interviewing techniques, and data processing;
- 2) flexibility and ease of implementation given the diverse and often difficult research environment found in developing countries;
- 3) ability to extract useful and consistent data for food policy analysis such as descriptive demographic and economic statistics and demand parameters;
- 4) realism of training objectives; and
- 5) ability to reduce costs relative to the traditional lengthier and more intensive household food consumption or expenditure surveys.

The report is divided into eight sections. The first section defines and compares several types of surveys commonly used in food policy research, and establishes the rationale behind the application of rapid appraisal methodologies to expenditure surveys, including the specific objectives of the Liberia study. Sections two through five evaluate respectively the survey design, sampling techniques, the questionnaire, and survey implementation. Under each section, the procedures of the first phase of the survey are described. Then, second and third phase alterations are introduced along with a theoretic discussion and some practical observations. Section six describes data processing and analysis. Section seven presents the results of the analysis of each phase confirming whether they are consistent between survey phases as well as with theory and the present body of research. Finally, conclusions and recommendations are presented in section eight.

1.2 Background

1.2.1 Brief Review of Nutrition, Consumption and Expenditure Surveys

Nutrition, consumption and expenditure surveys are basic tools for collecting standard household or individual consumption data used in designing and analyzing national food policy as well as food programs. In particular, consumption and expenditure survey results provide insights to establishing wage and price policy and weights for price indices.

Nutrition surveys focus on the individual, estimating the nutritional status of each or a target member (e.g. infants or women of child bearing age) of the household. Variables associated with intra-household distribution and anthropometric measures are usually included.

Consumption surveys focus on the quantity of food consumed. Generally, they analyze consumption on a meal by meal basis, identifying and quantifying each ingredient that comprises the meal. Considerable attention is given to accurately measuring food stocks, wastage and meals eaten away from home and served to guests.

Expenditure surveys extract information on household expenditures and place market values on the amounts of home production consumed for a series of food and non-food items. Total expenditures are considered an appropriate substitute for income based on the premise that household expenditures and consumption vary less over time than current income, and thus provide a better approximation of permanent income and "normal" consumption patterns (Smith, Whelan and Schmidt, 1982:19 and Senauer, 1987:15). In addition, expenditures are more highly correlated with consumption choices than is income (Zalla, 1987:3).

Price data are ordinarily collected concurrently with the expenditure survey and permit the derivation of consumption quantities. Given greater ease of expenditure data recall and collection as compared to consumption data, expenditure surveys can be an appropriate alternative to consumption surveys.

As a result, expenditure data are often used to derive consumption patterns and quantities. Detailed consumption data on the other hand, is used to approximate nutritional status. All three types of data are highly correlated; and as such, researchers commonly make inferences about one using another.

1.2.2 Nutrition Economics Group's (NEG's) Experience

The Nutrition Economics Group (NEG) of the United States Department of Agriculture (USDA) has worked with a variety of organizations and individuals undertaking surveys of household food consumption, nutrition and/or expenditures: Senegal and Cameroon (Ariza-Nino, 1982), Indonesia (CARD, 1987), Haiti (Fleischer), Tanzania (Leonard, 1983), Ecuador (Immink, 1984), Jamaica (Banskota, et al., 1985), Guatemala (Conroy, 1983) and Liberia (Hiemstra and Savadogo, 1986 and Keuhn, et al., 1987).

Over time, NEG has acquired considerable experience with numerous relevant research techniques, and is presently attempting to organize that experience into a set of practical, cost-effective methodologies which can be readily applied to new research projects.

1.3 The Need for a Rapid Appraisal Approach

The application of rapid appraisal techniques is not restricted to research in less developed countries. However, the advantages of cost and time savings are most readily apparent in this context where the research capacity is often limited and overburdened. Ministries and research institutes suffer from insufficient budgets. Their research staff may be overworked or involved in other activities. Because the timing of many agricultural surveys is inflexible, the schedules of regular, priority research projects may overlap with that of a proposed specialized consumption or expenditure survey.

Measurement for deriving area estimates is undertaken during the planting season, for yield estimates during harvest season. Similarly, collection of harvest season consumption data is critical for food policy analysis since supplies of harvested commodities increase and their prices decrease at this time, altering household consumption patterns. For producers, the proportion of food purchases to total food consumption declines. A technique which limits the time enumerators are in the field reduces the bottleneck in terms of available survey staff.

Rapid appraisal surveys are usually executed once, or at most intermittently (three or four times) throughout the year in order to capture seasonal variation. They generally rely on a single visit per household per season and sometimes just one visit per year if a new sample is drawn each season. In contrast, traditional surveys are often executed on a more regular periodic basis (e.g. monthly or weekly) and employ multiple visitation. The time savings with a rapid appraisal methodology that covers seasonal variations is, therefore, in the actual field work and data entry, rather than the life-span of the project.

The need for food policy data is often deemed immediate. In less developed countries, baseline data are uncommon and rarely consistently reliable. Without timely survey implementation and results, food policy might have to be formulated in a void. In addition, survey financing and expatriate technical expertise may fall under the umbrella of a larger project with perhaps a short and finite life-span. Survey identification, design, execution, analysis and presentation, not to mention the implementation of recommendations, are best carried out within the life-span of the larger project guaranteeing support and continuity, and therefore, require a timely research technique.

Finally, there are diseconomies of information in most policy contexts. Research performed in a less developed country context is generally tied to aid projects and overseen by academic institutions. Many researchers and analysts prefer complex methods and presentations incomprehensible to policy makers who are frequently not technicians themselves. Policy makers awaiting the results of such research frequently find themselves confronted with overly sophisticated and difficult to interpret documentation. They may be left with just the complex output while the responsible technicians have permanently departed without providing adequate clarification. The remaining local technicians may be unable to make sense of results because their level of expertise is limited and/or the final report and affiliated data sets are not adequately documented.

This is not to imply that the work of all expatriates is inappropriate, but rather to emphasize that the presentation of results should conform to the audience. In many instances, policy makers may be politically, not competitively, appointed, and consequently less able to understand sophisticated and voluminous reporting. Rapid appraisal techniques, instead, attempt to keep the objectives simple and tailored to specific needs.

1.4 The Liberia Survey Model

1.4.1 Agricultural Policy in Liberia

Rice is the major food staple in Liberia. Approximately 65% of the total population and 85% of the agricultural population is engaged in rice production (Ministry of Planning and Economic Affairs, 1986:11 and Statistics Division, 1986:8). The level of rice imports is frequently quoted at 30% of total supply. However, this figure probably represents the lower bound given that official estimates do not account for rice movement across intra-continental borders (Bonnard, 1987).

Because rice plays a crucial role in the lives and diets of Liberians, the government has persistently placed rice production and marketing issues at the center of agricultural policy debates

and initiatives. Over a decade ago, the Liberian government established a goal of rice self-sufficiency (Ministry of Agriculture, 1986:29). The consequent research and policy efforts have largely centered on production and marketing with only limited success. Meanwhile little attention has been given to the analysis of food consumption patterns and the potential substitution of alternative starches for rice.

1.4.2 Objectives of the Liberia Expenditure Survey

The Government of Liberia expressed a need for current and improved food consumption data in order to evaluate present food and agricultural policies and, if necessary, formulate new ones. The Liberia expenditure survey was conducted by the Liberian Ministry of Agriculture in response to this need, with technical assistance from Purdue University and the University of Missouri sponsored, respectively, by NEG and the United States Agency for International Development (USAID). Their purpose was to gain a greater understanding of food consumption and the determinants of demand.

Given the Liberian's previously stated dependence on rice, the survey awarded special emphasis to the analysis of domestic and imported rice consumption; potential substitution of alternative starches, such as cassava, plantain and other roots and tubers; and to the nutritional implications of substitution.

The study confined itself to urban areas where the access to, and dependence on, imported rice is concentrated. According to the original plan, the survey was to be executed three times between March and December, 1986 with the intent to capture the seasonality of local food supplies and the resultant variation in consumption. Although the decision to employ a rapid appraisal methodology was largely based on financial constraints, the project was a logical extension of NEG's interest in establishing a time and cost efficient prototype methodology for collecting standard consumption, or alternatively expenditure, data for food policy research.

SURVEY DESIGN

2.1 Introduction

2.1.1 Participants

The expenditure survey was administered by the Marketing /Division of the Ministry of Agriculture. The preliminary survey design, including a draft questionnaire, were developed outside Liberia and introduced by the expatriate consulting team. Staff from the Marketing and Statistics Division (including one Peace

Corps Volunteer, the author) as well as the Planning Bureau actively participated in a series of design meetings, selecting the cities to be included in the survey, identifying key demographic variables, listing commodities commonly consumed by Liberians, devising appropriate definitions of terms, modifying the questionnaire, and clarifying certain cultural behaviors. The Statistics Division played a prominent role in developing the sampling procedures.

USAID and USDA provided financial and logistical support while the Marketing Division staff was responsible for creating budgets, procuring supplies, training, field logistics, and supervision. Due to insufficient in-country expertise, the analysis of Phase One and Two took place at Purdue University and University of Missouri respectively. Each university also provided basic training for Ministry staff members. (See sections 6.2 and 6.3 for further details.)

Whereas the foreign consultants gave recommendations based on their work of processing and analyzing the Phase One and Phase Two data, the Ministry staff made the actual revisions and independently implemented all three phases of the survey. At present, the Ministry is attempting to preform Phase Three data processing and basic statistical analysis themselves. However, the derivation of demand parameters is expected to require continued foreign assistance.

2.1.2 Timing of Survey Phases

The survey was divided into three phases in order to capture the seasonal availability of food, especially rice. The agricultural season of different regions of Liberia can vary as much as two months. However, for most of the areas included in the survey, harvest begins in late October and runs through December, while August and September represent the "hungry season" when supplies are nearly depleted and the new crop is not yet harvested.

The time periods chosen for the survey possess off-setting bias. The months of December and September were selected to cover the two extreme seasons, while March was chosen to represent an average between the two. The intention was to execute all three phases within the same agricultural year: December, March, and September. But unfortunately, political disturbances in Liberia and financial difficulties with the project extended the survey from March, 1986 through December, 1987.

Unlike most rapid appraisal methodologies which rely, at least partly, on informal interviewing techniques, the expenditure survey utilized only a formal interview approach. Households, defined as people eating from the same pot, were

interviewed once over the two week duration of a phase, and new samples were drawn for each new phase.

2.1.3. Cities Selected

Since assessing Liberia's potential of achieving rice self-sufficiency was of primary importance and consumption of imported rice occurs mostly in cities, the survey team elected to restrict the study to urban centers. The total sample size was constrained by the budget which created a trade off between the number of cities and households per city. The number of cities included expanded with each phase. Cities were not deleted from one phase to the next, only added.

