USAID Liberia Feed the Future Population-Based Survey

FINAL REPORT

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LEARNING, EVALUATION, AND ANALYSIS PROJECT
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USAID LIBERIA FEED THE FUTURE POPULATION-BASED SURVEY

FINAL REPORT

Prepared for United States Agency for International Development/Liberia

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Acronyms

BFS	Bureau for Food Security
CSV	Comma-Separated Values
DHS	Demographic and Health Survey
EA	Enumeration Area
EPI	Expanded Programme on Immunization
FtF	Feed the Future
GDP	Gross Domestic Product
GPI	Gender Parity Index
GPS	Global Positioning System
HH	Household
IRB	Institutional Review Board
LEAP	Learning, Evaluation, and Analysis Project
LISGIS	Liberian Institute for Statistical and Geo-Information Services
MYS	Multi-Year Strategy
ODK	Open Data Kit
PBS	Population-Based Survey
PDA	Personal Data/Digital Assistant
PII	Personal Identification Information
QA	Quality Assurance
QC	Quality Control
SOP	Standard Operating Procedure
SOW	Statement of Work
UL-PIRE	University of Liberia—Pacific Institute for Research and Evaluation
USAID	United States Agency for International Development
USG	United States Government
WEAI	Women's Empowerment in Agriculture Index
XML	Extensible Markup Language
ZOI	Zone of Influence

Executive Summary

The United States Agency for International Development (USAID) global Feed the Future (FtF) initiative has the primary goal of sustainably reducing poverty and hunger through regional and national programs. The FtF initiative uses a collaborative approach to achieve this goal by working with host governments, development partners, and other stakeholders who are committed to addressing the root causes of global hunger. This goal is attained by facilitating efficient market systems to meet the growing demand for food, increasing agricultural productivity, and increasing incomes so the poor can purchase food and also improve health and nutritional practices to reduce under-nutrition.[1] Twenty countries, including Liberia, were selected to be part of the FtF initiative. The initiative aims to strengthen the capacity of selected countries and communities in an effort to anticipate, prevent, and cope with adverse conditions that can lead to food crises. The aim is to help countries transform their own agricultural sectors to sustainably grow enough food to feed their people.[2]

Liberian Context and FtF Objectives

Agriculture is Liberia's principal sector of activity. It makes up 61 percent of the country's gross domestic product (GDP) and involves 70 percent of its workforce.[3] Despite the extensiveness of agricultural inputs, Liberia remains one of the most food-insecure countries in Africa. Only 9 percent of the country's rural population is food secure.[4] In addition to food insecurity, the country is faced with widespread poverty, high unemployment, and low human capital. The country's dismal infrastructure also paralyzes the value chains. As the agricultural sector has slowly begun to recover in recent years, production has increased, but yields are still well below the regional average, and food insecurity remains high. There is however, recognition of the importance of agriculture in kick-starting the economy, which supports Liberia's participation as one of the twenty countries selected to be part of the FtF initiative.

In an effort to support global stability and prosperity, the Liberia FtF initiative, now in its third year of implementation, has continued to support country-driven approaches in addressing causes of global hunger and food insecurity. As a national program, the Liberia FtF Multi-Year-Strategy (MYS) has two main objectives: (1) Support equitable growth in Liberia's agricultural sector and (2) improve the nutritional status of Liberians. To reach the most vulnerable communities, the FtF initiative focuses on smallholder farmers, particularly women,[5] and aims to help an estimated 332,000 vulnerable Liberian women, children, and family members escape hunger and poverty. More than 96,000 children will receive services to improve their nutrition and prevent stunting and child mortality. Significant numbers of additional rural populations will achieve improved income and nutritional status from strategic policy engagement and institutional investments.[6]

[1] http://feedthefuture.gov/resource/volume-1-feed-future-monitoring-evaluation-overview.
[2] http://www.feedthefuture.gov.
[3] Organization for Economic Co-operation and Development. (2012). *African Economic Outlook: Liberia*, p. 365. Retrieved from http://devdata.worldbank.org/AAG/lbr_aag.pdf.
[4] http://www.feedthefuture.gov/sites/default/files/country/strategies/files/FTF_2010_Implementation_Plan_Liberia.pdf.
[5] http://www.feedthefuture.gov/country-tagged-content/liberia
[6] http://www.feedthefuture.gov/country/liberia.

Purpose of Study

Under the USAID *Learning, Evaluation, and Analysis Project* (LEAP), contract no. AID-OAA-C-11-00169, Optimal Solutions Group, LLC (Optimal), was requested to plan, design, and conduct a baseline PBS for FtF Liberia to help inform decisions regarding how to implement FtF programs in Liberia. The project was implemented in collaboration with University of Liberia—Pacific Institute for Research and Evaluation (UL-PIRE) and other independent consultants. The contract period of performance was July 2012 through April 2013.

The project had two main objectives:

- Complete the survey and associated reports.
- Develop capacity of UL-PIRE to manage similarly complex surveys in the future.

Survey and Data- Analysis Methodologies

Sampling Methodology

The Liberia FtF was conducted in six pre-selected counties— Montserrado, Nimba, Bong, Lofa, Grand Bassa, and Margibi. These counties are located within Liberia's principal growth corridors with the largest populations and account for 75 percent of Liberia's population, 68 percent of Liberia's farmers, and 69 percent of Liberia's poor.[7] The survey employed a multi-stage cluster approach that is consistent with the FtF guidelines.

The sampling frame was based on the enumeration areas (EAs) identified through the National 2008 Census. Information on the number of houses and the geographic boundaries of each EA was provided by the Liberian Institute for Statistical and Geo-Information Services (LISGIS). The six counties covered by the survey include 5,358 EAs, comprising an estimated 525,306 households. A sample size of approximately 2,400 was deemed adequate to detect a change in the prevalence of poverty from 58 percent (estimated baseline) to 51 percent (target). The 2,400 households were grouped into clusters of 20, resulting in 120 clusters, each defined by a single EA.

Data-Analysis Methodology

The FtF baseline survey was conducted to identify and analyze data collected within the following criteria: consumption, poverty, hunger, and women's empowerment. Each of these indicators was a composite that drew from numerous survey questions.

1. The *consumption* aggregate was a summation of all household expenditures. Household expenditures included a variety of dissimilar items, purchased at various intervals, in various units. Total daily household expenditure is the sum of the daily expenditure values of all goods. Subcategories of consumption were computed by taking the sum of expenditures on food, water, nonfood items, durable goods, and housing. Expenditures on education, health, public goods, insurance, and other fees were excluded from the consumption aggregate. To increase the

[7] http://www.feedthefuture.gov/sites/default/files/country/strategies/files/FTF_2010_Implementation_Plan_Liberia.pdf

reliability of the consumption measure, outliers were removed from the data. The Paasche Index was used to adjust for cost-of-living differences.

2. *Poverty* was defined as per-capita consumption of less than US$1.25 per day in constant 2005 US$. It was necessary to adjust this poverty level to account for differences in purchasing-power parity between counties as well as changes in the consumer price index over time. By coincidence, the adjusted 2012 poverty threshold in Liberia corresponded to US$1.25 in current US$.

3. The *Hunger Index* was based on three yes-or-no questions within the baseline survey.
   - In the past 4 weeks, was there ever no food to eat of any kind in your house because of a lack of resources to get food?
   - In the past 4 weeks, did you or any household member go to sleep at night hungry because there was not enough food?
   - In the past 4 weeks, did you or any household member go a whole day and night without eating anything at all because there was not enough food?

   The respondents received a follow-up question depending on their initial response. The responses were then scored to create the Hunger Index, which resulted in a scale from zero to six. A score of two or higher qualified as "Moderate to Severe Hunger."

4. The *Women's Empowerment in Agriculture Index* (WEAI) measures how much input women have in productive activities and decision-making. The WEAI is a combination of indices: the Five Domains of Empowerment (5DE) and Gender Parity Index (GPI). The five "domains" of empowerment are: Production, Resources, Income, Leadership, and Time. Each of these domains encompasses one or more subdomains, with 10 subdomains in total. An individual is considered empowered if he or she achieves "adequacy" in 80 percent or more of these 10 subdomains. The WEAI also measures gender parity. A female respondent is considered to have gender parity if her empowerment score is equal to or greater than the empowerment score of the male respondent in her household.

Findings

The primary goals of the survey were to measure household consumption, prevalence of poverty, food insecurity, and women's empowerment. Unless otherwise noted, all statistics pertaining to Montserrado do not include the greater Monrovia metropolitan area.

Demographics

The FtF Liberia PBS survey data generated updated estimates of the country's demography. The demographic analysis provided overall estimations of population in the areas surveyed as well as population breakdown by the categories of people most important to the FtF initiative.

For this survey, households were classified in one of four ways, based on the gender of adults belonging to the household: male and female adults, male no female adults, female no male adults, and children only. Concerning the composition of households, female no male adult households were the most

common type of household in the survey (43 percent), followed by households with both male and female adults (38 percent). Although male and female adult households were more common, the data indicated that a greater percentage of the population lived in households with both male and female adults.

Consumption

The results were determined by an aggregate of 1,300 survey questions relating to consumption, poverty and hunger. On average food consumption in Monrovia was 134 percent higher than outside the city. Housing costs were more than 300 percent higher. Although households in the capital spent an average of US$0.23 per day on water, households outside the city acquired water at no cost.

The survey also uncovered interesting variations in per-capita consumption. Households that included both male and female adults exhibited the lowest per-capita consumption (US$2.84/day). Households with male no female adults exhibited the highest per-capita consumption (US$5.02/day), and households with female no male adults exhibited slightly less than the average per-capita consumption (US$3.55/day) at US$3.35/day. Households with female no male adults fared slightly better than households with both male and female adults. Per-capita consumption in female no male adults households was 18 percent higher compared to households with male and female adults, although total household consumption was 7 percent lower.

Differences in per-capita consumption across the survey area were also computed. Outside Monrovia (US$15.42/day), the highest consumption is observed in neighboring areas of Montserrado County (US$9.94/day). Consumption generally decreases with distance from the capital city, although remote Lofa County consuming US$6.60/day displays slightly higher consumption, on average, than Nimba (US$5.42/day) or Grand Bassa (US$6.54/day).

Poverty

The overall prevalence of poverty, defined as per capita daily expenditures of less than $1.25/day is measured at 33 percent. This figure, however, is skewed by Monrovia. Outside of the capital, the prevalence of poverty is measured at 50 percent. Moderate-severe hunger is experienced by 38 percent of all households in FtF initiative areas, and 44 percent of households outside of Monrovia. All of these estimates are likely to be minimum bounds on the true values of poverty and hunger, as the survey was conducted immediately following the primary harvest season in Liberia, when food is most readily available.

Consistent with the consumption estimates, households with both male and female adults exhibited the highest levels of poverty (40 percent). Contrary to the consumption results, however, female no male adult households fared better than their male no female adult counterparts at 28 and 34 percent, respectively. Given that households with male no female adults consumed more; this meant that such households exhibited a more unequal welfare distribution: although some male-adult-only households were relatively rich, many more were relatively poor.

Hunger

Although the majority of rural Liberian households engage in farming, many are unable to meet their subsistence needs. High levels of hunger were observed in the poorest counties of Nimba and Grand

Bassa, with 50 and 46 percent of their populations, respectively, falling within the moderate to severe category. Hunger was as prevalent in relatively affluent Margibi County, with 48 percent scoring at the moderate to severe level. Lower levels of hunger were observed in Lofa County (36 percent), which is often described as the breadbasket of Liberia. Interestingly, 28 percent of families in Monrovia experienced moderate to severe hunger, which is dramatically higher than the 6 percent poverty estimate.

Although household types corresponded to differences in consumption and poverty, these differences did not translate to hunger. All household types exhibited similar levels of hunger at approximately 38 percent.

Women's Empowerment in Agriculture Index

The 5DE, GPI, and WEAI for Liberia are estimated at .66, .95, and .69, respectively. These scores for Liberia are comparable to the figures obtained in neighboring countries, such as Ghana and Senegal. The survey also found that women were less empowered than men in 8 out of 10 empowerment domains, and that the capital city, Monrovia, generally exhibits the lowest levels of empowerment for both genders.

Exhibit 1. Summary of main findings

FTF Feedback Indicator	N Unweighted	Baseline Value Weighted	Standard Deviation	95% CI	DEFF
Prevalence of Poverty: Percent of people living on less than $1.25/day	2,419	0.33	0.022	0.29-0.38	4.99
Male and Female Adult	920	0.40	0.032	0.34-0.46	3.76
Female Adult Only	1,022	0.28	0.022	0.24-0.32	2.26
Male Adult Only	477	0.34	0.038	0.27-0.41	2.85
Child Only	N/A	N/A	N/A	N/A	N/A
Per capita expenditures of USG targeted beneficiaries	2,419	10.37	0.388	9.61-11.13	2.66
Male and Female Adult	920	10.84	0.527	9.81-11.87	2.38
Female Adult Only	1,022	10.22	0.458	9.32-11.12	1.93
Male Adult Only	477	9.89	1.108	7.72-12.06	2.09
Child Only	N/A	N/A	N/A	N/A	N/A
Prevalence of households with moderate or severe hunger	2,471	0.38	0.016	0.35-0.41	2.38
Male and Female Adult	920	0.39	0.021	0.35-0.43	1.64
Female Adult Only	1,022	0.38	0.021	0.34-0.42	1.68
Male Adult Only	477	0.39	0.029	0.33-0.45	1.55
Child Only	N/A	N/A	N/A	N/A	N/A
Women's Empowerment in Agriculture Index	2,170	0.69	N/A	N/A	N/A
5DE Sub-Index	2,170	0.66	N/A	N/A	N/A
GPI Sub-Index	2,170	0.95	N/A	N/A	N/A

I. INTRODUCTION AND BACKGROUND

The United States Agency for International Development (USAID) global Feed the Future (FtF) initiative has the primary goal of sustainably reducing poverty and hunger through regional and national programs. The FtF initiative uses a collaborative approach to achieve this goal by working with host governments, development partners, and other stakeholders who are committed to dealing with the root causes of global hunger by facilitating efficient market systems to meet the growing demand for food, increasing agricultural productivity, and increasing incomes so the poor can purchase food and also improve health and nutritional practices to reduce under-nutrition.[8] Twenty countries were selected to be part of the FtF initiative; the selection was based on, among other criteria, their degree of need and their potential for agricultural growth and development.[9] The initiative aims to strengthen the capacity of selected countries and communities in an effort to anticipate, prevent, and cope with adverse conditions that can lead to food crises. The aim is to help countries transform their own agricultural sectors to sustainably grow enough food to feed their people.[10]

The FtF initiative places a strong emphasis on research, with a focus on transforming agricultural development by improving crop yields and livestock and poultry productivity as well as diminishing postharvest losses while enhancing nutrition and food safety.

FtF Initiative in Liberia

As a national program, the Liberia FtF Multi-Year-Strategy (MYS) has two main objectives: (1) Support equitable growth in Liberia's agricultural sector and (2) improve the nutritional status of Liberians. To reach the most vulnerable communities, the FtF initiative focuses on smallholder farmers, particularly women,[11] and aims to help an estimated 332,000 vulnerable Liberian women, children, and family members escape hunger and poverty. More than 96,000 children will receive services to improve their nutrition and prevent stunting and child mortality. Significant numbers of additional rural populations will achieve improved income and nutritional status from strategic policy engagement and institutional investments.[12]

The Liberia FtF MYS revolves around three core investment programs.[13] These are based on a "change agent" model that relies on lead farmers, lead processors, traders, and various associations to implement the program's singular strategy by removing or transforming constraints in the value chain to improve productivity and income. FtF Liberia is making key investments in the following areas:

- **Transforming staples' value chains**, with a focus on improving product quality and yields for Liberia's two principal staple foods: rice and cassava. This will be accomplished through the production and distribution of seed and plants and through the provision of technical assistance via public and private extensions in an effort to equip lead farmers and producer organizations identified as change agents with specialized skills. The program will also provide start-up

[8] http://feedthefuture.gov/resource/volume-1-feed-future-monitoring-evaluation-overview.
[9] http://www.feedthefuture.gov.
[10] http://www.feedthefuture.gov.
[11] http://www.feedthefuture.gov/country-tagged-content/liberia.
[12] http://www.feedthefuture.gov/country/liberia.
[13] http://www.feedthefuture.gov/sites/default/files/country/strategies/files/LiberiaFTFMulti-YearStrategy.pdf.

financing for processing equipment, storage facilities, and transport in an effort to minimize postharvest losses. This will be facilitated by contracting support and assistance in improving market linkages.

- **Developing income and diet diversification value chains**, with a focus on expanding vegetable horticulture and re-establishing goat husbandry.[14] The expansion of vegetable horticulture will be facilitated by start-up financing for lead traders and farmers, development of private-sector extension services, and capacity building in producing, processing, contracting, and strengthening market linkages. The goat-husbandry component will focus primarily on improving animal health through training health workers and developing an animal health-care system but will also include establishing breeding programs.

- **Advancing the enabling environment**, with a focus on agricultural research and advocacy as well as private-sector market-structure development. This program expects to improve the market structure through market-information systems and experimentation with various types of profit sharing and contracting models between the change agents receiving assistance and smallholders, which should ensure an equitable power dynamic.

Republic of Liberia Overview

Liberia, a country on the west coast of Africa (reference map provided in Exhibit 2 below), has been faced with a series of rebel resistances, including one of Africa's bloodiest civil wars, which occurred between 1989 and 1996. In 2003, the Liberian government signed a peace agreement with the rebel groups and then formed a 2-year transitional government, which led to peaceful presidential elections in 2005. The prolonged civil wars, however, left a trail of devastation, mismanagement, and neglect that is still evident today in the economic, education, and social sectors. But perhaps no sector was more badly hit than agriculture.

Agriculture is Liberia's principal sector of activity. It makes up 61 percent of the country's gross domestic product (GDP) and involves 70 percent of its workforce.[15] Before the war, the economy was largely agricultural, and the great majority of Liberians made their living on traditional farms, each averaging perhaps 5 acres in size. They concentrated on growing edible crops, such as rice and cassava, although some also grew cash crops, including rubber, coffee, cocoa, and oil palms; others grew vegetables and fruit and kept chickens, goats, and sheep. Years of war caused productivity to plummet. For example, the production of rice alone—the most important staple—plummeted by 76 percent between 1987 and 2005.[16]

Liberia is one of the most food-insecure countries in Africa, a tragic irony considering that Liberia is abundant in water and green vegetation. Only 9 percent of the country's rural population is food secure.[17]

[14] http://www.feedthefuture.gov/sites/default/files/country/strategies/files/LiberiaFTFMulti-YearStrategy.pdf.
[15] Organization for Economic Co-operation and Development. (2012). *African Economic Outlook: Liberia*, p. 365. Retrieved from http://devdata.worldbank.org/AAG/lbr_aag.pdf.
[16] http://www.fao.org/isfp/country-information/liberia/en/.
[17] http://www.feedthefuture.gov/sites/default/files/country/strategies/files/FTF_2010_Implementation_Plan_Liberia.pdf.

In addition to food insecurity, the country is faced with widespread poverty, high unemployment, and low human capital. The country's dismal infrastructure also paralyzes the value chains. More than 5,600 kilometers (km) of roads are unpaved and mostly inaccessible during rainy season. Farmers are worried that the remote areas where they live and farm may not be reachable, and thus it will be difficult for them to get their produce to the market. Milling is primarily done by hand, and the storage capacity for food grains is very limited.

As the agricultural sector has slowly begun to recover in recent years, production has increased, but yields are still well below the regional average, and food insecurity remains high. Productivity has been marred by a lack of quality inputs, pest infestations, damaged irrigation and drainage systems, and limited capacity in postharvest processing, especially among small farmers.

There is, however, recognition of the importance of agriculture in kick-starting the economy: "Agriculture will provide the export income and the basis for taxation that the government can use to sustain development. Agriculture is very important for employment, for getting the refugees who are coming back started, for getting the internally displaced back on the farms, and for training the youth who participated in the war," says James Logan, Deputy Agriculture Minister for Planning.

According to Richard Tolbert, Chairman of the National Investment Commission, before the agro-industry can take off, Liberia's basic infrastructure has to be rebuilt. Agriculture Minister Chris Toe acknowledges that the government depends heavily on external help in getting reconstruction plans off the ground and that collaboration with national and international partners is critical to helping farmers.[18]

In an effort to support global stability and prosperity, the FtF initiative, now in its third year of implementation, has continued to support country-driven approaches in addressing causes of global hunger and food insecurity. In February 2012, FtF launched the Women's Empowerment in Agriculture Index (WEAI), the first-ever measure to directly capture women's empowerment and inclusion levels in the agriculture sector. FtF places a strong emphasis on research, with a focus on improving crop yields and livestock and poultry productivity as well as diminishing postharvest losses while enhancing nutrition and food safety. The initiative also enhances coordination among various donors, multilateral agencies, and the private sector. This goal has been evident in the FtF Liberian project, where the University of Liberia—Pacific Institute for Research and Evaluation (UL-PIRE) has benefitted from capacity building and technological know-how. Twenty countries were selected to be part of the FtF initiative; the selection was based on, among other criteria, their degree of need and their potential for agricultural growth and development.[19] A population-based survey (PBS) in the Republic of Liberia, one of the selected countries, was successfully completed in January 2013 (refer to Appendix C for project timeline).

[18] http://allafrica.com/stories/200801080784.html.
[19] http://www.feedthefuture.gov.

Exhibit 2. Liberia reference map

Description of Feed the Future Counties

The Liberia FtF focuses on the six counties within Liberia's principal growth corridors with the largest populations, the highest number of farmers, the largest numbers living in poverty, and the greatest potential for agricultural development. These six counties—Montserrado, Nimba, Bong, Lofa, Grand Bassa, and Margibi—account for 75 percent of Liberia's population, 68 percent of Liberia's farmers, and 69 percent of Liberia's poor.[20]

Exhibit 3, below, provides basic information about the six counties that helped guide the survey team during survey implementation. Exhibit 4, below, provides additional information about the counties.

[20] http://www.feedthefuture.gov/sites/default/files/country/strategies/files/FTF_2010_Implementation_Plan_Liberia.pdf.

