Food Security and Nutrition Survey

REPUBLIC OF LIBERIA
Monrovia

September 2009

Data collected between
August - December 2008

WFP
wfp.org

United Nations
LIBERIA
At Work Together

FOREWORD

This report presents the findings of the Liberia 2008 Food Security and Nutrition Survey which updates findings of the 2006 Comprehensive Countrywide Food Security and Nutrition Survey. The report provides rich information on the issues of food insecurity and nutrition. It also provides very rich and invaluable data on livelihood, health and education.

Years of conflict destroyed the infrastructure and undermined the ability of our people to provide for their own most basic and essential needs. The Government and all its partners realize the importance of an updated data, not only for policy formulation and implementation, but also for monitoring progress and promoting accountability and transparency in the decision making processes.

The quest to improve food security and nutrition, which is closely associated with the fight against poverty, is not only a Liberian challenge but a global one. It shows that food insecurity and malnutrition remain significant causes of concern – as a large portion of the population of Liberia still remains food insecure or highly vulnerable to food insecurity—a phenomenon mainly attributed to low agricultural productivity due to a lack of agricultural inputs, animal pests, poverty, and lack of access to basic services among many other factors.

The report proposes a wide range of responses to address food insecurity in the immediate and longer term. Whilst food assistance to vulnerable groups as well as children attending school remains a necessary element of any action plan in the short-term, the survey considers other interventions such as the rehabilitation of the agricultural sector, road infrastructure, market access, health, water, and sanitation, child care services and the education system, to be vital for the improvement of Liberia's post-war food security situation.

The eradication of food insecurity and malnutrition cannot be done overnight. Programmatic steps addressing both acute manifestations, as well as the chronic and structural dimensions, are needed. The report emphasizes the need to strengthen the Food Security and Nutrition Monitoring System that informs, guides, and coordinates recovery and development activities to eradicate poverty, hunger and malnutrition. The issue of human capacity to support such institutional framework cannot be over-emphasized. The report clearly recognizes that food security is multi-faceted and as such requires the intervention of many departments and agencies.

On behalf of the Government of Liberia, I would like to congratulate and thank all agencies and organizations for their technical, financial and logistical support in the field and at headquarter levels. In particular, I would like to thank MOA, MOHSW, LISGIS, FAO, UNICEF, WFP and WHO. We are also grateful to all the enumerators from various ministries and agencies, as well as to the individuals, households and communities who provided their time and efforts to participate in this important survey.

We are deeply appreciative for the useful comments from all partners on the design, implementation and compilation of the survey tool, and particularly ACF. We are also thankful to LISGIS, UNICEF and WFP, whom designed the sampling methodology

The Government looks forward to an open dialogue on addressing food insecurity and malnutrition. This report provides a framework to map the way forward towards achieving food security and adequate nutrition for all Liberians.

Florence A. Chenoweth (PhD)
MINISTER
Ministry of Agriculture - MOA
Monrovia-Liberia

ACKNOWLEDGEMENTS

The Government of Liberia is deeply grateful to the individuals, households, and communities of rural and urban Liberia for their time and hospitality.

The survey was truly an integrated food security and nutritional assessment and many organizations were involved in its design, the collection of data, and the production of this report.

The food security component of the survey was primarily supported by the Ministry of Agriculture (MOA), United Nations Food and Agriculture Organization (FAO), and the United Nations World Food Programme (WFP). The primary agencies for the health and nutrition section of the survey were the Ministry of Health and Social Welfare (MOHSW), the United Nations Children's Fund (UNICEF), WFP and the World Health Organization (WHO). The sample methodology was designed by the Liberia Institute of Statistics and Geo-Information Services (LISGIS), UNICEF, and WFP.

In the field, many agencies contributed staff, vehicles, flights and other logistical support to ensure the smooth implementation of the survey. In particular, we would like to thank the Ministry of Agriculture, Ministry of Health and Social Welfare, LISGIS, FAO, UNICEF, WFP, WHO, and Action Contre La Faim (ACF)

We are deeply appreciative for the useful comments of various organizations on the design, implementation and compilation of survey report, and particularly Action Contre la Faim (ACF).

The survey was funded by UNICEF and WFP and technical contributions were made by ACF, FAO and WHO. The Government of Liberia is grateful for these generous contributions.

We would also like to thank UNMIL, County authorities, and WFP Sub-offices for supporting the logistics and helping to ensure safety of the data collection and monitoring teams in the field.

This report was compiled in collaboration by various stakeholders including FAO, UNICEF, WFP and WHO. National stakeholders including representatives from MOA, MOHSW and LISGIS have reviewed the report and provided valuable comments which were incorporated in the final report. For any feedback, clarification or comments, please contact any of the following persons:

James B. Logan
MOA - Deputy Minister Planning and Development
Email: JBLOGAN02@yahoo.com

Bernard Owadi
WFP – VAM Officer
Bernard.owadi@wfp.org

Dr. Bernice T. Dahn
MOHSW –Chief Medical Officer
Email:

Kinday samba
UNICEF-Nutrition specialist
ksamba@unicef.org

TABLE OF CONTENTS

LIST OF ACRONYMS ……

EXECUTIVE SUMMARY 9
1. Scope and Methods 9
2. Trends in agriculture and socio-economic indicators 10
3. How many households are food insecure?.....11
4. How many and who are the malnourished?.....12
5. Where are the food insecure households? 12
6. Recommendations.....14
INTRODUCTION.....15
1 PART I – STUDY OBJECTIVES AND METHODOLOGY 16
1.1 Objectives.....16
1.2 Definitions, Terminology and Concepts 17
1.3 Stakeholders and Implementation Process 20
1.4 Survey Instruments.....20
1.5 Data Collection 20
1.6 Sampling Procedures 21
1.7 Anthropometric survey.....21
1.8 Data Entry and Statistical Analysis.....22
1.9 Survey Limitations.....22
2 PART II- BACKGROUND 23
2.1 Historical, Population and Political Context 23
2.2 Macro-economic Context 23
2.3 Agricultural Sector.....24
2.4 Infrastructural facilities 25
3 PART III: SOCIO-ECONOMIC SITUATION 26
3.1 Demography.....26
3.2 Migration 26
3.3 Adult Literacy 27
3.4 Housing and Living conditions 28
3.5 Education.....29
3.5.1 Enrolment of School Age Children 29
3.5.2 Impact of school meals on enrolment 30
3.6 Access to Water and Sanitary Services 31
3.6.1 Water sources.....31
3.6.2 Sanitary Facilities 31
3.7 Employment, Livelihood Activities and Sources of Income 32
3.7.1 Work Status of Household Members 32
3.7.2 Demographic and literacy dimension of employment.....33
3.8 Income Sources 33
3.9 Livelihood Profiles using Multivariate Techniques.....35
3.10 Access and Use of Loans.....36
3.11 Contract work 37
3.12 Change in Household Income: households' perception 38
3.13 Household Expenditures 39
3.13.1 Per-capita Expenditures, Food and Non-Food Expenditure Shares 39
3.13.2. Expenditures by Sex and Age of Household Head and Livelihood Group ..41
3.13.3 Changes in household expenditure 43
3.14 External Assistance.....44
4 PART IV – HOUSEHOLD FOOD SECURITY AND VULNERABILITY 46

4.1 Availability of Food/Agricultural Production....46
4.1.1 Access to Agricultural Land and Tenure....46
4.1.2 Food Crop Production and Use of Harvest....47
4.1.3 Rice Production....48
4.1.4 Production of Cash Crops....49
4.1.5 Livestock and Fisheries....49
4.2 Households' Access to Food....50
4.2.1 Change in Household Food Consumption....51
4.2.2 Food Consumption Groups: new standard methodology....54
4.2.3 Food groups, weights and justification....54
4.2.4 Food Sources....57
4.2.5 Asset ownership and Wealth Index in Rural Liberia....57
4.2.6 Socio-economic Profile of the Food Consumption Groups....60
4.2. 7 Household Food Security Profiling....61
4.2.8 Geographic Patterns of Vulnerable Groups....61
4.2.9 Who are the food insecure households?....64
4.3 Vulnerability to shocks and coping strategies....67
4.3.1 Exposure to risks and shocks....67
4.3.2 Household coping strategies....68
4.3.3 Coping Strategy Index....69
4.4 Food Utilization: Mother and Child Health and Nutrition....71
4.4.1 Child Morbidity....71
4.4.2 Child feeding practices....72
4.4.3 Nutritional Status of Children....74
4.4.4 Nutritional status of women of childbearing age....78
4.4.5 Causes of malnutrition....79
5 PART V: RECOMMENDATIONS....82
5.1 Conclusion and summary....82
5.2. Recommended interventions to address transitory food insecurity in rural Liberia:....82
5.3 Recommended interventions to address chronic food insecurity in rural Liberia:....83
5.4 Recommended interventions to address urban food insecurity:....83
5.5 Recommended interventions to address malnutrition:....83

LIST OF FIGURES

Figure 1: Food and Nutrition Security Conceptual framework....17
Figure 2: Impact of School Meals on Enrolment....30
Figure 3: Access to water and sanitation facilities....31
Figure 4: Employment Status of Household Heads by Region....32
Figure 5: Employment Status by Literacy levels....33
Figure 6: Contribution of Income Source to HH Income....34
Figure 7: Purchase of Food on Credit by Households....36
Figure 8: Main Reason for Decreased Income....38
Figure 9: Perceived Decrease in Income by Livelihood Group....39
Figure 10: Trends in Per Capita Expenditure....39
Figure 11: Share of Household Expenditures....40
Figure 12: Per Capita Expenditures by Region....40
Figure 13: Main External Assistance to HHs by Region....44
Figure 14: Trends of Participation in Food Production....46
Figure 15: Use of Staple Food Harvest....47
Figure 16: Rice Production Techniques by Region....48
Figure 17: Percentage of households involved in Cash Crop Production by Region ..49

Figure 18: Trends in Food Security (2006-2008).....52
Figure 19: Frequency of Consumption by FoodcConsumption Score 55
Figure 20: Changes in Meals by Food Consumption Group.....56
Figure 21: Asset Ownership by Wealth Quintiles (Rural Liberia) 58
Figure 22: Food Security Status in Liberia, 2008.....61
Figure 23: Food Security and Livelihood Profile.....65
Figure 24: Food Security and Wealth Indices.....65
Figure 25: Food Security and Age of Household Head.....66
Figure 26: Coping Strategy Index Quintiles by Rural/urban Strata.....69
Figure 27: Trends in Child Morbidity (2006-08) 72
Figure 28: Continued Breastfeeding Rates 73
Figure 29: Trends in Complementary Feeding Rate 73
Figure 30: Prevalence of Timely Complementay Feeding rate by Region 74
Figure 31: Prevalence of Usage of Infant Formula 74
Figure 32: Trends in Acute Malnutrition (2006-08) 75
Figure 33: Prevalence of Acute malnutrition by Agegroup.....76
Figure 34: Trends in Chronic Malnutrition (2006-08) 76
Figure 35: Chronic Malnutrition by Agegroup.....77
Figure 36: Trends in Underweight (2006- 08).....77
Figure 37: Acute Malnutrition using MUAC by Area.....78
Figure 38: Prevalence of Underweight among Adults, 2008 78
Figure 39: Conceptual Framework for Analysing Malnutrition 79
Figure 40: Child Malnutrition and Education status of Caretakers 80
Figure 41: Child Malnutrition and Illness.....80
Figure 42: Chronic Malnutrition and Access to Water 80
Figure 43: Malnutrition and Food Security Indicators.....81
Figure 44: Time and Frequency of FSN Data Collection Activities.....84

LIST OF TABLES

Table 1: Household Living Condition, 2008 28
Table 2: School Enrolment, 2008.....29
Table 3: Contribution to Annual Income by Urban/Rural areas 35
Table 4: Expenditure on Food by Quintiles 41
Table 5: Per Capita Expenditures by Livelihood Group 43
Table 6: Market Dependency 49
Table 7: Food Items in Food Consumption Module, 2008.....50
Table 8: Description of Household Consumption Groups (old Methodology).....52
Table 9: Changes in Food Consumption (2006-08).....54
Table 10: Food Groups and Justification (New Methodology).....54
Table 11: Standard Threshold for Food Consumption Score 55
Table 12: Source of Household Food Items 57
Table 13: Variables included in Wealth Index Creation.....58
Table 14: Household Wealth Status by Livelihood Group 59
Table 15: Wealth Group by Food Security Characteristics.....60
Table 16: Food Security Status (December 2008) 63
Table 17: Coping Strategy Indices by Livelihood Group.....70
Table 18: Age Distribution of Children 6-59 months, 2008 71
Table 19: Child Morbidity, 2008 71
Table 20: prevalence of Recommended Feeding Practices, 2008 72
Table 21: Nutrition Status of Children by Region.....75
Table 22: Malnutrition among Children based on MUAC 78
Table 23: Type, Frequency, and Sources of Data 85

LIST OF MAPS

Map 1: Food Security Status-Summary 13
Map 2: Political Map of Liberia.....23
Map 3: Food Security Status Map 63

LIST OF ANNEXES

Annex 1: Employment by Region and Gender of HH Head 86
Annex 2: External Assistance by Livelihood Group 86
Annex 3: % of HHs Reporting Increased Expenditure by Region.....88

LIST OF ACRONYMS

ACF	Action Contre la Faim
BMI	Body Mass Index
CFSNS	Comprehensive Food Security and Nutrition Survey
CFSVA	Comprehensive Food Security and Vulnerability Assessment
CHT	County Health Team
CMR	Crude Mortality Rate
CRS	Catholic Relief Services
CSI	Coping Strategy Index
DFID UK	Department for International Development
ECHO	European Commission's Humanitarian Aid department
ESF	Emergency School Feeding
EU	European Union
FAO	Food and Agriculture Organization
FCG	Food Consumption Group
FCS	Food Consumption Score
FFE	Food-For-Education
FFT	Food-For-Training
FFW	Food-For-Work
GAM	Global Acute Malnutrition
GDP	Gross Domestic Product
GoL	Government of Liberia
GTZ	German Technical Cooperation
HAZ	Height for Age Z-score
HH	Household
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IDP	Internally Displaced Person
IMCIs	Integrated Management of Childhood Illnesses
LD	Liberian Dollars
LISGIS	Liberia Institute of Statistics and Geo-Information Services
LURD	Liberians United for Reconciliation and Democracy
MOA	Ministry of Agriculture
MOE	Ministry of Education
MOF	Ministry of Finance
MOHSW	Ministry of Health and Social Welfare
MPEA	Ministry of Planning and Economic Affairs
NCHS	National Centre for Health Statistics
NGOs	Non-Governmental Organizations
PCA	Principal Component Analysis
RUF	Revolutionary United Front

SAM	Severe Acute Malnutrition
SC UK	Save the Children United Kingdom
SENAC	Strengthening Emergency Needs Assessment Capacity
SFP	Supplementary Feeding Program
TFC	Therapeutic Feeding Centre
TFP	Therapeutic Feeding Program
U5MR	Under-Five Mortality Rate
UN	United Nations
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNMIL	United Nations Mission in Liberia
USAID	United States Agency for International Development
USD	United States Dollars
VAM	Vulnerability Analysis and Mapping
WAZ	Weight for Age Z-score
WFP	World Food Programme
WHO	World Health Organization
WHZ	Weight for Height Z-score
WVL	World Vision Liberia

EXECUTIVE SUMMARY

1. Scope and Methods

The survey provides findings that are representative at regional and national level. The findings are presented by region (in total 7 regions including Greater Monrovia as a stratum) and are aggregated at rural, urban and national levels using a weighting system based on the 2008 census. As far as possible, comparisons are made with the 2006 CFSNS to monitor trends and changes during the recovery phase. Seasonality, however, was taken into account when comparing the findings. The CFSVA 2006 was conducted in March, the beginning of the lean season, while the LFSNS 2008 – except for Greater Monrovia – was conducted in December, during the harvest/post-harvest season.

The data collection for Greater Monrovia took place in August 2008, which was a direct response to increasing food prices. Data collection for the other regions in Liberia took place in December 2008; hence seasonality was also an issue when comparing Greater Monrovia results with the other regions. This is mitigated in terms of consumption, by the fact that 99 percent of the rice consumed by households in Greater Monrovia is imported and the agricultural season is not expected to be an important factor.

The survey is the baseline for a food security and nutrition monitoring system and the collection of key indicators should be repeated at least on a bi-annual basis taking into account seasonality as much as possible.