Phase One included Monrovia, Buchanan, Gbarnga, Ganta, Sanniquellie, Zorzor and Voinjama. Originally, it was felt that the selected group would encompass adequate variation of perceived regional differences in consumption without limiting the sample size of any one city. Later, however, cities were added to make the sample more representative. Tubmanburg, Harper and Zwedru and then Harbel, Bong Mines, Kakata and Greenville were selected for the second and third phases respectively.

2.2 Discussion

2.2.1 Using local Expertise

In his report on rapid appraisal techniques, Tom Zalla discusses the advantages of making local contacts and "taking-time" to observe more than the obvious (Zalla, 1987:5-8). Although foreign consultants headed the Liberia survey design team, many Liberians were included. Nonetheless, the Liberians could have been granted more decision-making authority, especially concerning language, local institutions and customs, variables which can be culturally influenced, and the content and presentation of training materials.

During the planning stage, the locals had identified the need to group commodities as well as delete a few items and add others. In addition, they expressed concern that the enumerator instruction booklet had to be expanded and clarified. These suggestions were not followed at the time, but were all included on the consultants' post-analysis list of recommendations. This type of problem can be easily resolved on the spot by giving patient and practical consideration to local expertise.

2.2.2 Interview Frequency

Historically, consumption and expenditure surveys had interview frequencies of once a week or once a month continuously

over a one year period. More recently, as table 1 illustrates, the tendency is for the frequencies to decrease, often to one, and for the survey periods to become discontinuous, targeting seasonal fluctuations specifically.

The existence of seasonal variation increases the need to revisit households or, at least, extend the interviewing period. In smaller, less developed, more rural areas, the variation in food supplies tends to be more pronounced as there is generally less diversity in growing seasons, fewer storage facilities, and markets are poorly integrated. This is certainly the case in Liberia.

Unfortunately, if the survey budget is inflexible, as was the case with Liberia, repeat visits will be gained at the expense of sample size, reducing the level of captured variation. In Liberia, there is also the problem of tracing households and adjusting for the constantly changing household size. If the survey had employed a multiple visitation system, many households associated with incomplete information would have to have been dropped, further reducing the sample size. This problem is particularly relevant to research projects undertaken in less developed countries.

In the case of Liberia, the unit of analysis was income groups and not individual households. As Zalla points out, this allows for a reduction in the number of household visits and a smaller sample size without adversely effecting precision (Zalla, 1987:9). Alternatively, with grouped units of analysis, interview frequency can be reduced, and as a result, the sample size can be increased. A larger sample tends to increase variability and, consequently, precision.

Although the present tendency of researchers is to reduce the time allotted to the actual field research portion of expenditure surveys, their objective remains estimating annual expenditures. This requires at least sporadic interviewing over the year whether the sample is redrawn each season or not.

SAMPLING DESIGN

3.1 The Original Sampling Design

As mentioned previously, the survey originally included seven cities: Monrovia, Buchanan, Gbarnga, Ganta, Sanniquellie, Zorzor and Voinjama. These cities were chosen because together they represent over 3/4 of the total urban population of Liberia and because the team felt that they represented a substantial

TABLE 1: Interviewing Frequencies of Selected Consumption and Expenditure Surveys

Country	Visit Freq.	Time/HH	Duration	Sample Size	Year	Source*
1 Zambia		1 mnth	2 years	2,576	1966-68	15
2 Ghana	Alternating 3 days, 1 wk	1 mnth	1 year	358	1967-68	15
3 Botswana	daily	1 mnth	2 months		1977	15
4 Zaire	2/day	1 mnth	1 year	1,177	1969	15
	2/day	1 mnth		295	1971	15
5 Guatemala			1 year	2,800	1969	15
6 Colombia			1 year	2,103	1971	15
7 Chad	daily		1 year	60	1971-72	15
8 Sierra Leone	weekly or monthly	1 year	1 year	36	1974-75	33
		1 year		99		
9 Nigeria			1 year	144	1974-75	35
10 Ecuador	daily	1 week	1 year	9,518	1975-76	18
11 Jamaica**			3 years	486-3,495	1975-77	3
12 Brazil			1 year	55,000	1977	15
13 Indonesia		1 week	2 months	60,000	1980	8
14 Burkina Faso	weekly	1 year	1 year	100	1982-83	29
15 Bangladesh	1/quarter	1 year	1 year	5,750	1983	1
16 Sudan	monthly	1 year	1 year	4,930	1983	1
17 Cameroon	daily	3 days	3 months	72		2
18 Senegal	daily	3 days	3 months	72		2
20 Liberia	once	1 day	10 months	942-1,000	1986-87	16 & 20

* numbers correspond to bibliography number.

** the Jamaica sample size changed each of the three years.

degree of ethnic and regional diversity (Hiemstra and Savadogo, 1986:37 and Ministry of Planning and Economic Affairs).

Households were selected using a two-stage random sampling design. The first stage utilized a cluster, or more specifically, an area sampling procedure. The Ministry of Planning and Economic Affairs had previously constructed city maps with clearly demarcated enumeration areas (EAs) and the structures contained in each EA. These maps provided the initial sampling frame. Three EAs were randomly chosen from each city. The number of EAs for Monrovia was arbitrarily (not based on proportionality) increased to six due to its singularly large population.

Then, each enumerator assigned to a specific EA listed all the structures excluding strictly commercial or abandoned buildings. This was used as the sampling frame from which field supervisors randomly drew 37 structures or 111 structures per city (46 structures per EA in Monrovia). The sample had a 10% margin to account for households which might relocate, be considered non-housekeeping or refuse to be interviewed.

An additional selection procedure was established for structures with multiple dwellings. When an enumerator came across such a structure, the choice of which household to interview had to be made. For Phase One of the survey, there was a system whereby the enumerator listed all the last names alphabetically and then picked the one that came first. The next time he/she selected the second, then the third and so forth. Score sheets with different structure sizes (i.e. 2 dwellings, 3 dwellings, etc.) were distributed, and enumerators had to keep track of the selections. These procedures were later simplified. (For information on selection procedures of other survey phases, see section 3.2.)

Prices were collected once during the survey period for an abridged list of key commodities. One enumerator visited the weekly market and took two samples, recording the price and weights for each.

3.2 Phase Two and Three Alterations

After reviewing the results, it was decided that the number of households per EA could be reduced. This enabled the inclusion of additional cities: Harper, Zwedru and Tubmanburg. It was also observed that ethnic groups tended to cluster together in communities often small enough to fit within one EA. Furthermore, non-farming, merchant families lived in the centers of town near the market and shop district. These households were apt to be Mandingo (a West African ethnic group), other African (i.e. non-Liberian Africans) or non-African. At the outskirts of town, many households had farms.

These distinct groups exhibited different consumption patterns, and in order to capture that difference, stratification was introduced: EAs located in the dense center of town versus all other EAs. In addition, the number of EAs in Monrovia was increased to 10.

The complex system of selecting the household to be interviewed when confronted with a multiple dwelling structure was eliminated. Enumerators continued to pick according to a system based on the alphabetical order of the last names insuring some degree of random selection, but the system became supervisor dependent and varied from city to city.

Due to insufficient variation and suspected inaccuracy in prices, the second phase price collection was extended over two weeks. The analysts suspected that the enumerators, as a group, may not have consistently selected the same size pile and/or quality of a specific commodity. For Phase Two, enumerators were instructed to consistently chose one large and one small pile.

The new price survey contained more food items. A one-day survey was taken of canned or bottled commodities normally found in merchant shops and less likely to vary in price over a two week period. Prices were collected from five different markets in Monrovia.

The number of cities was once again changed for Phase Three: Bong Mines, Kakata, Harbel and Greenville were added. All of these cities are located relatively close to Monrovia and the paved highway, with the exception of Greenville which is situated on the southern coast with a small port but no all-weather access to other cities. EAs were increased and selected based on, but not perfectly proportional to, the number of structures within a city. Table 2 illustrates the distribution.

The number of households per EA was reduced again to 10. Because Monrovia has many multiple dwelling structures where households of all income levels reside, it was decided to list all households in the sampling frame and not just structures as was done with the other cities.

Price collection was altered as well. More items were included. It was hypothesized that the lack of sufficient variability in prices to estimate price elasticities was due the inability to tag specific market prices to individual households in Monrovia. A city average had been used for all Monrovia households in the regression models, which represented approximately 75% of the total households. This obviously had a disastrous effect on price variability. Therefore, a questionnaire item was included in order to tag households to markets.

TABLE 2: Number of Sampled Enumeration Areas and households
Number of Enumerators Employed, Three Phases

City	PHASE ONE				PHASE TWO				PHASE THREE			
	EAs	HH/EA	EEs	PEs	EAs	HH/EA	EEs	PEs	EAs	HH/EA	EEs	PEs
Bong Mine	not in sample				not in sample				5	10	1	1
Buchanan	3	37	3	1	3	35	2	1	7	10	2	1
Ganta	3	37	3	1	2	35	1	1	5	10	1	1
Gbarnga	3	37	3	1	3	35	2	1	7	10	2	1
Greenville	not in sample				not in sample				6	10	1	1
Harbel	not in sample				not in sample				5	10	1	1
Harper	not in sample				3	35	2	1	6	10	2	1
Kakata	not in sample				not in sample				7	10	2	1
Monrovia	6	46	6	1	10	35	NA	5	35	10	7	5
Sanniquellie	3	37	3	1	2	35	1	1	5	10	1	1
Tubmanburg	not in sample				3	35	2	1	7	10	2	1
Voinjama	3	37	3	1	3	35	2	1	7	10	2	1
Zorzor	3	37	3	1	3	35	2	1	5	10	1	1
Zwedru	not in sample				3	35	2	1	7	10	2	1

EE = Consumption survey enumerators
PE = Price survey enumerators
EA = Enumerated Area
NA = Not Available

The Phase Two analysts decided that two full weeks of price data collection did not significantly improve accuracy or justify the additional costs incurred. Consequently, the interview period was reduced to one week. Enumerators were asked to take only one sample per day rotating daily between large and small piles.

3.3 Discussion

Arnold Pacey identifies several common sampling biases: project, infrastructural, spatial and seasonal (Pacey, 1979:7-10). These terms could easily be regrouped into one collective, "bias of convenience," meaning that researchers often select survey locations based on how easy an area is to get to and how comfortable it is to work in.

One could argue that the small group of cities included in Phase One exhibited some bias of convenience in that these cities have a history of receiving greater attention from the government and, with the exception of Voinjama, are relatively easily accessible all year round. Because the research teams were situated in one city throughout the survey, accessibility, dependent on seasonal road conditions, was less relevant here.