Exhibit 3. FtF program counties in Liberia

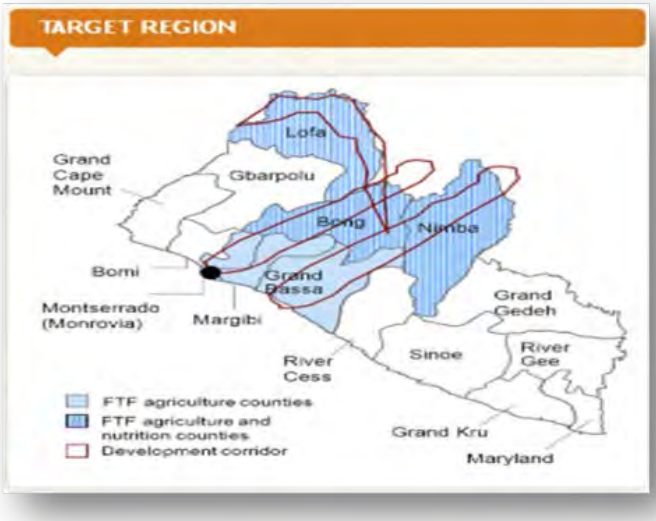


Exhibit 4. Resource information on FtF program counties

County	No. of districts	Population[21]	Population density (sq. miles)	Agriculture	Employment	Climate
Montserrado	5	1,144,806	1,553	Cassava, rice, corn, sweet potatoes, bananas	Petty trading/ small business, agriculture	Dry and wet seasons; (annual precipitation: 190.5cm.)
Nimba	17	468,088	105	Rice and cash crops, such as cocoa, sugarcane, and coffee	Small rubber plantations and subsistence farming	Wet and dry seasons; highest rainfall in Oct (annual precipitation: 20-25cm)
Bong	12	328, 919	97	Rice, maize, oil palm, cocoa, coffee, rubber, and sugarcane	Self-employed in informal sector, some employed in government	Tropical, humid, and hot; rainy and dry seasons
Lofa	7	270,114	70	Rice, cassava, potatoes, plantains, corn, vegetables, coffee, and cocoa	Agriculture and mining	Tropical, hot, and humid; rainy season Apr–Oct, dry season Nov–March (annual precipitation: 300 – 450cm)[22]
Grand Bassa	8	224,839	73	Palm oil and food crops, cassava, rice, and plantains	Agriculture and petty trading	Hot and humid; one of the wettest counties of Liberia (annual precipitation: 40cm
Margibi	4	199,689	198	Rice, cassava, corn, and cash crops, such as rubber, cacao, sugarcane, and plantains.	Subsistence farming, petty trading, and rubber plantations	Hot and humid; avg annual temperature 80 F; dry season Dec–Mar; (annual precipitation: 508cm

[21] Government of the Republic of Liberia (2008) "2008 National Population and Housing Census: Preliminary Results".
[22] World Food Program (2005) Lofa County: Food Security and Nutrition Assessment http://reliefweb.int/sites/reliefweb.int/files/resources/1A8713BA3C7F866F4925704C00124AEE-wfp-lbr-28feb.pdf

Exhibit 5 below provides demographic information for Liberia nationally, as well as within the FtF program counties. The FtF zone of influence (ZOI) covers approximately 75 percent of the national population. Fifty-six percent of the ZOI population lives in areas classified as "urban" by the Liberian government.

Exhibit 5. Demographic information on FtF program counties

	Population* (National)	Zone of Influence
Total Population	3,476,608	2,622,227
Rural	1,842,889	1,147,082
Urban	1633,719	1,475,145
Total Households	670,295	525,306
Women of Reproductive Age (15 -49 years)	863,872	865,121
Children (0-59 months)	534,475	402,837
Males (0-59 months	270,564	202,984
Females (0-59 months)	263,911	199,853

II. PROJECT PURPOSE AND ASSIGNMENT

Under the USAID *Learning, Evaluation, and Analysis Project* (LEAP), contract no. AID-OAA-C-11-00169, Optimal Solutions Group, LLC (Optimal), was responsible for conducting a PBS for FtF Liberia. This baseline PBS was planned, designed, and conducted by Optimal to help inform decisions regarding how to implement FtF programs in Liberia. The project was implemented in collaboration with UL-PIRE and other independent consultants. The contract's period of performance is July 2012 through April 2013.

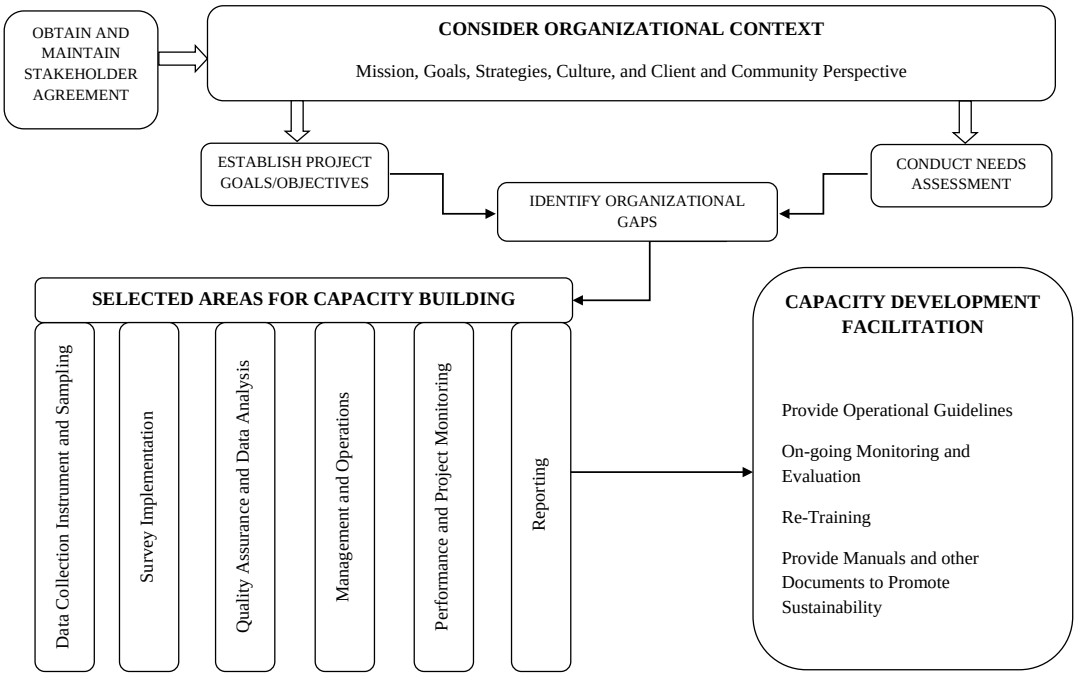
Project Objectives

The following objectives were assigned to the LEAP team for this project:

- Complete the survey and associated reports.
- Develop capacity of UL-PIRE to manage similarly complex surveys in the future. Specific tasks include
    - working with UL-PIRE to finalize, field test, and modify as necessary data-collection instruments for the survey;
    - determine a sampling frame, appropriate sample size, and methodology in consultation with the Mission; and
    - train and supervise enumerators; collect, clean, and analyze the data; and prepare the survey report.

Based on USAID's request, the LEAP team focused on capacity building during each phase of the project, as demonstrated in Exhibit 3, below.

Exhibit 6. USAID Liberia PBS Capacity development Plan



An overall detailed project work plan was developed that included the technical, operational, and training components of this project, detailing the outputs that contributed to achieving each objective and related tasks, the inputs required, and the level of effort needed to ensure that the team was equipped with the needed guidelines, tools, and time lines for completing the project in an efficient manner and ensuring that all deliverables would be of high quality.

Exhibit 4, below, illustrates the phases of survey design, planning, and implementation for this project.

Exhibit 7. USAID Liberia PBS implementation phases

Report Structure

This report begins with an introduction to the FtF program in Liberia and details the project objectives, goals and overall implementation plan. This is followed by an overview of the design implemented to conduct the PBS. The next chapter outlines the activities and planning for the capacity development task as part of this project. Chapter 4 delves into the pre-survey implementation planning, recruitment, training for survey implementation and operational activities. The section regarding data collection and survey implementation follows, providing an overview of data collection areas, field training, daily upload, and quality assurance. Then, the report explains the data cleaning process and transitions into the data analysis section. Following the analysis section, the report discusses survey findings based on the data collected and analyzed. Each major chapter of the report presents challenges faced during the timeframe of the respective activities and mitigation strategies implemented to address these challenges.

III. SURVEY DESIGN

The FtF baseline survey employed a multistage cluster approach that is consistent with the FtF guidelines and nearly identical to the designs used by other national-level surveys in Liberia since the 2008 census data became available. These surveys include the Malaria Indicator Survey (2009), Small Arms Survey (2010), and UC Berkeley's "Talking Peace" Survey (2011). This sampling design is appropriate for environments where the population in each cluster is known (e.g., Kalton 1983; Kish 1995). In such information-rich settings, this cluster design outperforms the Expanded Programme on Immunization (EPI) survey methodology (Turner et al. 1995).

This survey is designed to provide a representative, population-based sample of six counties in Liberia. The LEAP team employed a multistage cluster sampling design for the survey, as indicated in the statement of work. The overall sample was based on a poverty reduction rate agreed upon by USAID/Liberia and the LEAP team: 80 percent statistical power, 95 percent statistical significance, and a two-stage cluster sample. The first stage involved the selection of clusters, stratified among the six counties and the capital city, Monrovia. The second stage involved selecting households within these clusters.

The sample size for the PBS was driven by the requirement to capture changes in the key impact indicator of prevalence of poverty. A sample size of approximately 2,400 should be adequate to detect a change in the prevalence of poverty from 58 percent (estimated baseline) to 51 percent (target) with 95 percent statistical significance and 80 percent statistical power in a two-stage cluster sample with a design effect of 2.0 and an expected nonresponse rate of 10 percent, as determined by previous surveys in the country. This sample size should also be sufficient to measure changes in poverty at the county level and among various subpopulations.

The sampling frame was based on the enumeration areas (EAs) identified by the Liberian government during the 2008 census. Information on the number of houses and the geographic boundaries of each EA was provided by the Liberian Institute for Statistical and Geo-Information Services (LISGIS). The six counties covered by the survey include 5,358 EAs, comprising an estimated 525,306 households.
The 2,400 surveys were grouped into clusters of 20 surveys, resulting in 120 clusters, each defined by a single EA. This cluster size was derived from the need to balance the costs and difficulties associated with reaching survey locations in Liberia with the need for statistical power and coverage of the survey population.

From a statistical point of view, the ideal sampling design would be a simple random sample with replacement. Rather than selecting clusters of houses defined by boundaries such as census enumeration areas, this design selects individual households from anywhere in the survey area. In essence, simple random sampling is equivalent to a cluster sample design in which each cluster contains only a single household. Logistical and budgetary constraints, however, make this design infeasible in large settings. As more observations are added to each cluster, the survey's power declines due to intracluster correlation.

Scheaffer et al. (2012) explains the problem:

> Elements within a cluster are often physically close together and hence tend to have similar characteristics. Thus, the amount of information about a population parameter may not be increased substantially as new measurements are taken within a cluster. Because measurements cost money, an experimenter will waste money by choosing too large a cluster size (253).

In general, it is not recommended to exceed 30 observations in a single cluster. This project targeted 20 households per cluster to balance statistical power with logistical efficiency. The first stage of the sampling design stratified the 120 clusters among the six counties and the capital city based on the relative number of households. Within each stratum, EAs were selected with probability proportional to size. For example, an EA that encompasses 200 households was twice as likely to be included in the sample as an EA with 100 households. Exhibit 5 below, details the cluster allocations.

Exhibit 8. Cluster allocations

Stratum	Clusters	Surveys
Bong	16	320
Grand Bassa	10	200
Lofa*	12	240
Margibi	10	200
Nimba	19	380
Montserrado (excl. Monrovia)	7	140
Monrovia	46	920
Total	120	2,400

NOTE: The number of EAs in Lofa County was expanded from 12 to 14 to account for two inaccessible EAs.

In the second stage, a fixed number of households (20) in each EA were systematically selected with equal probability. For each EA, a sampling interval was determined by dividing the number of households by 20, and a "random start" was computed by drawing a random number between one and the sampling interval.

In the field, survey supervisors used the random start and sampling interval to select houses for the survey and then assigned a pair of enumerators to each selected household. For example, if the sampling interval was 5 and the random start was 3, the supervisor would select the third house encountered in the EA, followed by every fifth house thereafter until all houses in the EA were counted. [23]

In many cases, the number of households in the EA had changed since the 2008 census. By implementing the assigned sampling interval, supervisors would sometimes select more or fewer than the targeted 20 households due to these population changes. This variation allowed for an accurate estimate of current population without affecting the calculation of survey weights or other statistics.

[23] The process for selecting EAs was included in the pre-survey implementation training and practiced during field testing.

This sampling design facilitated data analysis by simplifying the calculation of survey weights and other design characteristics. The weight for a given household survey was the inverse of the probability that the household was selected. For this sampling design, the survey weight *W* for household *i* is:

$$W_i = \frac{EA_C}{EA_S}\frac{hh_k}{hh_s}$$

where EA_C is the total number of EAs in the county according to the 2008 census; EA_S is the number of EAs selected for the survey in the county; hh_k is the number of households in the EA according to the 2008 census; and hh_s is the number of expected households surveyed.

For most EAs in this survey, hh_s equals 20, but hh_s equals 30 for some EAs due to a modification in the survey design in the final weeks of implementation (an explanation for changes to the sampling design is provided in the subsequent section). These weights were also adjusted to account for two inaccessible EAs in Lofa County[24] and for nonresponse in each of the EAs.[25]

Modifications to Sampling Framework

In general, the implementation of the baseline survey was smooth, but three minor changes were introduced to accommodate the situation on the ground:

i) The sampling interval was changed for two EAs after the teams discovered errors in the census data.
ii) The number of EAs selected in Lofa County was expanded from 12 to 14 to compensate for 2 inaccessible EAs.
iii) The targeted number of households in 33 EAs was increased from 20 to 30 to compensate for lower-than-expected rural populations.

The final survey weights were adjusted in light of these changes as well as to account for nonresponse in each of the EAs. These changes did not substantively affect the representativeness of the sample, the data analysis, or the results.

[24] The two inaccessible EAs in Lofa County were excluded because in order to access these areas enumerators would have to walk for a full day from the nearest road, and the nearest road was about 1 full days' drive from anywhere.
[25] Nonresponse includes situations in which a selected household was absent during the three days that the survey teams operated in each EA, and situations in which a household declined to participate in the survey.

IV. CAPACITY DEVELOPMENT

Capacity building as it relates to the FtF Program refers to

> "activities that support the evolution of healthy agricultural economies and communities by strengthening institutions and human resources. It includes partners, host countries, and farmers improving their ability to achieve measurable and sustainable results. Partnerships that increase capacity building address the means by which communities are better able to offer skilled workers, stable institutions, and robust commerce capable of overcoming root causes of poverty and hunger. Feed the Future works to improve the capacity of countries to take the lead in their own development."[26]

Capacity building has become central to USAID and has made significant progress since the USAID Forward initiative was launched in 2010 by building the capacity of countries to lead their own development.[27]

Capacity building is a continual process of improvement[28] that is both dynamic and multidimensional. Optimal was tasked with building the capacity of a local research organization—the UL-PIRE Africa Center—as part of implementation of the Liberia PBS. The LEAP team began this capacity building by first assessing the needs of UL-PIRE, reviewing its strengths and weaknesses at the organizational, staff, and management levels. At the same time, the team leveraged the local knowledge of this organization to provide important input to conducting the PBS in the Liberia context, because of a clear understanding that capacity building is a process based on organizational and local needs. The capacity-building process was implemented through a collaborative approach, where the local consultants (partners) were included in decision making for various aspects of the project, including modification of the data-collection instrument (to fit Liberia's social and cultural context) and recruitment and hiring of the survey-implementation team. A comprehensive capacity-development report is provided separately as part of this project.

Needs Assessment

A needs assessment was implemented after the LEAP team conducted an initial desk review of the FtF Liberia context and PBS statement of work and held meetings with USAID/Liberia to understand the objectives of the project. Two management team members from the LEAP team conducted a site visit to assess UL-PIRE's organizational, management, and staffing capabilities for conducting the PBS. The team developed an assessment tool and held several workgroup sessions and semi-structured interviews with UL-PIRE staff. A summary of the needs-assessment findings are presented in the exhibit below.

[26] http://www.feedthefuture.gov/focus-areas/nojs/term/643.
[27] http://www.usaid.gov/results-and-data/progress-data/usaid-forward.
[28] Lusthaus, C., G. Anderson, and E. Murphy. (1995). *Institutional Assessment: A Framework for Strengthening Organizational Capacity for IDCR's Research Partners.* International Development Research Center.

Exhibit 9. Capacity development needs assessment findings

STRENGTHS

- Ability to collect data and enter data into a database or system
- Firm knowledge of the Liberian context
- Deep networks within the survey implementation community that can be leveraged
- Access to enumeration staff

WEAKNESSES

- Lack of Standard Operating Procedures for general operations and accounting
- Capacity lacking in operations staff (Human Resources/ Accounting)
- Significantly lacking in operations equipment (laptops, slow internet connection)
- Low skills in technical operations of conducting surveys (sampling design, data cleaning, quality assurance, analysis, reporting)
- No knowledge of data storage applications or technology for survey implementation and analysis

OPPORTUNITIES

- Divide staff into smaller teams based on strengths and provide training to build expertise in specific subject-matter areas
- Hire consulting staff for operations and financial management
- Conduct performance measurement activities in a systematized manner (on an on-going basis)
- Purchase technology that would leverage survey operations; implementation and analysis
- Update communication tools to attain on-going projects which would improve financial status and use of survey equipment

THREATS

- Staff retention and growth within the organization
- New enumeration organizations
- Organizations with more in-depth understanding of technology, survey analysis, and methods

Ongoing On-the-Job Trainings and Assessments

Based on the initial findings from the needs assessment, the team developed a work plan that included conducting various on-the-job training sessions to allow the staff to gain the skill set needed to conduct not only the current project but also future FtF surveys. The training topics included *survey implementation* for supervisors and enumerators as well as survey operations, finance management and tracking, project and performance management, data entry, cleaning, analysis and reporting, and monitoring and evaluation.

Understanding that capacity building is an on-going process, the LEAP team from the beginning of the project implemented what could be called "in-service training," which accommodated staff development and growth by identifying and effectively pairing LEAP team staff (and roles) with UL-PIRE consultants in the areas of management, accounting, survey implementation logistics, and technical teams (refer to Appendix A for the staffing categories that were created for this project). This allowed for one-on-one communication and transfer of knowledge based on very specific areas of the project. During the process,

numerous user manuals and templates were created that will be used as tools for UL-PIRE upon project completion, promoting sustainability of the skills acquired.

During each stage of implementation, the team provided surveys and assessments to gauge whether the staff members were able to adequately grasp the training provided and could implement the respective phases of the project and their assignments. Appendix B provides sample evaluation templates used for the PBS.

Review of Capacity Development

As discussed previously, capacity development was at the heart of this project, and the team spent significant amounts of time ensuring that the UL-PIRE were adequately trained for conducting each component of this project in the future. Upon completion of the PBS, the LEAP team then devoted time to reviewing all the major components of survey implementation – from design and operations, to financial management and data analysis. This review process was provided through workshops that were conducted in a collaborative manner to ensure that the UL-PIRE team attained the tools needed for conducting a survey such as this one in the future. Part of the capacity development review, was finalizing all manuals with the UL-PIRE team and having them develop respective templates in order to develop templates most useful to their context, and ensure ownership of the products that will remain with them.

The final phase of capacity development activities focused on the technical components of survey analysis and reporting, by reviewing the processes that were used to analyze the survey data and report findings, as well as the processes for developing a survey report that details all the processes followed for survey implementation.

The second component focused on operations and management, reflecting the tools provided to the team during survey implementation, and the resources needed to promote sustainability of survey implementation. This component explored topics including leadership, project management, performance management, compliance to USAID rules and development of standard operating procedures. The exhibit below illustrates the focus of these activities:

Exhibit 10. Capacity Development Review Management and Operations Focus

V. SURVEY PLANNING AND PRE-IMPLEMENTATION ACTIVITIES

This section provides an overview of activities that were conducted in preparation of survey implementation, including development of an overall project work plan; hiring of survey-implementation team staff; on-the-job training for survey implementation; survey operations, logistics planning, and implementation, including purchases of survey equipment and vehicles; and modification of the survey instrument to suit the Liberian context.

Survey Operations Planning and Implementation

Operations planning for conducting the survey were very important to the survey's success. Therefore, the team devoted a significant amount of time and effort to establishing standard operating procedures for the various components of survey planning, design, and implementation. The main operations components included:

- development of work plans and checklists for various tasks;
- definition of logistics for survey implementation, including travel, accommodations, recruitment, and security;
- quality control and monitoring and evaluation/performance-measurement structures; and
- overall project management, including mapping and establishment of time lines and funding needed for enumeration areas and staff assignments and maintenance of financial documentation, timesheets, expense tracking, and reporting.

Development of Project Work Plan

At the onset of this project, the LEAP team conducted a literature review of the USAID FtF project, and particularly FtF in Liberia, closely examining the agricultural sector in Liberia to gain an understanding of the task at hand. With the findings from the literature review, the team developed a detailed work plan that served as the overall guide for conducting the PBS. The work plan included activity time lines and staffing assignments, mapped project objectives with tasks, and provided the guidelines for conducting the various project tasks. The work plan covered technical, operational, and capacity development activities as the three main components of the project.

Recruitment of Survey-Implementation Team

The recruitment period for hiring enumerators took place from August 27, 2012, to October 1, 2012. The process involved developing a job description, advertising the position, identifying and training a panel for interviewing and vetting, conducting two-stage interview processes (a written test followed by a formal interview), and vetting the shortlisted candidates based on pre-established criteria. Exhibit 11, below, summarizes the recruitment time line.

Exhibit 11. Recruitment time line

Activity	Date
Post advertisement	August 27, 2012
Receive applications	August 27–September 7, 2012
Develop interview written assessment	September 3, 2012
Develop interview protocol	September 3, 2012
Develop selection criteria	September 5, 2012
Conduct first round of candidate vetting (from 427 to 200)	September 12, 2012
Interview short-listed candidates	September 13–21, 2012
Conduct written assessment	September 20–21, 2012
Compile interview results	September 24, 2012
Select final candidates	September 25–27, 2012
Notify candidates of selection	September 28, 2012

Selection of appropriate staff for data collection was crucial to the success of conducting the PBS. As a result, the LEAP team devoted a significant amount of time to training and conducting recruitment activities. Given the large number of enumerators needed for this project, the team consulted with local organizations that have conducted similar surveys to identify suitable candidates. This ensured that several of the candidates had past experience in data-collection processes. Advertisements were also put in the local newspapers as well as at the University of Liberia to identify candidates. After the application period ended, candidates were selected through an interview process and written test. The selection committee also prioritized hiring enumerators from within the areas where the surveys were conducted to enhance cultural sensitivity, reduce language barriers, and minimize travel and lodging costs during the data-collection phase.