A two-stage cluster sampling approach was applied. In Greater Monrovia, 45 clusters (Enumeration Areas) were randomly selected, 1,338 households were interviewed and the nutritional status of 789 children under five and 1,875 women of child-bearing age was determined. In each of the remaining six regions, 30 clusters were selected, a total of 2,933 households were interviewed and 2,508 children and 2,865 women measured.

The survey was a joint effort led by the Government of Liberia, in particular the Ministries of Agriculture, Health and Social Welfare, the Liberia Institute of Statistics and Geo-Information Services in collaboration with FAO, UNICEF, WFP, ACF and Africare. The survey was funded by UNICEF and WFP, and in-kind contributions were made by ACF and WHO.

The survey design and data collection was led by the Liberia Institute for Statistics and Geo-Information Services in close cooperation with all stakeholders. WFP took the lead for analyzing the food security indicators in close collaboration with FAO and the Ministry of Agriculture (MOA), while UNICEF took the lead in analyzing the nutrition indicators in collaboration with ACF, WHO and the Ministry of Health and Social Welfare.

2. Trends in agriculture and socio-economic indicators

There are several key factors that explain current trends and future outlooks for the food security and nutrition situation in Liberia:

- *Agriculture:* Overall, agriculture improved greatly between 2005 and 2008. In 2005, only 66 percent of rural households had access to agricultural land and out of these only 73 percent cultivated food crops. In 2008, 88 percent of households reported access to agricultural land of which 95 percent cultivated their land during the 2008 agricultural cycle. The most dramatic changes were observed in northwest interior, historically the food basket of Liberia, where in 2005 only 32 percent of all households cultivated food crops compared to 95 percent in 2008. Despite these improvements, Liberia remains a food deficit country which is highly dependent on commercial food imports, particularly rice. Further investments in the agriculture sector will be required to expand production, increase agricultural productivity and improve farm to market linkages.
- *Education*: Similarly, education figures have improved at all levels and the education gap caused by the pro-longed civil crisis is starting to narrow. In 2006, only 68 percent of boys and 67 percent of girls of primary school age (6-11) were enrolled in school or pre-school in rural Liberia. In late 2008, it was 86 percent and 83 percent, respectively. Despite this, net enrolment of primary school aged children remained low at 45 percent and 42 percent, respectively in 2008 and 2006. A similar trend was observed for secondary school-age children. The large difference between net and gross enrolment indicates that Liberian children are still catching up as many of them are enrolled in levels below their age group. At the national level, girls do not seem to be disadvantaged when compared to boys in terms of enrolment. However, there is indication that girls are attending school with less frequency than boys. Unfortunately, current national school statistics are not reliable enough to provide evidence for sex-disaggregated attendance rates.
- *Livelihoods:* The composition of livelihoods has changed more in rural Liberia than in urban areas due to the fact that households have been able to restore their traditional livelihoods, in particular food crop and cash crop farming. Activities that dominated in 2006, such as petty trade, palm oil production and casual labor which were traditionally considered to be coping strategies, are less predominant now. Changes in Greater Monrovia have been less apparent, although it is remarkable that the number of households relying on skilled labor and remittances have decreased, while those depending on support and gifts have increased—an observation attributed to the impact of global financial crisis which led to reduction in remittances.
- *Household expenditure:* Household cash expenditure serves as a proxy indicator for income. In rural and urban Liberia, both food and non-food expenditure have increased between 2006 and 2008. The trend may be illustrative of varied reasons i) an indication of improving economic indicators as was reflected in the rise of per capita GDP that from USD 163 in 2006 to an estimated USD 230 in 2008[1] ii) increased purchasing power as households livelihoods are improving during the recovery phase iii) increasing living costs due to high global food and fuel prices in 2008 and high inflation rates. Looking at the share of food in total expenditure, rural households only spent 51 percent on food in 2008 compared

[1] Ministry of Planning and Economic Affairs/Central Bank of Liberia, 2009

to 66 percent in 2006. This may indicate that rural households are now less dependent on markets compared to 2005/6 especially given the fact that most households reported more engagement in agricultural production in 2008 as compared to 2006. However, there could also be a seasonal bias since the 2008 data collection took place during the harvest/post-harvest season. Interestingly, there has been no change in the share of food expenditure in the total expenditure in Greater Monrovia which might have reflected the effects of increasing food prices during 2008 that kept prices higher than they would have been during the harvest season. In terms of regional differentiation, income poverty and food security are correlated in Liberia, hence, it is not surprising that households in Greater Monrovia and northwest coastal have the highest food and non-food expenditure, while households in central coastal, southeast interior and northwest interior have the lowest expenditure.

- *Water and sanitation*: Improvements in the water sector were observed. While in 2006, only 32 percent of rural households had access to improved drinking water sources, in 2008 it improved to 57 percent. In terms of access to sanitary services, improvements have been limited: In 2006, 76 percent of rural households had no access to any type of sanitary facility, in late 2008; it only slightly decreased to 70 percent.

3. How many households are food insecure?

Using the standard WFP VAM food consumption analysis methodology, 14.3 percent of all Liberians have poor food consumption and dietary diversity, meaning that an estimated 499,000 Liberians can be considered to be severely food insecure. In addition, 34.9 percent (about 1,218,000 Liberians) have borderline food consumption, meaning that they are moderately vulnerable to food insecurity. Finally 50.9 percent are considered to have adequate consumption and can be considered to be food secure (about 1,776,000 Liberians).

Despite general improvements in other socio-economic indicators, food insecurity remains of high concern in Liberia. The 2006 CFSNS used a different methodology and classification system but the same input variables were utilized. In order to compare the food security situation from 2006 to 2008, the old methodology (see section 4.2.1 for a description of the methodology) was applied to both datasets. However, to report the true food security status of the population, a new WFP methodology is also used as described in section 4.2.3. The analysis reveals that food security in rural Liberia has remained at the same level with about every second household having poor or borderline food consumption. In Greater Monrovia, the food security situation worsened which confirms the results of the interagency High Price Impact Assessment conducted in June/July 2008. There is strong indication that the increasing global food prices during 2008 and Liberia's high dependency on food imports have been underlying causes for this trend. In urban Liberia, 70 percent of households mentioned high food prices as a major shock during the past 12 months compared to only 38 percent in rural Liberia. Expected positive impacts from improvements in many other sectors including agriculture, education and health on the general food security situation have been hampered by the negative effects of the global food crisis and other external factors.

4. How many and who are the malnourished?

Wasting: Using the new WHO growth reference standards, 4.9% of all Liberian children under-5 are acutely malnourished or wasted. Of this total, 1.1% suffers from severe acute malnutrition and 3.8% from moderate acute malnutrition. This means that at any one time, 6,888 children are in need of treatment for severe acute malnutrition and 23,780 in need of treatment for moderate acute malnutrition. Overall, malnutrition rates are higher in rural Liberia. Based on the WHO classification of severity of malnutrition the rates of global acute malnutrition in rural Liberia are poor at 5.2 percent compared to acceptable level in urban Liberia (4.4 percent).

Stunting: Overall, chronic malnutrition or stunting levels are estimated at 36.1%. This figure is serious by WHO standards of classification of malnutrition. 13.5% have severe chronic malnutrition. There has been no significant improvement in rates of chronic malnutrition in Greater Monrovia since 2006. In rural Liberia, the prevalence of chronic malnutrition is at the critical threshold of 40 percent.

Underweight: In Liberia, underweight (a composite indicator of acute and chronic malnutrition) is estimated at 16.6%. This level is considered high by WHO child growth standards. Levels of underweight remain higher in rural Liberia compared to Monrovia while stunting and wasting are more common in boys (20.0%) than girls (15.5%).

Women's BMI: Nutritional status of female adults of reproductive age was assessed by using the Body Mass Index (BMI). The analysis indicated that 12.9% of women had low BMI. Women from the southeast interior region (Grand Gedeh, River Gee and Grand Kru), had the highest rates of low BMI when compared to other regions. Between 2005/6 and 2008, there was no significant change in rates of low BMI in rural and urban Liberia. The analysis indicated that 13.7% and 11.8% of women in rural and urban Liberia respectively, had low BMI compared to 13.0% and 12% in 2005/6.

5. Where are the food insecure households?

According to the 2008 census, 39 percent of Liberians live in urban communities (out of these, 74 percent in Greater Monrovia) and 61 percent in rural communities. As in 2006, food insecurity remains more severe in rural Liberia—19.6 percent of rural households are considered to have poor food consumption compared to 7.5 percent in urban Liberia (6.2 percent in Greater Monrovia).

Based on an analysis taking severity and time dimension into account, the study identified five different food security groups (definitions provided in a text box located section 4.2.8). These groups are described and represented in the map as follows:

- "Better off" (42 percent of population): *Greater Monrovia*, which makes up 29 percent of the total population, and northwest coastal region, characterized by having good market access and direct access to the sea are considered to be better-off. Despite this, they have experienced a negative trend in terms of food security between 2006 and 2008. Increasing food prices and high market

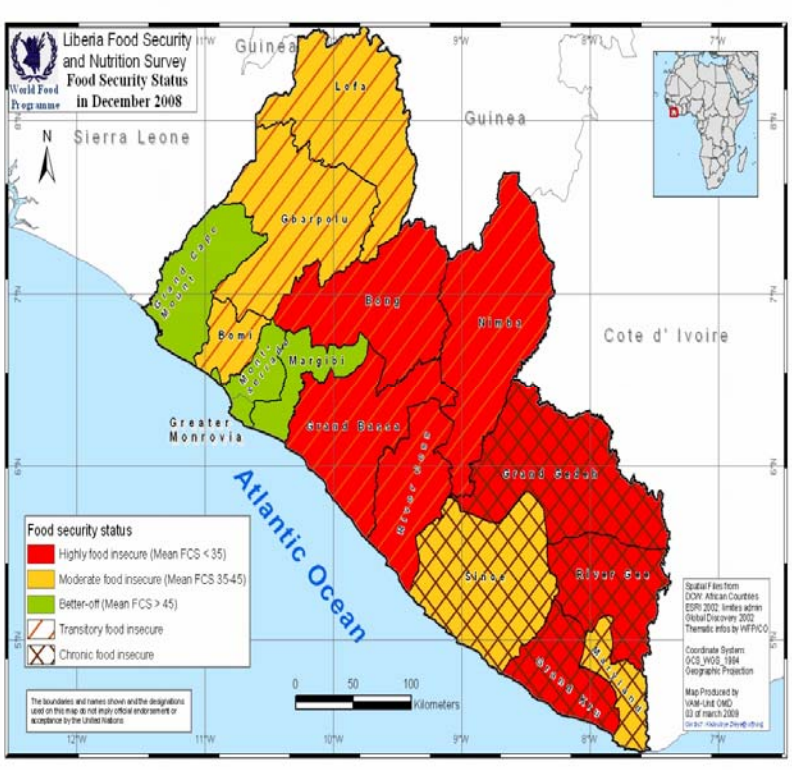
dependency are the main underlying factors for this trend, and it is recommended that the food security situation be closely monitored.

- "Moderate transitory food insecure" (12 percent): Northwest interior was highly food insecure in 2006 but is on the way to recovery. It is amongst the regions most heavily affected by displacement and fighting in the late phase of the civil crisis. Improvements have been achieved mainly through the rehabilitation of the agricultural sector, which was totally disrupted during the civil crisis. While in 2006, 19 percent of households in this region were considered to have poor food consumption, it is now only 6 percent, an indication that households have been able to re-establish their livelihoods. Yet, the food security status would be expected to follow seasonal patterns as many households are now again depending on food crop production as one of their main livelihoods, it is strongly recommended to re-assess the situation during the annual agricultural lean season.

- "Highly transitory food insecure" (31 percent): The central interior remains highly vulnerable to food insecurity – though it is one of the traditional food basket of Liberia. Progress in terms of recovery has been slower compared to northwest Liberia, however, the potential for recovery to pre-crisis level within the next two to three years remains high and the general trend is positive. Central coastal was better-off in 2006 when compared to 2008 and a more in-depth analysis will be required to analyze the underlying causes for this negative trend.

Map 1: Food Security Status-Summary

- "Moderate chronic food insecure" (7 percent): Southeast coastal (*Maryland* and *Sinoe*) is characterized by moderate chronic food insecurity. Food insecurity is mainly caused by geographic isolation and high living costs, however the general food security situation has improved between 2006 and 2008, an indication that investments in infrastructure during the past two years have had positive impacts on the general food security situation. Despite this positive trend, the situation must be closely monitored as this region is geographically cut-off on a regular basis during the rainy season.



- "Highly chronic food insecure" (7 percent): The southeast interior region, characterized by geographic isolation and low market integration is considered to be highly vulnerable to chronic food insecurity, which require longer-term interventions. Despite positive trends, the region remained amongst the most food insecure in 2008.

6. Recommendations

As for the chronically food insecure, the measures could include expanding *skills-enhancing* and *literacy programs* targeting female and unemployed household heads; increasing households' access to *livestock and poultry*; expanding *agricultural extension services* to improve pest-management and post-harvest losses; and continuation of *school-meals* program in counties within the context of a development program

Some of the recommendations to address transitory food insecurity include: *Rehabilitation of agricultural assets* with food and/or cash programs to boost agricultural production in areas of greater agricultural potential especially northwest and central interior regions; enhancing small-holder access to markets through *local food purchases,* expanding *agricultural extension services* to improve pest-management and post-harvest losses and promote horticulture; *school- meals* in highly food insecure counties; as well as instituting food safety net program targeting food insecure counties to address seasonal hunger during the lean seasons.

Urban food insecurity could also be addressed through expanding *skills-enhancing* and *literacy programs* targeting unemployed household heads and implementing *social safety nets strategies* which target the most vulnerable urban groups.

INTRODUCTION

After 14 years of conflict and associated widespread destruction of the social, economic and physical infrastructure, Liberia has started enjoying relative political stability and improved security, especially since the peaceful legislative and presidential elections in October 2005. Government's efforts coupled with international support have led to extension of civil authority throughout the country and gradual recovery of the economy.

Despite this progress, formidable challenges still stand in the way of setting Liberia on an irreversible course towards recovery and long-term development. Poverty and food insecurity have been singled out as both drivers and consequences of conflict in Liberia, and are included among the seven key factors threatening the peace building process.

Liberia is particularly vulnerable to economic shocks and fluctuations of global market prices. The country is a low-income-food-deficit country and relies heavily on food imports to meet its consumption needs. The global crisis of increasing food prices – coupled with high fuel and fertilizer prices during 2008 – worsened the already high levels of food insecurity in Liberia putting in particular vulnerable population groups such as children under-5 and pregnant and lactating women at risk to malnutrition. The ongoing global financial crisis could have spill-over effects that exacerbate the situation through a reduced foreign aid inflow, reduced remittances from the Liberian Diaspora abroad and negative impacts on the export sector that only recently started a slow recovery process after total collapse during the civil war.

1 PART I – STUDY OBJECTIVES AND METHODOLOGY

In 2007/08, The Liberia government formulated the Food Security and Nutrition Strategy (FSNS) which emphasizes on institutionalizing regular effective food security and nutrition monitoring as of central importance to reducing vulnerability to food insecurity. Accordingly, establishment of a Food Security and Nutrition Monitoring System was identified as a key deliverable in the PRS led by Ministry of Agriculture (MOA). The 2008 food price crisis made it even more urgent to monitor shocks and impacts on vulnerable population groups. Thus, food security and nutrition monitoring in Liberia is an integral part of the Government response to increasing prices.

The Government of Liberia with support from FAO, UNICEF, WFP and several NGOs conducted the Food Security and Nutrition Survey (LFSNS) in late 2008 as a follow-up to the Liberia and Greater Monrovia Comprehensive Food Security and Nutrition Surveys (CFSNS) which were conducted in 2006. The survey was designed to provide updated information on key food security and nutrition indicators and causes of food insecurity and malnutrition to inform project/program formulation processes and provide a baseline for the national Food Security and Nutrition Monitoring System.

As far as possible, comparisons are made with the 2006 CFSNS to monitor trends and changes during the recovery phase. Seasonality, however, has to be taken into account when comparing the results. The 2006 CFSVA was conducted in March, at the beginning of the lean season, while the LFSNS 2008 – except for Greater Monrovia – was conducted in December, the peak of the harvest/post-harvest season.