The addition of cities counteracted some spatial and project bias; however, there remains some argument as to whether the group is representative and/or sufficiently large enough. Certainly, selecting the seven most populous and accessible cities in a country, as was inadvertently done here, should be guarded against. Big and small towns, frontier and interior towns can all have significantly different consumption patterns, particularly in developing countries.

The increase in EAs sampled is also considered an improvement. The situation of Sanniquellie illustrates the problem associated with spatially clustered ethnic groups. Sanniquellie is predominantly Mono and Gio. One of the three EAs selected for Phase One was almost entirely comprised of Mandingo families and was densely situated between the central market and the small business district. The Mandingo exhibit unique consumption preferences compared to the Mono and Gio, who are quite similar. Capturing the consumption patterns of the Mandingoes is extremely important; yet, extrapolating that they represent about 30% of the population misappropriates weight to this ethnic group, distorts the overall pattern for Sanniquellie, and reduces the precision of statistics.

Most of the surveys reviewed as part of this study employed multi-stage random sampling using EAs as sampling units for one of the stages. Although, with the benefit of census or population statistics, EAs could have been selected in proportion to their

population size, e.g. Indonesia (CARD, 1987), Ecuador (Immink, 1984) and Sierra Leone (Smith, 1979).

The Nigeria study was additionally stratified according to cropping intensity and fertilizer use; yet, this was done in order to analyze production and marketing choices, not specifically consumption. Overall, the Liberia procedure is adequate provided that the sample is drawn from an ample number of cities and EAs.

QUESTIONNAIRE DESIGN

4.1 Introduction

The questionnaire was subdivided into expenditure and price data collection. In turn, the expenditure questionnaire was comprised of demographics and two expenditure sections: one specifically for rice, the other for all other food and non-food items. Home production, gifts and pay-in-kind were valued at present market prices and included in the term expenditures. Each of the four questionnaire sheets, including an introduction, had a space reserved for the city, household and enumerator code number. The questionnaire took approximately forty-five minutes to one hour to complete.

The price survey was made up of a daily questionnaire covering produce in the local market and a one-time questionnaire for products, mostly canned and bottled imports, found in local merchant shops. A space was provided on the daily market questionnaire for marking regular versus special weekly market prices.

4.2 Demographics

The original questionnaire requested detailed information on the age and sex composition of the household as well as how many members were attending or completed various levels of schooling. As Ben Senauer points out, these questions were too specific in the first phase (Senauer, 1987:9). In general, collection of education data should be restricted to the head of household and spouse (Zalla, 1987:17). Just the total number of members attending school could be used to capture the influence of education and school health programs on household consumption.

The questionnaires used in the following two phases were simplified. Appendix A presents a sample of the final questionnaire used. Sex and age categories were compressed. Questions concerning age, occupation and education were confined

to the head of the household and spouse, while sex and marital status were asked of the head only.

The farming questions were relocated from the rice to the demographics section. Households were asked to identify which crops they grew: rice, cassava, coffee, cocoa, groundnuts or sugarcane. A question concerning the total number of household members working was added to phase three.

4.3 Expenditures

4.3.1 Section on Rice

For all three phases of the survey, a separate section of the questionnaire was constructed for rice expenditures, illustrating the importance of rice in the study. All rice questions distinguished between imported rice, country rice (i.e. rice produced in Liberia) and concessions (i.e. a low-grade rice imported mainly by the mining, rubber and logging concessions in Liberia to be used as partial payment to workers). The reference period chosen was one week and households were interviewed once, although call-backs were required for the completion of some questionnaires.

To establish meal equivalence, respondents were asked to state the number of meals normally eaten per day. Originally, the question was worded "meals eaten yesterday," but zero answers created difficulties with mathematical formulas used in the analysis. Meals "eaten away from home" and "served to guests" were used to adjust the calculation of the total number of people eating the recorded volume of rice.

A series of questions referring to type of rice preferred, availability of preferred rice in the market, and at which market did the household normally shop was added to the Phase Two questionnaire. The market question applied only to Monrovia where there is more than one market, and hence, a need to tag households' expenditures with appropriate prices.

Respondents were asked how frequently they purchased rice and by what unit: cup, 100 lb bag or kenke (local measure approximately equal to two cups). If rice was purchased on a monthly basis (i.e. 100 lb bag), the respondent was asked to calculate the number of cups used during the past week and to retrieve the household measuring cup filled with rice in order to directly weigh the cup contents. The market value of home produced or gift rice consumption was estimated and recorded under "other sources," along with a source code.

4.3.2 Other Foods and Non-Foods Expenditures

The second portion of the expenditure questionnaire dealt with food other than rice and non-food commodities. In total, the final phase included fifty-nine food and thirty-five non-food items (see appendix A pre-coded data recording sheets). Phase Three, unlike the previous two, was completely pre-coded. The reference periods for food and non-food items respectively, were the previous week and the previous month. There was no direct measurement involved in this section of the survey, and only actual, not normal or average, expenditures were to be recorded. All consumption from home production or gifts was valued at current market prices.

4.4 Price Questionnaires

In Liberia, food commodities are purchased in the local marketplace or in merchant shops. The marketplace is generally reserved for local, fresh and unprocessed produce; although, imported potatoes, tomatoes, onions, pig feet and vegetable oil can be found there as well. Canned and bottled, largely imported, commodities are sold in the shops. Price data collection during Phase Two and Three was divided between these two market points (see appendix B).

Enumerators undertook a two week daily survey of the marketplace, collecting prices and directly measuring weights. For Phase Two and Three, they also indicated for specific commodities, whether the seller produced or purchased it, what was the value of the seller's previous day sales and how many sellers there were. The Marketing Division devised these questions relating to the seller in order to acquire greater knowledge of marketing activities, and not specially for use in the expenditure analysis. The number of commodities listed increased with each new phase of the survey.

A one-time shop price questionnaire was added during Phase Two. The commodities appearing on this questionnaire had generally non-fluctuating prices which were periodically adjusted over the long-run. The column marked, "inscribed weight," referred to the weight appearing on the label, while "observed weight" was used to establish the actual weight when the commodity was being sold in local units (i.e. piles, plastic bags, etc.). This distinction was developed after observing considerable confusion among the enumerators in the field as to how to measure canned and bottled goods. For Phase Three, the survey team also added the "previous day sales" column. Prices were not collected for any non-food items.

4.5 Discussion

4.5.1 Demographics

Economic theory suggests that adults influence the consumption of their respective households through their income, age (i.e. level of maturity and life-cycle position), education and ethnic background (i.e. associated preferences and habits). Adults affiliated with the household but who do not contribute to the income or decision-making, do not generally influence the level and type of consumption. In areas where people often form loose and temporary relationships and/or when polygyny or matriarchal household structures are prevalent, it may be necessary to rigorously define what is meant by the head of household.

In contrast, the Liberia study did not define the head at all. The enumerator simply asked who was the head of household and if no man was identified, picked the woman by default. This method has dubious theoretical precepts and can perhaps weaken the statistical significance of demographic variables associated with the head of household.

The occupation variable posed some problems as well. Recorded occupations could have represented temporary positions because enumerators were not required to systematically distinguish between seasonal and permanent employment.

In addition, the category, "government worker," overlapped with several others; in that, the public sector included semi-skilled and skilled labor. It also spanned most income groups. The category was singled out because of the unique situation in Liberia where government employees have continually been owed back pay for three months and more. This delay was expected to effect household level of consumption. Perhaps another binary variable should have been added to capture this relationship.

Lastly, the variable, "number of persons employed," although a logical addition, was rendered meaningless by its operational definition. Only salaried work was included. All self-employed members of the household, such as market women, millers, restaurant and shop owners, tailors, etc., were excluded.

Basically, the study had identified a series of potentially powerful variables. Unfortunately, the importance of clear definitions was overlooked, and probably to the detriment of the explanatory power of analytical models. During the planning stage, more attention should have been awarded to the specific expected theoretical relationships and associated data requirements. The questionnaire structure was adequate, it's the content that still needs a little refinement.

4.5.2 Expenditures Questionnaire

A great deal of controversy exists in the literature concerning appropriate reference periods. Tom Zalla quotes Buck and Pao as suggesting that a recall period of three days is too long to evaluate the protein and energy intake of an individual, but nevertheless, sufficient for a household (Zalla, 1987:21). He also notes that dietary histories can over-estimate a seven day recall by as much as 25-60% (Zalla, 1987:22).

Sarah Lynch studied the difference in mean responses derived from samples drawn from the same region in Sierra Leone, but using different reference periods (Lynch, 1979). She found that estimates from one and two day recall periods were significantly different. Estimates from the first day of recall were consistently 20% higher than those from other days. However, among two day and all other longer periods, there was no significant difference (Lynch, 1979 and Smith, et al., 1979:105).

Obviously, it is easier and more accurate to recall purchases made yesterday than over the entire past week. Yet, purchases made yesterday are not indicative of, and can seriously overstate the variation in, purchases made throughout the week. On the other hand, paying daily visits to households becomes quite costly and tends to reduce the sample size.

The decision concerning the number of repeat visits and the recall period, of course, ultimately depends on the type of analysis desired: nutritional or economic. Nutritional studies require more detailed data at the level of the individual. Economic studies, however, are satisfied with aggregate data.

Consumption surveys frequently choose recall periods of one to four days. The U.S. Labor Statistics use one week periods for two consecutive weeks (Alderman, 1987). Of the surveys reviewed here, Nigeria (Smith, et al, 1979:3), Senegal (Ariza-Nino, 1982), Indonesia (CARD, 1987), Ecuador (Immink, 1984), and Burkina Faso (Savadogo, 1986) all used or recommended the use of one week reference periods.

A one week recall period is deemed appropriate for the Liberia survey as well. Data should be collected for a period covering both the weekly market day and Sunday, a day when Liberians cook special meals in greater than average quantities. This variation should be incorporated since it represents customary behavior rather than sporadic, exceptional events.

The constrained budget of many rapid appraisal methodologies creates a trade-off between the making repeat visits and reducing the sample size to accommodate the these visits. The precision derived from repeat one day reference periods is warranted for studies of intra-household consumption and individual nutritional

status; but, it is deemed too costly for aggregated economic inference.

In order to increase recall accuracy, a number of non-food products could be assigned a recall period of one week instead of one month. A study of rice in Madagascar (Senauer, 1987:10) and a proposed survey scheme for Guatemala (Conroy, 1983) employed variable recall periods. In Liberia, purchases of soap, matches, firewood, and kerosene are made on a frequent, often weekly, basis. Respondents can more accurately remember purchases of these commodities made the previous week than calculate in their heads the total monthly expenditure for them.