UL-PIRE project staff members with previous survey experience were hired as survey supervisors and field managers for this project. The final survey implementation team comprised 90 enumerators, 10 survey supervisors, and 5 field managers.

Identification and Purchase of Survey Equipment

Electronic equipment was used for conducting the PBS for various reasons, including ease of use and more efficient data-collection capabilities; removal of extensive data-entry activities and hence reduction in entry errors; and provision of the opportunity for near-real-time quality-assurance (QA) activities due to daily uploads of data for analysis. Tablets were used for data collection, and laptops were purchased for supervisors to complete daily checks and upload data on a daily basis. Prior to purchasing the equipment, the team conducted environmental scans of hardware and software to be used for the survey implementation.

Hardware

Based on a comprehensive selection criteria of analyzing processor type, number of cores, CPU frequency (Mhz), RAM memory (MB), data storage (GB), operating system, Wi-Fi connectivity, GPS, screen size (inches), Bluetooth connectivity, battery life (minutes), weight (grams), outdoor readability, rugged design, availability, and price, the team settled on a final list of three equipment types. After conducting

field testing on the three options selected, the LEAP team recommended the Lenovo ThinkPad as the best choice due to its durability, sustainability, and ease of use. The only weakness the Lenovo demonstrated during the test was a lack of Bluetooth capability. However, this was not a priority for the survey implementation.

To select the tablets for survey implementation, the team conducted a similar environmental scan based on comprehensive criteria, which included the general variables used for the netbook scan as well as the tablets' capability for international use (voltage, cable type, etc.), ruggedness (waterproofing, durability, etc.), and compatibility with survey software platforms. After qualitative and quantitative field tests were finished, the team concluded that the Asus Nexus 7 was the best choice based on the assessment. The tablet offered fast processing speed and vertical and horizontal ways to zoom and flip photos for the modules, and navigating the touch screen and the menu options were very intuitive for the end user.

Software

The LEAP team explored multiple sources to find a suitable software solution for the survey, including conferring with companies that had conducted similar surveys as well as reports and studies on software choices for electronic surveys implemented in other projects.

The software scan revolved around data capture, questionnaire navigation, skipping and branching capabilities, case management, and data quality control. The team also considered compatibility with the hardware, the operating system, access to a network, and, most importantly, compatibility with the survey's requirements. The scan produced a wide array of choices; however, the field was narrowed down to four choices. The team decided to use Open Data Kit (ODK) as the choice software for the survey due to the platform's being user-friendly, developer-friendly, and widely recognized, thus fitting the LEAP team's requirements for compatibility, functionality, and usability.

Modifying the Survey Instrument to Fit the Liberian Context

USAID FtF has an established survey instrument that is used for all FtF baseline surveys, so one of the major tasks for the LEAP team was to modify the existing survey to fit the Liberian context. Through work meetings with the UL-PIRE team, the survey instrument was modified so that units of analyses and responses were relevant to the local context. The work meetings resulted in adding approximately 30 items to the initial consumption list, while about 10 items were removed. After revision, the modified survey was submitted to the USAID Bureau for Food Security, which approved the adapted questionnaire.

In addition to modifying the survey to fit the Liberian context, the team also consolidated the eight modules of the FtF survey into three sections because of the use of electronic equipment, which meant that the paper survey question format needed to be modified. The modifications were as follows: Module 1 was titled "Roster, Dwelling, and Expenses" and collected information regarding consent, dwelling characteristics (roof, façade, floor tiles, etc.), household characteristics (household members, education level, employment), and an account of the household's non-food expenses.

Module 2 was titled the "Women's Empowerment in Agriculture Index (WEAI)." The module contained questions regarding participation in various labor sectors (food or cash crops, livestock, wage employment), access to productive capital, access to credit, decision making, individual leadership and influence in the community, and group membership and influence in the group. This module was completed by the primary and secondary respondents in each household. A portion of the WEAI was conducted on paper, a timesheet to record the labor time usage of a woman in a day. The structure of the timesheet made it difficult to format for the electronic equipment. This paper portion of the survey was scanned and stored for safekeeping; data entry was conducted upon completion of the survey.

Module 3 was titled "Food and Consumption." The module documented the household's consumption and hunger scale. The consumption portion was broken up into consumption by intervals of 1 week, 1 month, 3 months, and 1 year to account for durable and nondurable goods (soft goods).

All three modules contained identifier information—Enumeration Area, Household ID, Supervisor ID, and Enumerator ID—to enhance data cleaning and analysis processes.

Finally, the LEAP team used Microsoft Excel in conjunction with Open Data Kit's (ODK) XLSForms to convert the survey instrument into an XML file. This XML version of the survey instrument was downloaded into the tablets for implementation.

Gaining Institutional Review Board Approval for Survey Implementation

One important component of conducting the PBS was acquiring Institutional Review Board (IRB) approval for conducting the survey. Upon completion of developing the sampling design and modifying the survey to fit the Liberian context, the LEAP team completed an IRB application that responded to questions regarding the sampling design, survey planning, implementation, analysis, and reporting. One important aspect of the IRB application was responding to the team's strategy for protecting the human subjects. Through the application, the team shared its interviewing technique and data-management systems that would ensure that all personal identification information (PII) would be secure and accessible only to applicable team members for analysis. For public-use data, the team would ensure that all data were stripped of PII. The application also assured the IRB that consent forms would be provided to respondents prior to beginning the survey and that at any time, a respondent could decide to end the survey. The LEAP team attended a hearing to respond to questions from the IRB and received IRB approval for conducting the survey in Liberia on October 23, 2012.

Survey Implementation Training

After an exhaustive recruitment process, the team trained a total of 90 enumerators and 10 supervisors. The field managers, enumerators, and supervisors were required to participate in a 2-week intensive training exercise. An instruction program (including lesson plans) and a training manual were used to conduct the training. The training exposed field managers, supervisors, and enumerators to survey operations, professionalism, ethics, teamwork skills, interviewing techniques, and safety. The majority of the training focused on the use of the tablet, smart phone, and other technological devices for survey

implementation. The training included review of potential challenging scenarios, and the participants worked together to identify mitigation strategies.

Survey supervisors were trained separately on their role as facilitators of data collection and managers of logistics while in the field. They were provided with tools for motivating the enumerators and making appropriate decisions regarding day-to-day operations and possible challenges in the deployment process. They were also trained on using the checklists for monitoring survey implementation and providing feedback to the management team. Supervisor training also included selecting households in EAs as designed in the sampling framework.

Field managers participated in the facilitation of the training but were also provided with separate training for conducting monitoring and evaluation activities of survey implementation; responding to challenges shared by survey supervisors; and developing projections and purchasing logistics for the survey-implementation teams.

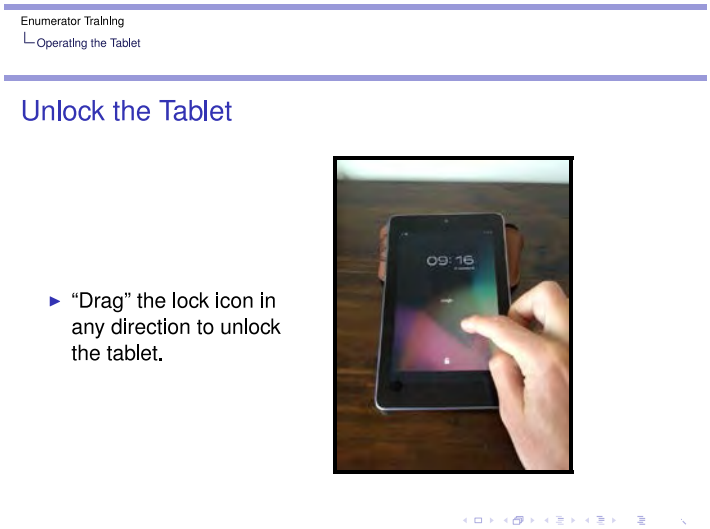
Understanding the Survey Process

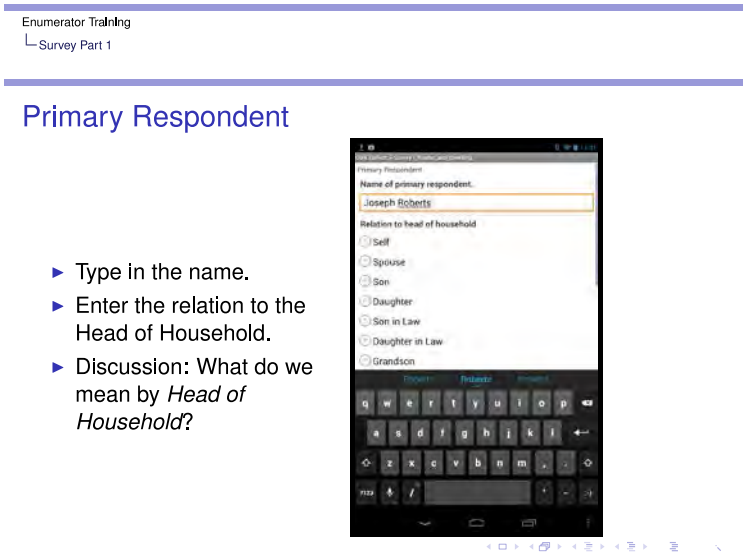
Supervisors and enumerators were trained in a group setting, using manuals developed for the FtF Liberia baseline survey. The training manuals provided step-by-step instructions for survey tasks and covered all the survey questions. Survey questions were reviewed individually, with group discussions to ensure full understanding of the questions as well as key concepts, such as “informed consent” and “head of household.” The training manual included images of survey questions as displayed on the electronic devices. In addition to the manual-based training, enumerators and supervisors participated in role-play activities to practice introducing the survey and appropriately explaining the overall project to the respective respondents.

Use of Survey Equipment

Participants were trained on the use of the survey equipment; training manuals highlighted key issues on the use and care of the equipment. Because it was essential that the electronic equipment be handled with care and stored in a clean dry place, part of the training sessions covered safe use of the electronic equipment and fundamental aspects of the tablet. The training manual provided protocols to follow in rare cases of damage or loss to survey equipment. Exhibit 12 below, shows an abbreviated illustration of how supervisors and enumerators were lead through step-by-step processes of operating the tablet.

Exhibit 12. Operating Survey Electronic Equipment





Field Training and Testing

Upon completion of the training exercises, two pilot tests were conducted in three economically disadvantaged communities in Monrovia that simulated the enumeration areas (EAs) that were randomly selected for the FtF survey. Upon completion of the first pilot test, the team met to assess the findings, after which a second pilot test was conducted as a corrective measure of the first.

Subsequently, 10 teams each comprising a supervisor and eight enumerators were constituted, and the teams began to practice survey operations and implementation together. The eight enumerators were paired to make up four teams. Ten enumerators were selected to be on a surge team to conduct surveys if any unforeseen circumstances occurred that meant that an enumerator were unavailable. The surge team

members were selected upon completion of the training to ensure that they were able to conduct a survey as soon as needed.

Pre-deployment Sensitization

As the second pilot test progressed, the field managers conducted a pre-deployment mission to selected areas in the six counties where the surveys would be conducted. They were tasked with sensitizing community leaders about the pending survey to ensure that the survey teams were welcomed in the communities and also to respect the traditions of areas to be visited. The pre-deployment activities were useful, and in most areas, the community leaders had announced to the community that the pending survey would take place, which made the implementation process smoother.

Pre-Implementation Challenges and Mitigation Strategies

While planning for a project of this nature can span from initiation to end of project this section will focus on planning limitations and mitigation strategies for pre-survey implementation. The team faced both technological and operational challenges prior to survey implementation. These are discussed below.

Technological Challenges

One of the first challenges faced by the LEAP team during the course of planning for the Survey Implementation of the Liberia PBS was the inconsistent and unpredictable nature of the Information technology infrastructure within Liberia. As a result, the project experienced technical challenges uploading/downloading documents, and hence information sharing. To address this challenge, the team identified alternate options to improve the host organization's internet connectivity and information systems, as well as committed funding to purchasing alternative internet connectivity including 4G modems.

With the use of electronic equipment needed to conduct the Liberia PBS, the team was now faced with the challenge of identifying appropriate equipment that would work effectively within Liberia. This was an extensive process trying to identify appropriate equipment, and matching software and hardware with the understanding that upon completion of the project all equipment would remain with, and therefore have to be maintained by personnel of UL-PIRE. A systematic approach was employed to evaluate the merits and weaknesses of each equipment selected and to select the top three software and hardware combinations.

Due to the decision to use electronic equipment for the Liberia PBS, the team had a major task of converting the entire survey instrument into formats that would fit the electronic equipment. Once this task began, it was realized that the format of certain modules made it too cumbersome to be converted, and hence a decision was made to use a hybrid approach and maintain certain portions of the survey in paper form.

Operational Challenges

The LEAP team faced a unique challenge in finalizing a system for hiring UL-PIRE staff for this project because at the onset of the project, UL-PIRE was to be signed on as a subcontractor. Meetings were held with UL-PIRE and USAID to solve this issue, which led to a shift from subcontracting to consulting

agreement with the host organization, which caused significant project delays. For every challenge there is a lesson to be learned. This challenge was defined as a part of the process of capacity building for UL-PIRE as an entity, and the procedures for finding a workable compromise on this issue were documented to be included in Lessons Learned document as part of the Capacity Development Report for this project.

The scope of the project had teams traveling on impassable roads in some of the selected counties. The lengthy rainy season also compounded the deplorable roads. This was a major challenge to teams that were to travel further out of Monrovia. To mitigate this situation, the team spent time exploring the types of vehicles available in Monrovia and identified a local car rental company to hire heavy-duty four wheel trucks for survey implementation.

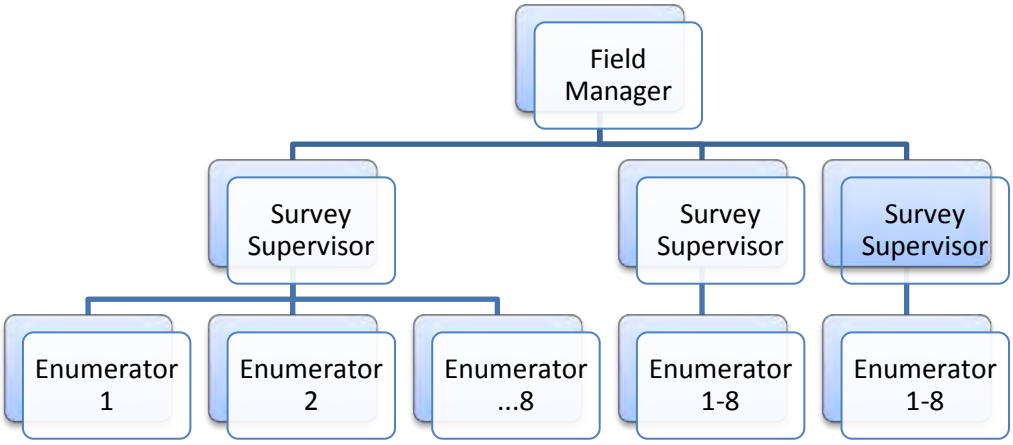
Another operational challenge faced was with clearing equipment shipped to Liberia for implementing the PBS, which led to a slight delay in survey implementation training. Once shipment was completed and arrived in Liberia, the team was informed that clearing the goods would not be possible because they should have been sent to a local entity. Fortunately, due to the partnership with UL-PIRE on this contract, the team was able to rectify this situation after several meetings between UL-PIRE and the respective Ministries establishing UL-PIRE as a locally-owned organization that was part of this project. Future shipments were all sent to UL-PIRE to rectify this issue.

VI. DATA COLLECTION AND SURVEY IMPLEMENTATION

To facilitate conducting the Liberia PBS, 90 enumerators and 10 supervisors made up the complete survey-implementation group. The implementation group included 10 teams, with 1 supervisor managing a set of 8 enumerators on each. Gender composition was prioritized in developing the teams so that as much as possible, the gender of the enumerator would match that of the respondent. Approximately 90 percent of the time, a female would be interviewed by a female, and male by male. The administering of each survey took approximately 3 hours per respondent (and 6 hours per household) to complete. Given the length of the survey, pre-deployment activities discussed previously were essential to ensure that respondents were aware of the time commitment and importance of participating in the survey. Having buy-in of the local leaders was very useful to promoting high response rates. Also, given the survey length, each household was provided with a small thank you gift (under $1 in cost per respondent) at the end of the survey for taking time off their work activities, and to be respectful of local practices. Breaks were also taken as needed during survey implementation to ensure that respondents did not feel rushed throughout the process.

Ten enumerators served as surge members, making themselves available in situations where enumerators were unavailable to complete their assigned surveys. As indicated previously, all 100 team members received the same training, while the supervisors also received additional leadership, managing, and reporting training. Exhibit 13, below, illustrates the survey-implementation team structure.

Exhibit 13. Survey implementation team structure



In order to enhance management of the survey, given the large size, the survey implementation followed a phased approach in which multiple teams were grouped in specific areas, and completed surveys in the area, prior to moving to another area. The phased approach allowed for better communication and quality control. The deployment timeline is provided in Exhibit 14.The survey implementation of the FtF PBS project commenced in Monrovia (46 EAs) on November 5, 2012, with each of the 10 teams being assigned EAs to survey for 3 days (each team was required to work in an EA for only 3 days). Survey teams were provided with a daily implementation schedule and overall worksheet that guided the time line for implementation and selection of EAs and households according to the sampling framework. All 10 teams worked in Monrovia from November 5 – 17, 2012. Subsequently, the teams were disbursed for deployment in rural Montserrado and the other five counties. Vehicles capable of withstanding rough terrains were hired to transport the teams to and from their respective destinations throughout the survey

implementation. Each team was equipped with a basic field package that included 10 personal data/digital assistants (PDAs), one each for eight enumerators and two for the supervisor (with one serving as a back-up); one laptop with accessories; one smart phone with accessories; one Internet modem; one first-aid kit; one portable generator along with accompaniments; a voltage regulator; a flashlight; one watertight equipment case; printable documents; and a shovel and a cutlass (to aid in accessing difficult terrains). Generally, the electronic equipment used was reliable and out of 110 PDAs and 14 laptops purchased, only 6 PDAs and 1 laptop experienced permanent damage; none of the equipment were stolen or misplaced.

Two teams assigned to the 12 selected EAs in Lofa were the first to be deployed (upon completion of survey implementation in Monrovia) on November 21, 2012, considering the distance and the bad road conditions; while the remaining eight teams were disbursed into EAs in rural Montserrado and Margibi where they surveyed 7 and 10 EAs, respectively. Following the completion of the surveys of the EAs in rural Montserrado and Margibi, the eight teams then repositioned in Grand Bassa (three teams) and Bong (five teams), which comprised 10 and 16 enumeration areas, respectively, on November 29, 2012. As the process in the field came to an end in Lofa, Grand Bassa, and Bong, the eight teams from Grand Bassa and Bong proceeded to Nimba (19 EAs) on December 13, 2012, for the concluding phase of the field survey.

All teams returned to Monrovia by December 23, 2012. Enumerators working in pairs were assigned to complete a maximum of two surveys per day for each EA within the assigned 3-day period. The survey implementation targeted 20 households (later extended to 30 in the last 2 weeks) for the survey in each EA. Exhibit 14, below, provides the work plan for survey operations, illustrating the phased approach for implementation discussed previously and denoting changes that occurred. Typically survey clean-up occurred during the last day in a particular EA, given that there was usually only one additional survey per enumerator team to complete on that day. At the end of each day, data collected from the field were uploaded and submitted via e-mail to the QA team (QA activities are discussed in detail in the Quality Assurance section).

The teams remained for the most part on schedule, except for a few instances when it became physically difficult to access an area due to the terrain. In two instances, the survey teams had to reschedule their visits due to traditional ceremonies occurring in the area. Also, a minor road accident delayed the implementation for conducting the survey by one team. The initial work plan projected surveys to be completed by December 21, 2012, with a break for the holidays and then a clean-up phase between January 7 and 14, 2013. The initial survey was completed on December 23, 2012 except for surveys in 4 EAs. The remaining 4 EAs were completed during the clean-up phase in January 2013 and all 200 EAs were surveyed by January 14, 2013, as initially estimated in the project work plan.

Exhibit 14. Projected Operations Work Plan for Survey Implementation

USAID LIBERIA FEED THE FUTURE POPULATION BASED SURVEY

Staffing Plan for Survey Implementation

Countries	Total No. of EA'S	Nov 5- Nov 7 (No. of Terms)	Nov 8- Nov 10 (No. of Terms)	Nov 12- Nov 14 (No. of Terms)	Nov 15- Nov 17 (No. of Terms)	Nov19 - Nov 21 (No. of Terms)	Nov 22- Nov 24 (No. of Terms)	Nov 26- Nov 28 (No. of Terms)	Nov 29 - Dec 1 (No. of Terms)	Totals
Bong	16							1	5	6
Grand Bassa	10								3	3
Lofa	12						2	2	2	6
Margibi	10						3	7		10
Montserrado	7					2	5			7
Monrovia	46	10	10	10	10	6				46
Nimba	19									0

Countries	Total No. of EA'S	Dec 3- Dec 5 (No. of Terms)	Dec 6- Dec 8 (No. of Terms)	Dec 10- Dec 12 (No. of Terms)	Dec 13- Dec 15 (No. of Terms)	Dec 17- Dec 19 (No. of Terms)	12/20/2012 (No. of Terms)	
Bong	16	5	5					16
Grand Bassa	10	3	3	1				10
Lofa	12	2	2	1				11
Margibi	10							10
Montserrado	7							7
Monrovia	46							46
Nimba	19			7	8	4		19

NOTES

*The Spreadsheat is devided into half-weeks to make the deployment of teams easier

*** 1 Supervisor + 8 Enumerators = 1 Team

****Each team will use 3 days to cover an EA (averaging 5 surveys over 3 days)

Field Monitoring and Visitations

Monitoring of survey progress occurred on a daily basis. The subsequent section on Quality Assurance provides details on the various quality checks that were implemented during the survey and feedback that was provided to the field on a daily basis. Five field managers were assigned to provide oversight of the survey-implementation teams. They communicated consistently with the teams and with survey management to provide feedback on survey implementation and discuss any challenges faced and mitigations identified. Additionally, the field managers, divided into teams of two, conducted weekly monitoring visits to the field to assess activities of the team, conduct quality checks of survey implementation, interact with communities, provide solutions to problems encountered (as needed), and provide operational and logistics support to the teams. The field managers also provided support to the survey supervisors for survey uploads in areas where Internet access was not available by traveling to areas where Internet connectivity was available and uploading the surveys, while the survey supervisors continued to supervise surveys to remain on schedule. Finally, field managers conducted random checks at enumerated households to inquire whether surveys had been professionally and efficiently conducted by the enumerators. These random checks ensured that supervisors effectively monitored their teams and that enumerators visited selected households and conducted surveys.