1.1 Objectives

Specifically, the CFSNS was intended to:

1. Assess levels of household food insecurity focusing on:
    - Who are the food insecure?
    - Where do they live?
    - Why are they food insecure?
    - And what are the recommendations for improving food security

2. Assess impact of increasing food and fuel prices, and fine-tune and update the response strategy

3. Assess both the prevalence and distribution of malnutrition among children under-five and mothers and to determine their health status (including feeding practices, morbidity) with the aim of assessing the root causes of malnutrition and determining linkages between malnutrition and food access, consumption and utilization.

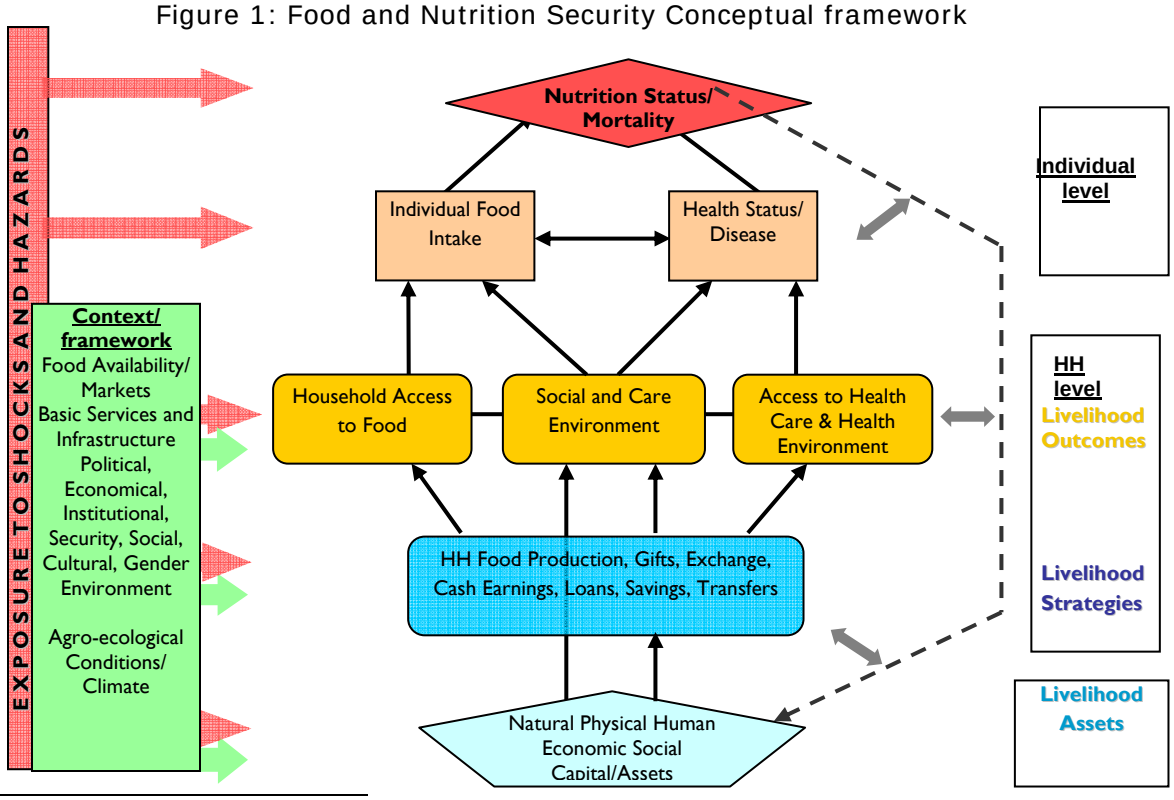
4. Provide an updated baseline to monitor trends and outcomes in food security and nutrition over time

1.2 Definitions, Terminology and Concepts

In this section, basic concepts and terminologies of food insecurity and nutrition as used in this report are defined. In addition detailed definition of concepts used in the report is also provided in the relevant sections before the usage of such terms or in the footnotes in some cases. Unless indicated, the definitions presented here are provided by Chambers & Conway as adapted by VAM-WFP, 2005, EFSA (2nd edition and CFSVA handbooks, 2009). On the other hand, the nutrition definitions are derived from WHO reference guides[2] and SPHERES Handbook, 2008.

Food security: According to the 1996 World Food Summit, food security was defined to exist when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.
Food security as a livelihood outcome is difficult to measure directly. In this survey, measure of the main immediate result of food security: dietary intake (measured by the "food consumption score") was utilized. The frequency of weighted diet diversity score or "Food consumption score" is a score calculated by the frequency of consumption of different food groups consumed by a household during the 7 days before the survey. The underlying idea is that when food consumption is insufficient, the household is food insecure. When it is acceptable, the household is food secure. When it is just less than acceptable (or one is really insufficient where the other is acceptable), the household is vulnerable to some degree.

Figure 1: Food and Nutrition Security Conceptual framework



[2] WHO Multicentre Growth Reference Study Group: WHO Child Growth Standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development. Geneva, World Health Organization, 2006.

For better understanding of food security and nutrition analysis, the report utilizes the framework adopted for understanding food security and nutrition in Liberia (MOA, Food Security and Nutrition Strategy, 2008) which describes four dimensions of food security: food availability; access to food; utilization of food; and vulnerability. Thus, food security status is determined by the interaction of a broad range of political, socio-economic, agricultural, and health-related factors. While there is no single, direct measure, food security has three distinct, but interrelated dimensions: food availability, household food access, and biological utilization of food. The framework illustrates the interrelations between all factors influencing food security and vulnerability. Household's exposure to shocks is determined both by the frequency and the severity of natural and man-made hazards, as well as the institutional or larger political context of the society. Coping capacity is determined by the ability of households to diversify their sources of both income and consumption. The vulnerability status of any household or individual is dynamic and may change over time as a series of factors, often out of the control of the affected households or individual, interact and fluctuate.

Food availability: All physical supplies of food in a given area from domestic production, commercial imports, food aid, and national stocks;

Household Food Access: It refers to the provision for all members of the household of sufficient food supplies through home production, through market purchases, or through transfers from other sources,

Utilization: This refers to consumption, transformation and absorption of accessed food supplies to meet the specific dietary and health needs of all individuals within the household.

Vulnerability: It refers to the probability of an acute decline in food access, or consumption, often in reference to some critical value that defines minimum levels of human well being (e*xposure and susceptibility to losses.* In the context of the the survey, vulnerable households are those households who are not experiencing significant problems to access and consume sufficient food at the time of the analysis, but who could be brought into a situation of insufficient access to food however because of a shock affecting livelihoods. Vulnerability is a result of the households' means of sustenance (including their capacity to cope) and of the exposure to risk factors—such as flooding, extreme price fluctuations, pest and animal attacks etc. To assess vulnerability, one has also to consider the risk to which the household is exposed.

A livelihood comprises the capabilities, assets (including both material and social resources) and activities utilised by a household for a means of living. A household's livelihood is secure when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and productive asset base.

A Household Livelihood Strategy is the type of activities and the way a household chooses to use its assets to create their means of living. Livelihood groups are thus, those characterized by different livelihood activities or combinations of activities. The groupings are derived from cluster analysis (was preceded by principal component analysis) performed on a set of different livelihood activities structured as different variables (each activity is a separate variable).

Coping strategy is defined as the way a community, household, or individual adjust their livelihood strategies in response to a shock or risk. **Coping Strategy Index (CSI)** is composite score which takes into account frequency and severity of a variety of food-related coping strategies. The survey calculated CSI based on reduced coping strategy outline by WFP in which five ways employed by households in response to risks/shocks are used. These coping strategies include: eating less-preferred foods, borrowing food or money, limiting portion size, reducing the number of meals, or favoring some members of the household at the expense of others.

Wealth Index: Wealth is the value of all natural, physical and financial assets owned by a household, reduced by its liabilities. The wealth index is therefore a composite index composed of key asset ownership variables; it is used as a proxy indicator of household level wealth whose calculation requires different steps based on a principal component analysis.

Transitory food insecurity: According to the World Bank, in 1986, transitory food insecurity refers to temporary sharp reductions in a population's ability to produce or purchase food and other essentials that may undermine long term development and cause loss of human capital from which it takes time to recover. It is temporary since the household is capable of recovery if the problems are addressed. The major sources of transitory food insecurity are year-to-year variations in international food prices, foreign exchange earnings, domestic food production and household incomes. These are often related. On the other hand "**chronic food insecurity"** refers to protracted inability by a household to produce or access food and other essentials as a result of long-term socio-economic, political and other much rooted causes.

Acute malnutrition (WHZ or wasting) is a result of reduced energy intake over a short period of time due to either food shortage or poor health (in the immediate sense). This is measured by indexing weight and height against WHO reference and the data distance from the median value recorded in z-scores or standard deviations (SD).

Chronic malnutrition (HAZ or stunting) reflects longer term issues of insufficient nutrient intake/utilisation and exposure to disease. This measured by indexing height and age against WHO reference data and the data distance from the median value recorded in z-scores or SD.

Underweight (WAZ) reflects poor development of the child as it grows. As such is a useful tool for growth monitoring in MCH clinics. It is a composite indicator for both acute malnutrition and chronic malnutrition. This measured by indexing weight and age against WHO reference data and the data distance from the median value recorded in z-scores or SD. This indicator is widely used under the term "malnutrition" by WFP and other agencies. However note should be taken as to the definitions outlined here.

The results of the analysis are presented here as the percentage of children that fall into different categories as follows:

- **Normal**: Greater than or equal to -2 standard deviations (SD) from the median.
- **Moderate**: Less than -2 SD or greater than or equal to -3 SD from the median.
- **Severe**: Less than -3 SD from the median

This applies to each of the indices presented previously. An additional term that is frequently used is "**Global**". This is used to describe all the individuals that fall into the "moderate" and "severe" categories (e.g. Global Acute Malnutrition or GAM).

1.3 Stakeholders and Implementation Process

The survey is a joint effort led by the Government of Liberia, in particular the Ministries of Agriculture, Health and Social Welfare, the Liberia Institute of Statistics and Geo-Information Services (LISGIS) in collaboration with FAO, UNICEF, WFP and ACF. The survey was funded by UNICEF and WFP. In-kind contributions were made by ACF, FAO and WHO.

The survey design and data collection was led by the Liberia Institute for Statistics and Geo-Information Services in close cooperation with all stakeholders. WFP took the lead for analyzing the food security indicators in close collaboration with FAO and the Ministry of Agriculture (MOA), while UNICEF took the lead in analyzing the nutrition indicators in collaboration with ACF, WHO and the Ministry of Health and Social Welfare

1.4 Survey Instruments

The LFSNS survey was designed to collect quantitative information at household and individual level. The household questionnaire which collected information at household, household member and child level included the following modules: demographics and education, household status, labor migration, housing and facilities, agriculture, income and access to credit, household expenditures, food sources and consumption, shocks and coping strategies, external assistance, and maternal and child health and nutritional status. All instruments were developed in English; however, with more than 14 indigenous or local languages spoken throughout the country, translation of the questionnaire into each language was not feasible. To address this constraint, Liberians were asked to review the questionnaire and translate it into Liberian English which the majority of respondents could understand. Additionally, wherever possible, data collection teams were composed of team members who had knowledge of the various languages and dialects spoken in their assigned counties.

1.5 Data Collection

The data collection for Greater Monrovia took place in August 2008, which was a direct response to increasing food prices. Data collection for the other regions in Liberia took place in December 2008; hence seasonality is an issue when comparing Greater Monrovia results with the other regions. This is mitigated in terms of food consumption by the fact that 99 percent of the rice consumed by households in Greater Monrovia is imported and the agricultural season is not an important factor. It is intended that the survey be utilized as the baseline for a Food Security and Nutrition Monitoring System and the collection of key indicators in Liberia.

The survey also involved undertaking extensive secondary data review from many sources including the Liberia Demographic and Health Survey (LDHS), the 2008 Core

Welfare Indicator Questionnaire (CWIQ), the 2006 Comprehensive Food Security and Nutrition Survey, the 2007 Comprehensive Assessment of Agriculture Sector, the 2008 Post Harvest Crop assessment, ACF nutrition assessments, the Joint High Food Price impact assessment and price monitoring data.

1.6 Sampling Procedures

The LFSNS is representative at regional and national level. The country was segmented into seven regions (six in the rest of the country and Greater Monrovia as the seventh). Data has been aggregated at rural, urban and national level using a weighting system based on the 2008 census.

A two-stage cluster sampling approach was applied. In Greater Monrovia, 45 clusters (Enumeration Areas) were randomly selected while in the remaining six regions systematic random sampling procedure based on probability proportional to size was used to select 30 clusters from each region. The sample frame was constructed by LISGIS during the preparatory stages for the 2008 Liberia census. During the second stage, a total of 4,272 households were selected (1,339 for Greater Monrovia and 2,933 for rest of Liberia) using a random sampling procedure from the household listing provided by LISGIS.

1.7 Anthropometric survey

The nutritional module of the household questionnaire was administered to the mother/caretaker of the child or in their absence, the head of the household. In each household *all children aged between 6 and 59 months or measuring 65-110cm,* as well as all women aged 15-49 years, were weighed and measured. If a child or woman was absent during the team's visit, arrangement was made to go back later and measure the child or woman meeting the criteria. If the team identified more than one child aged 6 – 59 months or woman in the last household, all of them were measured.

A total of 3,537 under-five year old children (929 in greater Monrovia and 2,608 in the rest of Liberia) and 4,740 women (1,875 in Greater Monrovia and 2,865 for the rest of Liberia) were included in the analysis of mother and child information. To ensure that the required number of children to estimate the prevalence of acute malnutrition was met, a decision was made to prioritize on selection of households with under-five year-old children in case one household was to be selected from a structure that had several households.

Mothers/caretakers of under-fives were asked questions regarding breastfeeding practice and recent illness of the child. Questions were asked to mothers with children 0 to 24 months of age regarding breastfeeding initiation and duration and infant and young child feeding practices. Both children and women were weighed to the nearest 100 grams with a UNICEF uniscale.

For children younger than two years of age or less than 85 cm, length was measured to the nearest millimeter in the recumbent position using a standard height board. Children 85 to 110 cm and women were measured in a standing position. Mothers' height was measured using a specially designed height board.

1.8 Data Entry and Statistical Analysis

Data were entered using SPSS Version 11.5 under the supervision of WFP. Data cleaning and analysis was carried out by the Liberia WFP VAM and UNICEF Nutrition units using SPSS 11.5, ADATTI, Nutrisurvey, and SMART. The calculation and analysis of anthropometric indices was conducted in Nutrisurvey.

Tests of statistical significance for proportions were done using a chi-square test. A *p*-value <0.05 was considered to be statistically significant. Results were reported both at regional and national level. To obtain results at national level, a weighting system was applied to reflect the population size of each region. The following formula was used.

W (unstandardized weight) = total estimated population per region / number of people sampled in each region
w' (standardized weight) = W * (total number of regions / sum of weights)

The quality of data was constantly controlled through data entry control checks and during the data cleaning phase. The analysis included descriptive analysis and multivariate techniques such as principal component analysis, cluster analysis and regression analysis.

1.9 Survey Limitations

There are several constraints and limitations that should be taken into account when considering the results of this survey. The first and perhaps most difficult limitation is the fact that while the Greater Monrovia survey was undertaken in August, the remaining regions of Liberia was surveyed in December, four months apart. While greater Monrovia survey was conducted at the peak of the global food price crisis, the rest of the regions were done at a time when food prices had eased somewhat. The surveys were also conducted at different seasons of the year, limiting the extent of comparability. Furthermore, the 2008 surveys are not directly comparable to the 2006 studies. While the former was conducted during the harvest/post harvest season with exception of Greater Monrovia, the 2006 surveys were conducted in March, the beginning of the lean season.

2 PART II- BACKGROUND

2.1 Historical, Population and Political Context

Map 2: Political Map of Liberia

Liberia is a nation rich in natural resources and in which bad governance has perennially engendered poverty, conflicts and low human development. The country remains one of the world's poorest nations: per capita GDP was only US$ 362 in 2009; unemployment is widespread, and at least two-thirds of Liberians are living on less than one United States dollar per day. In 2009, Liberia had a Human Development Index of 0.442, ranked 169th out of 182 countries in the world *(2009 UNDP Human Development Report).*

Though the political situation is calm, the general internal security situation is still considered precarious. The re-establishment of state authority and the rule of law over the whole territory, as well as the recovery of basic social services, are still in the early stages. Many of the structural factors that contributed to the outbreak of violence, including exclusion of large parts of society in governance, and ethnic and class animosities, have yet to be addressed while the legacy of the conflict continues to affect many aspects of life.