There are some schemes involving a kind of dynamic reference period whereby respondents define the period themselves indicating the frequency at which they purchase each item or class of items (Conroy, 1983; Zalla, 1987; and Senauer, 1987). These methods attempt to eliminate the problem of incorrectly choosing conversion factors, which are used to relate all expenditures to one specific time period. In addition, large infrequent expenditures can be identified with these methods. Unfortunately, these procedures necessitate more training and actual time in the field. Moreover, this degree of detail was not required given the objectives of the Liberia study.

Expenditures did not account for wastage, leftovers or stock changes. Nevertheless, this is not a serious omission in the case of Liberia and most developing countries. Given the harsh weather conditions of the tropics and the lack of refrigeration and adequate storage, households do not generally maintain stocks of food or leftovers (except, in the case of Liberia, the small amount reserved for the children's breakfast the following day). Logically, wastage is also relatively small in poorer countries.

Food eaten outside the home and number of meals eaten away from home were certainly underestimated. Respondents couldn't be expected to know when and what other household members ate outside the home. Also, alcoholic beverage consumption was probably understated. Generally, the respondent was not the major consumer of alcohol, and those who did drink probably preferred not to disclose the amount.

As with the Liberia study, most expenditure surveys do not rely on direct measurement. It is argued that respondents have less difficulty remembering the value of expenditures than actual quantities consumed (Senauer, 1987). Direct measurement requires time, a tremendous amount of patience on the part of the enumerator and respondent, and there are considerable costs without any sizable gains in accuracy (Ferroni, 1980:13). Scales were abandoned in the Cameroon survey because enumerators complained about the difficulties in transporting them around (Ariza-Nino, 1982:391).

4.5.3 Price Questionnaire

There were no specific problems identified with the actual tangible price questionnaire. There were, however, some problems with the system of measurement. Prices lacked variability, and enumerators were not sufficiently trained in measurement techniques. (See sections on sampling and implementation for further details.)

SURVEY IMPLEMENTATION

5.1 Description of Survey Implementation

Phase One survey implementation began with a pre-test. For two days the Marketing Division staff observed various Monrovia enumerators in the field. Very few minor problems were identified at this point. A four day enumerator training session was administered in Monrovia immediately preceding the actual field work. Miscommunication lead to a three day delay in arrival of the Buchanan group, thereby compressing their entire training into one day only. With few exceptions, enumerators were assigned to their regular work areas. From the training, the survey teams headed directly to the field.

Each city, except Monrovia, had a permanent supervisor and originally four enumerators: three working on the expenditure survey and one on prices. The number of enumerators changed during Phase Two and Three because the sample size per city was reduced. Table 2 demonstrates the distribution of enumerators over all three phases.

The supervisor was to contact the superintendent and other local officials of their survey county in order to introduce their mission and request cooperation. In certain instances, religious leaders were notified as well. There was an announcement broadcasted over the radio in the various local languages explaining the intent of the survey and asking for the cooperation of the general public.

The supervisor and his/her enumerators jointly determined the EA boundaries. Then, as previously mentioned, the enumerators created a sampling frame from which the supervisor drew the random sample, assigning code numbers to each individual household. The supervisor was to remain readily accessible to the enumerators and periodically accompany them in the field. He/she was required to make spot checks, field edit all completed questionnaires and disperse enumerator per diem as their work progressed.

The survey administrators observed that some supervisors misunderstood directions, neglected to thoroughly edit questionnaires, did not avail themselves to their team, and relinquished all per diem at the start of the survey, destroying the enumerators' work incentive. There were also cases of poorly disciplined enumerators. The results were not at all disastrous, but this did create extra work for the administrators.

To rectify the situation, phase two was modified slightly. Supervisors were given special training and instruction manuals. A mandatory system of enumerator per diem disbursement was initiated. Furthermore, supervisor payment was made conditional upon fulfillment of all duties. In addition, price or market survey instructions were distributed, and the expenditure questionnaire instructions were significantly revised at the request of the enumerators themselves. These last two items upgraded the field references available to the enumerators.

5.2 Discussion

The Cameroon and Senegal surveys used roving supervisors responsible for several locations simultaneously (Ariza-Nino, 1982). However, it is felt that the stationary supervisor method works best with quick and intensive research such as the Liberia expenditure survey. Many enumerator errors were picked up and easily corrected in field by the supervisors. This is reflected in the extremely high (above 90%) rate of usable questionnaires.

There were several structural elements in particular that contributed to the success of the survey. The set of instruction manuals provided a handy back-up resource and helped to establish consistency among cities. With the standard introduction, enumerators tended to give respondents confident and legitimate reasons for the survey. This, in addition to the reliance on experienced enumerators with local language proficiency, raised the confidence of the participating households. Ultimately, clear expenditure definitions and measurement procedures were developed and reviewed during training. All enumerators partook in role plays. Listing both food and non-food items in a logical sequence promoted smooth interaction between the enumerator and respondent as well as reduced interview completion times.

Problems that continued to recur, but with less frequency through time, were: 1) forgetting to distinguish between household consumption and purchases for resale purposes, 2) improper selection or measurement of market samples, 3) and failure to indicate household identification numbers on all sheets of the questionnaire. In the case of the one-day market survey, consisting largely of canned and bottled commodities, many price enumerators were unaware of label weights and preceded

to weigh the entire container. The manuals and individualized field supervision greatly reduced these errors.

The more persistent problems had to do with bias introduced by the enumerators. There were some instances of "bias of personal contact" (Pacey, 1979:12) where enumerators would interview any willing member of the family, and not insist upon speaking to the individual who did the purchasing or cooking.

"Enumerator bias," as defined by Pacey, was also observed, meaning that enumerators imposed their views and interpretations. Some male enumerators tended to listen to male members of the household, not to women who did the purchasing and cooking. Women were listed as housewives (i.e. not working) simply because they were married. Enumerators neglected to probe, or in some cases even ask, as to whether they worked outside the home as well. However, an enumerator rarely clarified whether a male member was performing a specific job regularly or not.

It was possible for a woman to identify a man as the head of the household who was seldom present and perhaps in no way contributed to the household. As a result, consumption was sometimes analyzed with respect to the occupation, age, ethnic group and education of someone who was only loosely connected to the household. A variable marking the presence of the head of household was added the Phase Two questionnaire, but it is uncertain how the variable was actually treated by the different supervisors and enumerators. The approach was probably supervisor dependent.

Finally, there are the personal dynamics between the enumerator and the respondent, which is given the label here, "bias of enumerator ethics." Several cases were reported in which enumerators propositioned respondents, prompting them to lie about the presence of men in the house.

Overall, the low ratio of enumerators to supervisors and the constant supervision were effective elements in the field work design. Tying enumerator and supervisor integrity with per diem was a useful trick.

Some of the remaining confusion surrounding the origin of the households means of acquiring consumption goods (income, production or gifts) could be eliminated if the term "work" was avoided, and if clearer definitions were arrived at during the planning stages, not in the field. It would be helpful to identify key words in the local languages to insure the accuracy and consistency of enumerators.

The experience with the various types of bias suggests the need for more women on the survey staff. The Liberia survey had just one female supervisor and one female price enumerator. There

were no female household enumerators. This problem is not limited to Liberia, but rather pervasive. A concerted effort must be made to promote the interest of, and grant support to, female researchers, keeping in mind that their work should not have to surpass, but merely equal the performance of their male co-workers.

Establishing a clear and orderly procedure reduces confusion and interview fatigue. Lastly, whenever possible interviews should be conducted in private. Respondents sometimes alter information in order to impress neighbors and other strangers.

SURVEY ANALYSIS

6.1 Introduction

The staff of the Marketing Division designed and administered all three phases of the Liberian survey with assistance from Purdue University (the original consultant team) and the University of Missouri. Data processing and analysis were performed at Purdue and Missouri for Phase One and Phase Two respectively, while the Division recently (December, 1987) took essentially full responsibility for Phase Three field-work, and is now attempting to independently analyze the data at the Ministry of Agriculture in Monrovia.

All analyses were based on the precept that expenditures are a suitable approximation of income and hence permit estimation of income elasticities, an important economic tool for food policy analysis. This study will not attempt to evaluate the merits of the econometric methodologies of either phase. Instead, a brief description of the procedures, as well as some expressed difficulties, will be presented here.

6.2 Phase One Data Processing and Analysis

The first phase of the survey was analyzed at Purdue University under the direct supervision of Dr. Stephen Hiemstra and Dr. Kimseyinga Savadogo (then a doctoral candidate). Tarnue Koiwou, chief administrator of the survey project, provided consultation during the early stages of analysis.

It took six to seven weeks to process and edit the data and produce basic demographic descriptions. This was the extent of the output produced at the time Koiwou had to return to Liberia, which unfortunately, limited the training value of his trip. In addition, the version of SASS software that was used on the University's mainframe computer could not easily be made

compatible with the Ministry's Wang micro-computer system. In fact, no translation between systems has ever been made.

The following two months were devoted to creating models and writing up the preliminary documents. The first set of results were then re-worked after soliciting comments from various individuals associated with the project, and a final report was presented in late 1986. In total, the analysis took approximately seven months to complete.

The Purdue team calculated standard descriptive statistics concerning household and per capita expenditures on each commodity as well as budget shares and percentages of households purchasing various commodities. The team tested three model specifications that would allow income elasticities to vary over a range of income levels, i.e. the Ratio Semi-Log Inverse (RSLI), the Translog Version, and the Almost Ideal Demand Systems (AIDS).

The latter, similar to that used in Savadogo's dissertation research, was chosen for the study. The seventy-eight survey items were compressed into fifteen commodity groups. Then, equations were fit to each commodity group using total expenditures, adjusted by a general price index to approximate real income, and a series of demographic characteristics as the exogenous variables. Due to irreversible problems of multicollinearity in prices, no price elasticities were estimated.

6.3 Phase Two Data Processing and Analysis

Dr. John Kuehn directed the analysis of Phase Two data at the University of Missouri. Again, Mr. Tarnue Koiwou participated, as did Mr. David Newman, the Ministry computer specialist.

It took approximately one week to set up the data entry team and another two weeks to enter all the data. Unlike Phase One, Koiwou and Newman arrived after all the data were entered. For a little longer than one month, they had the opportunity to design data cleaning programs, range checks, cross-tabs and graphs of summarized data. The first regression models were run at this time as well.

After the Liberians' departure, more regressions were developed for another one and a half weeks and the final reports were completed two weeks later. The whole process took just under four months.