Challenges and Mitigation Strategies for Data Collection

During data collection and field monitoring the teams faced some challenges. These challenges are detailed below, along with the mitigations provided.

During the recruitment process, 10 supervisors were hired to be a part of the survey implementation team. Once the hiring process was completed and survey implementation training began, the LEAP team realized that some supervisors had limited computer literacy, which would be problematic when conducting an electronic survey of this nature. The team therefore provided additional training to these supervisors by pairing them with more computer-literate supervisors. The LEAP team also carefully monitored the supervisors during survey implementation and provided re-training, as needed, during survey implementation, to ensure that all the processes were followed adequately.

Teams also experienced technical difficulties due to inadequate communications and technological network coverage, as well as limited power supplies in Liberia. As a result, in several areas, the survey implementation team experienced difficulties with transmitting data collected. Teams also faced challenges with some of the electronic equipment crashing while in the field. Several mitigation strategies were employed to deal with these issues: Each team was provided with spare equipment to ensure that problematic equipment could be replaced quickly. In addition, small field generators were provided for the teams to address the lapses in electricity. Finally, supervisors were trained to back up data daily on encrypted flash drives to ensure that data would not be lost due to equipment problems.

The survey implementation phase began during the rainy season in Liberia. This meant that some of the access roads to the EAs were inaccessible. The phased approach for implementing the survey was useful to tackling this issue, because by the time the teams made it to the most difficult areas, the dry season had begun and most of the roads were in better condition than at the start. The teams still faced several challenges with accessing EAs and employed creative methods (crossing rivers via canoes, purchasing tarpaulins to protect equipment, leverage locals who knew of alternate access routes, etc.) to make it to their EAs.

Besides bad road and hazardous terrains; community rivalries in some rural areas, as well as traditional rites delayed survey implementation. Field teams were sometimes given wrong directions, delaying their survey implementation. In one particular instance, the residents of one of the towns attempted to prevent the team from reaching the targeted EA by dismantling the bridge from that town to the EA. Due to traditional rites, survey implementation in three EAs had to be postponed till the traditional rites were completed. In such situations, the teams respected the area's cultural practices and returned to the areas once the ceremonies were completed. By the end of survey implementation, the teams had reached all but two of the 122 assigned EAs.

VII. DAILY DATA TRANSMISSION AND QUALITY ASSURANCE

QA was crucial for the successful implementation of the Liberia PBS. The LEAP team recognized the importance of testing processes and improving developments in an effort to be proactive rather than reactive prior to and during the survey-implementation process. Once survey implementation began, ongoing QA activities ensured that needed changes were effected quickly to improve the process. QA activities on this project leveraged the use of various technologies and tools that allowed for a successful survey-implementation process. The entire process was team-oriented and collaborative, and each member of the survey implementation team played an important role in the QA process (refer to Appendix E for QA process templates).

This section provides details on the overall QA process and procedures for implementing the USAID Liberia PBS and brief descriptions of specific quality control (QC) responsibilities for each assigned role as well as an overview of findings that were gathered as a result of QA processes. The QC also focused separately on technical-analysis processes and operational aspects of survey implementation.

Staffing Roles and Feedback from Quality Assurance

QA process was defined for each survey-implementation staff member during survey implementation. Each of these roles was reviewed during training, and the team ensured that the staff members understood the importance of their individual roles to the overall success of the PBS.

The survey supervisors were responsible for initiating the QA process during survey implementation. They were tasked with conducting rigorous checks prior to and during survey implementation, including ensuring that enumerators were appropriately geo-locating the selected households; checking to ensure that survey implementation was occurring appropriately and that, upon completion of the day's survey, the data were collected, saved, uploaded, and backed up; conducting random QA checks on data received and addressing any discrepancies revealed; ensuring that enumerators were "saving and exiting" the tablets once data collection had been completed; and completing daily reports and communicating all relevant information from the field to the field managers assigned to the EAs. The supervisors were also tasked with communicating issues identified by the QA analysis team with the enumerators that were flagged and conducted retraining to ensure that human errors were not repeated.

The survey enumerator was expected to conduct a number of activities to ensure QC during survey implementation. The enumerator had to ensure that the correct household was being surveyed by matching the EA codes provided on the schedule and the household number posted on each house being surveyed. This check was done prior to beginning the survey to ensure accuracy of the basic information collected. The enumerators also documented challenges throughout the process and reported issues as they arose to supervisors. Enumerators worked in teams of twos, which served as another tool for checks and balances. In addition to submitting completed surveys on a daily basis to field supervisors, the enumerator also had to complete a daily progress report and provide survey tablets to supervisors for upload. This served as QC to ensure that data were not compromised and were at all times kept safe throughout survey implementation.

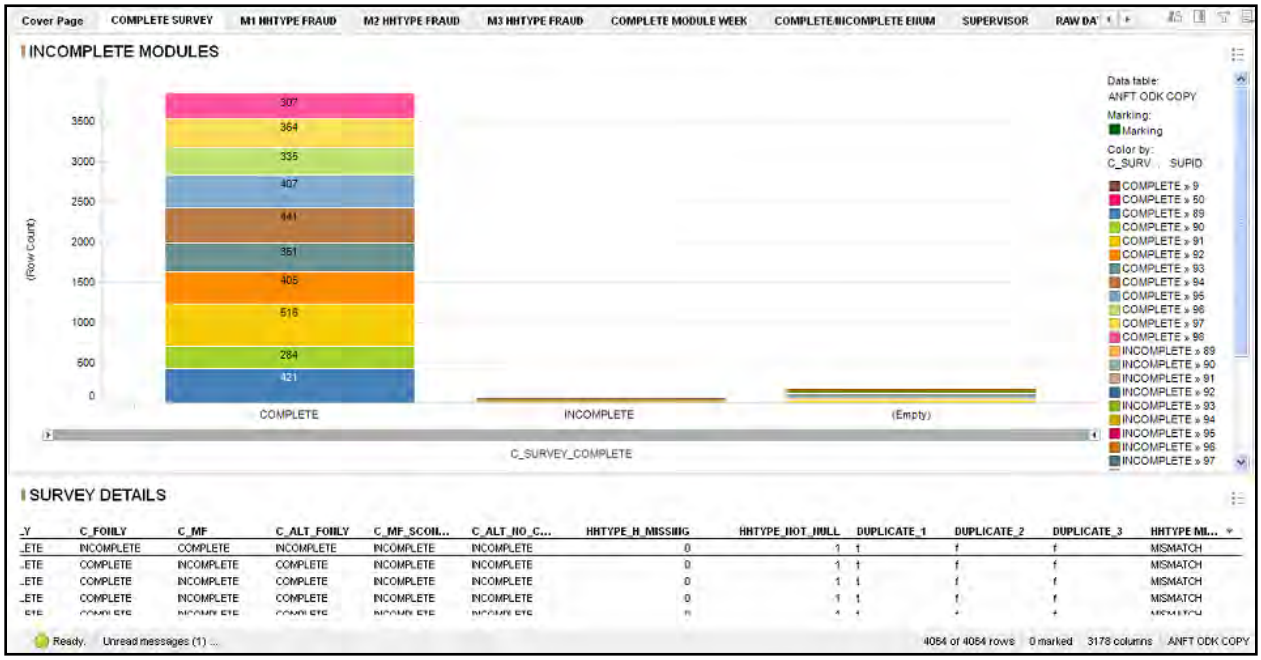
The field manager was responsible for ensuring overall QA of the project by conducting monitoring and evaluation activities during the survey-implementation process. The field manager's QC role encompassed operations and analysis tasks. The field manager also served as the liaison between the survey-implementation team, the project-management team, and the data-analysis team. The QC activities that were conducted by the field manager included reviewing daily progress reports, flagging any challenges faced, and quickly alerting the QA specialists. The field manager also tracked challenges and worked with other team members to provide solutions in a timely manner. Constant communication was expected between the field manager and teams in the field as well as with the QA specialist and other members of the management team. This ensured a constant flow of communication, which evidently led to a successful survey-implementation process. Finally, the field managers conducted spot checks of survey implementation when they visited the field and documented information gathered through a weekly progress report on all aspects of survey implementation that occurred in the respective week.

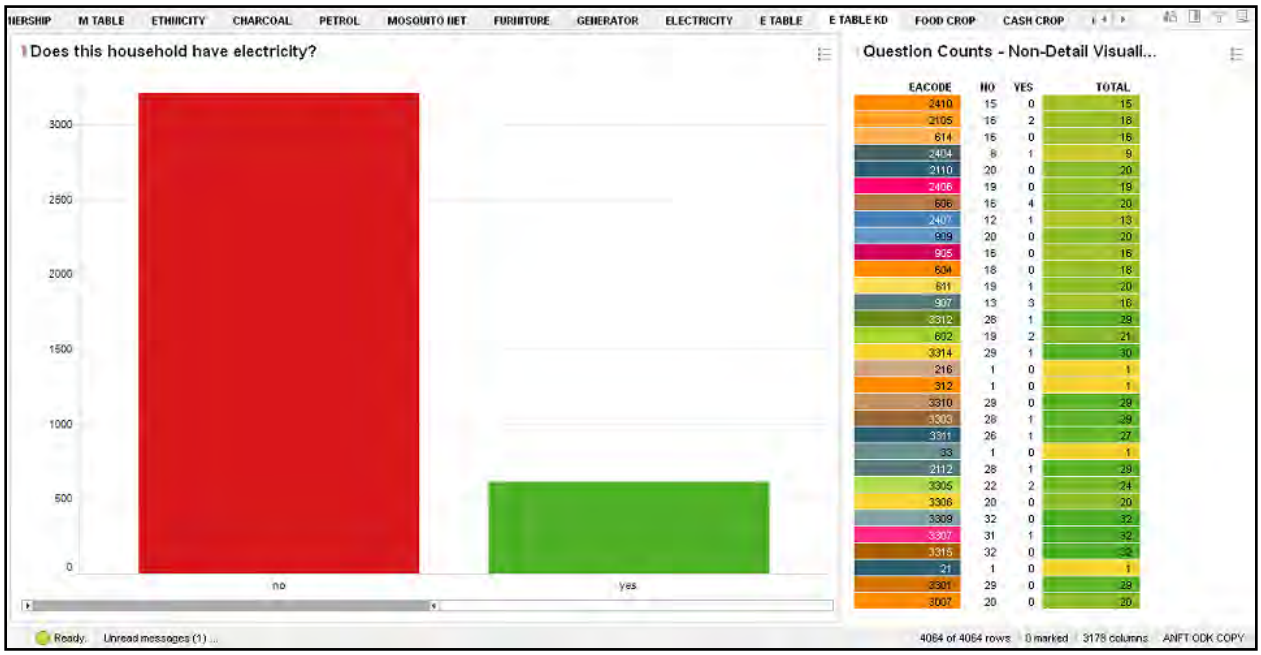
Once data were collected, the next step was to upload the data via ODK Aggregate, after which the QA analysis team would conduct data QA and cleaning prior to analysis. The data-cleaning process was to ensure that the data collected were complete and the information provided would be acceptable for analysis as well as to provide immediate feedback to the field to rectify any inaccuracies with the data collected.

Once the data were uploaded securely to the server, the QA analysts ensured that all data-related e-mails from the supervisors were properly organized and that all data had been downloaded. Through a real-time framework, the team leveraged technology to provide more timely access to data. Data were uploaded from ODK to Spotfire,[29] which allowed the team to create visual displays (dashboards) that were consolidated and arranged on a single screen so the information could be monitored at a glance. For example, using dashboards, the QA team was able to identify the number of surveys produced in a day and whether there were any anomalies in the data received. The presence of data in the dashboard reduced the amount of time that was needed to conduct QA activities, meaning that the survey-implementation team members received feedback quickly and were able to make corrections needed prior to leaving an EA. Exhibit 15, below, provides screenshots produced from the dashboard for various data queries.

[29] Spotfire is a statistical analysis software platform.

Exhibit 15. Sample Dashboard Display Screen for Queries





The QA analysts verified that the expected number of surveys had been collected by each team according to the numbers provided by the supervisors for a set day and confirmed this information by reviewing the survey field-operations master spreadsheet. The QA analysts visually scanned the EA codes and household codes to identify the presence of any anomalies. For example, EA code entries that were longer than four digits, EA code entries that did not match the list of codes for the 120 selected EAs, or gaps in the household codes (e.g., missing household numbers) were all flagged as anomalies and were addressed

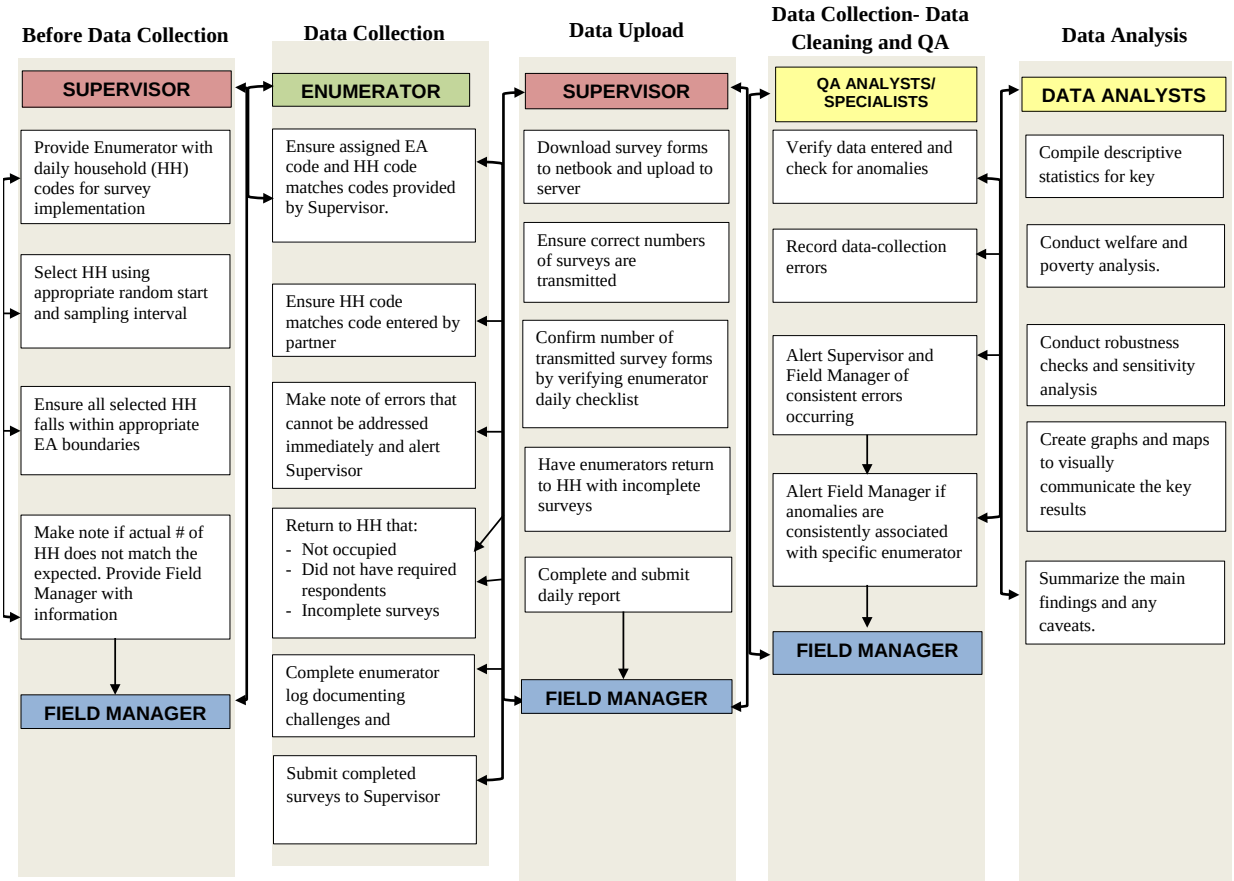
by the QA analysis team. Upon completion of the initial QA checks, a more detailed QA analysis was conducted as described in the next section.

A QA specialist conducted an in-depth analysis of data received upon completion of survey implementation in each EA (every 3 days). The tasks for the QA specialist included:

- Plotting the geo-tags on maps of the EAs and satellite imagery to measure sampling quality.
- Analyzing the time stamps on the surveys to identify enumerators who may have provided low-quality survey data. These enumerators were identified by computing the average amount of time spent per question on each of the three survey parts and then identifying "outlier" enumerators who consistently took an unusually short amount of time to complete questions. This process was made possible through the use of a dashboard that provided statistics on average survey times and number of responses according to each enumerator and supervisor.

If outliers were identified, the surveys associated with those enumerators were carefully reviewed to assess whether the survey responses were plausibly accurate. Methods of judging the plausibility of the answers included comparing (1) the average number of household members in surveys conducted by the "outlier" enumerator versus the average number across the entire dataset, (2) the average number of items recorded in the household-consumption module compared to the average across the dataset, and (3) the consumption of key items, such as water and rice, compared to the entire dataset.

Exhibit 16. QC methods and staff assigned



Data-Cleaning Processes

The approach to QA involved the following:

- **Merging modules:** It was essential to ensure that all relevant survey modules were present for a survey to be determined as complete. The survey was divided into three modules, with Module 2 delivered to both the primary and secondary respondent when appropriate.[30] Depending on household composition, up to four survey module files were required for the survey to be marked as complete.

- **Data integrity (analysis):** Data integrity was the second part of the completeness criteria. Analyzing the sample list of questions provided information regarding whether (1) the results conformed to the survey skip patterns and (2) the results were consistent within a given context, such as geographic breakdown. For example, respondents were asked about participating in cash-crop agriculture; analysis revealed a greater prevalence in rural areas, which demonstrated that survey data were consistent within the Liberian context.

- **Skip patterns:** QA analysts also investigated questions that triggered skip patterns and had missing responses. This was perhaps the most difficult step in the process, because it involved proficiency with if-then statements, given the length of the survey. This analysis was conducted through processes including making sure that follow-up questions were answered for any question that triggered a skip pattern and prompted a respondent to answer "Yes" to the question.

- **Survey-location verification:** High-quality sampling was characterized by (1) the surveys' being located inside the appropriate EA and (2) the surveys' being spread among all the houses located in the EA. The sample selection was implemented by the survey supervisors, who used GPS-enabled tablets to locate the boundaries of the EA and the random start/sampling interval to select houses with the proper coverage. The quality of the sampling was measured by plotting the GPS coordinates of the survey over a map of the EAs, and then analyzing the spatial patterns through a Geographic Information System (GIS). A high percentage of surveys conducted outside the EA or unusual grouping patterns would indicate problems with the sampling.

- **Survey-time verification:** The surveys were detailed and time-intensive. The length of time required for a high-quality survey varied from survey to survey (due to skip sequences) and enumerator to enumerator (due to personal differences). Despite this variation, it was possible to put a minimum threshold on the time required for a high-quality survey by looking at the distribution of survey times among all the enumerators. The survey software automatically recorded the start and end times of the survey enumeration. By looking at the average time required and the standard deviation, it was possible to identify outliers, enumerators who took too little or too much time to complete the surveys. If particular enumerators were repeatedly identified as outliers, their supervisors would intervene with additional instruction or closer supervision.

[30] Survey Module 2 was delivered to the primary and secondary respondents in households that contained both male and female adults.

- **Outliers in the survey responses:** The survey focused heavily on the amount of goods purchased by a household and the prices paid for those goods. A high-quality survey was characterized by responses that were appropriate within the given context, given the nature of the goods. For example, a bag of rice might cost US$50; it would not cost US$500. As the survey results were compiled, unusual and inappropriate responses were identified by computing average values and standard deviations of the responses and then identifying outliers. If many outliers were found in surveys conducted by particular enumerators, their supervisors intervened.

Data Management

All staff members were required to adhere by Optimal's standard operating procedures (SOPs) for ensuring data quality and management. Optimal used secured servers and industry-standard methods, such as firewalls, monitored access logs, virus protection, encrypted connections, password-protected accounts, and user-authentication mechanisms, to ensure the confidentiality of the survey design, test data, and subsequent analyses.

VIII. DATA-ANALYSIS METHODOLOGY

The FtF baseline survey was conducted to identify and analyze data collected within the following criteria: consumption, poverty, hunger, and women's empowerment. Each of these indicators was a composite that drew from numerous survey questions. The consumption and poverty measures, for example, drew from more than 1,300 questions relating to 218 commonly used items in Liberia. The code used to create these indicators is included with the datasets. The subsequent sections provide descriptions of the methods used to develop the main criteria for the FtF survey findings. Appendix H provides a reference sheet that explains the overall methodology for conducting data analysis for each indicator.

Consumption Aggregate

The consumption aggregate was a summation of all household expenditures. The index was created following the instructions in Angus Deaton and Salman Zaidi's (2002) "Guidelines for Constructing Consumption Aggregates for Welfare Analysis." Consistent with these guidelines, expenditures on education, health, public goods, insurance, and other fees have been excluded from the consumption aggregate.

Household expenditures included a variety of dissimilar items, purchased at various intervals, in various units. The primary challenge for compiling the consumption aggregate was to standardize the quantities and currencies involved and compute a daily expenditure estimate. Different classes of goods (e.g., food, housing, etc.), therefore, had to be handled differently.

The following steps were completed for each consumption item, excluding durable goods and housing. First, the amounts purchased and used were converted into standard units—either kilograms, gallons, or pieces. Costs for these items could be reported either in Liberian dollars or US$, so all purchases were converted into US$ to allow for uniform comparisons across individual family consumption. Second, the unit prices were computed by dividing expenditures in US$ by the amount consumed. Third, the amount consumed per day was computed by dividing the standardized amount consumed by the number of days in the reference period (for example, the reference period for food items was 7 days). Fourth, daily expenditures were computed by multiplying the amount consumed per day by the unit price. This was the key value that was used to compile the consumption index. Fifth, the median unit price for the good was computed for the specific EA where the survey was conducted as well as the overall median price. These median prices were used to clean outliers, discussed below.

For durable goods, the current value of the good was divided by the age of the item, measured in days, to attain the daily welfare component (equivalent to the daily expenditure value, above). This method assumes that, on average, durable goods have been used for ½ of their total lifespan. This assumption follows the recommendations in Deaton and Zaidi (2002).

For housing, the daily rental equivalent was computed by dividing the amount of monthly rent paid by 30. If the family did not pay rent, the estimated amount of rent that could be charged was divided by 30. This produced an amount analogous to the daily expenditure value.

Correcting for Outliers

Incorrect price information could have a big impact on consumption estimates. To increase the reliability of the consumption measure, outliers were removed from the data according to procedures described in Deaton and Zaidi (2002).