The current official population of Liberia is 3.5 million (Census 2008). The population of the national capital (Monrovia) has expanded significantly over the past years to more than one million people.

2.2 Macro-economic Context

The Liberian economy is small, with a narrow production base that has primarily been devoted to the export of raw materials with minimal emphasis on small-scale agriculture. The basic weakness of the economy became evident in the 1970s when increases in petroleum prices led to a fall in economic activity and with it the demand for raw materials such as iron-ore and rubber. The external shock created domestic economic imbalances and led to a marked fall in GDP from 1976-1980 by 4.0 percent annually (Second Development Plan 1981). The economy was recovering in 2004 and

by 2007 GDP grew by 9.5 percent. It was projected that growth will maintain a trajectory path to 10.3 percent in 2009 with a further increase to 14.8 percent in 2010. The projections were predicated on the reopening of the iron-ore mining sector (to be led by Mittal Steel) and the renewal of forestry concessions.

However, the global financial meltdown of 2007/08 dampened this prospect. As an agricultural-based economy, the government recognizes that by focusing on promoting agricultural expansion through small-holder cash and food crops, growth can be generated and shared among all members of the society since growth in agriculture also induces strong growth in other sectors of the economy through multiplier effects. However, exports have reduced sharply and a negative balance of trade has increased substantially. Local currency depreciated from parity with the USD$ in the early 1980s to approximately LD$70 to 1USD$ in 2008. Since 2004, the economy has slowly improved with a projected growth rate of over 6 percent in 2006. Rubber is currently the main export, accounting for approximately 90 percent of total export in 2006. Petroleum is the largest import, followed by food of which rice accounts for half of food commodity imports[3].

Liberia is particularly vulnerable to economic shocks and fluctuations of global market prices. The country is a low-income-food-deficit country and relies heavily on food imports to meet its consumption needs. Liberia is a rice-deficit country. National production only meets about 40 percent of the consumption requirements. In Monrovia, 99 percent of rice consumed is imported, while 25 percent of rural and 17 percent of urban incomes are spent on rice alone[4].

2.3 Agricultural Sector

The PRS contains the strategy through which the government intends to transform small-scale agriculture to sustain economic growth and improve the welfare of the rural communities including vulnerable groups. It is expected that transforming small-scale agriculture will reduce poverty and improve human development. This will require channeling adequate investment to expand food and cash crops, fishery and livestock productions. The World Development Report (WDR) of 2008 warned that without agriculture placed at the center of the development agenda with greater investment in the sector, halving extreme poverty and hunger by 2015 will not be realized. The WDR also stated: "for the poorest people, GDP growth originating in agriculture is about four times more effective in raising incomes of extremely poor people than GDP originating from outside the sector" (World Development Report, Press Release, October 2007).

According to the Ministry of Agriculture, more than two-thirds of Liberians are dependent on agricultural production for their livelihoods. The sector is characterized by low productivity, inefficient management, and low-level technology. The absence of agricultural markets combined with poor rural-urban linkages results in severely depressed rural economy.

[3] Liberia Market review, 2007
[4] Liberia High Food Price Assessment, 2008 and CAAS-Lib 2008

2.4 Infrastructural facilities

Up to 2006, the status of rural infrastructure in Liberia was quite disturbing as nearly all of the facilities were in disrepair and needing improvement. The situation has not improved significantly. Most Liberians have no access to electricity, improved water and sanitation facilities, acceptable health services or decent roads. For example, access to safe drinking water and adequate sanitation facilities declined from 37 percent and 27 percent in 1990 to 17 percent and 7 percent respectively in 2003. Water supply to Monrovia fell from 18 million gallons daily to 1 million gallons (PRS 2007) during the same period. However some progress has been made since the end of the conflict with 25 percent of Liberians having access to safe drinking water and 15 percent with access to human waste collection and disposal facilities (Liberia Poverty Reduction Strategy - PRS, 2008).

The existence of poor infrastructure is undermining opportunities for rural communities to increase employment and generate higher levels of income to improve their welfare. They are confronted with limited access to health and education services, and the high cost of basic goods and services due to limited supply and high transport and marketing costs. The impact of poor infrastructure on agriculture is reflected in low productivity and a declined food supply with incidence of rural hunger and malnutrition among children.

During the PRS consultations, Liberians across the country stated that roads were the most critical infrastructure investment needed to reduce poverty, distribute income among the poor, improve access to health and education facilities, reduce transport costs and commodity prices and help local governance. This was followed by education, water and electricity. Delivery of education, health and other infrastructure services needs to have special consideration for vulnerable group such as youth, women and persons with disabilities because they are often marginalized from such services. In addition to appropriately designed and maintained infrastructure, such as rural roads, telecommunication, and electricity can play a pivotal role in increasing rural productivity, reducing poverty and leading to shared growth among all, including vulnerable groups (PRS 2008).

3 PART III: SOCIO-ECONOMIC SITUATION

This section presents information on demography, migration, living conditions, livelihood activities, household expenditures, access to basic services and external assistance. All tables and charts presented in this section are based on the findings of the household surveys. Data is disaggregated by regions.

3.1 Demography

Liberia, like other developing countries in sub-Saharan Africa, continues to record large household sizes, which puts enormous strain on household resources and potential vulnerability to food insecurity and malnutrition. Nationally, the average household size for the study is 5.6 persons per household with insignificant variation between urban and rural Liberia. Of the sampled households, the majority (over 80%) were male headed with just one-fifth being female headed households. The overall mean age of household heads was 43 years with over 80 percent of household heads aged between 25 and 59 years. However, there were more elderly (>60 years) heads of households in rural areas than in urban Liberia (17% in rural as compared to 10% in urban), an observation commonly explained by the tendency for young people to migrate into urban centers leaving the elderly in rural areas.

The percentage of dependent population (i.e. number of dependent people in the households based on the household size), an indicator of vulnerability at household level is 47% meaning dependants is nearly equal to active population. The percentage of dependents is, however lower than the critical level of 70 percent. This may reflect the fact that Liberia, like any other developing nation has not had a major problem of aging population and majority of dependents are children less than 15 years.

Across the country, seven percent of respondents reported to have a chronically ill or disabled household member with about three percent of households headed by chronically ill or disabled people. The Northwest interior region (comprised of Lofa, Gbarpolu and Bomi) has the highest (15%) proportion of chronically ill or disabled members. This could be explained by the fact that Lofa was the worst hit county during the latest civil war which had wide ranging implications on the health status of the population. There was no marked difference in the proportions of the chronically ill or disabled persons across regions, though rural Liberia showed relatively higher percentage (9% in rural areas as compared to 5% in urban centers) for this category of population than urban centers. This has implications on development within the rural areas. The high proportion of the disabled or chronically ill creates additional burden to already impoverished households in rural areas and impedes engagement in agricultural production.

3.2 Migration

Overall, a quarter of the households reported having at least one member migrating out within the three months prior to the survey. Proportions of those migrating out of the households minimally varied between urban and rural Liberia although some

variations across regions were noticeable. The Northwest interior region (Lofa, Gbarpolu and Bomi) reported the highest (over a third) numbers of household members migrating out while Central interior (Bong and Nimba) reported the lowest (19%) of members migrating out).

Underlying causes of out-migration: The dominant reason for members of households to migrate out are: family related (nearly a half) followed by the drive to look for education opportunities at 29 percent. Other reasons included migrating in search of income opportunities, returning to place of origin and medical treatment. It is notable that the dominant reason for out-migrating in the Central interior as well as the Southeastern interior (Grand Gedeh, Grand Kru and River Gee) was to search for education, underlying the limited access of educational facilities in those areas.

The survey also reveals that one in ten households reported in-migration of a new member into the household within the three months preceding the survey. There was no difference between urban and rural Liberia with regard to in-migration during the period preceding the survey.

Main reasons for in-migration of new household members are: family related factors (half of households), to access educational opportunities (27%) and to search for income opportunities (15%). Greater Monrovia reported the highest proportion of in-migrating household members for educational opportunities. This confirms the known fact that Monrovia has better access to basic services than other counties followed by counties in the Northwest coastal areas (the rest of Montserrado outside Monrovia city, Margibi and Grand Cape Mount).

3.3 Adult Literacy

There is a disparity in literacy rates in Liberia according to the sex of the household head, region of residence and even age of household head. In total, 62 percent of household heads report ability to read and write basic messages. However, there was greater variability between urban and rural households. In urban areas of Liberia, 79 percent of household heads report basic literacy (ability to read and write basic messages) as compared to only 48 percent in rural households. Greater Monrovia reported the highest basic literacy levels (81%) compared to the Northwest interior (Lofa, Gbarpolu and Bomi counties) where only 38 percent of household heads are literate or the poor region of the Southeast interior (Grand Gedeh, Grand Kru and River) where 46 percent of the household heads are literate. The results are highly correlated with access to educational facilities with regions reporting greater access showing higher literacy levels as compared to their counterparts in regions where access is limited. Male heads of households were also more likely to be literate in all regions (68% nationally) as compared to female household heads at only 35 percent. Female household heads in rural Liberia reported the lowest literacy levels at just 13 percent compared to female household heads in urban areas that recorded literacy levels of 56 percent. This observation reflects the trend in education within Liberia where urban areas are more likely to be educated as compared to rural areas.

On average, younger household heads tended to be literate countrywide. The national mean age for literate household heads was 40 years as compared to the mean age for illiterate household heads whose mean age was 47 years.

3.4 Housing and Living conditions

Shelter is a basic need whose ownership plays a paramount role in stability and subsequent developments. Nationally, the majority (58%) of households own their dwelling units. However, this varied considerably between urban and rural clusters. As shown in table 1, while nearly three-quarters of households in rural Liberia own their dwellings, only 40% own dwellings in urban centers. In Greater Monrovia, which is more urbanized than any other region in Liberia, only 38% own their dwellings while close to a half of households rent them, with squatting at 8%.

On the other hand, in the Southeast interior region, almost nine in ten households own their dwellings with just 5%.

Table 1: Household Living Condition, 2008

	House ownership				**Monthly rent (LD)**
	Own	Rent	Squatter	Caretaker	LD
Northwest coastal	53.4%	9.9%	24.5%	12.2%	47
Northwest interior	74.3%	4.5%	12.5%	8.6%	17
Central coastal	66.5%	8.2%	17.1%	8.3%	26
Central interior	64.6%	6.8%	16.8%	11.7%	26
Southeast coastal	76.4%	14.5%	5.1%	4.1%	74
Southeast interior	87.5%	5.0%	5.9%	1.6%	16
Greater Monrovia	37.9%	45.3%	7.5%	9.3%	380
Total	58.3%	19.5%	12.9%	9.2%	141
Urban	40.5%	40.1%	10.0%	9.4%	302
Rural	72.4%	3.3%	15.3%	9.1%	14

The average monthly rent per household was USD 2 (141 LD) indicating a decline in amount of rent paid when compared to 2006 (reported at USD 5). As expected, Greater Monrovia reported the highest amount of monthly rent paid by households at 380 LD compared to only 16 LD in the Southeast interior region of Liberia. Rural households paid significantly less rents (14 LD) as compared to their counterparts residing in urban centers (300 LD).

Most of the households (61%) in Liberia live in stand alone structures followed by those residing in just a room within a bigger structure at 32% as shown in annex 2. Apartments are still very few in Liberia (only 6% reported living in apartments) and as expected, are more prevalent in urban Liberia (10%) compared to 3% in rural.

As was observed in 2006, the majority (60%) of the dwellings in Liberia are temporary (i.e. constructed from non-durable materials). Though not surprising, rural Liberia is dominated (81%) by temporary dwelling structures compared to urban areas at only 33%. This can possibly be explained by poverty incidences that are remarkably higher in rural areas than urban centers (Liberia poverty assessment 2007).

3.5 Education

Since the conflict ended, both children and young adults are able to attend school on a regular basis. However, due to the length of the war, many teenagers and young adults had to re-enroll in pre- or elementary schools. These findings show how important it is to strengthen accelerated learning initiatives as well as to encourage enrolment in secondary schools and advanced learning institutions.

3.5.1 Enrolment of School Age Children

Education figures have improved at all levels and the education gap caused by the pro-longed civil crisis is narrowing. In 2006, only 68 percent of boys and 67 percent of girls of primary school age (6-11 years) were enrolled in school or pre-school in rural Liberia. In late 2008, it was 86 percent and 83 percent respectively as shown on table 2. There was no significant difference in enrolment rates between rural and urban Liberia.

However, the net enrolment (i.e. the number of primary school age children enrolled in primary school out of the primary-school age children living in the sampled communities) of primary school aged children remained low at just about 50 percent nationally. There was a significant difference in net enrollment between rural and urban Liberia with the later reporting relatively higher NER[5] at 64 percent and 60 percent respectively for boys and girls while the former only reported 45 percent and 42 percent, for boys and girls respectively. This is a reflection of other development indicators such as access to social amenities and poverty indicators which tend to favor urban areas as compared to rural counterparts. School structures were destroyed during the conflicts and rehabilitation was much slower in rural areas. This is further compounded by the observation that most rural areas had inadequate access to the education facilities even prior to the wars. A similar trend was observed for secondary school-age children whose figures were lower than those of primary school age children. The Central coastal region (Grand Bassa and River Cess) and well as the South eastern interior have the lowest levels of percentages of children enrolled in school. The large difference between net and gross enrolment indicates that Liberian children are still catching up as many of them are enrolled in levels below their age group. While at national level, girls do not seem to be disadvantaged compared to boys in terms of enrolment, there are indications that girls are attending school less frequently than boys. Unfortunately, current national school statistics are not reliable enough to provide evidence for sex-disaggregated attendance rates.

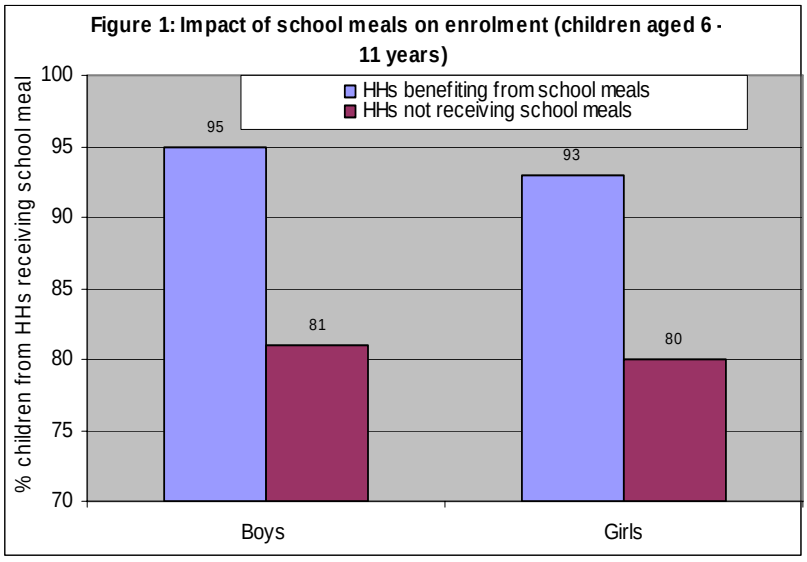
Table 2: School Enrolment, 2008

[5] Gross and Net Enrolment rates utilized in this report should be interpreted with care it is not data generated by Ministry of Education. The rates are derived from data collected during the survey. NER is used as a measurement for the number of primary school children enrolled in primary schools out of the primary school age children living in the surveyed households. It is calculated the total number of primary school age children included in the sample who are enrolled in primary school divided by the number of primary-school age children of the sample. The same principle applies for Gross Enrollment rates used in this study.