All of the analysis was performed on micro-computers, and these and their software are believed to be compatible with the Ministry's system. The team used Lotus 123 for data entry.

creating graphs and computation of t-tests and elasticities. SPSS PC Plus managed range and data checks.

The team calculated basic statistics similar to those of the Purdue study. But, in addition, they created several graphic representations of the results. Tables of price differences among cities, rice preferences and seller characteristics were also provided. Collection of information on the latter two items was unique to Phase Two.

The researchers first aimed to specify an AIDS model like the one developed at Purdue University. Unfortunately, the results were less than satisfactory. So, after testing a series of alternatives, Kuehn selected an "ad hoc" single log model. The goodness-of-fit and conformity with descriptive tabulations were better than those of the AIDS model. Nevertheless, the Phase Two report presented statistics derived by both methods.

Although household income is a common independent variable in consumer demand regression equations, nominal per capita monthly household income was incorporated here. In Liberia, households vary widely in size and number of working members. Consequently, high income households can be associated with low per capita incomes and vice versa. Because of this, per capita income was judged a more logical construct than household income. Like the Phase One analysis, prices lacked sufficient variation to derive price elasticities.

SURVEY RESULTS

7.1 Introduction

The central feature of the evaluation of Phase One and Two results was consistency. Here, consistency refers to: 1) whether the results accurately describe the Liberian reality, and 2) whether the difference between Phase One and Two results can be explained by either seasonal or random events, and not systematic error.

The evaluation was hampered by the manner in which the two sets of results were presented. Phase One distinguished between Monrovia and all other urban areas with city averages generally excluding Monrovia. Conversely, Phase Two averages included Monrovia, which due to its large size, skewed the figures. Moreover, Harper, Zwedru and Tubmanburg had to be removed from the mean estimates since they were incorporated only in the Phase Two survey. In order to make the necessary comparisons, the averages were reworked using weight factors appearing in the

final reports. Tests of the difference between mean estimates could not be performed without the actual data sets.

7.2 Demographic Variables

The two surveys yielded plausible, although not necessarily similar, demographic statistics. In both cases, the average household was comprised of approximately six people. The ethnic distribution among cities is reasonable. Cities had ethnic compositions similar to that of the regions in which they are located.

Mandingo households were more frequently selected for Phase One in Ganta, Sanniquellie and Voinjama, while the ethnic representation of the Monrovia sample changed from predominantly Bassa and "other African" to Bassa, Kpelle and Kissi. As mentioned in the sampling section, these ethnic shifts were strongly influenced by EA selection and the fact that ethnic groups clustered within EAs.

For both phases, gender distribution in education follows a logical pattern as well. The gap between the percentage of males and females attending or having completed various levels of schooling was narrow at the lower end while toward the university level progressively widened.

On the other hand, total household and per capita expenditures differ between phases. Total estimated annual household expenditures was \$5,153 and \$3,264 respectively for Phase One and Two. Likewise, average annual estimated per capita expenditures was approximately \$851 and \$544.

The dissimilarity can be explained, however, by seasonal variation. Phase Two coincided with the rainy season when food stocks are dwindling and various income generating activities are impeded by the weather. Logically, there would be a reduction in consumption from both own stock and purchases at this time. In contrast, Phase One data collection occurred during the dry season, one third of the way through the agricultural season.

Similarly, the reduction in the percentage of both heads of households and spouses with farming occupations may reflect seasonal variations in agricultural labor input. Respondents tend to identify those activities that they and their spouses are involved in at that specific point in time.

Generally, the variability in occupation of both the head and spouse suggests that enumerators may have picked up seasonal rather than permanent occupations. In addition, the entire research team might not have consistently classified government

workers, i.e., some government employees may be listed as skilled, unskilled or professional workers. Finally, the dramatic difference in percentage male heads of households, 70% for Phase One and 90% for Phases Two, is likely attributed to error.

While the Phase One team found that total expenditures, marital status, sex-age composition, age of the head of household and occupation were all significant in a number of the regressions (especially the rice equations), the Phase Two analysis found that all demographic variables, with the exception of per capita expenditures and household size, performed poorly. The R-squares for most of the regression equations of both phases were quite low. In comparison, many of the surveys referred to in this study estimated strong coefficients on their demographic variables and higher R-squares, e.g. Smith, et al., 1979 and 1980; Immink, 1984; Ariza-Nino, 1982; CARD, 1987 and Savadogo, 1986). It is suspected that the lack of clear and appropriate variable definitions may be partly at fault with respect to the Liberia survey.

One final point concerning the binary geographic variable (i.e. the dummy variable for city) should be noted. The Phase One report stated that the coefficient on country rice was positive, which appropriately implies that country rice is preferred up country where it is produced.

The study also mentioned that the coefficient on the geographic variable in the cassava equation was significant but sometimes positive and sometimes negative. The result was treated as if it was peculiar and unexpected when, in fact, it could be easily explained. Voinjama and Zorzor had significant negative city coefficients indicating correctly that the Lorma and Mandingo (the ethnic background of the vast majority of the population of either city) tend to consume less cassava than people living in Monrovia, many of whom are Bassa, Mano and Gio who are all known as cassava eaters. Buchanan, which is predominantly Bassa, had a significant positive coefficient, correctly suggesting that Buchanan residents have a stronger preference for cassava than Monrovia residents.

7.3 Expenditure Variables

7.3.1 Rice Expenditures

The Phase One report did not present an estimate for daily per capita rice consumption, but it can be inferred from monthly estimates. Average daily per capita rice consumption is, respectively, .70 lbs and .67 lbs for Phase One and Phase Two. This drop in consumption is expected during the "hungry season." In addition, the proportion of rice consumption in the form of country rice declined from 11% to 4%. When Monrovia is excluded

from the averages, the results are surprisingly reversed: .72 lbs for Phase One as compared to .75 lbs for Phase Two. Both figures demonstrate higher total rice intake levels up country.

Unfortunately, without the data sets, significance tests of the difference in means could not be calculated. However, another Marketing Division study of rural rice consumption found that there was significant difference among counties and over seasons (Bonnard and Koiwou, 1986). In addition, the figures are similar to alternative estimates of per capita rice consumption: approximately 70 lbs (Bonnard, 1987:3) and a steady .69 lbs over the past few years as estimated by the Statistics Division of the Ministry of Agriculture using the disappearance approach (Statistics Division, 1986). Overall, the rice consumption data followed a reasonable pattern.

7.3.2 Budget Shares of Selected Expenditure Items

When comparing household budgets between survey phases it is important to note that the base (i.e. total expenditures) from which the percentages are derived is nearly sixty percent larger for phase one than for phase two (see section 7.2 on demographic variables). Budget shares are presented in table 3. When their incomes (total expenditures) decline, households spend a higher percentage, but smaller absolute amount on food, adjusting the overall composition of the budget to accommodate food intake.

As budgets decline from March to September, households attempt to maintain their level of rice consumption at the expense of other cereals and starches, including cassava. Although the relative share of meat is nearly constant, the absolute quantity decreases, while fish consumption increases. The reduction in rent payment suggests that food requirements are a priority.

However, varying delays in salary payment to government employees causes large fluctuations in rental payments as well as purchases of other expenditure items. These delays confound the analysis and make functional relationships between variables more difficult to ascertain.

Comparing the Liberia survey data with those of other studies illustrates that the methodology yielded relatively reasonable results (see table 4). Food budget shares of 40% to 55% fall within the range of 41% to 73% established by the other studies. Although, rice budget shares for countries where rice is also the main food staple, Indonesia (17%-24%) and Sierra Leone (33%), are much higher than for Liberia (9%-14%). Meat and cereal shares are included on table 4, but the categories are comprised of different commodities for each study.

TABLE 3: Average Budget Shares (%) for Selected Commodities
Comparison of Phase 1 and 2, With and Without Monrovia

Commodity	!WITH MONROVIA		!!WITHOUT MONROVIA	
	!PHASE 1	!PHASE 2	!!PHASE 1	!PHASE 2
Rice	9.48	13.90	13.59	18.19
Other Cereal	2.23	0.38	1.55	0.48
Cassava	1.82	2.46	2.01	2.62
Fish	3.85	7.55	3.70	10.70
Meat/Poultry	6.60	6.00	6.83	5.88
Total Food	41.33	55.00	49.29	63.00
Education	18.92	3.33	18.63	3.57
Rent	9.65	6.32	5.25	3.73
Total Non-Food	58.67	45.00	50.71	47.00

NOTE: Phase 2 does not include Harper, Zwedru and Tubmanburg

TABLE 4: Budget Shares (%) for Selected Commodities
Country Comparison

Country	!Food	!Non-Food	!Rice	!Meat	!Cereal	!Source*
Burkina Faso	0.73	0.27	0.11	0.11	0.20	28
Ecuador	0.45	0.55				18
Indonesia						
Rural	0.69	0.31	0.26	0.05		8
Urban	0.58	0.42	0.17	0.08		8
Liberia**	.41-.55	.59-.45	.09-.14	.07-.06	.03-.04	17,20
Sierra Leone	0.67	0.33	0.24	0.12		33,1
Sudan						
Khartoun	0.41	0.59	0.01	0.22	0.15	29

*Bibliographic source number.

**For each commodity, the first figure is from phase one and the second figure is from phase two.

7.3.3 Income Elasticities of Selected Commodities

Analyses of both survey phases estimated significant income elasticities. Table 5 presents average income elasticities for selected commodities, providing a cross country comparison. It should be noted that some statistics were estimated from cross-sectional data and therefore are long-run elasticities. Whereas, others that were estimated from time-series data are short-run elasticities (Timmer, et al., 1983).

In accordance with economic theory, the non-food items and meat generally have income elasticities of one or greater, meaning that they are superior goods. Rice and other cereals and starches, usually considered necessities, have expected elasticities as well: greater than zero but less than one. Interestingly, the average income elasticities of both survey phases are quite consistent.

Elasticities for additional commodity groups are included in table 6. Here the data are broken down according to lowest, highest and average income groups. Again, average income elasticities of the additional commodity groups are similar. However, the results differ considerably with respect to the magnitude of change in the income elasticity for each commodity over the various income levels. Nevertheless, the direction of change (in nearly all cases declining) agrees with Engel's Law which states that poor households allocate a larger portion of their budget to food than do wealthier households (Deaton, 1980). Results from the Khartoun (Pinstrap-Anderson, et al., 1983), Burkina Faso (Savadogo, 1986) and Indonesian (CARD, 1987) studies elicit similar behavior.

The results also follow Bennett's Law, which claims that "...the ratio of calories derived from starchy staples to total calories declines as income grows..." (Ferroni, 1980:19). Staple food income elasticities are smaller and decline more rapidly than those of other items such as meats, fruit and other cereals.