Correcting for outliers involved a three-step process. First, unit prices greater than two standard deviations above the mean price for the item were identified. Second, those prices were replaced by the median price for the EA. Third, the family's daily expenditure for the item was recomputed using the median price.

Aggregating the Expenditures

Total daily household expenditure (the variable *xh* in the Survey_CPH_Data.csv dataset) is the sum of the daily expenditure values of all goods. Subcategories of consumption were computed by taking the sum of expenditures on food, water, nonfood items, durable goods, and housing. In the Survey_CPH_Data.csv dataset, these subcategories are identified by the variables *food.d*, *waterspend.d*, *nonfood.d*, *durables.d*, and *housing.d*, respectively.

Adjusting for Cost-of-Living Differences

The Paasche Index adjusts for cost-of-living differences and was computed in five steps, following the instructions in Deaton and Zaidi (2002).[31] First, the share of household budget allocated to each good was computed by dividing the daily expenditure value for the good by total household consumption. Second, the share of budget allocated to the good was multiplied by the median unit price for the good and then divided by the unit price paid by the household.[32] Third, this value was summed for all goods. Fourth, the inverse of this summation was computed, yielding the Paasche Index. Finally, total household consumption (*xh*) was divided by the Paasche Index to get adjusted household consumption (the variable *uh* in the Survey_CPH_Data.csv dataset).

Poverty

Poverty was defined as per-capita consumption of less than US$1.25 per day in constant 2005 US$. It was necessary to adjust this poverty level to account for differences in purchasing-power parity between counties as well as changes in the consumer price index over time. By coincidence, the adjusted 2012 poverty threshold in Liberia corresponded to US$1.25 in current US$.

The variable poverty in the Survey_CPH_Data.csv dataset is a binary variable that equals 1 if adjusted per-capita expenditures were less than US$1.25 and equals 0 otherwise. Adjusted per-capita expenditure was computed by dividing adjusted household consumption by the number of household members.

[31] For more detailed information and codes, see the dataset documentation
[32] If the unit price paid by the household was flagged as an outlier, the median price of the good in the EA was used instead.

Hunger Index

The Hunger Index was based on three yes-or-no questions:

- In the past 4 weeks, was there ever no food to eat of any kind in your house because of a lack of resources to get food?
- In the past 4 weeks, did you or any household member go to sleep at night hungry because there was not enough food?
- In the past 4 weeks, did you or any household member go a whole day and night without eating anything at all because there was not enough food?

If the respondent answered "yes" to any one of these questions, he or she received a follow-up question: "How often did this happen in the past 4 weeks?" The response options for the follow-up were as follows:

- Rarely (1–2 times)
- Sometimes (3–10 times)
- Often (more than 10 times)
- Decline to Answer/No Response

The responses were then scored to create the Hunger Index. A "yes" answer followed by "often" received two points, while a "yes" answer followed by "sometimes" or "rarely" received one point. A "no" or "decline to answer/no response" answer received zero points.

Adding up these scores resulted in a scale from zero to six. A score of two or higher qualified as "Moderate to Severe Hunger." For more information on the Hunger Index, see Terry Ballard et al. (2011), "Household Hunger Scale: Indicator Definition and Measurement Guide."

Women's Empowerment in Agriculture Index

Women play a prominent role in agriculture and because of the persistent economic constraints they face, women's empowerment is a main focus of the Feed the Future (FtF) initiative and empowering women is particularly important to achieving the FtF objective of inclusive agriculture sector growth. The Womens' Empowerment in Agriculture Index (WEAI) was developed to track the change in women's empowerment levels that occurs as a direct or indirect result of interventions under FtF.

The WEAI indicators drew from several dozen questions in Module 2 of the survey. Instructions for computing the WEAI statistics can be found in the USAID presentation "Calculating the Women's Empowerment Index," which is included with the datasets for reference. For most households, the WEAI survey was administered to one female and one male adult. In female no male adult households, the WEAI survey was administered to a female adult. The WEAI survey was not administered if the household did not include any female adults.

The WEAI measures the empowerment, agency, and inclusion of women in the agriculture sector in an effort to identify and address the constraints that limit women's full engagement in the agricultural sector. The WEAI is composed of two sub-indices: the Five Domains of Empowerment sub-index (5DE) measures the empowerment of women in five areas, and the Gender Parity sub-index (GPI) measures the

average level of equality in the empowerment of men and women within the household. The WEAI is an aggregate index reported at the ZOI level and is based on individual-level data on men and women in the same household and data on women living in households with no adult male.

Exhibit 17. Indicators of the WEAI

Domain (each weighted 1/5 of 5DE sub-index)	Definition of Domain	Indicators	Weight of indicator in 5DE sub-index
Production	Sole or joint decision-making over food and cash-crop farming, livestock, fisheries, and autonomy in agricultural production	Input in productive decisions	1/10
		Autonomy in production	1/10
Resources	Ownership, access to, and decision-making power over productive resources such as land, livestock, agricultural equipment, consumer durables, and credit	Ownership of assets	1/15
		Purchase, sale or transfer of assets	1/15
		Access to and decisions on credit	1/15
Income	Sole or joint control over income and expenditures	Control over use of income	1/5
Leadership	Membership in economic or social groups and comfort in speaking in public	Group member	1/10
		Speaking in public	1/10
Time	Allocation of time to productive and domestic tasks and satisfaction with the available time for leisure activities	Workload	1/10
		Leisure	1/10

An individual is considered empowered if he or she achieves "adequacy" in 80 percent or more of these 10 subdomains. For example, an individual demonstrates adequacy in the Income domain if he or she participates in productive activities and has input into how the income from these activities is spent (input that is limited to minor household expenses is not sufficient). Scores for each of the 10 subdomains can be found in the Survey_WEAI_Data.csv dataset. A weighted sum of these subdomains creates an "empowerment score" ranging from 0 to 1.

Several indices are related to WEAI. The Five Domains of Empowerment (5DE) score was computed as follows:

$$5\text{DE} = H_e + H_n(A_a)$$

where H_e is the percentage of women who are empowered, H_n is the percentage of women who are *not* empowered, and A_a is the percentage of dimensions in which disempowered women have adequate achievements. The 5DE score ranges from zero to one, where higher values indicate greater empowerment.

The WEAI also measures gender parity. A female respondent is considered to have gender parity if her empowerment score is equal to or greater than the empowerment score of the male respondent in her household. In most cases, these are husband and wife, but they can also be the primary male and female decision-maker regardless of their relationship. For households that have not achieved gender parity, the GPI shows the gap that needs to be closed for women to reach the same level of empowerment as men. Households without a primary adult male are excluded from this measure, and thus the aggregate WEAI uses the mean GPI value of dual-adult households. The Gender Parity Index (GPI) is computed as follows:

$$\mathrm{GPI} = 1 - H_w(R_p)$$

where H_w is the percentage of women without gender parity in their households, and R_p is the average empowerment gap between women compared with men in their households.

The total WEAI score combines the 5DE and GPI as follows:

$$\mathrm{WEAI} = 0.9(\mathrm{5DE}) + 0.1(\mathrm{GPI})$$

Robustness Tests and Sensitivity Analysis

Once the data-analysis processes were concluded, the final step was to conduct robustness tests and sensitivity analyses. The conclusions from a survey are more persuasive if the results of the analysis do not dramatically change when some surveys are excluded or some measures are slightly altered. For this survey, robustness tests involved recalculating the results while excluding surveys from certain enumerators or survey teams, or from surveys that were flagged as potentially low quality. Further, regression models with fixed effects for enumerators and survey teams were run for each of the main results to measure whether enumerator or team effects had a significant impact. The results proved to be robust to all these tests.

A sensitivity analysis was also conducted for the poverty data. Ideally, small changes in the poverty threshold—increasing the threshold from US$1.25 to US$1.30, for example—produce small changes in the poverty estimate. The poverty figures would not be reliable if small changes produced wildly different estimates. For this survey, the poverty estimate changed only slightly with small changes to the poverty threshold, as expected. The results were not sensitive to specification.

The survey results section, below, provides tables, maps, and findings of these indicators from the analyzed data.

Limitations and Mitigation Strategies for Data Analysis

The majority of questions in the FtF baseline survey required respondents to state the prices and amount consumed for goods over various recall periods. This dependence on recall comprised the primary limitation when analyzing the survey data.

Recalled information affects survey results in two ways. First, recalled information is “noisier” due to the difficulty of remembering exactly how much of a particular good was consumed over the past week, month, or three-month period. The amount of noise depends on both the length of the recall period and the characteristics of the item involved.

Second, recalled information potentially has systematic biases. Respondents may have underreported the amount consumed of a certain item because it was difficult to remember all the times when any member of the household consumed that item. Some respondents also underreport information in the belief that they would secure aid or other assistance by demonstrating poverty. It is also conceivable that certain items were over-reported. Because these biases are impossible to identify from the survey data, the analysis followed standard practice and assumed that no systematic bias exists.

The limitations created by recalled information were mitigated as much as possible through an outlier analysis in which unusually high price reports were replaced by median price values. Unfortunately, it was not possible to identify or adjust for unusually low consumption levels, due to the variation in quantities and types of goods consumed among families.

Estimating the variance was straightforward for individual items, but decidedly more complicated for the consumption and poverty indicators, which combined data from hundreds of individual items. Even the most advanced statistical packages are likely to under-estimate the true variances of these measures. As a result, it was not possible to construct 95% confidence intervals for the composite indices. The consumption and poverty estimates, however, remain valid.

IX. SURVEY RESULTS

The survey results fell into five main categories: demographics, consumption, poverty, hunger, and women's empowerment. ***Unless otherwise noted, all statistics pertaining to Montserrado do not include the greater Monrovia metropolitan area.***

Demographics

The most recent population figures for Liberia were produced for the 2008 national census. The FtF Liberia PBS data generated updated estimates of the country's demographics. The demographic analysis provided overall estimations of population in the areas surveyed as well as population breakdown by the categories of people most important to the FtF initiative (see Exhibit 18 below).

Overall Demographics Results

Exhibit 18. Survey Data for Demographics Results

	Household Samples	Surveys Completed	Response Rate	Household Size
Bong	359	356	0.99	4.8
Grand Bassa	198	198	1	5
Lofa	269	261	0.97	4.8
Margibi	178	176	0.99	4.9
Monrovia	882	807	0.91	4
Montserrado	136	134	0.99	5.3
Nimba	541	540	1	5.2
Unknown	94	7	0.07	NA
Outside Monrovia	1,681	1,665	0.99	5
Total	2,657	2,479	0.93	4.6

Survey Population Results

Exhibit 19, below, displays the changes in estimated population identified from the survey findings as compared to the 2008 national census data.

Exhibit 19. Estimated Population in USG-Assisted Areas

	Population (Survey Est.)	Population (2008 Census)	Percent Increase
Bong	395,220	333,481	18.51
Grand Bassa	248,167	221,693	11.94
Lofa	237,351	276,863	-14.27
Margibi	220,010	209,923	4.81
Montserrado and Monrovia	1,051,427	1,118,241	-5.97
Nimba	484,979	462,026	4.97
Total	2,637,156	2,622,227	0.57

The changes in estimated population suggested large increases in population for Bong and Grand Bassa counties and steep declines in population for Lofa and Montserrado. None of these findings, however, is statistically significant at the 95 percent confidence level.

Of particular interest to the broader FtF program was the composition of households in Liberia. Households were classified in one of four ways, based on the gender of adults belonging to the household: male and female adults, male no female adults only, female no male adults only, and children only. The survey sampling did not identify any child-only households. Exhibit 20 below, estimates the number of households of each type within the survey area, with 95 percent confidence intervals.

Exhibit 20. Estimated Households in USG-Assisted Areas

	Total			Excluding Monrovia		
Household Type	Population Estimate	95% Confidence Low	High	Population Estimate	95% Confidence Low	High
All	563,793	486,979	640,707	361,965	323,430	400,501
Female no Male Adult	241,366	214,383	268,350	141,558	118,259	164,857
Male no Female Adult	107,039	88,938	125,141	74,357	58,859	89,856
Male and Female Adult	214,678	183,657	245,700	145,855	117,478	174,232
Child no Adults	NA	NA	NA	NA	NA	NA
Unknown	707	0	1,515	194	0	574

NOTE: No child-only households were sampled in this survey.

Interestingly, the survey estimated female no male adult households to be the most common type of household in Liberia, followed by households with both male and female adults. Only 19 percent of the households in the survey area were households with male no female adults.

Exhibit 21 below, estimates the total population in the surveyed area, according to household type.

Exhibit 21. Population by Household Type in USG-Assisted Areas

	Total			Excluding Monrovia		
Household Type	Population Estimate	95% Confidence Low	High	Population Estimate	95% Confidence Low	High
All	2,637,156	2,229,796	3,046,212,	1,811,516	1,581,621	2,041,411
Female no Male Adult	1,057,958	926,499	1,189,418	661,649	547,047	776,250
Male no Female Adult	370,327	298,536	442,119	282,916	216,558	349,274
Male and Female Adult	1,204,551	1,004,760	1,404,342	865,008	682,163	1,047,854
Child no Adults	NA	NA	NA	NA	NA	NA
Unknown	4,317	0	10,331	1,942	0	7,030

NOTE: No child-only households were sampled in this survey.

Although female no male adult households were more common, this table estimates that a greater percentage of the population lived in households with both male and female adults. This discrepancy arises because households with female no male adults contained fewer members, on average, than households with both male and female adults. An estimated 46 percent of the population in the survey area lived in households with male and female adults, 40 percent of the population lived in female no male adult households, and only 14 percent lived in male no female adult households.

The FtF survey collected data on children, given that one of the goals of the FtF program is improving child welfare. Children and infants tend to be particularly vulnerable to food insecurity and poverty-related health issues.

Exhibits 22 and 23 provide data on children under 5 years and infants (children under 2 years). The survey found that the former comprised an estimated 16 percent of the population, with approximately 51 percent of households having at least one child in this age range. Children under 2 years were an estimated 5 percent of the population in the survey area, and 23 percent of households in the survey area included at least one child under 2 years of age.

Exhibit 22. Children under 5 years in USG-Assisted Areas

	Total			Excluding Monrovia		
	Population	95% Confidence		Population	95% Confidence	
Gender	Estimate	Low	High	Estimate	Low	High
All	431,176	383,934	478,418	319,585	276,045	363,125
Male	205,447	181,596	229,299	150,530	129,675	171,384
Female	215,789	188,301	243,277	162,672	137,050	188,294
Unknown	9,938	0	13,698	6,383	0	9,498

NOTE: No child-only households were sampled in this survey.

Exhibit 23. Children under 2 years in USG-Assisted Areas

	Total			Excluding Monrovia		
	Population	95% Confidence		Population	95% Confidence	
Gender	Estimate	Low	High	Estimate	Low	High
All	140,347	122,017	158,677	101,999	85,312	118,686
Male	63,749	53,656	73,843	44,821	36,088	53,554
Female	68,620	57,349	79,891	52,040	41,735	62,344
Unknown	7,976	0	11,147	5,137	0	7,838

NOTE: No child-only households were sampled in this survey.

A central focus of the FtF program is to increase the economic empowerment of women ages 15-49. Exhibit 24 below, estimates the population of this demographic group.

Exhibit 24. Women ages 15–49 years in USG-Assisted Areas

	Population	95% Confidence	
Location	Estimate	Low	High
All	627,920	555,435	700,406
Urban	367,023	313,831	420,215
Rural	260,896	231,367	290,426

Nearly two-thirds (66 percent) of Liberian households included at least one adult woman age 15 to 49. A majority of these women (58 percent) lived in urban areas, reflecting the general urbanization of Liberia.

Exhibit 25. Household composition in USG-Assisted Areas

	#HH Members	Std Dev	# Females	Std Dev	# Children (0-59 months)	Std Dev	# Children (0-23 months)	Std Dev	# Children (5-17 years)	Std Dev	# Children Currently Attending School(5-17 years)	Std Dev	n Unweighted
All Households	4.68	0.11	2.42	0.07	0.76	0.03	0.25	0.01	2	0.05	1.61	0.06	2,469
Type of Household													
Male and Female Adult	5.61	0.14	2.93	0.08	0.88	0.04	0.28	0.02	2.21	0.08	1.78	0.09	934
Female Adult Only	4.38	0.12	2.38	0.07	0.75	0.03	0.27	0.02	2.00	0.07	1.67	0.07	1,047
Male Adult Only	3.46	0.16	1.51	0.10	0.56	0.06	0.14	0.02	1.60	0.10	1.10	0.08	388
Child Only	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0

Exhibit 25 above, shows that the number of children and the rate of school attendance is similar for female adult only households and households containing both male and female adults. Households with only male adults, on average, contain fewer children.

Exhibit 26. Dwelling characteristics in USG-Assisted Areas

	Dwelling Characteristics				Water and Sanitation				
	# Rooms	Std Dev	Electricity	Std Dev	% HH Using Improved Water Source	Std Dev	% HH Using Improved Sanitation Facilities	Std Dev	n Unweighted
All Households	3.6	2.2	0.15	0.36	0.72	0.45	0.22	0.42	2,476
Type of Household									
Male and Female Adult	3.8	2.3	0.16	0.37	0.68	0.47	0.21	0.41	938
Female Adult Only	3.6	2.2	0.16	0.37	0.78	0.41	0.24	0.42	1,048
Male Adult Only	3.2	1.9	0.12	0.33	0.69	0.47	0.21	0.41	490
Child Only	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0

Exhibit 26 describes the prevalence of electricity and sanitation in USG-assisted areas, which is very low for all household types. Only 15 percent of households in the survey area have access to any electricity, and only 22 percent of households have access to improved sanitation facilities, such as a ventilated improved pit latrine ("VIP" latrine). A much higher percentage of the sample (72 percent) has access to improved water sources, which includes protected wells and communal taps.

Exhibit 27. Roof Type in USG-Assisted Areas

	Concrete	Zinc	Tarpaulin	Thatched	Other	n Unweighted
All Households	3.6	2.2	0.15	0.36	0.72	2,476
Type of Household						
Male and Female Adult	3.8	2.3	0.16	0.37	0.68	938
Female Adult Only	3.6	2.2	0.16	0.37	0.78	1,048
Male Adult Only	3.2	1.9	0.12	0.33	0.69	490
Child Only	N/A	N/A	N/A	N/A	N/A	0

Exhibit 27 describes the various types of roofing material observed during the survey. Zinc is considered a high-quality roofing material and was observed on 79 percent of the households selected for the survey. Tarpaulin is the lowest quality roofing material and was observed on only 1 percent of households.

Exhibit 28. Wall Type in USG-Assisted Areas

	Earth/Mud	Concrete/Flag Stone/ Cement	Tile/Brick	Wood	Thatched	Zinc	Other	n Unweighted
All Households	0.48	0.37	0.07	0.01	0.01	0.05	0.02	2,564
Type of Household								
Male and Female Adult	0.52	0.32	0.08	0.01	0.01	0.04	0.01	936
Female Adult Only	0.43	0.4	0.07	0.01	0	.07	0.02	1,048
Male Adult Only	0.56	0.34	0.05	0	0.01	0.03	0.01	490
Child Only	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0

Exhibit 29. Floor Type in USG-Assisted Areas

	Earth/Mud	**Concrete**	**Tile**	**Wood**	**Other**	**n Unweighted**
All Households	.45	.50	.03	.00	.01	2,566
Type of Household						
Male and Female Adult	.47	.48	.04	.00	.01	938
Female Adult Only	.42	.54	.02	.00	.01	1,047
Male Adult Only	.53	.41	.04	.00	.01	490
Child Only	N/A	N/A	N/A	N/A	N/A	0

Exhibits 28 and 29 describe the various types of wall and floor materials observed during the survey. These results show a clear urban-rural divide, with mud and earth-based materials being common in rural

areas, while cement walls and floor were more common in urban areas, as expected. There are no notable differences in housing materials between the various types of households.

Exhibit 30. Cooking Fuel Type in USG-Assisted Areas

	Electricity	Kerosene	Charcoal	Firewood	Animal Dung	Other	n Unweighted
All Households	.00	.00	.48	.51	.00	.00	2,473
Type of Household							
Male and Female Adult	.00	.00	.44	.55	.00	.00	936
Female Adult Only	.00	.00	.56	.43	.00	.00	1,046
Male Adult Only	.00	.00	.37	.62	.00	.00	489
Child Only	N/A	N/A	N/A	N/A	N/A	N/A	0

Exhibit 30 shows the various types of cooking fuel used by Liberian households. Most households show a fairly even split between charcoal and firewood, although male adult only households show a clear preference for firewood.

Consumption

The results pertaining to consumption, poverty, and hunger compiled responses from as many as 1,300 survey questions (refer to Appendix F for variables used to calculate consumption). Total household consumption summed the daily value of all items consumed in the household. This figure was then adjusted for cost-of-living differences across the survey area using the Paasche Index (refer to the section on data-analysis methods for more information). Exhibit 31 below, illustrates the total amount consumed each day by Liberian households according to survey responses. The adjusted total is the best estimate for the household's living standard, measured in US$/day. Consumption in various categories—food, housing, non-food items, durables, and water—is also displayed.

Exhibit 31. Household expenditures (US$/day) by County

	Adj. Total	Total	Food	Housing	Non-Food	Durables	Water	Paasche Index	Household Size
Bong	7.28	10.49	3.15	2.59	3.14	1.60	0.00	1.38	4.8
Grand Bossa	6.54	8.81	2.82	2.43	2.80	0.75	0.01	1.61	5
Lofa	6.60	7.55	2.35	1.67	3.01	0.52	0.01	1.32	4.8
Margibi	8.07	12.97	4.30	2.02	3.10	3.55	0.00	1.52	4.9
Monrovia	15.42	30.11	7.54	9.11	6.51	6.72	0.23	1.95	4
Montserrado	9.95	14.76	4.93	3.52	4.91	1.40	0.01	1.53	5.3
Nimba	5.42	7.23	2.42	1.40	2.75	0.66	0.00	1.42	5.2
Outside Monrovia	7.15	10.03	3.22	2.23	3.21	1.37	0.00	1.45	5
Total	10.37	17.83	4.90	4.88	4.50	3.46	0.10	1.65	4.6

NOTES: Numbers are for entire household (not percaita). Adjusted total consumption is calculated by dividing total consumption by Paasche cost-of-living index. See Deaton and Zaidi. ND. "Guidelines for Construction Consumption Aggregates for Welfare Analysis."

The most striking result was the dramatically higher consumption rate among households in Monrovia. On average, food consumption in Monrovia was 134 percent higher than outside the city. Housing costs were more than 300 percent higher. Although households in the capital spent an average of US$0.23 per day on water, households outside the city acquired water at no cost.