	Boys (6-11) enrolled in any school	Girls (6-11) enrolled in any school	Boys (6-11) enrolled in primary school	Girls (6-11) enrolled in primary school	Boys (12-18) enrolled in any school	Girls (12-18) enrolled in any school	Boys (12-18) enrolled in sec. school	Girls (12-18) enrolled in sec. school
Northwest coastal	87%	85%	44%	44%	90%	81%	20%	23%
Northwest interior	85%	82%	44%	39%	88%	79%	28%	20%
Central coastal	87%	86%	21%	23%	97%	90%	8%	16%
Central interior	84%	80%	60%	56%	89%	85%	45%	44%
Southeast coastal	97%	97%	57%	57%	94%	96%	34%	33%
Southeast interior	99%	97%	56%	54%	95%	95%	21%	16%
Greater Monrovia	86%	85%	63%	59%	85%	86%	47%	42%
National	88%	85%	53%	50%	89%	86%	36%	34%
Urban	89%	88%	64%	60%	88%	89%	46%	42%

3.5.2 Impact of school meals on enrolment

Figure 2: Impact of School Meals on Enrolment



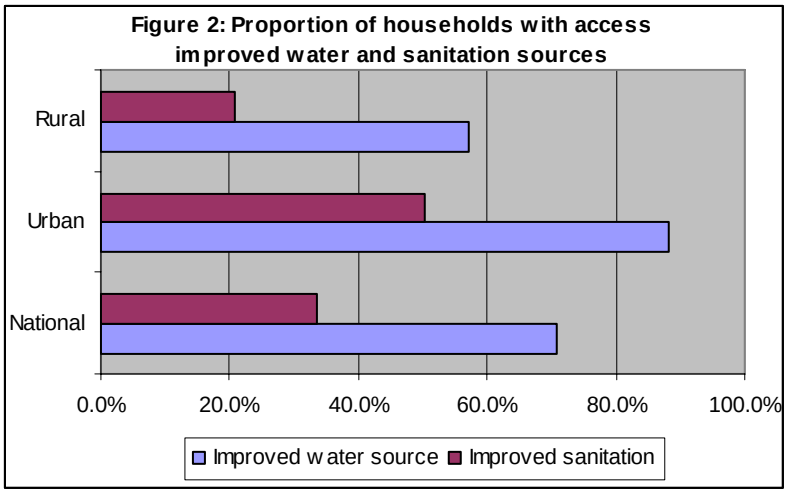
The impact of school meal on school enrolment was assessed. Overall, figure 2 depicts that over 90 percent of children in between the ages of 6 and 11 years in households that reported to be benefiting from WFP feeding program are enrolled in schools compared to only 80 percent of children in households that do not report receiving WFP school meal ration. There was no noticeable difference in enrollment across sexes with respect to whether a household benefited from school meals or not. The survey confirms the 2006 findings that households benefiting from school meals are 1.2 times more likely to send their children to school than households not receiving school meals.

3.6 Access to Water and Sanitary Services

3.6.1 Water sources

The survey uses the classification of improved water source (piped water/ standpipe, borehole with hand-pump, protected wells/ springs) as defined by Spheres Guidelines (Spheres Handbook, 2004). Figure 3 below summarizes the status of access to water in Liberia. According to UNICEF definition, safe drinking water as used here implies water from improved sources and vice versa.

Figure 3: Access to water and sanitation facilities



Overall, there was an observed improvement in the water sector since 2006 with 57 percent currently reporting drawing water from improved sources in rural Liberia as compared to only 32 percent in 2006. Nationally, more than two-thirds of households have access to improved drinking water (draw water from safe sources). The rest of the households draw their water from unimproved sources (unprotected wells, rivers, ponds, swamps or creeks). However in Central Coastal, only36 percent of households have access to water from improved sources. There was a difference between urban and rural Liberia in terms of access to water from improved sources. Urban households were more likely to report drawing drinking water from improved sources (88%) as compared to only 57 percent in rural households.

Nationally, only a small percentage (12%) of households indicate a change in the source of drinking water with rural areas reporting less likelihood of change (only 10%) compared to urban households (14%). The main reason for changing water sources was when the source had broken down[6] (32%), moving to a new water source within the locality (23%) and when the source is contaminated (18%) especially for those drawing water from open wells and rivers/streams.

3.6.2 Sanitary Facilities

The survey indicates limited improvement in access to sanitation. While 76 percent of rural households had no access to any type of sanitary facility in 2006, the situation had changed only marginally with 70 percent still reporting no sanitary facility in 2008. Overall, access to improved sanitary facilities is extremely low with rural Liberia only reporting 21 percent while urban areas report 50 percent. Over a half (51%) of households in Monrovia reported no access to improved sanitation. Most of the population with no access to improved sanitation in Greater Monrovia use

[6] mainly water pumps on wells and boreholes

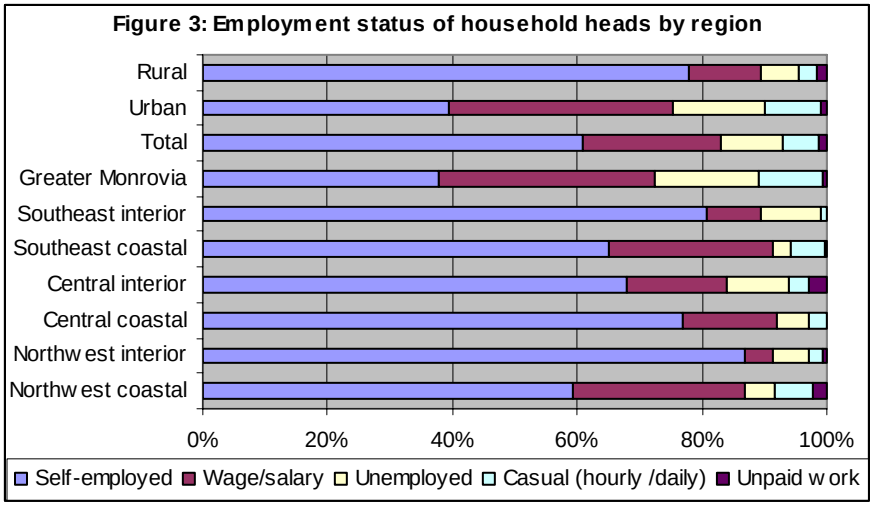
bush /open fields (63%) and a further 37 percent reported communal latrines or open pits with some toilets constructed over water bodies (river and sea). This is greatly worrying for an urban settlement making sanitation a major challenge that requires urgent redress.

3.7 Employment, Livelihood Activities and Sources of Income

Households were asked to name their four main sources of income and estimate the contribution of each source to their total annual income. From these responses, livelihood profiles were created using multivariate techniques.

3.7.1 Work Status of Household Members

Figure 4: Employment Status of Household Heads by Region



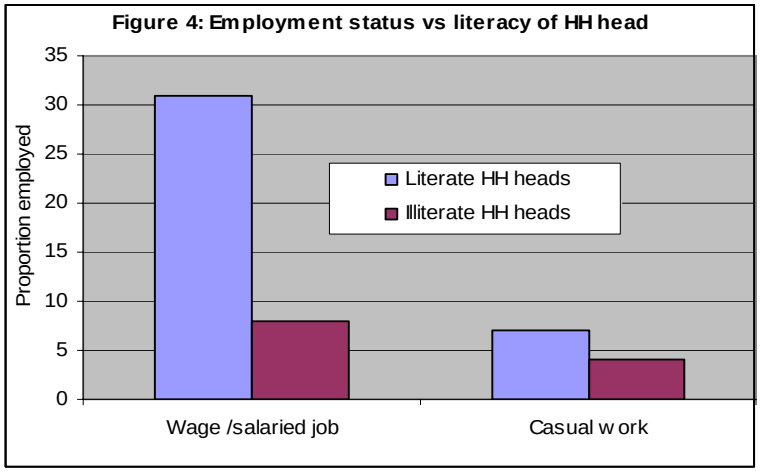
The survey collected information on the employment status of the household head. Nationally, 61 percent of household heads are self-employed (see figure 4). Twenty-two percent are on wage/salaried employment, and about ten percent indicate that they are currently unemployed. Greater Monrovia has the highest proportion of salaried/wage employees (35%) while northwest interior (Lofa, Gbarpolu and Bomi) has the least (5%) followed by South east interior at 9%. The findings coincide with employment opportunities in different regions where Greater Monrovia has the highest concentration of formal employment opportunities.

Self employment (mainly on farms or other activities as charcoal burning, etc) is mainly a rural phenomenon—i.e. 78 percent of households in rural Liberia as compared to about 40 percent in urban areas report self employment. Unemployment for household heads was also highest in rural Liberia (at 14%) as compared to urban areas that reported six percent unemployment among household heads. As indicated earlier, salaried employment and casual work is mainly an urban observation (40% of household heads had salaries/wages in urban areas compared to only 11% in rural Liberia) while nine percent of household heads had casual employment in urban Liberia as compared to only three percent in rural areas.

3.7.2 Demographic and literacy dimension of employment

As shown in figure 5, male heads of households were more likely to have salaried/wage employment or alternatively casual work than their female counterparts (25% for male heads versus 10% for female heads for salaried/wage employment and 7% male heads versus 2% female heads for casual work). On the other hand, female heads were more likely to have been unemployed (19% for females versus 8% for males), self employed (65% for females versus 60% for males) and be in unpaid employment (2% for females versus 1% for males), than their male counterparts.

Figure 5: Employment Status by Literacy levels



Literacy status of household heads also had a similar effect on employment status as sex of the household head. Literate household heads were significantly more likely to have wage/salaried employment as well as casual work than their illiterate counterparts (31% and 7% for wage/salaried employment and casual work respectively for literate heads versus 8% and 4% respectively for illiterate heads).

Households headed by younger members (aged less than 25 years) or the elderly (aged 60 years and above) were less likely to have had salaried/wage employment or be in casual work when compared to those aged 25 to 59 years. These younger or older household heads were more likely to have been unemployed than those aged 25 to 60 years.

3.8 Income Sources

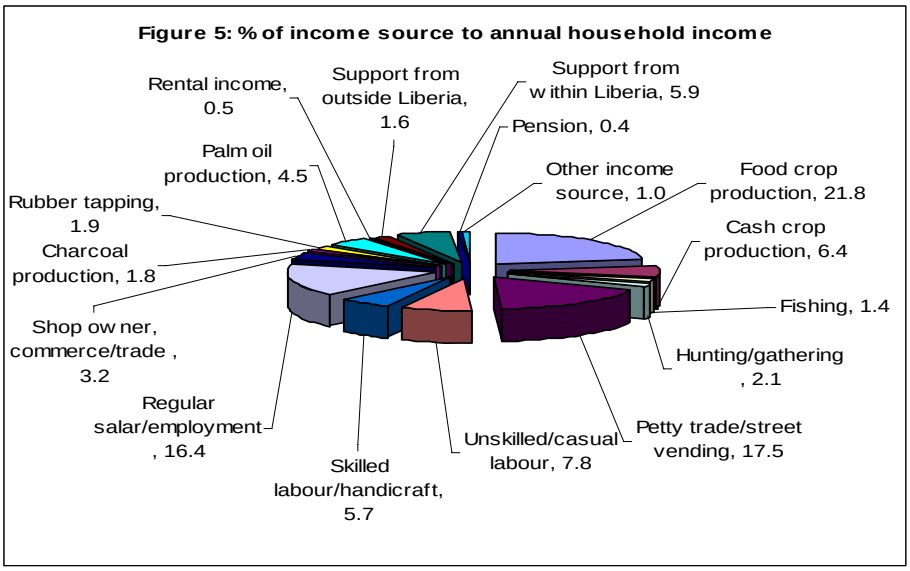
Respondents were asked to report the number of household members that are contributing or have contributed to household's income in the past three months. Nationally, an average of two household members is involved in income generation or contributes to the household's total income. There was no significant variation across regions with the exception of the Northwest interior which reported more household members (3 members) contributing to the household's income. This was probably due to the Northwest interior region being predominantly agricultural communities, thus almost all household members contribute in farm work.

The respondents were also asked to name the four main household income sources. On the overall sample, 25 percent of households engage in "food crop production", 16 percent in "petty trade/ small scale business", 15 percent in "regular salaried employment", and 8 percent in "contract/ casual work" as their income source. In South eastern interior, more than a half of the households are engaged in food production followed by Northwest interior (Lofa, Gbarpolu and Bomi) at 36 percent (see table 3 below). In Greater Monrovia, nearly half (49%) of households engage in petty trade, 38 percent receive a regular salary/wage from an employer, 19 percent receive support (13% from family/friends in Liberia, 6% from family/friends outside

of Liberia). Seventeen percent are engaged in unskilled/casual labor and 14 percent in skilled labor. Other activities do not play a crucial role in the economy of Greater Monrovia.

Using proportional piling, respondents estimated the average contribution of each income source to the total annual household income. In terms of share of the total annual household income, food crop production and selling/processing of palm nuts have the highest contributions followed by petty trade and contract work/casual labour (see figure 6).

Figure 6: Contribution of Income Source to HH Income



The contribution of food crop production is particularly high in the southeast interior at 52 percent followed by northwest interior and Central Interior at 36 percent and 30 percent respectively but lowest in Greater Monrovia at only one percent. Processing/selling of palm nuts is a key income generating source and also serves as a coping strategy across Liberia and is particularly high in Central coastal and northwest interior at 10 percent and nine percent respectively. Cash-crop production is predominant in northwest interior and central interior at 14 percent respectively but completely non-existent in Greater Monrovia. Income from fishing contributes up to 5 percent of the household income in Central Coastal but least in southeast interior and Greater Monrovia at a meagre 1 percent. Trapping and hunting dominates in Southeast interior (7.43%). The south-eastern interior is densely forested areas. Contract work is one of the major income sources in Greater Monrovia (11%) and northwest interior (10.6%). Greater Monrovia also shows the highest contributions from petty trade/small-scale business (29%) and salaried employment (29%). Selling of charcoal and firewood is more common in northwest coastal (6%). Finally rubber tapping is more common in southeast coastal (12%) followed by Central coastal and northwest interior regions at 4 percent.

Female headed households were at least twice (17 % versus 7% for male headed households) more likely to rely on petty trading and almost 6 times (11% versus 2% for male headed households) more likely to be support receivers as well as almost three times more likely to rely on remittances as the male headed households. On the other hand, male headed households were significantly (13.3 for males versus 8.7% for females) more likely to depend on salaries from regular employment, be skilled laborers (5% versus 2% for females), be involved in hunting and gathering combined with food cropping (4% versus 1%), be rubber tappers (4% versus 1%) as well as be involved in casual work (8% versus 5%) as compared to their female counterparts.

Households headed by literate individuals were significantly more (26% versus 6% for illiterate headed households) likely to have relied on regular employment and also as twice more likely to have relied on petty trading (11% versus 6%) or on cash crop combined with food crop production as compared to those headed by illiterate individuals who were more likely to have been support receivers food crop producers or hunters (5% versus 2% for literate and illiterate headed households respectively).

3.9 Livelihood Profiles using Multivariate Techniques

Table 3: Contribution to Annual Income by Urban/Rural areas

	RURAL				URBAN			
Livelihood profile	%	Main income	Second income	Third income	%	Main Income	Second Income	Third income
Employees	8.0	Regular salary, 73%	Food crop production, 10%	Petty trade 9%	32.0	Regular salary, 84%	Petty trade, 11%	Food crop production, 1%
Petty traders	6.0	Petty trade, 71%	Food crop production,16%	Casual work, 4%	24.0	Petty trade, 88%	Casual work, 3%	Regular salary, 2%
Contract laborers	5.0	Contract work, 65%	Food crop production, 17%	Palm oil production, 3%	10.0	Casual work, 84%	Petty trade, 10%	Receive support from within Liberia, 2%
Skilled laborers	3.0	Skilled labor, 62%	Food crop production, 18%	Petty trade, 7%	10.0	Skilled labor, 84%	Petty trade, 10%	Regular salary, 2%
Support receivers	3.0	Receive support from within Liberia, 84%	Food crop production, 7%	Petty trade, 4%	6.0	Receive support from within Liberia, 91%	Petty trade, 5%	Casual work, 2%
commercial trading	2.0	Commercial trading, 73%	Food crop production, 12%	Petty trade, 5%	6.0	Commercial trading, 83%	Petty trade, 7%	Regular salary, 3%
HH renting out	0.0	Rental income, 71%	Petty trade, 29%	None	1.0	Rental income, 58%	Receive support from within Liberia, 12%	Regular salary, 11%
Food crop producers	25.0	Food crop production,76%	Petty trade, 5%	Casual work, 5%	4.0	Food crop production, 62%	Fishing, 10%	Petty trade, 8%
Remittance receivers	2.0	Receive support from outside, 46%	Receive support from within Liberia, 27%	Food crop production, 15%	3.0	Receive support from outside, 68%	Receive support from within Liberia, 10%	Regular salary, 10%
Pensioners	0.0	Pension, 50%	Receive support from within Liberia, 17%	Food crop production, 15%	1.0	Pension, 72%	Commercial trading, 7%	Receive support from within Liberia, 6%
Hunters	6.0	Hunting/gathering , 43%	Food crop production, 38%	Palm oil production, 5%	0.0	Hunting/gathering , 52%	Food crop production, 30%	Petty trade, 15%
Palm oil & food crop producers	11.0	Palm oil production, 52%	Food crop production, 29%	Petty trade, 5%	0.0	Palm oil production, 80%	Food crop production, 17%	Petty trade /vending, 2%
Rubber tappers	4.0	Rubber tapping, 68%	Food crop production, 11%	Petty trade, 8%	0.0	Rubber tapping, 65%	Petty trade, 22%	Food crop production, 8%
Charcoal and food crop producers	6.0	Charcoal production, 45%	Food crop production, 26%	Palm oil production, 6%	1.0	Charcoal production, 53%	Skilled labour, 14%	Regular salary, 10%
Fisherfolks	2.0	Fishing, 49%	Food crop production, 31%	Cash crop production, 8%	1.0	Fishing, 65%	Food crop production, 14%	Petty trade, 13%
Cash and food crop producers	15.0	Cash crop production, 55%	Food crop production, 32%	Petty trade, 3%	1.0	Cash crop production, 58%	Food crop production, 20%	Petty trade, 4%
Others	2.0	Other income sources, 73%	Food crop production, 9%	Petty trade, 5%	1.0	Other income sources, 33%	Charcoal production, 27%	Rubber tapping, 10%

Using principal component (PCA) and cluster analysis, 16 relatively homogeneous livelihood profiles were created on how much each individual activity contributed to the annual household income. This methodology also captures if households depend on one or several income activities.