In sum, the income elasticity estimates derived from both survey phases are good. They are significant, consistent from one phase to the other, and in agreement with economic theory.

7.4 Price Variables

7.4.1 Average Prices

As expected, most prices were higher in Monrovia than up country where commodities are produced. Phase Two prices were higher, accurately reflecting the seasonal availability of Liberian produce.

TABLE 5: Average Income Elasticities for Selected Commodities, Country Comparison

Country	Rice	Other Cereals	Meat	Veg.	Food	Non-Food	Source*
Brazil	0.30	0.15	0.74		0.83		1
Burkina Faso		0.66	0.19	0.10		2.50	29
Ecuador	0.59		0.56		0.77		18
Indonesia							
Rural	0.58		1.77	0.85		1.34	8
Urban	0.24		1.49	0.70		1.35	8
Liberia**	.16-.12	1.13-1.34	1.25-1.46	.60-.60	.67-	1.40-1.44	17,20
Nigeria	2.55						29
Sierra Leone	0.95	0.82	0.92				33,1
Sudan	0.97	0.33	0.97		0.74		1
Khartoun		0.38					28

*Bibliographic source number.

**For each commodity, the first figure is from phase one and the second figure is from phase two.

TABLE 6: Income Elasticities for Selected Commodities Over Income Groups

Commodity	INCOME GROUPS						
	Low	PHASE ONE			Low	PHASE TWO	
		High	Average		High	Average	
Rice	0.67	-1.82	0.16	-0.09	-1.99	0.12	
Other cereal	1.16	1.17	1.13	2.38	0.26	1.34	
Cassava	0.59	-0.33	0.41	0.94	0.24	0.73	
Other starches	1.08	1.21	1.10	1.86	0.31	1.19	
Meat/poultry	1.42	1.24	1.25	2.37	0.25	1.46	
Fish	0.70	-0.43	0.49	0.57	0.21	0.44	
Fruit	1.14	1.09	1.08	2.19	0.38	1.38	
Vegetable/pulses	0.70	0.14	0.60	0.75	0.21	0.60	
Oils	0.78	0.01	0.55	0.74	0.27	0.50	
Other food	1.03	1.06	1.04	1.92	0.27	1.23	
Total food	0.80	0.40	0.67	-	-	-	
Non-food	1.19	1.10	1.40	-	-	1.44	

In 1985, the rice crop was adversely affected by uncharacteristically dry weather and the political instability resulting from an unsuccessful coup attempt during harvest season (Marketing Division, 1986a and 1986b). The resultant decrease in supply is appropriately illustrated by the elevated prices of country rice relative to imported rice for both survey phases. The country rice price for most cities was higher than that of imported rice.

Phase Two country rice prices were generally higher in those areas with limited rice production, e.g. Monrovia and Tubmanburg, or those suffering crop losses, e.g. Sannequellie, Ganta, Gbarnga, Zorzor and Voinjama. Phase Two imported rice prices were highest in Voinjama, Zwedru and Ganta. Voinjama and Zwedru are located far away from the ports or Monrovia, and are accessible by poor seasonal roads only. Although, Voinjama occasionally receives imported rice from Sierra Leone (Bonnard, 1987:6). In the case of Ganta there had been rumors of excessive hoarding and speculating (Marketing Division, 1986a:12).

7.4.2 Price Elasticities

The major weakness of the Liberia expenditure survey was the inability to calculate price elasticities. As Zalla points out, the quality of data collected in LDCs seldomly permits estimation of price elasticities for "...anything smaller than expenditure groups or principal commodities," (Zalla, 1987:3) and elasticities calculated from rapid appraisal data are not very reliable (Zalla, 1987:7).

Although there was some measurement error in the collection of price data (see section 4.5.3 on the price questionnaire), the critical problem here was the lack of variation in prices. This inability to capture sufficient price variability is a chronic problem with cross-sectional data sets, the most common type of data set available in LDCs.

Phase One recorded only one price per city for a small subset of expenditure items. For Phase Two, data collection was extended over a two week period (including regular and special weekly market days), and the list of commodities was expanded. The number of Monrovia markets included increased to five, but unfortunately, there was no system established for linking household with markets. Consequently, an average price for all of Monrovia, 75% of the sample, had to be employed. Phase Three added an item to the questionnaire which identified the market where the household usually shops. Regretfully, these data have not yet been analyzed.

The surveys reviewed here for comparison are quite dissimilar in terms of sample size, duration of the survey period, price data collection, variety of geographic areas

covered, etc. Several have had smaller sample sizes than the Liberia study: Sierra Leone (Smith, et al., 1979), Nigeria (Smith, et al., 1982), Burkina Faso (Savadogo, 1986) and Cameroon (Ariza-Nino, 1982). Yet, all of these surveys yielded significant price elasticities for at least major food items. With the exception of the Cameroon survey, the interviewing period of these studies was one year.

Ariza-Nino concluded that for the Cameroon, as opposed to the Senegal study, the calculation of price elasticities was made possible by the deliberate selection of a wider range and more diversified set of geographic areas. In all other ways, these two studies were identical.

The progression from one phase of the Liberia study to the next represents a continuous increase in the number of cities, EAs within a selected city, and price observations. Perhaps the final design will have overcome the stated price problems. If not, as Johnson has suggested, combining cross-sectional data sets could resolve the problem of limited price variation (Johnson, 1983). Then, the next logical step would be to combine all three phases of survey.

CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

Overall, the Liberia expenditure survey has strong potential as a methodological model for future food policy research in developing countries. The term "rapid appraisal" aptly applies to each distinct phase of the survey, with two weeks for data collection and approximately four months for Phase Two data processing and analysis and document preparation. Although Phase One analysis took more time to complete, it is felt that the administration of Phase Two was more indicative of the requirements of a survey of this kind.

Limiting the enumeration to one interview per household, i.e. no repeat visits, permitted a larger sample to be drawn without expanding the survey budget. Given the existence of seasonality and consequent need to interview at multiple points throughout the year, time and cost savings were achieved through the reduction in amount of field work and data processing rather than the overall survey time schedule.

The original sampling methodology exhibited some bias in that cities were purposefully chosen and the total numbers of selected cities and EAs were limited. These may have assigned unrealistic weights to specific subgroups of the sampling units.

Phase Two and Phase Three procedural modifications reduced this form of bias.

The multi-stage clustered sampling procedure employed in all phases of the survey is actually a standard practice. The system of redrawing the sample each phase eliminated the problem of relocating previously sampled households and allowed for a substantial increase in sample size.

The Ministry has a cadre of well trained enumerators which facilitated the implementation of field work. Nonetheless, the survey procedures are simple and clear, and it is likely that additional training can easily compensate for the lack of well trained staff, if the situation should arise in other countries.

Because the staff of the Ministry of Agriculture played a significant role in the design and administration of the survey, it is evident that they possess the expertise to independently execute future surveys of a similar nature. Phase Two training, which took place at the University of Missouri, enhanced both participants' computer knowledge. They have expressed confidence in their own ability to process and analyze the data. Estimation of regressions and calculations of elasticities will still require some outside assistance.

The Phase Two team selected standard Lotus 123 and SPSS PC-Plus software packages and did the entire analysis, including both the AIDS and Ad-Hoc regressions, on micro-computers. A major consideration was the compatibility with the Ministry's computer system.

Basic statistics on levels and patterns of expenditures are reliable and consistent between survey phases. Differences in survey results, for the most part, accord with economic theory.

Income elasticities are generally significant and their magnitudes and signs are as expected. Furthermore, estimates for Liberia follow patterns similar to those of other countries.

Phase One and Two analysts were unable to estimate price elasticities, an extremely useful economic tool. However, it is anticipated that Phase Three estimation will succeed, given the modifications made in price data collection.

Estimation of significant demographic coefficients was also problematic. Recommendations for overcoming this problem as well as several other minor ones, are listed below. The list identifies some recommendations presently implemented but included here for emphasis.

8.2 Recommendations

8.2.1 Survey Design

1. Whenever possible, informed locals should be encouraged to actively participate in the survey and questionnaire design. The identification of appropriate demographic variables and their respective definitions requires their input. Women, specifically, need to be included. In most countries, women are responsible for purchasing and preparing food. Men are often transient household members with varying degrees of influence over household management. Women, on the other hand, remain continuously attached to the basic household unit and very often have significant influence over its management. Since respondents will usually, and should be, women, it is necessary to have their perception of how the respondents will interpret and react to specific questions.

2. One visit per household is deemed sufficient. Given limited financial and human resources, there is a trade off between visits and sample size. It is felt that the expected increase in recall accuracy derived from repeat visits does not compensate for the potential precision loss associated with a restricted sample size.

8.2.2 Sampling Design

1. Increasing the number of cities should be a priority. The selected group of cities must represent the full range of population densities and regional characteristics. The Liberia survey, if repeated, ought to include several small, remote centers.

2. It is better to select more EAs and fewer households per EA than vice versa, especially where distinct groups (e.g. ethnic or income groups) cluster geographically. The scheme developed for phase three is probably adequate (see table 2).

3. Structures need to be specifically defined. Originally, for all cities, a building was labelled according to how many doors it possessed. Later, Monrovia buildings were subdivided into structures according to how many dwellings they contained. This definition will undoubtedly change from country to country, but it is important that in all cases it not lead to systematic weighing of specific groups of sampling units.

4. For cities with households clustered according to one or more specific characteristic, e.g. ethnic or income group, a stratified sampling technique is recommended. EAs could be stratified according to ethnic group in Monrovia.

5. Selection procedures left to the enumerator (in the case of Liberia, the household selection within structures comprised of multiple dwellings) should be simple to understand and implement.

6. Price data collection must coincide both temporally and geographically with the household survey.

8.2.3 Questionnaire Design

1. Variables should be identified and defined according to economic theory and not strictly convention. The concept of the head of household and members of the household for which specific demographic information is collected need to be based on the variable's presumed relationship to the level and pattern of consumption or expenditures.

2. Considerable attention needs to be directed towards local interpretation of words such as work, earn, occupation, or profession. Many respondents misunderstood the "occupation" question. What expenditure surveys are really after is what a person does to get money or acquire the things he/she consumes. It is necessary to distinguish between temporary and permanent activities.

3. Age/sex categories should be consistent with the needs of nutritionists, at least with respect to the standard grouping of individuals according to daily calorie and protein requirements. All children under the age of 10 could be placed in one of two groups: 0 to 3 and 4 to 9. Adolescents and adults could be divided by sex and age. The age groups for each sex taken independently would be as follows: 10 to 15, 16 to 59 and 60 and older.