These differences were not entirely surprising, given that Monrovia residents did not typically produce their own food and thus had to purchase imported food or food that has been transported from the countryside, resulting in higher costs. The high population density in the city increased the cost of housing when compared to villages. Households in Monrovia also owned more durable goods, which increased their estimated consumption.

Exhibit 32. Household Expenditures (US$) of USG-targeted beneficiaries (unweighted)

		Quartiles				Deciles		
	Mean	1	2	3	4	Top	Bottom	n
All Households	9.74	3.97	7.09	11.86	173.97	18.95	2.32	2,467
Type of Household								
Male and Female Adult	10.28	3.84	7.37	12.96	110.13	22.03	2.21	920
Female Adult Only	9.6	4.58	7.5	11.7	165.51	18.36	2.55	1,022
Male Adult Only	9.08	3.3	5.92	10.28	173.95	16.28	2.14	477
Child Only	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0

Exhibit 32 shows the distribution of household expenditures. Male adult only households generally demonstrate lower consumption than other household types, although Exhibit 33, below, reveals that this pattern is reversed when per capita consumption is considered.

Exhibit 33. Per-Capita Daily Expenditures in USG-Assisted Areas

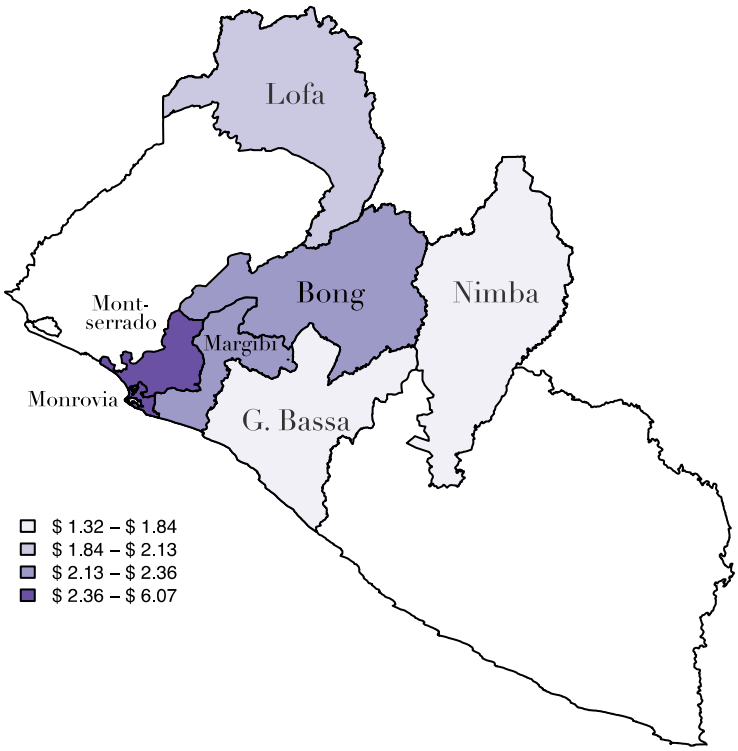
	Total			Excluding Monrovia		
Household Type	Avg. Consumption (US$/day)	Household Size	Population (Est.)	Avg. Consumption (US$/day)	Household Size	Population (Est.)
All	3.55	4.7	2,440,195	1.95	5.0	1,612,426
Female no Male Adult	3.35	4.4	963,881	2.22	4.7	574,466
Male no Female Adult	5.02	3.5	349,239	2.33	3.9	260,294
Male and Female Adult	2.84	5.6	1,111,698	1.51	5.9	774,995
Child no Adults	NA	NA	NA	NA	NA	NA
Unknown	7.84	1.3	15,375	2.61	2.9	2,669

NOTE: No child-only households were sampled in this survey.

Perhaps surprisingly, households that included both male and female adults exhibited the lowest per-capita consumption. Households with male no female adults exhibited the highest per-capita consumption. Although households with male and female adults had 60 percent more people, on average, than male no female adult households, total household consumption was 10 percent less. Households with female no male adults fared slightly better than households with both male and female adults. Per-capita consumption in female no male adult households was 18 percent higher compared to households with male and female adults, although total household consumption was 7 percent lower.

Exhibit 34 below, depicts differences in per-capita consumption across the survey area. Outside Monrovia, the highest consumption is observed in neighbouring areas of Montserrado County. Consumption generally decreases with distance to the capital city, although remote Lofa County displays slightly higher consumption, on average, than Nimba or Grand Bassa.

Exhibit 34. Map of Per-Capita Daily Expenditures



These consumption patterns provided an interesting addition to the population estimates. The lower levels of consumption in Nimba and Grand Bassa can be partially explained by the increased population in these counties: If population increased faster than the economic opportunities available, household consumption declined.

Although consumption estimates provide a good indicator of a household's welfare, these estimates can be misleading when aggregated at the population level. In unequal societies, high average consumption could obscure high levels of poverty. Male no female adult households, for example, may exhibit higher consumption, on average, than other household types, while simultaneously displaying high levels of poverty. The next section examines households at the lowest rungs of the economic ladder by analyzing poverty.

Poverty

Poverty is defined as per-capita consumption of less than US$1.25 per day and thus follows many of the same patterns as the consumption estimates, above. A poverty threshold, however, is better at identifying populations in need than consumption measures, which might be skewed by a small number of wealthy elite. Exhibit 35 depicts the prevalence of poverty in the survey area.

Exhibit 35. Prevalence of Poverty by County

	<$1.25/day
Bong	0.48
Grand Bassa	0.57
Lofa	0.49
Margibi	0.45
Monrovia	0.06
Montserrado	0.35
Nimba	0.63
Outside Monrovia	0.5
Total	0.33

High consumption in Monrovia resulted in an extremely low poverty measure of only 6 percent. Given the fairly low standards of living of many Monrovia residents, this suggests that the US$1.25 threshold may need to be revised to better reflect the needs of urban residents. The fact that only 6 percent of Monrovians consumed less than US$1.25 per day reveals the difficulty of surviving on such limited resources in an expensive and demanding city. The highest levels of poverty were observed in Nimba County, followed by Grand Bassa, which mirror the findings from the consumption estimates.

Exhibit 36, below, examines poverty by household type. Consistent with the consumption estimates, households with both male and female adults exhibited the highest levels of poverty. Contrary to the consumption results, however, female no male adult households fared better than their male no female adult counterparts: 34 percent of male no female adult households lived in poverty, compared to only 28 percent of female no male adult households. Given that households with only male no female adults consumed more, this means that male no female adult households exhibited a more unequal welfare distribution: although some male no female adult households were relatively rich, many more were relatively poor.

Exhibit 36. Prevalence of Poverty by Household Type in USG-Assisted Areas

	Total		Excluding Monrovia	
Household Type	<$1.25/day	Population (Est.)	<$1.25/day	Population (Est.)
All	0.33	2,440,195	0.5	1,612,426
Female no Male Adult	0.28	963,881	0.45	574,466
Male no Female Adult	0.34	349,239	0.48	260,294
Male and Female Adult	0.4	1,111,698	0.57	774,995
Child no Adults	NA	NA	NA	NA
Unknown	0.03	15,375	0.36	2,669

Exhibit 37. Map of Prevalence of Poverty

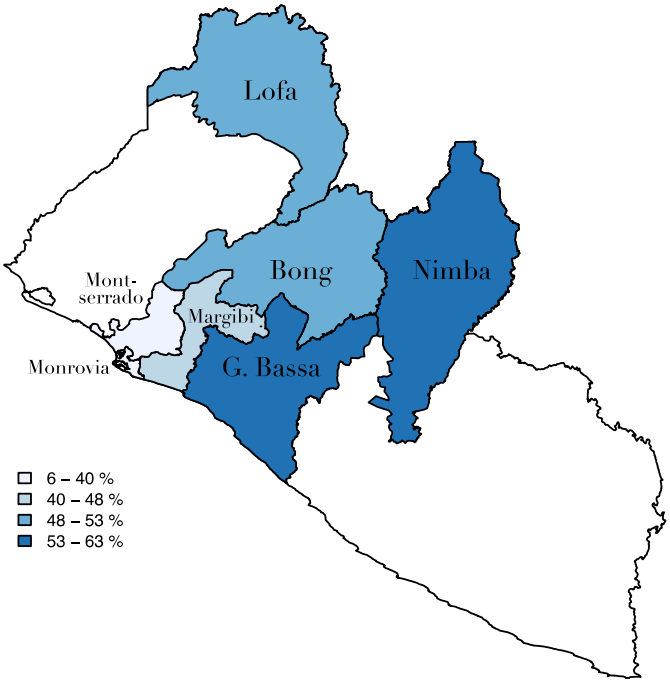


Exhibit 37, above, depicts how poverty varies across the survey area and is consistent with the consumption results. Poverty generally increases with distance to the capital city, although poverty is lower in Lofa County than in Nimba or Grand Bassa.

Hunger

Food security is a central focus of the FtF program. Although the majority of rural Liberian households engage in farming, many are unable to meet their subsistence needs. Moderate to severe hunger is defined in the section on data-analysis methods, above. In general terms, moderate to severe hunger occurs when a family is likely to go without food at least once in a 4-week period. Exhibit 38, below, describes hunger in the survey area.

Exhibit 38. Prevalence of Moderate-Severe Hunger by County

	Moderate-Severe Hunger
Bong	0.43
Grand Bassa	0.46
Lofa	0.36
Margibi	0.48
Monrovia	0.28
Montserrado	0.43
Nimba	0.5
Outside Monrovia	0.44
Total	0.38

High levels of hunger were observed in the poorest counties, Nimba and Grand Bassa, but hunger was even more prevalent in relatively affluent Margibi County. Lower levels of hunger were observed in Lofa County, which is often described as the breadbasket of Liberia.

The most striking result was that 28 percent of families in Monrovia experienced moderate to severe hunger, which is dramatically higher than the 6 percent poverty estimate. This discrepancy suggests that a more appropriate poverty threshold for Monrovia residents is required.

Hunger should be a sufficient, but not necessary, indicator for poverty. If the poverty level were pegged to the 28 percent hunger level, the poverty threshold would be US$2.35 in per-capita daily consumption. A poverty threshold even higher than this could be justified.

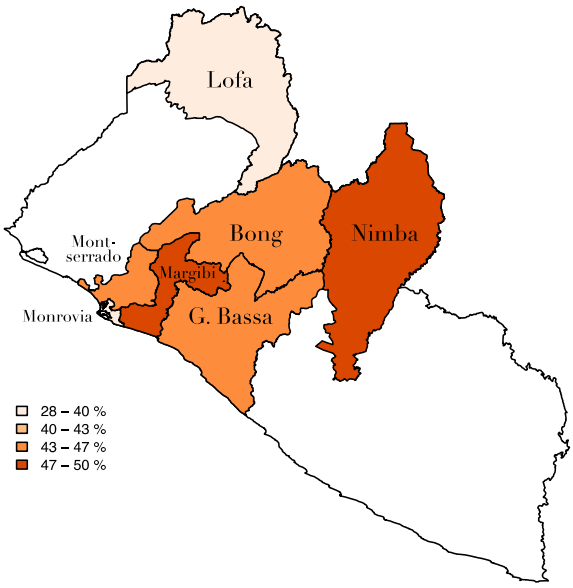
Exhibit 39 below, represents hunger according to household type. Although household types corresponded to differences in consumption and poverty, these differences did not translate to hunger. All household types exhibited similar levels of hunger.

Exhibit 39. Prevalence of Households with Moderate-Severe Hunger in USG-Assisted Areas

	Total		Excluding Monrovia	
Household Type	Moderate-Severe Hunger	Population (Est.)	Moderate-Severe Hunger	Population (Est.)
All	0.38	2,440,195	0.44	1,612,426
Female no Male Adult	0.38	963,881	0.46	574,466
Male no Female Adult	0.39	349,239	0.43	260,294
Male and Female Adult	0.39	1,111,698	0.44	774,995
Child no Adults	NA	NA	NA	NA
Unknown	0.23	15,375	0	2,669

Exhibit 40 below, shows the variation in hunger across the survey area. Hunger is lowest in Monrovia, although still high at 28 percent. Hunger is most prevalent in Margibi and Nimba counties.

Exhibit 40. Map of Prevalence of Moderate-Severe Hunger



Correlates of Poverty and Hunger

Spatial and demographic patterns shed some light on Liberia's situation but provide little insight into the driving factors behind poverty and hunger. Individual characteristics, such as level of education and employment, contribute to household welfare and food security. Exhibit 41, below, illustrates how individual attributes correlate with poverty and hunger. These correlations do not imply causation but reveal some interesting patterns.

Exhibit 41. Individual attributes, poverty, and hunger

		Poverty (%)	Hunger (%)	N	Pop. (%)
Employed	Yes	.41	.36	1,000	.18
	No	.48	.39	4,672	.82
Literate	Yes	.44	.39	2,293	.52
	No	.60	.50	2,141	.48
Bank Acct.	Yes	.13	.20	383	.07
	No	.40	.40	5,257	.93
Farmer	Yes	.71	.41	286	.03
	No	.48	.41	11,124	.97

NOTES: Attributes are based on the individual-level roster data, while poverty and hunger are coded at the household level. The reported differences in poverty and hunger, therefore, are likely to be underestimates of the true difference. "Farmer includes only individuals who reported owning their own farm.

As expected, employment and literacy corresponded to lower levels of poverty and hunger. People with bank accounts were much less likely to be poor or hungry, although this attribute is highly correlated with employment and literacy and thus does not provide much additional information. Perhaps surprisingly, individuals who owned their own farms were *more* likely to be poor than the rest of the population, but no more likely to go hungry.

Because households often included a mix of individuals with different attributes—employed and unemployed, literate and illiterate, etc.—the table underestimates the differences in poverty and hunger. The effect of employment and literacy on poverty and hunger (if such an effect could be identified) is likely to be higher than the differences depicted in the table.

Women's Empowerment in Agriculture Index

The WEAI measures the empowerment, agency, and inclusion of women in the agriculture sector in an effort to identify and address the constraints that limit women's full engagement in the agricultural sector. The WEAI is composed of two sub-indices: the Five Domains of Empowerment sub-index (5DE) measures the empowerment of women in five areas, and the Gender Parity sub-index (GPI) measures the average level of equality in the empowerment of men and women within the household. The WEAI is an aggregate index reported at the ZOI level and is based on individual-level data on men and women in the same household and data on women living in households with no adult male. See the section on data analysis methods for more information on calculating the WEAI.[33]

Exhibit 42, below, lists the 5DE and GPI scores as well as the total WEAI score for Liberia. These scores are comparable to the figures obtained in neighbouring countries, such as Ghana and Senegal. A score of 80% is required for a woman to be considered "empowered", which was achieved by only 30% of female respondents. On average, women demonstrate achievement in 67% of the domains of empowerment.

Exhibit 42. WEAI Indicators

	Baseline value
5DE Index	.66
% of women achieving empowerment (score of .80 or greater)	30
Mean empowerment score for all female respondents	.67
N	483
Mean empowerment score for disempowered women	.57
N	1107

[33] Because the WEAI measures within-household differences among non-randomly selected household members, the standard survey weights are technically incorrect and may produce misleading estimates. As a result, the reported WEAI figures were computed without survey weights. However, nearly all the WEAI values remain identical when recomputed with the survey weights. The only indicator that exhibits any change with the addition of weights is the GPI, which increases by only 0.002.

Exhibit 43. Empowerment by Domain

Domain	Indicator	All		
		% of females achieving indicator	Std Deviation	N
PRODUCTION	Input in productive decisions	49.77	50.01	2170
	Autonomy in production	50.83	50.00	2170
RESOURCES	Ownership of assets	77.97	41.45	2170
	Purchase, sale, or transfer of assets	38.29	48.62	2170
	Access to and decisions on credit	32.72	46.93	2170
INCOME	Control over use of income	85.94	34.76	2170
LEADERSHIP	Group member	72.72	44.55	2170
	Speaking in public	81.89	38.52	2170
TIME	Workload	64.47	47.88	1590
	Leisure	84.60	36.11	1623

Exhibit 43 breaks down the empowerment score by domain. The highest levels of empowerment are observed in the "Leisure" category, wherein women report whether or not they are satisfied with the amount of leisure time available to them. Relatively high percentages of women also demonstrated achievement in ownership of assets, control over income, speaking in public, and group membership. The lowest empowerment is observed with regards to access to and decisions on credit, which reflects the scarcity of credit and financial services in Liberia, especially outside the capital city.

Exhibit 44. Gender Parity Indicators

		Baseline Value	
Domain	**Indicator**	**% of males achieving indicator**	**% of females achieving indicator**
PRODUCTION	Input in productive decisions	66.4***	49.8
	Autonomy in production	60.5***	50.8
RESOURCES	Ownership of assets	86.6***	78.0
	Purchase, sale, or transfer of assets	53.4***	38.3
	Access to and decisions on credit	41.9***	32.7
INCOME	Control over use of income	94.6***	85.9
LEADERSHIP	Group member	80.8***	72.7
	Speaking in public	95.9***	81.9
TIME	Workload	64.7	64.5
	Leisure	84.2	84.6

*** Statistically significant at the 1% level according to a two-sample t-test.

Exhibit 44 above, compares empowerment between men and women. Men were significantly more empowered than women in every category except workload and leisure. For men, the highest levels of achievement were observed in speaking in public and control over the use of income. The lowest achievement levels were observed in the access to credit category.

Exhibit 45. Women's Empowerment by County

Domain	Indicator	Bong			Grand Bassa			Lofa			Margibi			Montserrado (incl. Monrovia)			Nimba		
		% of females achieving indicator	Std Deviation	N	% of females achieving indicator	Std Deviation	N	% of females achieving indicator	Std Deviation	N	% of females achieving indicator	Std Deviation	N	% of females achieving indicator	Std Deviation	N	% of females achieving indicator	Std Deviation	N
PRODUCTION	Input in productive decisions	69.82	45.97	328	65.77	47.61	149	72.62	44.68	252	54.11	50.00	146	21.57	41.16	890	73.83	44.01	405
	Autonomy in production	73.78	44.05	328	73.15	44.47	149	58.73	49.33	252	53.42	50.05	146	23.93	42.69	890	77.28	41.95	405
RESOURCES	Ownership of assets	82.62	37.95	328	75.84	42.95	149	68.65	46.48	252	73.29	44.40	146	77.19	41.98	890	84.20	36.52	405
	Purchase, sale, or transfer of assets	54.27	49.89	328	46.98	50.08	149	49.21	50.10	252	41.10	49.37	146	14.61	35.34	890	66.42	47.29	405
	Access to and decisions on credit	35.06	47.79	328	26.85	44.47	149	36.11	48.13	252	37.67	48.62	146	27.19	44.52	890	41.23	49.29	405
INCOME	Control over use of income	89.94	30.13	328	87.25	33.47	149	87.70	32.91	252	80.14	40.03	146	81.69	38.70	890	92.59	26.22	405
LEADERSHIP	Group member	78.35	41.25	328	74.50	43.74	149	85.32	35.46	252	63.01	48.44	146	62.70	48.39	890	85.19	35.57	405
	Speaking in public	85.67	35.09	328	68.46	46.63	149	78.97	40.83	252	82.19	38.39	146	82.47	38.04	890	84.20	36.52	405
TIME	Workload	50.74	50.12	203	59.26	49.32	135	73.91	44.05	161	70.21	45.98	94	69.93	45.89	685	57.05	49.58	312
	Leisure	84.95	35.84	206	83.21	37.51	137	88.62	31.85	167	79.81	40.34	104	82.01	38.43	695	90.13	29.88	314

Exhibit 45 demonstrates that, overall, Nimba County presents the highest level of empowerment. Women were less empowered than men in every county except Margibi, where men and women shared the same empowerment score. Most striking is the low level of empowerment for both genders in Montserrado. Residents of the county had significantly less input in productive decisions, less autonomy, less ability to purchase or transfer assets, and less access to credit than residents of every other county.