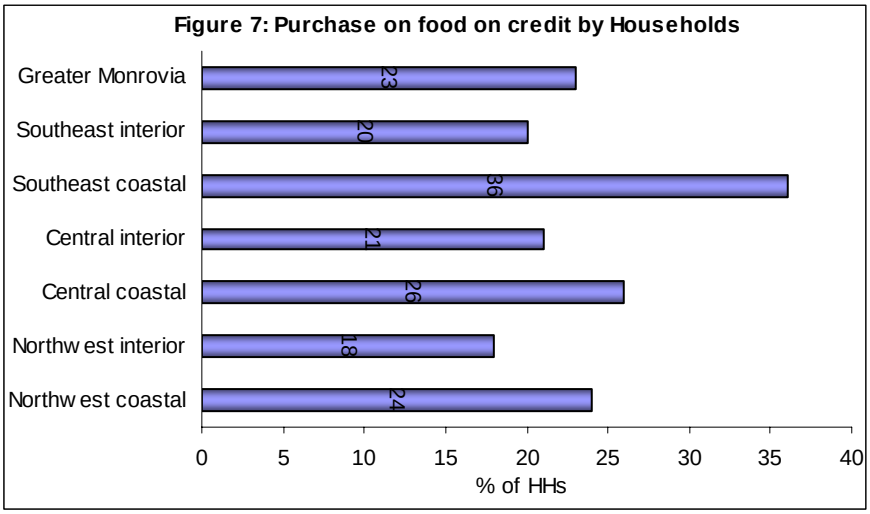
In rural Liberia, the survey reveals a major shift towards restoring traditional livelihoods. For instance, 25 percent of all households can be described as 'food crop producers', 15 percent as 'cash and food crop producers', 11 percent as 'palm oil and food crop producers', while activities that dominated in 2006 like petty trade, casual labour and palm oil production are less predominant now. These later (2006 finding) activities are traditionally considered as coping strategies in rural areas. It is notable that traditional "food basket regions" in Liberia like Central and northwest regions (comprising Lofa, Nimba and Bong) and the south eastern counties of River Gee and Grand Kru were dominated by agricultural production, either as food crop producers alone or a mixture of food and cash crop production. This means a positive shift on production, albeit at infancy stages.

Changes are however less apparent in Greater Monrovia, although it is remarkable that the number of households relying on skilled labor and remittances have decreased, while those depending on support and gifts have increased. Employees and petty trading still remained dominant in urban Liberia at 32% and 24% respectively. At the time of the survey, the full impact of the 2008/9 global financial crisis had not manifested much in developing countries like Liberia. Thus, there was no marked change in remittances when compared to 2006 findings.

3.10 Access to and Use of Loans

Households were asked whether they had taken any loans or made purchases on credit in the three months preceding the survey as well as on whether they have any existing loans.

Figure 7: Purchase on food on credit by Households



Overall, 44 percent of the households reported having an existing loan with southeast coastal region being the most indebted (53%) as compared to the South east interior counties that are the least indebted (31%). The difference in the level of indebtedness between these two neighboring regions is unclear.

As to whether households had taken loan in the three months prior to the survey, 39 percent reported that they had taken a loan. As was the case on whether households had existing loans, the southeast coastal region was still the most indebted.

There was no major variation shown on the extent of taking loans between urban and rural Liberia. The main reasons for taking loans were: to purchase food (23%), to pay fees (19%), to cover health expenses (18%) and to buy or rent a house for shelter (11%). As shown in figure 6, households in the southeast coastal regions were more likely to seek loans to purchase food (36%) compared to the rest of the regions (with 20% or less) as shown in figure 7. Seeking a loan to buy or rent a house was more common in urban areas and their surrounding districts (mainly Greater Monrovia, and the neighboring northwest coastal region.

Female headed households, those headed by chronically ill members as well as those whose heads are illiterate were slightly more likely (not statistically significant though) to have loans in the three months proceeding the survey. At least a quarter of the loans were likely to have been spent on food by these three demographic groups. The findings underscore that the above demographic profiles were more vulnerable to food insecurity and more affected by the 2008 high food price crisis than other demographic groups.

Loans were then investigated by livelihood profiles. The unskilled laborers and rubber tappers were more likely to have taken a loan than any other livelihood profile. While all other livelihood profiles indicated that less than 5% of the households had loans in the three months prior to the survey, it was only unskilled laborers and that rubber tappers that indicated proportions of households with loans at 61 percent and 52 percent respectively The livelihoods recorded proportions of around 33%. It is significant to note that loans taken by these groups were likely to have been used in purchase of food unlike skilled laborers who were mainly taking loans for business reasons or pensioners who were mainly taking loans to meet health expenses or employees whose loans were mainly for education purposes. Other groups who were likely to have been indebted included charcoal producers and petty traders. On the other hand, landlords employees, and skilled laborers were less likely to have debts.

3.11 Contract work

Respondents were asked if at least one member of the household was engaged in contract work and what the daily wage rate was. Nationally, twenty one percent of the households have at least one member engaged in contract work. Households in rural Liberia were only slightly more likely to have had a member engaged in contract work as compared to households in urban Liberia (16% in rural versus 15% in urban). In Greater Monrovia, fourteen percent of the households reported at least one household member with contract work, which is not far from the prevalence of households whose heads were unskilled/casual laborers in Greater Monrovia (11 percent). Northwest interior counties had the highest prevalence of at least a member of a household being involved in contract work. In the previous section, it was revealed that contract work (mainly in the agricultural farms) is a major income contributor to households in northwest interior.

On average, the national daily wage rate is 160 Liberian Dollar (approximately 2.5 USD). Urban Liberia reports almost double the daily wage rate as rural Liberia (236 LD in urban versus 126 LD in rural households). Greater Monrovia reports the highest levels of daily wage rate at 264 Liberian dollars (approximately 4.2 USD)[7] as

[7] Median is equal to 219. The mean has been computed by excluding 6 extreme values (from 1000 to 3000).

compared to Northwest interior that reports the lowest daily wage at only 104 LD. The average daily wage rate is lower among the female-headed compared to male-headed households (127 versus 168 LD for males), among the elderly-headed households as opposed to non-elderly headed households (142 versus 160 LD), among the illiterate-headed households compared to literate headed households (136 LD versus 182 LD) and for households headed by chronically ill compared to those headed by healthy household heads (102 LD versus 162 LD). However, the differences are not statistically significant.

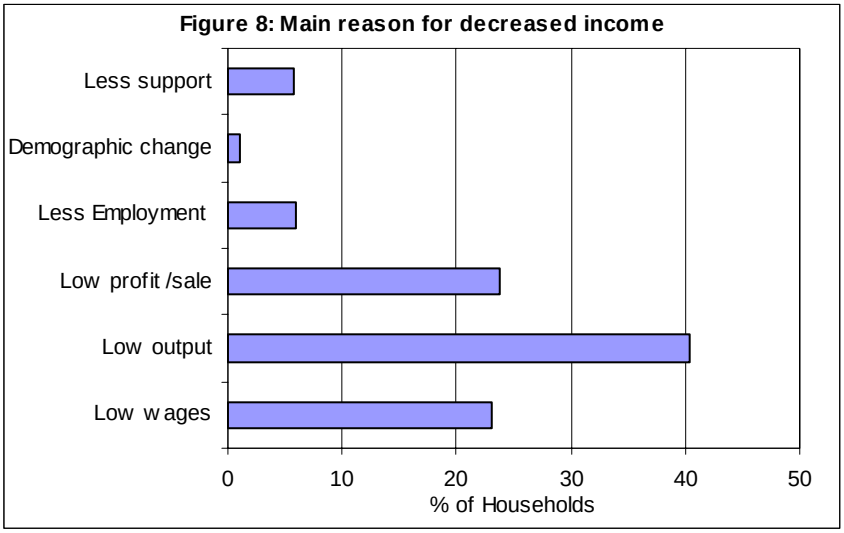
Households headed by skilled laborers and those involved in commercial trading are more likely to have daily wage rates of about 240 LD or higher, as compared to most other livelihood groups whose daily rate ranged between 110 and 150 LD. Other livelihoods with above average wage rate included employees (173 LD) and remittance receivers (216 LD).

3.12 Change in Household Income: households' perception

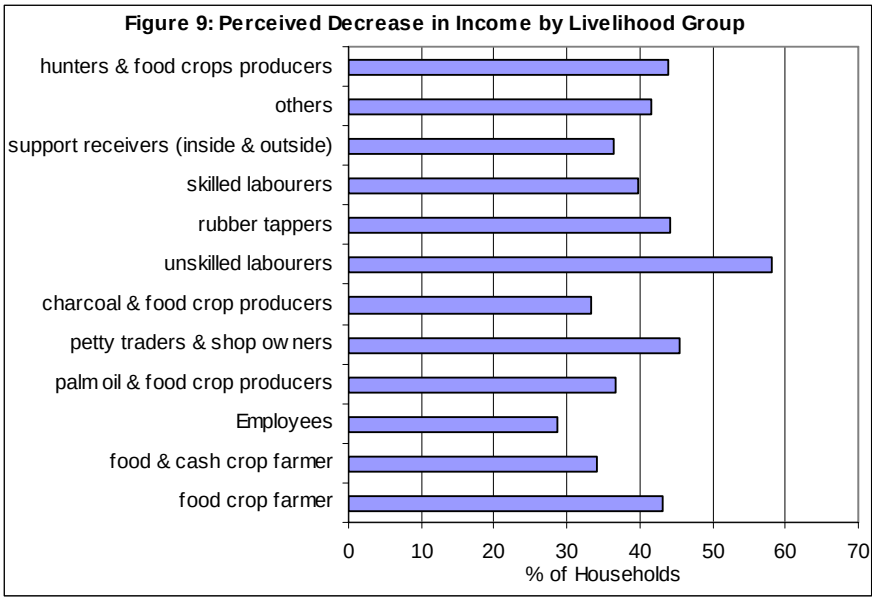
Besides information on main income activities, households were asked to report whether their income changed during the 12 months preceding the survey and to mention two main reasons for change. Nationally, almost a half (47%) of the households noticed a decrease in their total income; 21 percent reported no change; the remaining 32 percent perceived an increase in their total income. Significantly, more households in urban Liberia reported a perceived decrease (56%) as compared to rural Liberia (40%) at p-value <0.05. Southeast coastal reported the highest prevalence of perceived decrease in income (64%) followed by Greater Monrovia (63%) while the least perceived decrease in total income was reported in central interior (32%) closely followed by northwest coastal region (33%). This finding clearly depicts the impact of global food price crisis on Liberian population where urban areas were more affected as compared to regions that have increasingly relied on their own production.

Nationally, 40 percent of the households that observed a decrease in income relate it to 'low output; 24 percent to lower profits/sale while 23 percent report it is due to low wages (see figure 8). Households relying more on own production were more likely to have attributed decrease in income to low output than other livelihood groups. Populations in Greater Monrovia mainly attributed perceived decrease in total income to lower wages and lower profits or sales. This

Figure 8: Main reason for decreased income



observation is expected given that Greater Monrovia is dominated by employees and traders (petty and commercial).

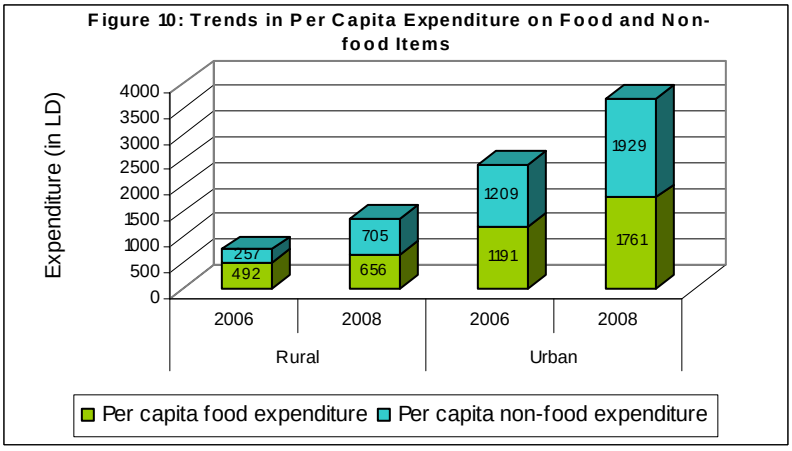


In terms of livelihood profiles, employees reported less frequently of perceived decrease in income than other livelihood groups as shown in figure 9, while unskilled laborers, hunters, petty traders, rubber tappers, and food crop producers noticed the most perceived decrease in income.

3.13 Household Expenditures

Data on expenditure on food and non-food items, such as education, health, transport, etc. were collected to understand how household decision-makers prioritize expenditure, especially when funds are limited. Monthly food and non-food expenditures also serve as proxy indicators of household food access. During the interviews, respondents were asked to provide estimates of recent expenditures for 21 food categories and 14 itemized nonfood categories. Estimations were based on a 1-month recall for short-term expenditures such as food, alcohol, transport, which were differentiated by purchases made in cash or on credit. A 6-month recall period was applied for medium to longer term expenditure, such as medical care, school fees, etc. For the following analysis, the total estimated monthly expenditure was calculated. As household expenditures are often over- or underreported, all absolute values provided in this section are only indicative and should be treated with care, while the analysis will focus on relative measures such as expenditure quintiles.