4. Collection of education data should be restricted to the head of household and spouse.

5. In the case of Liberia, specifically, to identify whether or not the household head or spouse works for the government, a separate binary variable rather than an occupation category ought to be used.

6. The list of expenditure items should be presented in a logical order.

7. The list of expenditure items as well as the selection and definition of some demographic variables will be modified for research in other countries.

8. The reference period for consumption items can remain one week. Non-food items, however, could be divided between those purchased frequently (at least once a week) and infrequently (less often than once a week) increasing recall accuracy.

9. Although occasionally chosen as a survey technique, usually by anthropologists and sociologists, asking respondents directly for prices is not advised. They may recall the overall cost of a commodity they purchased, but not a price per lb or other unit of measure. Some standardized local units can be weighed, e.g. large and small cups, and a conversion factor established; but unfortunately, all piles have unique weights. It is necessary to derive a price per standardized unit.

10. Price data collection should cover special weekly (periodic) market days.

11. Cross-sectional data pose some problems of insufficient variation in prices which hinders the estimation of price elasticities. Collecting prices over the duration of the survey period and from as many markets as logically possible can enhance both the accuracy of average prices and price variation.

8.2.4 Survey Implementation

1. To promote accuracy and consistency, it is important to compose clear and detailed enumerator and supervisor instructions. The explanations should be geared to the users' technical level and expressed in vocabulary familiar to the user.

2. Teaching price enumerators how to weigh commodities and properly read scales may be necessary.

3. Teaching in small groups, and particularly role playing, are very effective training techniques.

4. Because the women of the household do most of the purchasing and preparing of food, enumerators should interview women.

5. Neighbors should not be present while the interview is being conducted. Respondents may alter reality in order to impress or hide the truth from their audience.

6. Key words should be translated into local languages to insure that each enumerator is communicating the same ideas and concepts to each respondent. Enumerators often do not understand the technical significance of specific terms or variables and should, therefore, not be held responsible for translating them into local terminology.

7. Whenever possible, enumerators need to be assigned to regions, or cities in the case of Liberia, on the basis of language. Respondents can better understand and tend to have greater trust in enumerators who can speak their local language.

8. Women must be included on the enumerator and supervisor teams since most respondents of both the household expenditure and market price surveys will be female.

9. Using the radio, as well as other media sources, can rally the cooperation of the community and cultivate their trust in the survey team.

10. The use of pre-tests is extremely important. Perhaps households of distinct groups or strata should be purposefully pre-tested in order that problems specific to these groups can be identified before the actual field research begins.

8.2.5 Presentation of Results

1. Data should be presented in simplified and aggregated form in the body of the paper. Less fully summarized data is better situated in the appendix where technicians can easily locate it, but policy makers need not be overwhelmed by it.

2. Table titles need to be clear and concise. The wordy list of tables presented in the phase one descriptive report does not permit the reader to efficiently access tables.

3. Whenever possible, graphs should be used to simplify the presentation of statistics.

4. Daily or annual, rather than monthly, statistics are more practical for policy makers. The reader should not be expected to recalculate the results in order to arrive at basic statistics, e.g. the phase one document does not include an estimate of average per capita rice consumption and phase two does not estimate total food budget shares.

5. There is a need for standardization of food and other expenditure item groups. This is directed mainly at the cross-country comparisons. The two phases of the Liberia survey were consistent.

6. Reports should include tables of per capita nutrient intake and budget shares of specific nutrients, e.g. what percent of the household budget is allocated to starch or protein consumption. Figures concerning the composition of the diet could be broken down by various demographic characteristics. Finally, nutrient consumption functions could be estimated with the intake level of basic nutrients chosen as the dependent variable.

CODE SHEET FOR SECTION A AND B
DEMOGRAPHY AND EXPENDITURE

1. CITY CODE
 01. MONROVIA
 02. BUCHANAN
 03. GBARNGA
 04. GANTA
 05. SANNIQUELLIE
 06. ZORZOR
 07. VOINJAMA
 08. TUEMANBURG
 09. ZWEDRU
 10. HARPER
 11. KAKATA
 12. HARBEL
 13. BONG MINES
 14. GREENVILLE
2. SEX OF HOH
 1. MALE
 2. FEMALE
3. MARITAL STATUS
 1. SINGLE
 2. MARRIED
4. AGE OF HOH AND SPOUSE
 1. 34 OR UNDER
 2. 35 - 64
 3. 65 +
5. OCCUPATION OF HOH AND SPSE
 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 WORKING),
RETIRED, HOUSEWIFE
6. EDUCATION HOH AND SPSE
 0. NO FORMAL EDUCATION
 1. COMPLETED ELEMENTARY SCHOOL
 2. COMPLETED JUNIOR HIGH
 3. COMPLETED SENIOR HIGH
 4. ATTENDED COLLEGE OR ABOVE
7. ETHNIC GROUP
 1. LORMA
 2. KPELLE
 3. GBANDI
 4. KISSI
 5. MANDE
 6. MANDINGO
 7. BELLEH
 8. COLA
 9. VAI
 10. BASSA
 11. KRU
 12. KRAHN
 13. GREBO
 14. GIO
 15. MANG
 16. SARPO
 17. OTHER LIBERIANS
 18. OTHER AFRICANS
 19. LABANESE
 20. OTHER NATIONALITIES
8. PRESENCE OF HOH
 1. PRESENT AND EATS
AT HOME AT LEAST 4
DAYS OUT OF THE
WEEK.
 2. NOT PRESENT OR EATS
AWAY FROM HOME 3 OR
MORE DAYS PER WEEK.
9. FARMING
 1. YES
 2. NO
10. FREQUENCY PURCHASE
 1. DAILY, EVERY OTHER
DAY.
 2. EVERY 3 TO 7 DAYS
 3. 8 DAYS OR MORE
11. UNIT OF MEASURE
 1. CUP
 2. KENKE OR BOWL
 3. BAG
12. SOURCE CODE
 1. HOME PRODUCTION
 2. GIFT
 3. AS PAY

2. URBAN FOOD CONSUMPTION SURVEY IN LIBERIA-DECEMBER 1987
 B. CONSUMPTION AND EXPENDITURES

EA NUMBER _____

HOUSEHOLD NUMBER _____

INTERVIEWER CODE _____

DATE REVIEWED _____

CITY CODE _____

REVIEWED BY _____

ADDRESS _____

How many meals do you usually eat per day? _____

Number of meals served to guests (strangers) past 7 days? _____

Number of meals eaten away from home past 7 days by household members? _____

RICE ONLY

Product Name	Frequency of Purchase	Unit of Measure	Purchases Past 7 Days				Add/or Latest Large Purchase				No. of Units	Other Source		
			Number of Units	Dollar	Cent	Unit of Measure	WEIGHT	NO. of Units	Past 7 Days	Source Code				
Country Rice														
Imported Rice														
Concession Rice														

Which type of rice do you (respondent) Prefer? _____

Is it always available for sale? _____

At which market do you usually shop (buy)? _____

B. CONSUMPTION AND EXPENDITURES

EA. Number: _____ City Code: _____

H/H Number: _____ Interview Code: _____

FOODS OTHER THAN RICE

Prod. #	PRODUCT NAME	TOTAL SPENDING PAST 7 DAYS		OTHER SOURCES PAST 7 DAYS (DOLLAR VALUE)	
		Dollars	Cents	Dollars	Cents
4	Cassava (tubers)				
5	Fufu				
6	Farina				
7	Corn Meal				
8	Bread				
9	Flour				
10	Other Cereals				
11	Sweet Potatoes				
12	Yams				
13	Eddoes				
14	Plantain				
15	Irish Potatoes				
16	Fresh Fish				
17	Dried Fish				
18	Canned Fish				
19	Beef (Cow Meat)				
20	Pork (Pig meat)				
21	Pig feet				
22	Fresh bush meat				
23	Dried bush meat				
24	Poultry				
25	Eggs				
26	Palm Oil				
27	Vegetable Oil				
28	Banana				
29	Oranges				
30	Tangerine				
31	Lime				
32	Beans				

B. CONSUMPTION AND EXPENDITURES

EA. Number: _____ City Code: _____

H/H Number: _____ Interview Code: _____

FOODS OTHER THAN RICE

Prod. #	PRODUCT NAME	TOTAL SPENDING PAST 7 DAYS		OTHER SOURCES PAST 7 DAYS (DOLLAR VALUE)	
		Dollars	Cents	Dollars	Cents
33	Groundnuts				
34	beniseed				
35	Onion				
36	Bitterballs				
37	Cassava Leaves				
38	Potatoe greens				
39	Cabbage				
40	Okra				
41	Tomato Paste				
42	Fresh tomatoes				
43	Cucumber				
44	Dried Pepper				
45	Fresh Pepper				
46	Collard greens				
47	Palava Sauce				
48	Eggplant				
49	Maggi Cubes				
50	Salt				
51	Milk				
52	Infant Food				
53	Sugar				
54	Soft Drink				
55	Coffee				
56	Tea				
57	Restaruant Meal				
58	School/Work Meal				
59	Other Foods				

Appendix A (7)

Prod. #	PRODUCT NAME	TOTAL SPENDING PAST 30 DAYS		OTHER SOURCES PAST 30 DAYS (DOLLAR VALUE)	
		Dollars	Cents	Dollars	Cents
60	Club Beer				
61	Canejuice				
62	Palm Wine				
63	Other Alch. Drink				
64	School Supplies				
65	School fees				
66	Kerosene				
67	Wood				
68	Water bill				
69	House rent				
70	Electricity/mg.				
71	Charcoal				
72	Batteries				
73	Candles				
74	Flashlight				
75	Cooking gas				
76	Furniture				
77	Gasoline, diesel fuel				
78	Vehicle, bikes/Repair				
79	Bus & Taxi fares				
80	Soap (bath & washing)				
81	Medic./Medical Bill				
82	Tobacco Products				
83	Cooking Utensils				
84	Men's Clothing/Shoes				
85	Women's Clothing/ "				
86	Children's Clothing"				
87	Entertain/Social Exp				
88	Gift to family/Rela.				
89	Contribute/churches				
90	Licenses & Taxes				
91	Interest Expense				
92	Toothpaste				
93	Cosmetics				
94	Other nonfood items				
95	Savings				

Reviewed/Edited By: _____ Date: _____

Appendix B (1)

Marketing Division
Ministry of Agriculture
Urban Retail Sample Price Survey-Daily

Market/Town _____ Date _____ Interviewer Code _____

Product Code	Product Name	Unit Weight	Unit Price	Produced/ Purchased	Previous Day Sale	NO. of Sellers
1	Country Rice					
2	Imported Rice					
3	Concession Rice					
4	Cassava (Tubers)					
5	Fufu					
6	Farina					
7	Cornmeal					
11	Sweet Potatoes					
12	Yams					
13	Eddoes					
14	Plantain					
15	Irish Potatoes					
16	Fresh Fish					
17	Dried Fish					
19	Beef (Cow meat)					
20	Pork (Pig meat)					
21	Pig feet					
22	Fresh Bush Meat					
23	Dried Bush Meat					
24	Poultry					
26	Palm oil-LB/Bottle					
	" -GM/Bottle					
27	Veg. Oil-LB/Bottle					
	" -GM/Bottle					
28	Banana					
29	Oranges					
30	Lime					
31	Beans					

Marketing Division
Ministry of Agriculture
Urban Retail Sample Price Survey-Daily

Market/Town _____ Date _____ Interviewer Code _____

Product Code	Product Name	Unit Weight	Unit Price	Produced/ Purchased	Previous Day Sale	NO. of Seller
32	Groundnuts					
33	Beniseed					
34	Onion					
35	Bitterballs					
36	Cassava Leaves					
37	Potatoe greens					
38	Cabbage					
39	Okra					
41	Fresh tomatoes					
42	Cucumber					
43	Dried Pepper					
44	Fresh Pepper					
45	Collard greens					
46	Palava Sauce					
47	Eggplant					

Reviewed/Edited By _____

Date: _____

Please Print

NOTE: LB/Bottle = Large beer bottle

GM/Bottle = Gold medal bottle

In the column Produced/Purchased, write 1 if produced
and 2 if purchased.