X. APPENDICES

A. Staffing Roles

Human Resources Coordinator

- Drafts/revises job/role descriptions and responsibilities
- Conducts staff assessments in collaboration with the management team
- Recommends assignments for existing staff
- Develops recruitment approach for all positions and leads recruitment efforts

Assignment Coordinator

- Assigns managers and enumerator teams based on the residual number of household surveys in each EA
- Reassigns some portion of enumerators to other EAs within close proximity that may need additional resources to complete the targeted number of surveys within the specified period of time if the manager or enumerator team has or is anticipated to reach target within a week
- Identifies quantity of logistical flag types by time (week), EA, manager, and enumerator
- Lists descriptions of logistical flag type by time (week), EA, and source (enumerator, manager, other)

Data Quality Assurance Analyst

- Develops error flags with survey and sampling methodologist, analysis task leader, and management team
- Monitors error flags by manager and enumerator team as well as challenge reports (data collection, logistical)
- Compiles error flags, challenges, and mitigation strategies; holds nightly briefings with management team and daily morning briefings with managers to share challenges and mitigation strategies
- Manages FAQs and wiki
- Identifies quantity of data-error flag types by time (week), EA, manager, and enumerator
- Inserts supplemental training or staffing changes into analysis to guide effects on data-errors
- Lists descriptions of data errors by error flag type by time (week), enumeration area, and source (enumerator, manager, other)

Training Coordinator

- Analyzes organizational assessment and drafts capacity-development plan; coordinates the delivery of training and modification of organizational strategic plan (if necessary); develops performance metrics for gaps in capacity and regularly updates risk assessment
- Analyzes staff assessments and develops training plans (short and long term) based on staffing needs and staff comparative advantages and preferences for available roles/positions
- Coordinates with the data QA analyst and management team to customize training for in-field managers and enumerators virtually and in person
- Provides daily tips to managers and enumerators

Travel Coordinator

- Defines acceptable lodging/hotel accommodations
- Identifies acceptable lodging/hotel accommodations within each EA
- Assesses lodging costs and other amenities in close proximity and includes them in Wiki
- Completes requisition form for all in-field lodging and obtains signature/approval from UL-PIRE manager
- Compiles executed requisitions and expense reports and submits them to accounting coordinator
- Coordinates the delivery of replacement equipment in the field with the travel coordinator and assignment coordinator
- Identify quantity of logistical flag types by time (week), EA, manager, and enumerator
- Lists descriptions of logistical flag type by time (week), EA, and source (enumerator, manager, other)

Accounting Coordinator

- Disseminates timesheet and expense-reporting guidelines and forms
- Coordinates with the travel coordinator to pay for hotels upon receipt of executed requisitions
- Compiles requisitions and weekly expense reports from managers
- Compiles timesheet data and processes payroll semimonthly (twice per month)

IT/Equipment Coordinator

- Coordinates selection of equipment, software, and vendors with the LEAP team
- Documents rental, configuration, and setup of all critical equipment, software, and IT systems
- Manages equipment database and status
- Compiles and maintains IT Equipment and Software Manual that includes usernames and guides for managing IT systems
- Assigns equipment to managers/enumerators using bar codes; enables equipment location devices, if applicable
- Identifies quantity of equipment flag types by time (week), EA, manager, and enumerator
- Lists descriptions of logistical flag type by time (week), EA, and source (enumerator, manager, other)

Research Manager (Design)

- Develops a sampling design for the survey
- Justifies the sampling design to USAID/Liberia and the Bureau for Food Security (BFS), as applicable
- Develops a detailed sampling framework based on the approved sampling design
- Determines the software and hardware for data collection in tandem with the IT/equipment coordinator
- Applies for IRB clearance through UL-PIRE
- Modifies the sampling instrument to fit Liberian context

Research Manager (Analysis and Quality Assurance)

- Conducts field tests prior to the data-collection phase to gauge staff readiness and the questionnaire's quality
- Finds and creates encrypted and secure data storage in tandem with the IT/equipment coordinator
- Creates back-up encrypted storage
- Creates QA checks for data cleaning
- Conducts extensive data cleaning and QA
- Creates the analysis dataset
- Develops the data codebook
- Analyzes data and develops data visualizations for reporting

Research Manager (Reporting)

- Develops the outline for the reports
- Develops a draft of the survey and capacity-development reports
- Discusses tentative findings with USAID
- Conducts data QA
- Finalizes the reports and presents them to USAID

Field Managers

- Distribute travel instructions and kits, including lodging instructions (weekly)
- Coordinate the delivery of replacement equipment in the field with assignment coordinator
- Finalize travel vehicles and equip them with needed safety/survey equipment
- Participate in regular meetings with UL-PIRE (and LEAP management team)
- Conduct safety review
- Create first-aid instructions
- Develop, apply, and maintain a QC and QA system based on the PBS QA manual guidelines
- Maintain field operations checklist
- Deploy survey personnel and equipment to enable performance within the financial, safety, and deadlines of survey implementation
- Maintain equipment tracking log
- Provide the management team with weekly progress reports regarding overall survey operations, highlighting any challenges and mitigation strategies
- Participate in project-management meetings, as applicable
- Coordinate with supervisors in the day-to-day planning and implementation of operations
- Continually conduct risk-assessment operations to ensure that the safety of operations is maximized and report any issues to management in a timely manner
- Assist the training staff with the design, development, delivery, and evaluation of appropriate training programs for enumerators, supervisors, and other technical personnel, as assigned
- Submit operational reports to be included in the Final Survey Report
- Serve as the point of contact for local officials and other agencies during survey implementation to ensure operational efficiency

Survey Supervisors

- Participate in supervisor training and field testing
- Maintain daily communication with the field manager
- Alert field manager immediately (or as soon as possible) whenever a problem arises related to meeting data-collection deadlines or enumerator staff unavailability or noncompliance
- Collect completed surveys on a daily basis from the enumerators, conduct initial QA check, and upload the data to the server if complete
- Flag missing items in surveys and follow up with the enumerators on completing any missing gaps (e.g., going back to the household, if necessary)
- Participate in survey-management meetings with the field managers during monitoring activities, as applicable
- Identify survey EAs prior to survey implementation, based on sampling designs for respective EAs
- Provide daily check-in assignments to each enumeration team
- Conduct daily checkouts and upload checkout logs to the management team at the end of the work day
- Coordinate and supervise all enumeration activities in the cluster during the data-collection process
- Monitor, check, and assess the quality of the work of the enumerators, particularly the quality of the data recorded in completed questionnaires, in near real-time
- Monitor enumerators' data-collection procedures and techniques through spot-checks and provide feedback to correct procedure errors and improve technique, as applicable
- Be available and responsive to enumerators' needs, such as identifying sample units and addressing reluctant respondents
- Monitor survey equipment in the field

Survey Enumerators

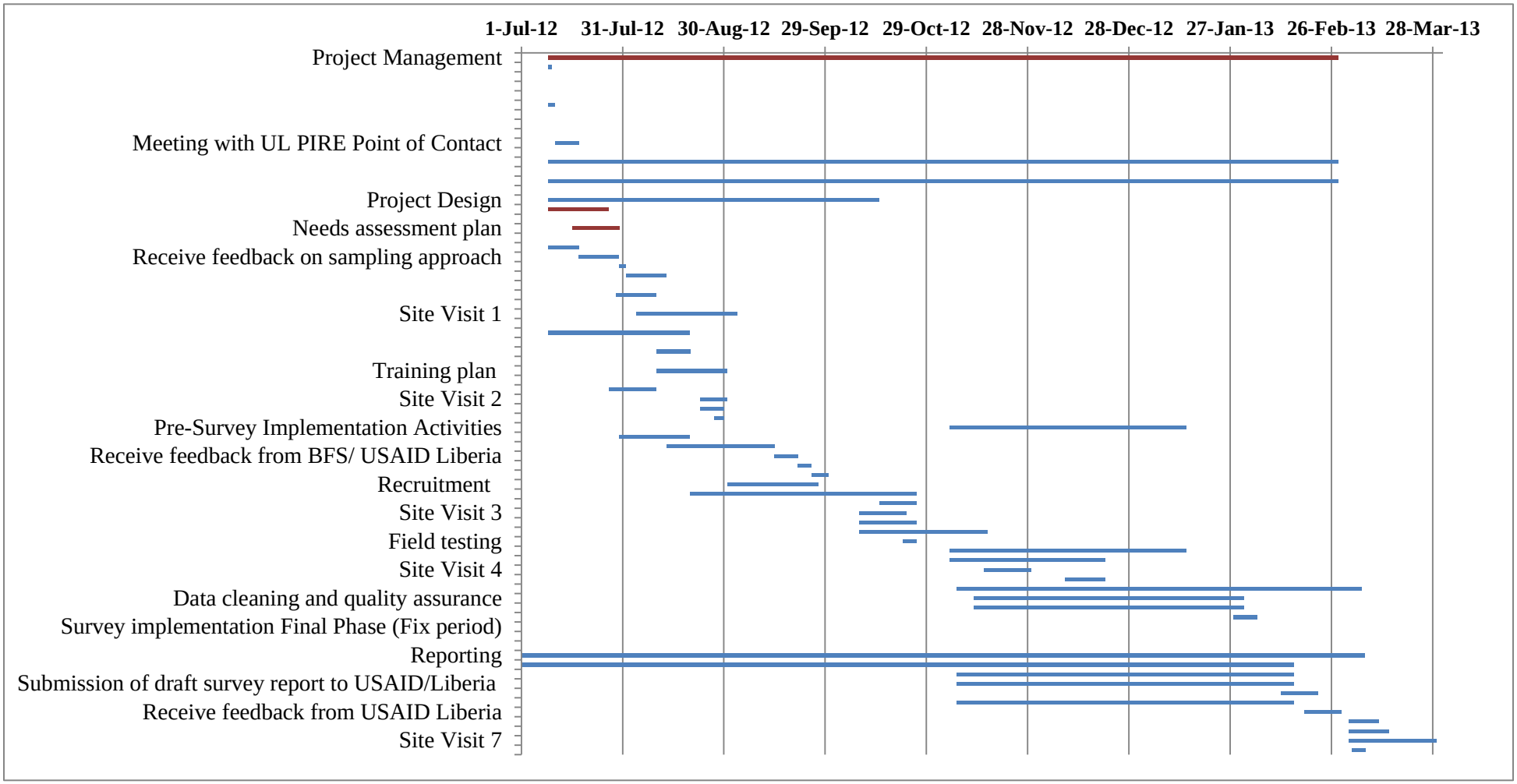
- Participate in the mandatory training on approach and methodology for survey implementation
- Become familiar with the content of the USAID/Liberia PBS questionnaire
- Understand with great proficiency the purpose of enumeration and data collection based on training and project guidelines and manuals
- Participate in field testing and participate in all project assessments
- Visit assigned EAs and complete questionnaires pursuant to the guidelines
- Review, correct, finalize, and validate completed questionnaires
- Collect, record, and report data accurately and diligently
- Submit completed questionnaires to the supervisor for upload to the server on a daily basis
- Review and verify completed (assigned) surveys
- Complete and submit daily enumerator logs

B. Sample Evaluation Forms

USAID/Liberia PBS Workshop (Pre-Survey Implementation) Evaluation Form					
Question	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
The workshop met my expectations.					
I will be able to apply the knowledge learned.					
The content was organized and easy to follow.					
The materials distributed were pertinent and useful.					
The trainers were knowledgeable.					
The quality of instruction was good.					
The trainers met the workshop objectives.					
Class participation and interaction were encouraged.					
Adequate time was provided for questions and discussion.					
Total					
	Excellent	Good	Average	Poor	
How do you rate the workshop overall?					

USAID/Liberia PBS Post-Survey Implementation Evaluation Form					
Question	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**	**Not Applicable**
Preparation for Survey Implementation and Training					
The purpose of the project was clear before going out into the field.					
I got enough training before going out into the field.					
The training manual was of assistance throughout the process.					
Retraining activities provided by the supervisors and field management team throughout training aided in survey implementation.					
I was adequately familiar with the survey questions before going into the field.					
The length of the survey instrument was appropriate.					
Respondents were able to understand the survey questions and respond appropriately.					
The equipment training was appropriate before going into the field.					
The equipment was easy to use in the field.					
There were many challenges using the equipment in the field.					
Enumeration teams were selected appropriately.					
Communication among enumeration team was professional.					
It was easy to communicate with my supervisor/ field manager.					
My supervisor/field manager played an important role in the process.					
I got clear instructions from my supervisor/field manager during the process.					
Enumeration teams were provided with the needed operational tools for survey implementation (transportation, communication, DSA, etc.).					
Total					

C. Proposed Project Timeline



D. Progress Reporting Templates

USAID Liberia Feed the Future Population-Based Survey

Weekly Progress Report

Contract #:	AID-OAA-C-11-00169
Internal Project #:	1400-308
Contract Title:	**USAID Learning, Evaluation, and Analysis Project Liberia Feed the Future Population Based Survey**
Task Order Duration:	July 2012 through March 2013
Performance Report sequence #:	
Performance period:	
Submitted by:	Optimal Solutions Group, LLC
Date:	Insert Date

I. Executive Summary

II. Progress Summary

This report covers the period of <insert date>. During this time, the LEAP team completed the following major tasks:

III. Current Core Activities

The following section provides an overview of activities conducted for each task during the past week.

Task 1: Planning and Needs Assessment

Task 2: Capacity Development

Task 3: Survey Instruments

Task 4: Survey Implementation

Task 5: Data Cleaning and Quality Assurance

Monthly Activity Projections

The following major activities are planned for the month of <insert month>.

IV. Challenges and Mitigation Strategies

This section discusses challenges faced in the past week and the mitigation strategies identified to address these challenges:

Exhibit 1: Project Challenges and Mitigation Strategies

Challenge	Mitigation strategy

Staffing

No key staff changes occurred during this performance period.

Exhibit 3: Project Deliverables Timeline and Due Dates Template

USAID LIBERIA FEED THE FUTURE POPULATION-BASED SURVEY		
Contractual Deliverables Schedule		
Deliverables	**Due Date**	**Status**

Task Leader Templates for Weekly Report

Task Leader Name	Click here to enter text.
Dates Covering This Update	Click here to enter a date. to Click here to enter a date.
Progress Summary *During the week, the LEAP team completed the following major tasks.*	Click here to enter text.
Activities Completed *The following is an overview of activities taken to accomplish each the task, and how the activities are relevant to accomplishing the task.(Include dates)*	Click here to enter text.
Next Steps *Next week, the major tasks to be completed and the activities to be conducted. (Include dates/deadlines)*	Click here to enter text.

Challenges/Mitigation: Discuss challenges faced in the past week and the mitigation strategies identified to address these challenges. Each challenge must have a mitigation strategy.

Challenges	**Mitigation**
Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.

E. Quality Assurance Processes Templates

Sample daily/cumulative QA report card template (screenshot)

Date	Household ID	House Hold Type	Consent	Module 1	Module 2	Module 2 Consent	Module 2 (2)	Module 2 (2) Consent	Module 3	Enumeration Area	Supervisor ID	Enumeration ID	Survey Status
12/5/2012	1	Male and Female	Yes	Complete	Complete	Yes	Complete	Yes	Complete	901	091-John Smith	73	Complete
12/5/2012	2	Male and Female	Yes	Complete	Complete	Yes	Complete	Yes	Complete	901	091-John Smith	75	Complete
12/5/2012	3	Male and Female	Yes	Complete	Complete	Yes	Complete	Yes	Complete	901	091-John Smith	77	Complete
12/6/2012	4	Male and Female	Yes	Complete	Complete	Yes	Complete	Yes	Complete	901	091-John Smith	79	Complete
12/6/2012	5	Male and Female	Yes	Complete	Complete	Yes	Complete	Yes	Complete	901	091-John Smith	74	Complete
12/6/2012	6	Male and Female	Yes	Complete	Complete	Yes	Complete	Yes	Complete	901	091-John Smith	75	Complete
12/6/2012	7	Female Only	Yes	Complete	Complete	Yes	Not Applicable	Not Applicable	Complete	901	091-John Smith	77	Complete
12/7/2012	8	Male and Female	Yes	Complete	Complete	Yes	Complete	Yes	Complete	901	091-John Smith	80	Complete
12/6/2012	9	Male and Female	Yes	Complete	Complete	Yes	Complete	Yes	Complete	901	091-John Smith	73	Complete

The image above is a sample of a daily QA report card. A cumulative report card mirrors the daily report card, with one major difference. Whereas the daily report card is a snapshot of the day's survey submissions, the cumulative report is a running compilation of all submissions.

Sample entry error list (screenshot)

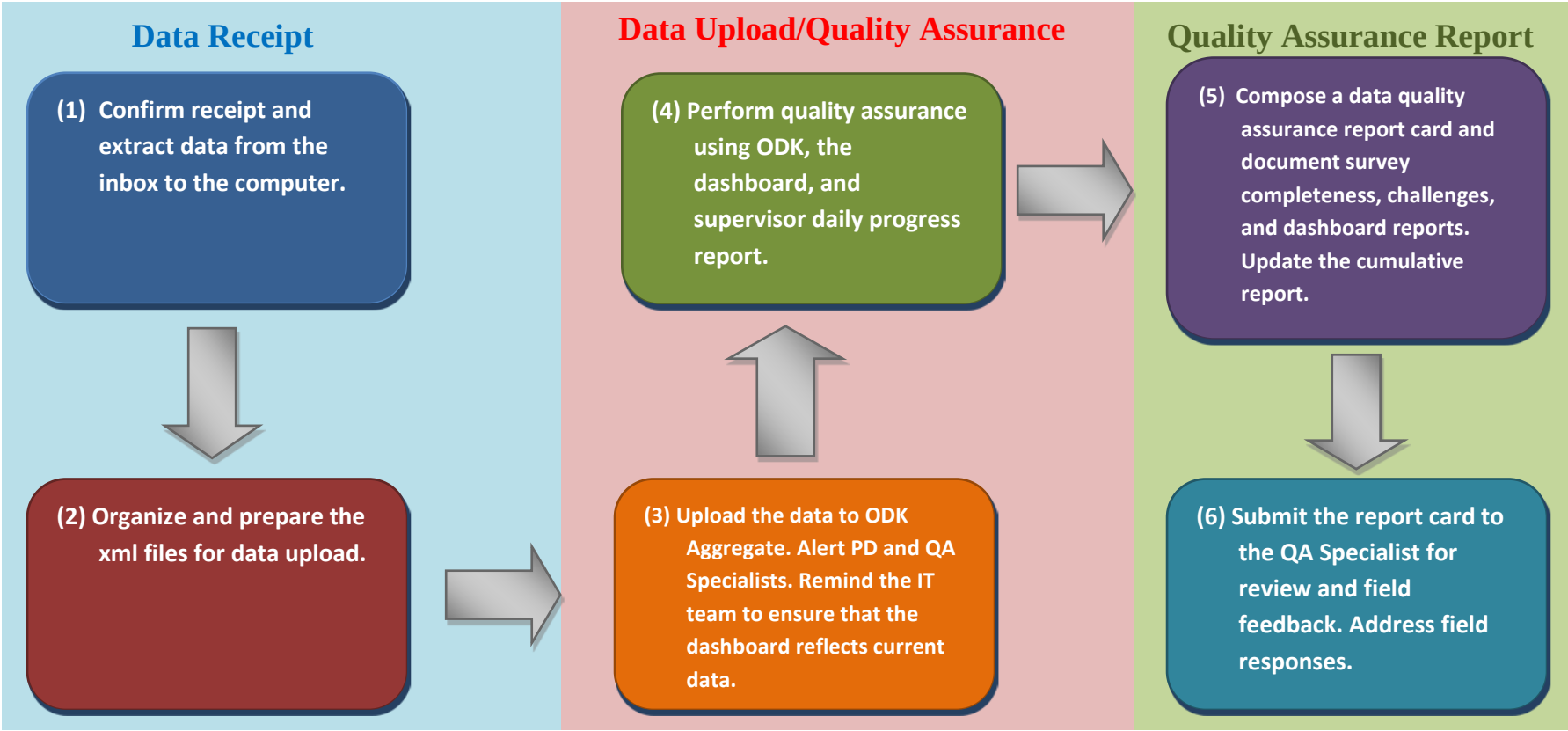
A	B	C	D	E	F	G	H	I	J	K	L	M
eacode	eacode_correction	supid	supid_correction	enumid	enumid_correction	hhid	hhid_correction	hhtype	hhtype_correction	outcome	meta:instanceID	duplicate
3301		95		48		28		monly		complete	uuid:33f940b4-b2e9-4e4a-a483-3b168b5154fb	0
3301		95		45		29		fonly		complete	uuid:26296e14-7889-47b9-bddf-9199650a882e	0
3301		95		47		30		monly		complete	uuid:6d77fee0-1f5c-4caa-92b1-4d4962e27214	0
3236	3136	98		70		11		fonly		complete	uuid:e9715982-22e3-421e-a1d0-fdfc736552f0	0
3214		89		23		4		null		null	uuid:d52f48ce-12ab-4910-973e-df371b2ec351	1
3214		89		23		4		mf		complete	uuid:9f83d283-0f92-4b74-a647-f17e4daef101	0
3214		89		23		20		null		null	uuid:f206b0a0-bb37-4265-8f5d-ccecd78b4a65	0
3177		92		13		13		null		refused	uuid:c28a8954-1043-41a7-a879-80792a6f46fa	0
3159	3109	93		50		5014	14	mf		complete	uuid:5bf4ffda-a2f2-49dd-9a51-d01a2d8b8c48	0
3146		98		65		1		mf		complete	uuid:b6fdb7ac-279b-46e4-8549-dabdc6bf4b93	0
3146		98		65		2		null		incomplete	uuid:abf13240-d9cc-43b6-a7f1-b223dc4575ee	0
3146		98		65		2		null		incomplete	uuid:4ef6ae21-32ec-4df0-a02e-35587ad58025	0
3146		98		65		3		monly		complete	uuid:d0527d3c-0d00-4104-9081-09778b9c0cc5	0
3146		98		65		4		mf		complete	uuid:7a7cbc61-a96c-446f-8255-fa7805e04b33	0
3146		98		65		4		mf		complete	uuid:cd4c23ee-1b53-4e94-a1b2-8aab13ad3c6c	0
3146		98		65		5		null		incomplete	uuid:5636c9e0-6d10-43b0-810b-87431c181989	0
3146		98		68		6		null		absent	uuid:a55fd661-56b6-4452-a5ee-2d2dc0dd1d17	0
3146		98		68		6		fonly		complete	uuid:c507ae1c-323b-44b4-835f-32d86fef0ebd	0
3146		98		67		7		monly		complete	uuid:3683e59a-2b97-47ce-8f9c-5b689aa562ff	0
3146		98		67		8		fonly		complete	uuid:de2929b8-498c-4131-bb1b-5e7bf131f1cc	0
3146		98		67		9		fonly		complete	uuid:90f4d688-dcb0-4065-90ad-a24c83b9e026	0
3146		98		67		10		monly		complete	uuid:013bf31c-ca5f-48d4-8531-3e1e100b4e8b	0
3146		98		70		11		null		absent	uuid:5000f63f-b2ee-4181-ba61-ffbe751c8a6d	0
3146		98		65		11		mf		complete	uuid:8ad3e27d-c9cf-4f58-9e47-b87f23708b42	0

The entry-error list allows the analysis team to effectively identify entry errors in the database and implement codes that fix the mistakes.

Sample missing modules report

Date	EA Code	SupID	HHID	ENUMID	Modules Missing	Status	Field Response
01/02	3117	92 Jane	10	11, 12	2	Complete (01/03)	Clarified hhtype to female only, but did not turn in the correct module.
	3103	90 David	3	5	2, 2(2)	Pending	
			10	2	3	Pending	
			15	7	3	Pending	
			16	3	3	Pending	
	3113		10	4	2, 3	Pending	
			13	1	2(2), 3	Pending	
			14	7	3	Pending	
			15	1	3	Pending	
	3109	93 Isaac	10	51	2	Pending	
			14	50	2(2)	Pending	
	3116	98 Mary	16	69	2	Pending. Module was turned in, but respondent name was the same as HH13's. Please clarify.	