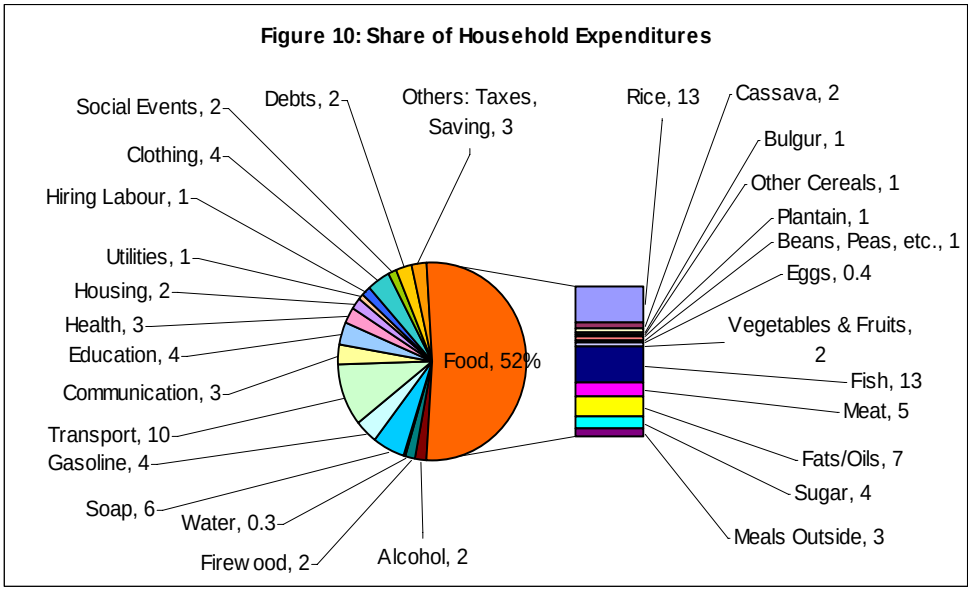
3.13.1 Per-capita Expenditures, Food and Non-Food Expenditure Shares



Household cash expenditure can serve as a proxy indicator for income. In both rural and urban Liberia, both food and non-food expenditure have increased between 2006 and 2008 as shown in figure 10. The trend might reflected

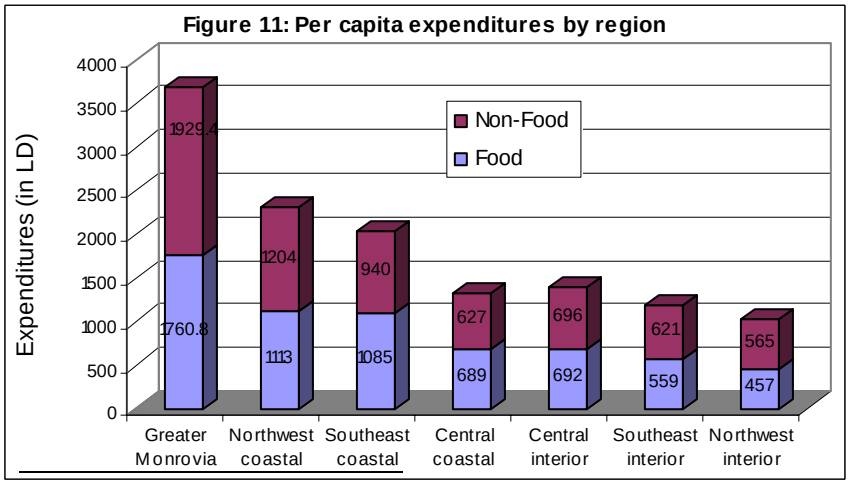
illustrative of varied reasons i) an indication of improving economic indicators as was reflected in the rise of per capita GDP from USD 163 in 2006 to an estimated USD 230 in 2008[8] ii) increased purchasing power as household livelihoods are improving during the recovery phase iii) increasing living costs due to high global food and fuel prices in 2008 and high inflation rates. The figure 9 illustrates the changes in absolute expenditures between 2006 and 2008.

Figure 7: Share of Household Expenditures



Overall, households report that 52 percent (51% in rural Liberia and 53% in urban areas) of their total expenditure is on food as shown in figure 10. This is significantly lower than the 66% reported in 2006. This is an indication that rural households are now less dependent on markets compared to 2005/6. However, there could also be a seasonal bias as the 2008 data collection took place during the harvest/post-harvest season. Families are more likely to spend on rice and fish than any other food item. Fish purchase is more pronounced in rural than urban centers probably because families are already producing some rice and may only need to purchase the deficit unlike 2006 when rice production was still very low.

Figure 8: Per Capita Expenditures by Region



Interestingly, there has been no change in the share of food expenditure in the total expenditure in Greater Monrovia (remains around 53%) compared to rural Liberia whose share of total expenditure on food declined from 66 percent to the current 52 percent. As would

[8] Ministry of Planning and Economic Affairs, Central bank and Liberia Institute of Geo-Information Services. Estimates for 2009.

be expected, Greater Monrovia reported the highest proportion of expenditures on rentals and firewood. This only confirms that housing is still an issue in urban areas. Again, households in urban areas rely on fuel (mainly firewood) from rural areas.

Overall, transport is a major cost in household budgets (accounting for 9-20% across regions). Southeast interior counties reported the highest proportion (20% of household expenditure) of their expenditures on transport when compared to other regions (Greater Monrovia only reported 10%). The poor state of roads in southeastern region is well understood in Liberia which also has a discouraging effect on potential fuel traders

Absolute expenditures provide an indication of household cash availability. However, as mentioned above, households often over – or underestimate expenditures when a recall-period is used. The values presented in Figure 12, therefore, only present trends, rather then exact values. In terms of regional differentiation regions that have shown high levels of income poverty (Liberia Poverty Assessment, 2007) also indicated per capita expenditures.. Thus, it is not surprising that households in Greater Monrovia and northwest coastal have the highest per capita food and non-expenditures, while households in central coastal, southeast interior and northwest interior have the lowest expenditure.

Table 4: Expenditure on Food by Quintiles

Table 4: Proportion of expenditure on food by quintiles

	% of expenditure on food by quintile				
	I	**II**	**III**	**IV**	**V**
Northwest coastal	57	55	56	53	45
Northwest interior	46	48	45	47	43
Central coastal	50	48	59	55	51
Central interior	56	54	57	53	39
Southeast coastal	61	64	63	59	48
Southeast interior	49	45	45	51	43
Greater Monrovia	44	60	60	55	46

The pattern of household expenditure on food and non-food items was examined across the quintiles for the different regions. As shown on table 4, the lowest expenditure quintile spend relatively higher proportion on food, compared with the fifth quintile with exception of Greater Monrovia, Northwest interior and central coastal regions. This observation reflects the regional trend where a greater proportion of those in poor regions spend more on food than any other item. On the other hand, in well-off regions (Greater Monrovia and the surroundings) food expenditure is skewed towards the upper quintile. Overall, expenditure on non-food items is also skewed towards lower quintiles which could mean communities are purchasing basic needs e.g. basic health and education expenses. However, for Greater Monrovia, purchases on non-food items are more undertaken by the highest quintile.

3.13.2. Expenditures by Sex and Age of Household Head and Livelihood Group

Expenditures were also examined by sex and age of household heads. Surprisingly, female-headed households were found to have slightly higher per-capita food

expenditures than male-headed households (1,145 LD vs. 1,044 LD) and a statistically significantly larger share of expenditures on food (57% versus 51% at $p<0.05$). In terms of overall expenditure, female headed households still reported higher absolute expenditure (4,953 LD versus 4,847 LD). The reason for this observation is unclear. However, it may also mean that female headed households were likely to disclose more of their expenditures that male counterparts (considering that most of the respondents were household heads). This confirms other findings in 2007 (poverty assessment Report) that female headed households are poorer than male headed households, which also tallies with other previous surveys which found that poorer households are more likely to spend more on food than relatively rich counterparts[9].

Households with heads aged 25-59 years spent only 51 percent of their monthly expenditures on food as compared to those lower than 25 years or more than 60 years who devote almost 60 percent of their expenditures on food. This reinforces the finding that households whose heads are younger or elderly are more vulnerable to food insecurity than those in the most productive age bracket (25-59 years.

Table 5 below presents expenditures differentiated by livelihood profile. Casual laborers, rubber tappers, and those depending on support spend higher proportions of their cash expenditure on food than other livelihood groups. It is notable that even crop producers spend substantially high proportions on food which could imply that their produce is not enough. This conclusion is also anchored on observation that households spend more (13%) on rice (still mainly imported in Liberia), a staple food commodity, than any other individual item in the expenditure basket.

Remittance receivers, employees, and traders have significantly higher cash expenditures than other livelihood groups. They also have the highest food, non food and total expenditures. Not surprisingly, all livelihood groups that engage in food crop production have lower food expenditures.

[9] CFSNS 2006

Table 5: Per Capita Expenditures by Livelihood Group Profiles[10]

	% Expenditure on food	Per capita total expenditure (LD)	Per capita food expenditure (LD)	Per capita non-fopd expenditure (LD)
Employees	51	**3527**	**1568**	**1959**
Petty traders	56	2612	1369	1244
Casual Labourers	**57**	2204	1207	997
Skilled Labourers	56	2686	1387	1299
Support receivers	**57**	2571	1388	1183
Other	**46**	**3548**	1454	**2094**
Traders	**47**	**3474**	1434	**2040**
HH renting out	**57**	2872	**1573**	1300
Food crop producers	51	**964**	**488**	**476**
Remittance receivers	56	**4332**	**2040**	**2292**
Pensioners	56	1825	1115	710
Hunters & food crop producers	**48**	**899**	**425**	**473**
Palm oil & food crop producers	**43**	1019	**444**	575
Rubber tappers	**58**	1877	1020	857
Charcoal and food crop producers	51	1426	677	748
Fisherfolks and food crop producers	50	1462	759	703
Cash & food crop producers	**49**	**989**	**461**	529

3.13.3 Changes in household expenditure

During the assessment, respondents were asked if they noticed a change in expenditure during the 12 months before the survey.

Nationally, an overwhelming majority (93%) of the households reported change with at least eight in ten households reporting an increase in expenditure.

Greater Monrovia reported the highest proportion of perceived increase in household expenditure—with almost all (96%) of the households reporting that expenditures increased over the past 12 months. Such results confirm the findings by the rapid high price assessment (June 2008) where 91 percent of the households perceived an increase.

On the other hand Northwest interior (that had significantly reported increase in own production) reported the lowest levels of perceived increase in household expenditures—at only 66%.

Most households (92%) reported an increase in the cost of commodities, especially food, as the reason for perceived increment in expenditure. Only 2% of households reported a decrease in agricultural production as a reason for increased household expenditure.

Households were more likely to report increased expenditure on food than any other commodity— 79 percent on food followed by increased expenditure on transportation

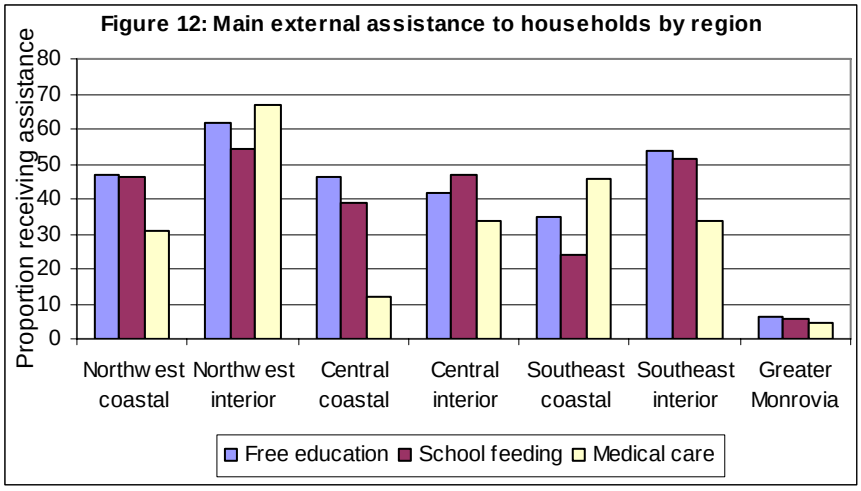
[10] Green color is considered relatively good indication while red color scheme depicts poor indication

(75%) and energy at 59 percent. Urban Liberia reported the highest prevalence of perceived increases in food expenditures at 95 percent compared to only 65 percent in rural Liberia. Increases in housing expenditure were also predominant in urban areas (51%) compared to only 20 percent in rural Liberia. In general, urban households were more likely to have observed higher prevalence of increases in costs of all commodities with exception of farm inputs which is a rural phenomenon. The results are expected given that urban areas were the worst affected in terms of the impact of the global crisis in food and energy prices. In Greater Monrovia, 97 percent of households reported increases in food expenditure, followed by energy (90%), transport (89%) and education costs (89%). Perception of food and transport cost increases is consistent with the evidence provided by the price assessment. However, Greater Monrovia FSNS 2008 data draws attention also on education, health, and housing. Indeed, 89 percent noticed an increase in education costs, 73 percent reported an increase in health costs, and 58 percent in housing costs. Such percentages are higher compared to those the price assessment revealed.

With exception of transport costs, Central coastal region (i.e. Grand Bassa and Rivercess) was likely to have experienced the least perception of expenditure increases in all commodities. It is well known that central coastal region is one of the areas least covered by good road network thus, it was not surprising for them to have reported relatively high prevalence of increases in transport costs.

3.14 External Assistance

Figure 9: Main External Assistance to HHs by Region



Respondents were asked whether the household or any of its members were recipients of any food, agricultural or other type of assistance within the three months prior to survey. Respondents may have underreported some of the assistance they have received due to the fact they were hoping to receive more. The survey focused on food and agricultural assistance, but also tried to capture interventions that addressed other factors related to food security and malnutrition. In figure 13, the external assistance is represented by region. In all regions, the three main forms of external assistance were free education, school feeding and medical care. Other forms of assistance not shown in the figure but provided to some few households included: skills training, cash transfers, nutrition interventions, seeds/fertilizer distribution, micro-credits, agricultural tools etc. With exception of skills training, cash for work or cash transfer programs, which were more or less evenly distributed between urban and rural, the rest of the interventions were rural focused. The nutrition program also appears to be more heavily tilted towards urban areas than rural—this was explained by the fact that nutrition NGOs had initially focused their programs in urban areas. The most common external support received by households were: free education, school meals

and health care services (at least over a quarter of households have benefited from these services), while the least available external support were: micro-credit, cash transfer and nutrition programs. It is notable that respondents mainly perceived nutrition in form of feeding program and failed to recognize other activities like vitamin supplementation as part of the program. Household members in northwest interior counties comprising Northwest interior was more likely to have received free education (62%), school meals (54%) and healthcare support (67%) than any other region followed by northwest coastal region whose respective indications were similar for education and school meals at 47 percent while healthcare support was 38 percent.. Greater Monrovia on the other hand, seems to be least targeted for these three programs at just between 6 percent and 8 percent.

Support with agricultural materials e.g. seeds, fertilizers and tools appeared to have been more targeted in the Southeast interior region.

With exception of free education and school meal, central coastal was the least likely to receive external support.

Overall, farming households (whether cash crop or food crop) were the main recipients of external support. On the other hand, the least recipients of external assistance were households mainly depending on social network support. This is surprising given that those supported through social networks would normally be the poorest. However, further analysis reveals that support receivers were more likely to be the elderly or the physically challenged who would not be active in activities like crop production or infrastructural improvement that attract food for work assistance and may also not have children to benefit from school meals. It is therefore likely that this category would not be targeted by most programs. As would be expected, food crop producers were more likely to have received agricultural assistance than any other livelihood.

4 PART IV – HOUSEHOLD FOOD SECURITY AND VULNERABILITY

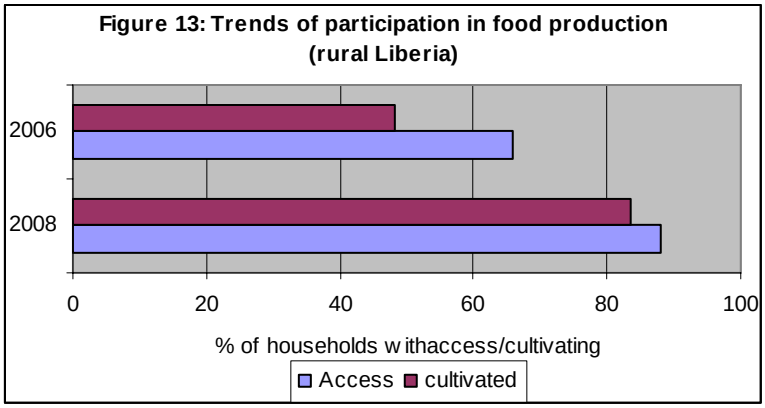
4.1 Availability of Food / Agricultural Production

Agricultural production plays a vital role in the food security status of rural and semi-urban Liberians. The agriculture module collected detailed information on land use, food and cash crop production, and agricultural constraints that limited agricultural productivity.

4.1.1 Access to Agricultural Land and Tenure

Respondents in rural Liberia were asked about their current access to land. Overall there was great improvement in agricultural activities between 2005 and 2008. In 2005, only 66 percent of rural households had access to agricultural land with only 48 percent cultivating the land for crop production. As shown on Figure 14, in 2008, 88 percent of households reported to have access to agricultural land of which while 84 percent cultivated during the 2008 agricultural cycle. Most dramatic changes were observed in northwest interior (comprising Lofa and other counties), historically the food basket of Liberia, where in 2005 only 32 percent of all households cultivated food crops compared to 84 percent in 2008. Despite these improvements, Liberia remains a food deficit country which is highly dependent on commercial food imports, particularly rice. Further investments in the agriculture sector will be required to expand production, increase agricultural productivity and improve farm to market linkages.