BIBLIOGRAPHY

1. Alderman, Harold. (1984). "The Effect of Income and Food Price Changes on the Acquisition of Food by Low-Income Households." Washington, D.C., International Food Policy Research Institute.
2. Ariza-Nino, Edgar. (1982). "Consumption Effects of Agricultural Policies: Senegal and Cameroon." Part Three. Washington, D.C., USAID, Bureau for Science and Technology, Office of Nutrition.
3. Banskota, Kanal; S.R. Johnson and G. Stampley. (1985). "Food Expenditure Patterns of Households in Jamaica, 1975-1977." Memorandum #2. Washington, D.C., USDA, OICD, Nutrition Economics Group.
4. _____ . (1985). Summary Results From the 1975, 1976, and 1977 Consumer Expenditure Surveys for Jamaica." Report #2. Washington, D.C., USDA, OICD, Nutrition Economics Group.
5. Bonnard, Patricia. (1985). "Increasing Food Production In the Third World: A Review of Research Methods and Their Relevance to Female Farmers." East Lansing, Michigan State University, Department of Agricultural Economics, MS Thesis.
6. _____ . (1987). "Rice Self-Sufficiency and the Origin of Rice Supplies in Liberia." Unpublished, internal document. Monrovia, Ministry of Agriculture, Marketing Division.
7. Bonnard, Patricia and Tarnue Koiwou. (1986). Patterns of Rice Consumption by Liberian Rice Producing Households in Bassa, Bong, Lofa and Nimba Counties." Monrovia, Ministry of Agriculture, Marketing Division.
8. Burk, Marguerite C. and Eleanor M. Pao. (1980). Analysis of Food Consumption Survey Data for Developing Countries. Rome, FAO, Food and Nutrition Assessment Service, Food Policy and Nutrition Division.
9. Center for Agricultural and Rural Development. (1987). "Evaluating Food Policy in Indonesia Using Full Demand Systems." Final Report. Ames, Iowa State University, CARD.

10. Chambers, Robert. (1980). "Shortcut Methods in Information Gathering for Rural Development Projects." Paper prepared for World Bank Agricultural Sector Symposia, Brighton, University of Sussex, Institute of Development Studies.
11. Conroy, Michael E. (1983). "Notes for the Baseline Study and Evaluation: USAID/Guatemala Small Farmer Diversification Project, With Special Reference to the Food Consumption Effects. Washington, D.C., USDA, OICD, Nutrition Economics Group.
12. Deaton, Angus and John Muellbauer. (1980). Economics and Consumer Behavior. New York, Cambridge University Press.
13. Evenson, Robert. (1983). "A Review of the Consumption Effects of Agricultural Policies Project Findings: Data, Methods, Models and Conclusions." Washington, D.C., USDA, OICD, Nutrition Economics Group.
14. Ferroni, Marco A. (1980). "Large-Sample Monitoring of Household Expenditures and Food Consumption in Partial Subsistence Economies: A Methodological Note." Washington, D.C., USAID, Development Support Bureau, Office of Nutrition.
15. Fleischer, Kathryn I. (1987). Haitian Household Expenditure and Consumption Survey: Report on the Field Observations for the Pilot Survey." Washington, D.C., Bureau of the Census, International Statistical Program Center.
16. Food and Agricultural Organization. (1979). Review of Food Consumption Surveys. Volume #2. Rome, FAO.
17. Hiemstra, Stephen J. (1987). "Urban Food Consumption Patterns and National Food Policy in Liberia." Report #4: Methodology and Evaluation. Washington, D.C., USDA, Nutrition Economics Group.
18. Hiemstra, Stephen J. and Kimseyinga Savadogo. (1986). "Urban Food Consumption Patterns and National Food Policy in Liberia." Report #2, Part #1: Results of the Household Survey. Washington, D.C., USDA, Nutrition Economics Group.
19. _____ (1986). "Urban Food Consumption Patterns and National Food Policy in Liberia." Report #2, Part #2: Statistical Analysis. Washington, D.C. USDA, Nutrition Economics Group.

20. Houseman, Earl E. (1975). Area Frame Sampling in Agriculture. Washington, D.C., USDA, Statistical Reporting Service.
21. Immink, Maarten D.C. (1984). "Food and Health Expenditure Patterns in Urban and Rural Ecuador: Analysis of Household Budget Survey Data." Washington, D.C., USDA, OICD, Nutrition Economics Group.
22. Johnson, Stanley R. (1983). "A Review of the Consumption Efforts of Agricultural Policies: Uses and Analyses of Consumption Data." Washington, D.C., USDA, OICD, Nutrition Economics Group.
23. Kuehn, John, Tarnue D. Koiwou and David N. Newman. (1986). "Urban Food Consumption Patterns in Liberia: Descriptive Results." Consultancy Report #6. Columbia, University of Missouri, MidAmerica International Agricultural Consortium.
24. _____ (1986). "Urban Food Consumption Patterns in Liberia: Regression Analysis." Consultancy Report #7. Columbia, University of Missouri, MidAmerica International Agricultural Consortium.
25. Leonard, Jerry B. (1983). "Examples of Simple Methods for Consumption Analysis Using Tanzanian Data." Washington, D.C., USDA, OICD, Nutrition Economics Group.
26. Lynch, Sarah Gibbons. (1979). "An Analysis of Interview Frequency and Reference Period in Rural Consumption Expenditure Surveys: A Case Study From Sierra Leone." East Lansing, Michigan State University, Department of Agricultural Economics, MS Thesis.
27. Marketing Division. (1986). "Results of the Rapid Reconnaissance Survey (DRAFT)." Monrovia, Ministry of Agriculture.
28. Marketing Division. (monthly). "Rice Situation Report." Monrovia, Ministry of Agriculture.
29. Ministry of Agriculture. (1986). Proceedings of the Liberian Agricultural Policy Seminar - 1985. Monrovia, Ministry of Agriculture, Planning Bureau.
30. Ministry of Planning and Economic Affairs. (1986). 1984 Census Results. Monrovia, Ministry of Planning and Economic Affairs.

31. Pacey, Arnold. (1979). "An Approach to the Information Needs of Rural Development Works, District Officials and Health Services Staff." Washington, D.C., World Health Organization.
32. Philips, Louis. (1983). Applied Consumption Analysis. New York, North Holland Publishing Company.
33. Pinstруп-Andersen, Per; Joachim von Braun; Thongjit Uy and Winifreda Floro. (1983). "Impact of Changes in Incomes and Food Prices on Food Consumption by Low Income Households in Urban Khartoum, Sudan With Emphasis on the Effects of Changes in Wheat Bread Prices." Washington, D.C., International Food Policy Research Institute.
34. Savadogo, Kimseyinga and Jon A. Brandt. (1987). Household Food Demand in Burkina Faso With Food Supply-Demand Balance Projections for 1995. West Lafayette, Purdue University, International Programs in Agriculture.
35. Senauer, Ben. (1987). "Rapid Appraisal: The Survey Instrument." Washington, D.C., USDA, OICD, Nutrition Economics Group.
36. Simmons, Emmy. (1981). "Budget, Expenditure and Consumption Surveys in Developing Countries: What, Why and How." Washington, D.C., USDA, OICD, Nutrition Economics Group.
37. Smith, Victor E.; Sarah Lynch; William Whelan; John Strauss and Doyle Baker. (1979). "Household Food Consumption in Rural Sierra Leone." East Lansing, Michigan State University, Department of Agricultural Economics, Rural Development Series, Working Paper #7.
38. Smith, Victor E.; John Strauss; David Trechter; William Whelan; Peter Schmidt; and James Stapleton. (1981). "Food Flows and Simulations: Rural Sierra Leone." East Lansing, Michigan State University, Department of Agricultural Economics, Rural Development Series, Working Paper #19.
39. Smith, Victor E.; John Strauss, William Whelan, David Trechter and Peter Schmidt. (1982). "Food Consumption Behavior: Rural Sierra Leone and Kano State, Nigeria." East Lansing, Michigan State University, Department of Agricultural Economics, Rural Development Series Working Paper #24.

40. Smith, Victor E.; William Whelan and Peter Schmidt. (1982). "Food Consumption Behavior in Three Villages of Northern Nigeria." East Lansing, Michigan State University, Department of Agricultural Economics, Rural Development Series, Working Paper #22.
41. Statistics Division. (1986). Production Estimates of Major Crops - 1985. Monrovia, Ministry of Agriculture, Statistics Division.
42. Strauss, John; Victor Smith; and Peter Schmidt. (1981). "Determinants of Food Consumption in Rural Sierra Leone: Application of the Quadratic Expenditure System to the Consumption-Leisure Component of a Household-Farm Model." East Lansing, Michigan State University, Department of Agricultural Economics, Rural Development Series, Working Paper #14.
43. Timmer, Peter C.; Walter P. Falcon; and Scott R. Pearson. (1983). Food Policy Analysis. Baltimore, Johns Hopkins Press.
44. Zalla, Tom. (1987). "Toward Rapid Appraisal of Consumption and Expenditure Patterns." Washington, D.C., USDA, OICD, Nutrition Economics Group.