Quality Assurance Process Map



F. List of Consumption Aggregate Variables

Food Items Used to Calculate Consumption Expenditure (One week recall)	
Bag of Mineral Water	Groundnut / Peanuts
Banana	Guava
Beer (Club, Heineken, etc…)	Honey
Biscuits	Hot sauce (kaytalay sauce, etc…)
Bitter Ball / Eggplant	Infant feeding formula (for bottle)
Bottled Mineral Water	Insects (Bugobug, grasshopper, bamboo worm, etc…)
Bread	Irish Potato
Bread Fruit	Jam
Bread Nuts	Kaytalay
Breakfast Cereal / Quaker Oats, Corn Meal	Kidney Beans
Brown Beans / Kpakutoweh/ "You will kill me"	Kool Aid / Foster Clark
Bulgar Wheat	Maize/Corn - Boiled
Bush Meat (Fresh)	Maize/Corn - Roasted
Butter Beans	Mango
Butter Pear	Margarine - Blue Band / Butter
Cabbage	Mayonnaise
Cane Juice	Meal at a restaurant / cook shop
Cassava Flour	Meal at a restaurant / cook shop
Cassava Leaf	Mushroom
Cassava Tubers	Okra / Therere
Cheese	Onion
Chicken	Other Beverage
Chicken Soup Season	Other food purchased from a vendor
Citrus - naartje, orange, grapefruit, etc…	Other Fruit
Cocoa, Milo	Other meat
Coconut Oil	Other Milk Product
Cocoyam	Other Oil
Coffee	Other poultry - Guinea Fowl, Doves, etc…
Collard Greens	Other seasonings or sweets
Cookies/Fritters/Kala	Other Vegetables
Cooking Oil	Palm Butter
Cow Meat	Palm Kernal Oil
Cucumber	Palm Oil
Dried Fish	Palm Wine
Eddoes	Pawpaw / Papaya
Eggs	Pineapple
Fish Soup / Sauce	Plantain, Cooking Banana
Food from Vendor - Cassava (boiled or roasted)	Plastic water / Big Bag (not treated)
Food from Vendor - Cassava (boiled or roasted)	Platto Leaf
Food from Vendor - Chicken	Pork
Food from Vendor - Chips	Potato Crisps
Food from Vendor - Doughnut / kala	Potato Greens
Food from Vendor - Eggs (boiled or fried)	Powdered Milk
Food from Vendor - Fish	Red Sweet Potato
Food from Vendor - Maize (boiled or roasted)	Rice
Food from Vendor - Meat	Rice/Plantain Porridge
Food from Vendor - Sausage	Salt

Food Items Used to Calculate Consumption Expenditure (One week recall)	
Freezes (flavored ice)	Season / Pepper
Fresh Fish	Sheep Meat
Fresh Milk	Small Animal - Groundhog, Oppasum, etc…
Fruit Juice	Smoked Fish
Gathered wild green leaves	Smoked Meat
Goat Meat	Soft Drinks (Coca-Cola, Fanta, Sprite, etc…)
Soured Milk	Tomato sauce (bottle)
Soursop	Water
Spaghetti, Macaroni	Watermelon
Split Peas	Wheat Flour
Sugar	White Beans
Sugar Cane	White Sweet Potato
Sweets, candy, chocolate	Wild Fruit (Monkey apple, walnut, etc…)
Tea / Hata'i	Wine or Liquor
Tinned Meat or Fish	Yeast, baking powder, bicarbonate of soda
Tinned Vegetables	Yoghurt
Tomato	

Household Items Used to Calculate Consumption Expenditure		
One Week Recall	**One Month Recall**	**Three Months Recall**
Candles	Batteries	Battery Lamp / Chinese Lamp
Charcoal	Bicycle / Pen Pen Service, Repair, or Parts	Books (not school-related)
Cigarettes or Other Tobacco	Donations- to church, charity, beggar, etc…	Guest House / Hotel (not related to school or health)
Internet Café	Generator Maintenance	House Decoration
Kerosene	Light Bulbs	Kerosene lamp / Hurricane lamp
Matches / Lighter	Milling fees for grains, oil, cassava (not including cost of grain itself)	Music, Movies, CD, DVD, cassette player
Newspapers or Magazines	Pet expenses	Stationery / Paper / Pens (not school-related)
Newspapers or Magazines	Petrol / Gas / Diesel / Fuel	Tickets for sports / entertainment / video clubs
Public Transport - Bus / Minibus	Postage Stamps or other postage fees	Torch Light
Public Transport – Other	Recharging Phones, Batteries	TV / DSTV
Public Transport - Pen Pen, Taxi (not for school)	Repairs and Maintenance to House / Apartment	Umbrella
Wood	Repairs and Maintenance to personal & household items	
	Scratch Cards / Phone Credit	
	Vehicle Service, Repair, or Parts	
	Wages Paid to Servants	

Household Items Used to Calculate Consumption Expenditure (One year recall)	
Air Conditioner	Mini-bus
Bed / Table / Chair	Mosquito Net
Bicycle	Motorcycle / Scooter
Boat, Canoe, Ferry	Other gathered items
Bricks	Other Household Tools (rake, whipper, digger, etc…)
Camera, Film, Film Processing	Planks / Lumber / Timber for Construction
Cane Juice Mill	Radio
Car	Refrigerator
Carpet, rugs, drapes, curtains, floor mats	Rice Dryer
CD/DVD Player, VCR, Tape Player	Rice Mill
Cement	Satellite Dish
Clock	Sewing Machine
Coal Pot	Sofa Set, Upholstered Chair
Coffee Table	Solar Panel
Computer Equipment	Sports Equipment, Musical Instruments, Other Hobby Equipment
Cupboard, Drawers, Bureau	Television
Cutlass	Towels, sheets, blankets
Desk	Truck / Pick-up
Electric Stove / Hot Plate	Washing Machine
Fan	Water Pump
Gas Stove	Wood poles, bamboo
Generator	Zinc, Roofing Material
Grass for thatching roof or other use	Rice Dryer
Hoes for garden / farm	Rice Mill
Iron for pressing clothes (charcoal or electric)	Satellite Dish
Kerosene Stove	Sewing Machine
Mat for sleeping or drying grain / flour	Sofa Set, Upholstered Chair
Mattress	Solar Panel
	Sports Equipment, Musical Instruments, Other Hobby Equipment

G. Hunger Index Variables

Questions below were used in calculating the Hunger Index	
Questions	**Possible Response**
Question 1: "In the past 4 weeks, was there ever no food to eat of any kind in your house because of a lack of resources to get food?"	Yes or No
If Yes	
"How often did this happen in the past 4 weeks?"	• Rarely (1–2 times) • Sometimes (3–10 times) • Often (more than 10 times) • Decline to Answer/No Response
Question 2: "In the past 4 weeks, did you or any household member go to sleep at night hungry because there was not enough food?"	Yes or No
If Yes	
"How often did this happen in the past 4 weeks?"	• Rarely (1–2 times) • Sometimes (3–10 times) • Often (more than 10 times) • Decline to Answer/No Response
Question 3: "In the past 4 weeks, did you or any household member go a whole day and night without eating anything at all because there was not enough food?"	Yes or No
If Yes	
"How often did this happen in the past 4 weeks?"	• Rarely (1–2 times) • Sometimes (3–10 times) • Often (more than 10 times) • Decline to Answer/No Response

H. FtF Data Analysis Reference Sheets

SPS LOCATION: Program Area 4.5: Agriculture
INITIATIVE AFFILIATION: FTF—Key Objective: Inclusive Agriculture Sector Growth

INDICATOR TITLE: 4.5-9 Per capita expenditures (as a proxy for income) of USG targeted beneficiaries (R)

DEFINITION:
This indicator will measure the expenditures of rural households as a proxy for income, based on the assumption that increased expenditures is strongly correlated to increase income. Data for this indicator must be collected using the Consumption Expenditure methodology of the Living Standards Measurement Survey (LSMS).Missions are encouraged to use the LSMS Integrated Survey in Agriculture Consumption Expenditure module, which has been incorporated in the FTF M&E Guidance Series Volume 8: Population-Based Survey Instrument for Feed the Future Zone of Influence Indicators. FTF will collect consumption-expenditure data in order to calculate prevalence of poverty as well as per capita expenditures to be used as a proxy for income.

This indicator is a proxy instead of measuring income directly because of the difficulty in accurately measuring income. Expenditures are used instead of income because of the difficulty in accurately measuring income and because expenditure data are less prone to error, easier to recall and are more stable over time than income data.

RATIONALE:
There is a relationship between increased incomes and improved food security, reduced poverty, and improved nutrition. The usefulness of an income proxy methodology derives from the importance of a change in household income and its impact on the overarching FTF goal of reducing poverty and hunger. Thus, measurement of household income(through this proxy) is one logical choice for monitoring the effects of policies and programs oriented towards accomplishing this goal.

UNIT: U.S. Dollar Please enter these two data points: 1. Average per capita expenditures (in USD) of sample 2. Total population in zone of influence *Note: To get USD, convert from local currency at the average exchange rate for the reporting period*	DISAGGREGATE BY: Gendered Household type: Adult Female no Adult Male (FNM), Adult Male no Adult Female (MNF), Male and Female Adults (M&F), Child No Adults (CNA)
TYPE: Outcome	DIRECTION OF CHANGE: Higher is better

DATA SOURCE:
Population-based surveys conducted by M&E contractor in the FTF zone of influence or UN for national level.

MEASUREMENT NOTE:
At the national level, this is a contextual indicator that is not USG-attributable, but should still be measured to assess overall food security situation in a country. Because this is a contextual indicator, no targets will need to be set at the national level.

- LEVEL of COLLETION: This indicator should be collected in the FTF Zones of influence (i.e. the targeted population/subnational level) through household/population-based surveys, as well as monitored at the national level. This data is already collected by the UN for measureing progress towards the MDG, and is available at the country and regional levels in the MDG database at http://mdgs.un.org/unsd/mdg/Data.aspx
- WHO COLLECTS DATA FOR THIS INDICATORS: The UN already collects this data for the MGDs at the country and regional level; however, an M&E contractor will do collection in the FtF Zone of Influence.
- HOW SHOULD IT BE COLLECTED: For the national level data, the M&E contractor should be consistent in pulling the country information from the MDG database, knowing the methods used by UN described in this data collection handbook: http://mdgs.un.org/unsd/mdg/Data.aspx. For the Zone of Influence, the M&E contractor should conduct a population-based survey using the LSMS methodology and the FTF M&E Guidance Series Volume 8: Population-Based Survey Instrument for Feed the Future Zone of Influence Indicators, in conjuction with collection of the nutrition indicators(i.e. there should be one survey to collect all the impact-level data for the FTF intiative)
- FREQUENCY OF COLLECTION: Data should be collected in the Zone of Influence for baseline, mid-term (ideally), and final reporting.

SPS LOCATION: Program Area 4:Economic Growth
INITIATIVE AFFILIATION: FTF Goal: Sustainably Reduce Global Poverty and Hunger

INDICATOR TITLE: 4-16 Prevalence of Poverty: Percent of people living on less than $1.25/day* (R)
The MDGs define this level as those living in "extreme poverty." Although we do not use the word "extreme in this title, we are referring to the same measure used by the UN for the MDGs.

DEFINITION:
This indicator measures Millennium Development Goal Target 1 a. Halving extreme poverty refers to the period 1990 to 2015. The applicable poverty line has been updated to $1.25 dollars per person per day, converted into local currency at 2005 "Purchasing Power Parity" (PPP) exchange rates. The use of PPP exchange rates ensure that the poverty line applied in each country has the same real value. Measurement is based on the value of average daily consumption expenditure per person, where food and other items that a household consumes out of its own production are counted as if the household purchased those items at market prices. For example, all members of a household of four people are counted as poor if its average daily consumption expenditures are less than $5 per day at 2005 PPP after adjusting for local inflation since 2005. The poverty rate is estimated by dividing the measured numer of poor people in a sample of households by the local population in the households in the sample.

Data for this indicator must be collected using the Consumption Expenditure methodology of the Living Standards Measurement Survey (LSMS).Missions are encouraged to use the LSMS Integrated Survey in Agriculture Consumption Expenditure module, which has been incorporated in the FTF M&E Guidance Series Volume 8: Population-Based Survey Instrument for Feed the Future Zone of Influence Indicators. FTF will collect consumption-expenditure data in order to calculate prevalence of poverty as well as per capita expenditures to be used as a proxy for income.. Expenditures are used instead of income because of the difficulty in accurately measuring income and because expenditure data are less prone to error, easier to recall and are more stable over time than income data.

RATIONALE:
This measures the first goal of the Feed the Future Initiative as well as a Millennium Development Goal. It is the purpose of the FTF Initiative. All objective, program elements, and projects are designed to reduce poverty.

UNIT:	DISAGGREGATE BY:
Percent Please enter these two data points: 1. Percentage of People from sample living on <$1.25/day 2. Total population in zone of influence	Gendered Household type: Adult Female no Adult Male (FNM), Adult Male no Adult Female (MNF), Male and Female Adults (M&F), Child No Adults (CNA)
TYPE: Impact	DIRECTION OF CHANGE: Lower is better

DATA SOURCE:
Population-based surveys conducted by M&E contractor in the FTF zone of influence or UN for national level.

MEASUREMENT NOTE:
At the national level, this is a contextual indicator that is not USG-attributable, but should still be measured to assess overall food security situation in a country. Because this is a contextual indicator, no targets will need to be set at the national level.

- LEVEL of COLLETION: This indicator should be collected in the FTF Zones of influence (i.e. the targeted population/subnational level) through household/population-based surveys, as well as monitored at the national level. This data is already collected by the UN for measureing progress towards the MDG, and is available at the country and regional levels in the MDG database at http://mdgs.un.org/unsd/mdg/Data.aspx
- WHO COLLECTS DATA FOR THIS INDICATORS: The UN already collects this data for the MGDs at the country and regional level; however, an M&E contractor will do collection in the FtF Zone of Influence.
- HOW SHOULD IT BE COLLECTED: For the national level data, the M&E contractor should be consistent in pulling the country information from the MDG database, knowing the methods used by UN described in this data collection handbook: http://mdgs.un.org/unsd/mdg/Data.aspx. For the Zone of Influence, the M&E contractor should conduct a population-based survey using the LSMS methodology and the FTF M&E Guidance Series Volume 8: Population-Based Survey Instrument for Feed the Future Zone of Influence Indicators, in conjuction with collection of the nutrition indicators(i.e. there should be one survey to collect all the impact-level data for the FTF intiative)
- FREQUENCY OF COLLECTION: Data should be collected in the Zone of Influence for baseline, mid-term (ideally), and final reporting.

SPS LOCATION: Program Area 3: Investing in People **INITIATIVE AFFILIATION: FTF- IR 5: Increased resilience of vulnerable communities and households**	
INDICATOR TITLE: 3.1.9.1-3 and 4.7-4 Prevalence of Households with moderate or severe hunger	
DEFINITION: This indicator measures the percent of households experiencing moderate or severe hunger, as indicated by a score of 2 or more on the household hunger scale (HHS). To collect data for this indicator, respondents are asked about the frequency with which three events were experienced by household members in the last four weeks: 1. No food at all in the house; 2. Went to bed hungry, 3. Went all day and night without eating. For each question, four responses are possible (never, rarely, sometimes or often), which are collapsed into the following three responses: never (value=0) rarely or sometimes (value=1), often (value=2). Values fofr the three questions are summed for each household, producing a HHS score ranging from 0 to 6. The numerator for this indicator is the total number of the households in the sample with the score of 2 or more on the HHS. The denominator is the total number of households in the sample with HHS data.	
RATIONALE: Measurement of household hunger provides a tool to monitor global progress of USG supported food security initiatives. A decrease in household hunger is also a reflection of improved household resilience. The indicator has been validated to be meaningful for cross-cultural use using data sets seven diverse sites.	
UNIT: Please enter these two data points: 1. Percent of households in sample with moderate to severe hunger 2. Total population of households in zone of influence	DISAGGREGATE BY: Gendered Household type: Adult Female no Adult Male (FNM), Adult Male no Adult Female (MNF), Male and Female Adults (M&F), Child No Adults (CNA)
TYPE: Impact	DIRECTION OF CHANGE: Lower is better
DATA SOURCE: Population-based survey and official DHS data (see notes below). USAID/W will work to get these HHS questions incorporated in the DHS in applicable countries. The, the DHS will also be able to show this data at the national level.	
MEASUREMENT NOTE: This indicator should always be measured at the same time each year, at the most vulnerable part of the year (e.g. right before harvest, during the dry season, etc.) Although this indicator will be collected in the Zone of Influence by an M&E contractor, USAID/W is also working with HQ and Missions to have HHS added as a module to the DHS, which is usually conducted every 5 years. Missions direct which modules the DHS should add to the default set of survey questions, and all Focus Countries should request that the HHS module be added to any upcoming DHS for collection of the national-level data. ➢ LEVEL of COLLETION: For FTF: We will monitor this indicator in our targeted sub-national regions/districts (i.e. "zones of influence," or the geographic regions (s)/ districts targeted by the USG intervention) to measure results attributable to USG assistance. Where possible, we will also monitor this indicator at the national level to keep a contextual "pulse" on the country situation. National level data should be obtained from the DHS, usually conducted every five years. ➢ WHO COLLECTS DATA FOR THIS INDICATORS: An M&E contractor will collect this data in FTF Zone of Influence and will also enter country-level DHS data into the FTF Monitoring System, when available. ➢ HOW SHOULD IT BE COLLECTED: The M&E contractor will conduct population-based surveys in the targeted Zones of Influence to collect this data, using the official DHS method of collection and the FTF M&E Guidance Series Volume 8: Population-Based Survey Instrument for Feed the Future Zone of Influence Indicators. This contractor will use DHS data, collected every five years, to look at national-level data. Information on the frequency of DHS by country can be obtained at: http://www.measuredhs.com/aboutsurveys/search/metadata.cfm?surv_id=228&ctry_id=33&SrvyTp=country ➢ FREQUENCY OF COLLECTION: Data should be collected in the Zone of Influence for baseline, mid-term (ideally), and final reporting. For more information on the HHS, including quidance for collection and tabulation of the prevalence of the households with moderate or severe hunger, refer to the FANATA-2 website: www.fanata-2.org	

SPS LOCATION: Program Area 4.5: Agriculture
INITIATIVE AFFILIATION: FTF- First level objective: Inclusive Agriculture Sector Growth

INDICATOR TITLE: 4.5-? Woman's Empowerment in Agrliculture Index Score (R)

DEFINITION: The Woman's Empowerment in Agriculture Index (WEAI) measures the empowerment, agency and inclusion of women in the agriculture sector in an effort to identify and address the constraints that hinder women's full engagement in the agriculture sector. The WEAI is composed of two sub-indexes; the Five Domains of Empowerment sub-index (5DE)measures the empowerment of women in five areas; and the Gender Parity sub-index (GPI) measures the average level of equality in empowerment of men and women within the household. The WEAI is an aggregate index reported at the Zone of Influence level and is based on individual-level data on men and women within the same households and data on women living in household with not adult male.

The 5DE sub-index assess whether women are empowered across fine domains examined in the WEAI. Each domain is weighted equally, as are each of the indicators within the domain. The five domains, their definitions under the WEAI, the corresponding indicators, and their weights for 5DE are:

Domain (each weighted 1/5 of 5DE subindex)	Definition of Domain	Indicators	Weight of indicator in 5DE sub-index
Production	Sole or joint decision-making over food and cash crop farming, livestock, fisheries as well as autonomy in agricultural production.	Input in productive decisions	1/10
		Autonomy in production	1/10
Resources	Ownership, access to, and decision-making power over productive resources such as land, livestock, agricultural equipment, consumer durables, and credit	Ownership of assets	1/15
		Purchase, sale or transfer of assets	1/15
		Access to and decisions on credit	1/15
Income	Sole or joint control over income and expenditures	Control over use of income	1/5
Leadership	Membership in economic or social groups and comfort in speaking in public	Group member	1/10
		Speaking in public	1/10
Time	Allocation of time to productive and domestic tasks and satisfaction with the available time for leisure activities	Workload	1/10
		Leisure	1/10

The 5DE is a measure of empowerment rather than disempowerment. A woman is defined as empowered in the 5DE if she reaches the threshold of empowerment in 80 percent or more of the weighted indicators. For disempowered women, the 5DE also shows the percentage of indicators in which those women meet the threshold of empowerment. The 5DE contributes 90 percent of the weight to WEAI.

The GPI reflect the percentage of women who are as empowered as the men in their households. It is a relative equality measure that demonstrates the equality in 5DE profiles between primary adult male and female in each household. In most cases, these are husband and wife, but they can be the primary male and female decision-maker regardless of their relationship to each other. For households that have not achieved gender parity, the GPI shows the gap that needs to be closed for women to reach the same level of empowerment as men. By definition, households without primary adult make are excluded from this measure, and thus aggregate WEAI uses the mean GPI value of dual-adult households. The GPI contributes 10 percent of the weight to the WEAI.

The 5DE score ranges from zero to one, where higher values indicate greater empowerment. It is constructed using robust multidimensional methodology known as the Alkire Foster Method (see http://www.ophi.org.uk/research/multidimensional-poverty/alkire-foster-method/ for information on the method) The score has two components. First, it reflects the percentage of women who are empowered (H_e). Second , it reflects the percentage of domains in which those women who are not yet empowered (H_n) still have adequate achievements (A_a). The 5DE formula is: 5DE= { $H_e + (H_n \times A_a)$} where $H_e + H_n$= 100% and $0<A_a<$ 100%.

The GPI also ranges from zero to one, with higher values indicating greater gender parity, and is constructed with two factors. First, it shows the percentage of women whose empowerment scores are lower then the men's in house (H_{wgP}). Second , the GPI shows the percentage of shortfall in empowerment scores (I_{GPI}) for those women who do not have gender parity. The overall formula is the product of these two numbers, following the Foster Greer Thorbecke "poverty gap" measure: GPI = $\{1-(H_{wgp} \times I_{GPI})\}$

The WEAI score is computed as a weighted sum of the ZONE of Influence-level 5DE and the GPI. Thus, improvements in either the 5DE or GPI will increase the WEAI. The total WEAI score = 0.9 $\{H_e =(H_e \times A_a)\}$ + 0.1 $\{1- (H_{GPI} X I_{GPI})\}$.

RATIONALE: Feed the Future supports the inclusion of poorer and more economically vulnerable populations in economic growth strategies in the agriculture sector in order to have a transformational effect on regional economies and restructure local production, distribution, and consumption patterns for long –term, sustainable development. Because women play a prominent role in agriculture and due to the persistent economic constraints they face, women's empowerment is a main focus of Feed the Future. Empowering women is particularly important to achieving the Feed the Future objective of inclusive agriculture sector growth. The WEAI was developed to track the change in women's empowerment levels that occurs as a direct or indirect result of intervention under Feed the Future	
UNIT: Number; Please enter these three data points: 1. Score for 5DE sub-index 2. Score for GPI sub-index *3.* Total population in Zone of Influence	DISAGGREGATE BY: None
TYPE: Impact	DIRECTION OF CHANGE: Higher is better
DATA SOURCE: Population-based surveys conducted by a M&E contractor in the FTF Zone of Ifluence	
MEASUREMENT NOTE:. ➢ LEVEL of COLLETION: This indicator should be collected in the FTF Zones of Influence (i.e. the targeted population/sun-national level) through household/population-based surveys. ➢ WHO COLLECTS DATA FOR THIS INDICATORS: An M&E contractor will collect this data in FTF Zone of Influence . ➢ HOW SHOULD IT BE COLLECTED: For the Zone of Influence survey, the M&E contractor should conduct population-based survey using the WEAI methodology and the FTF M&E Guidance Series Volume 8: Population-Based Survey Instrument for Feed the Future Zone of Influence Indicators (i.e. there should be one survey to collect all the impact-level data for the FTF initiative). ➢ FREQUENCY OF COLLECTION: Data should be collected in the Zone of Influence for baseline, mid-term (ideally), and final reporting.	

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