Figure 10: Trends of Participation in Food Production



Households were also asked about the size in acres or number of *tins planted*, which were then recalculated into acres. On average, households reported 16 acres (6.4 ha) per household. The findings vary heavily from region to region. Best current access to land is found in northwest region and Bomi and the worst is northwest coastal region (comprising Montserrado, Margibi and Grand Cape Mount). In terms of estimated size, households in central interior region (Bong and Nimba) has the largest plots while the least sizes of agricultural farm are located in northwest coastal, as would be expected because of proximity to urban areas and with resultant population pressure on land.

In terms of demographic factors, female-headed households have slightly less access to land than their male counterparts (83% versus 89%). Households headed by males were also slightly more likely to have cultivated in 2008 in case the household had access to farm land than female headed households (at 85% versus 79% respectively).

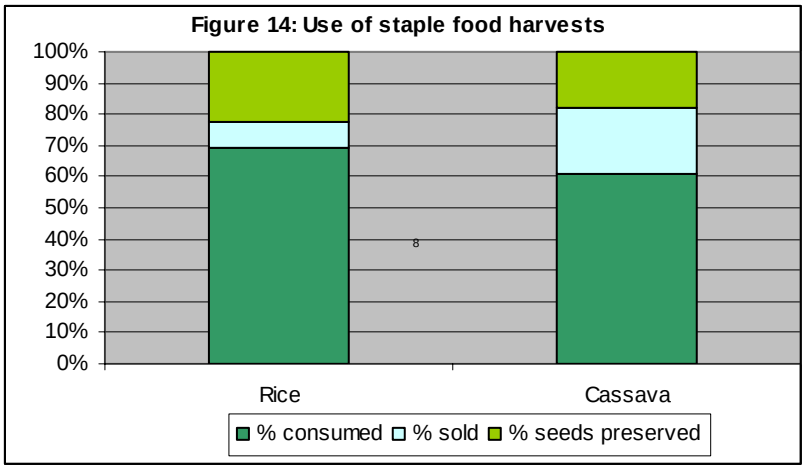
4.1.2 Food Crop Production and Use of Harvest

Overall, 83% of households in the sample produced crops. Households who produced crops in 2008 were asked to report on the food crops cultivated. The majority planted rice (70%), closely followed by cassava (66%). All other crops were much less frequently mentioned: Eddoes (26%), sweet potatoes (25%), and pulses (24%). On average, families cultivate 2-3 food crops per a season.

The Northwest interior (Lofa, Gbarpolu and Bomi), the central interior (Bong and Nimba) as well as the Southeast interior (Grand Gedeh, Grand Kru and River Gee) reported higher proportions of households involved in rice production while cassava was more produced in central coastal, as well as northwest interior. The observations represent the expected patterns in the traditional production of food crop in Liberia, meaning residents are getting back to normal in post-conflict Liberia.

Northwest Interior region had more diversified food crop production while southeast interior reported the least diversity in crop production. This tally with findings of studies carried out by Danish Refugee Council (DRC), an NGO, in 2008 among the Kru and Grebos who dominate southeast interior region reveal significant reluctance of these communities to engage in more diversified food production[11].

Figure 11: Use of Staple Food Harvest



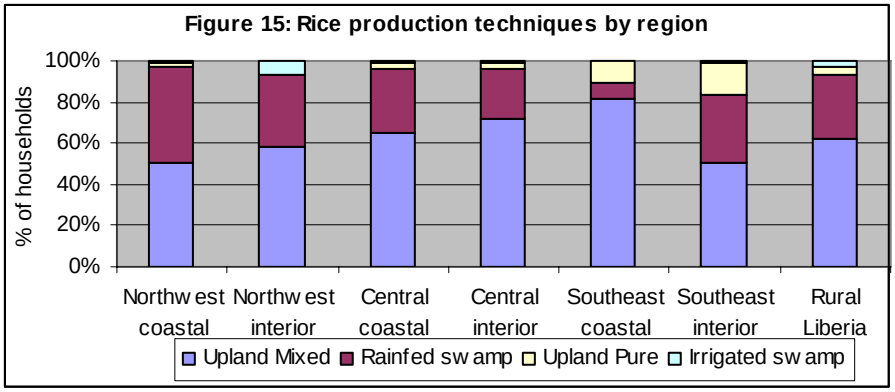
Using proportional piling technique, respondents were requested to divide the total rice and cassava harvest into proportions reflecting their usage as shown in figure 15. The majority of respondents consumed the staple foods (69% and 60% for rice and cassava respectively). For cassava, the remaining stock after consumption was either sold as fresh or after preservation. However, for rice, a significant proportion, nearly a quarter, was preserved as seeds. Rice producers in central interior region were more likely to sell their produce than any other region while those in northwest coastal region were more likely to sell their cassava (48% sell their produce).

On average the staple foods produced in Liberia last for six months or less. The respondents reported that rice lasts for 5 months, varying from 2 months in southeast coastal to 6 months in Northwest interior and Central interior regions of Liberia. Cassava stocks last much longer (6 months), probably because it is a less preferred staple that is usually consumed after all the rice stock is exhausted.

[11] DRC, KAP survey, 2008

4.1.3 Rice Production

Figure 12: Rice Production Techniques by Region



As indicated earlier in this report, 70% of respondent households cultivate rice, albeit at subsistence level. As shown on Figure 16, in 2008 Liberians undertake mixed cultivation of rice in the uplands (reported by over 50% of the respondents). Compared to 2006 where production of only rice in upland areas was dominant, the observation is a clear shift to restoration of the traditional way of rice production in Liberia at individual household level. Rain-fed swamp rice production is the most preferred alternative of rice production in all counties with pure upland rice production only pronounced in the south eastern counties. It appears that most farmers want to spread their risks as much as possible through mixed cropping practices. By diversifying, they are able to obtain some harvest even if one crop fails. However, this has an effect on the per acreage yield with limitations towards subsistence production. Irrigation farming is still less pronounced throughout Liberia. This underlies the low level of technological development and un-mechanized farming practiced within the country with corresponding low yields.

Whereas harvesting of rice starts and peaks much earlier (starts in August but peaks in September/October) in the South East counties, the rest of Liberia only begins rice harvesting in October with a peak in November for upland rice. However, harvesting of rain-fed swamp rice, the second most prevalent rice cultivation technique, peaks occur much later in November through January.

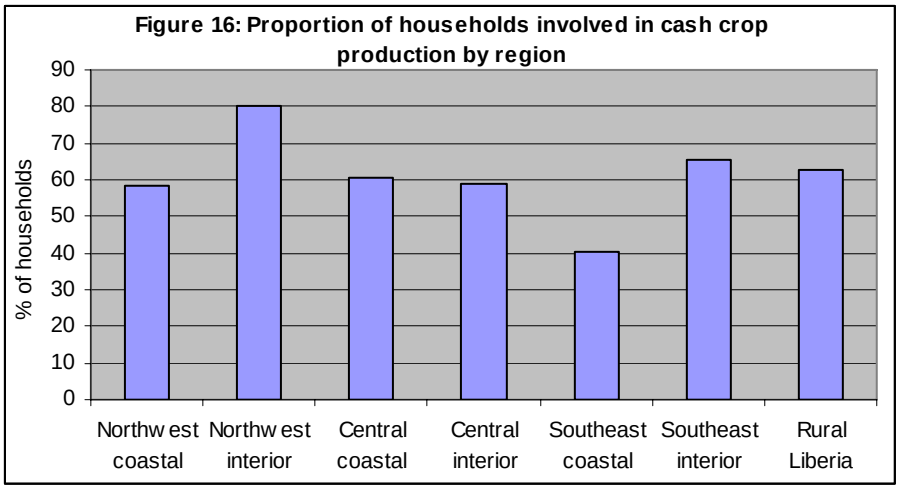
As shown in the table below, the majority of Liberians still depend on markets to access their staple food, rice. Overall, 57 percent of the respondent households reported wholly or substantially depending on markets to access rice and only 41 percent rely more on their own produced rice for consumption in the households. This underlies the fact that production of the staple food is still below the requirements. Farming households also tend to sell surplus production (once they have met their consumption requirements).

Table 6: Market Dependency

	% of HH depending on a source of rice consumed				
	Market only	More market than production	More production than market	Production only	Mainly gifts
Northwest coastal	67	8	9	15	2
Northwest interior	25	25	20	29	2
Central coastal	39	11	24	25	1
Central interior	41	13	26	18	1
Southeast coastal	69	8	10	13	0
Southeast interior	22	13	17	48	0
Total	**43**	**14**	**19**	**23**	**1**

4.1.4 Production of Cash Crops

Figure 13: Percentage Households in Cash Crop Production by Region



Compared to 2006, there has been a dramatic improvement in the production of cash crops. While only 28 percent of households produced cash crops in 2006, this has more than doubled in 2008 (63%) in rural Liberia. As presented in figure 17, northwest interior region reported the highest proportions of households involved in cash crop production followed by southeast interior region. Central interior region had also significantly improved their involvement in cash crop production when compared to 2006. The dominant cash crops cultivated in Liberia include plantains/banana (48%), kola nuts (17%), rubber (16%) and cocoa (15%). Others include palm oil, citrus, sugarcane and groundnuts.

As reported in 2006, Cocoa remains the most commonly grown cash crop in the Northwest interior, south east interior and Central Interior whereas rubber is more commonly grown in central coastal and central interior regions. The cultivation of plantains/bananas is more widespread than any other crop – particularly in the south-east and northwest regions. They provide enormous economic opportunities, particularly for rural households during Liberia's transition from recovery to sustainable development

4.1.5 Livestock and Fisheries

The Liberia livestock sector was heavily affected by the 14 years of civil strife and is only slowly starting to re-establish itself. The only main livestock owned by rural and

semi-urban Liberians today is poultry. In the overall sample, 47% of households own chickens and 8% own ducks. The least numbers of chickens were found in Northwest coastal region while the highest numbers were in South-eastern regions. Overall, 5% of households own pigs; the majority of them are found in Central Interior where 20% of households reported ownership of pigs. Also, goats were owned by 5% in the overall sample. They are mainly found in Southeastern and Central Interior regions. Sheep and cattle hardly exist in the country. Before the war, south-eastern Liberia had large cattle farms. Today they are only slowly being rehabilitated – mainly in Maryland. These three counties are characterized by vast areas of grassland which are less suitable for agricultural production but are ideal for raising livestock.

Overall, 55 percent of the households reported being involved in fishing. Ocean fishing is minimal in Liberia, maybe restricted by the type of equipment required. Most Liberians fish in creeks (reported by 44% of the households) followed by river fishing at 18 percent. The trend is similar to the 2006 CFSNS observations that also reported fishing in creeks and rivers as the dominant ones.

4.2 Households' Access to Food

Diet diversity, measured by the number of different foods from different food groups consumed in a household, and frequency of consumption is a good proxy indicator of the access dimension of food security and nutrition intake.

During the survey, households were asked to report the frequency of consumption (0 to 7 days) for 17 food items over the last 7 days prior to data collection.

Table 7: Food Items in Food Consumption Module, 2008

• Rice	• Fish (small and large quantities)	• Greens/leaves
• Cassava/other tubers	• Bush meat (small and large quantities)	• Vegetables
• Plantain	• Other meat	• Fruits
• Bulgur	• Eggs	• Oil, fats
• White flour/bread	• Milk / milk powder	• Sugar
	• Beans, peas, lentils	
	• Peanuts	

In the current study, two methodologies have been applied:

1. First, the methodology used in the previous studies (Greater Monrovia CFSNS 2007 and countrywide CFSNS 2006) has been applied in order to ensure comparability with the previous studies and capture the food consumption trend in Liberia.
2. Second, a new score (Food Consumption Score, FCS) has been computed following the new standard WFP methodology.

The score computed with the 'old' method will be used to describe the change in food consumption. The socio-economic profiling will be done on the food consumption groups identified with the new methodology.

4.2.1 Change in Household Food Consumption

During the countrywide CFSNS (2006), households were clustered into twelve distinct food consumption profiles characterised by their different food consumption patterns. These profiles were scored from “worst” to “best” on a continuous scale and this scale was iteratively revisited and adjusted through a regression analysis. Using the parameters obtained from the regression analysis it was possible to consistently evaluate each sampled household. The formula obtained was the following:

Predictor of Food Consumption = -1.601 + 0.130*(rice) + 0.103*(cassava/other tubers) + 0.039*(bulgur wheat) + 0.109*(bread/flour) + 0.118*(fish) + 0.068*(bush meat) + 0.186*(chicken/other meat) + 0.106 (egg) + 0.096*(pulses/groundnuts) + 0.090*(vegetables/greens/fruits) + 0.140*(oil) + 0.105*(sugar)

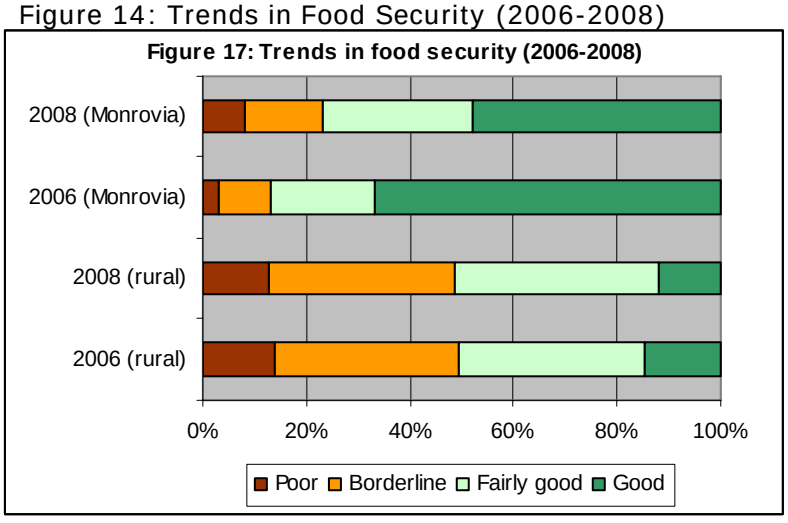
A predicted ranking value (range 0.1-4.0) was obtained for each household and cut-off points were used to separate households in food consumption groups. The rationale is that households within a certain range of score are very likely to belong to determinate consumption profiles because of the high intra-homogeneity within each sub-group. Cut-off points were decided after qualitative judgment of the different food consumption profiles. The same formula was used to calculate food consumption levels in subsequent surveys (Greater Monrovia 2007). In order to ensure comparability with previous assessments, the same formula is used to calculate consumption levels in the 2008 surveys.

Table 8 includes the description of the groups, their prevalence in rural Liberia (2006 and 2008) as well as for Greater Monrovia (2007 and 2008).

Table 8: Description of Household Consumption Groups (old Methodology)

HH Food Consumption group	% of HH (RURAL'08)	% of HH (Rural'06)	% of HH G/Monrovia'08	% of HH (G/Monrovia'07)	Cut-Off point	Description
Poor	12.7%	13.5%	8.0%	3.2%	Below 1.00	Poor diversification in the diet which is mainly based on consumption of staple – rural households substitute rice with less preferred tuber or bulgur. Fish is only consumed three days per week on average. Other protein sources are low. Consumption of fresh vegetables and fruits as well as oil/fat is low.
Borderline	35.7%	36.0%	14.9%	10.4%	Between 1.00 and 1.99	Households have a regular food intake of rice. They eat fish on a regular basis; however other protein sources remain low. Fresh vegetables, fruits and oil are consumed on a regular basis.
Fairly Good	39.8%	35.5%	29.3%	20.0%	Between 2.00 and 2.99	Frequency of consumption of eaten food is regular and also the diversity in each food group is good. Households consume rice and fish in high frequency. They gain additional protein sources from bush meat, eggs, or pulses.
Good	11.7%	15.0%	47.8%	66.4%	Equal /above 3.00	Households present good diversity and frequency of consumed food. Along with high rice, tuber, fish, vegetable and oil consumption, households obtain proteins from chicken/other meat, eggs and pulses. These protein sources are particularly common among urban households. This is the only group that frequently consumes bread/flour and sugar

Figure 14: Trends in Food Security (2006-2008)



In order to compare food security status findings in 2006 with 2008, similar classifications (methodological approaches) were utilized as reflected in figure 18. The figure describes the trend in food consumption levels between 2006 and 2008 for both Rural Liberia and Greater Monrovia. Results from the analysis reveal a generalized deterioration of food consumption in Greater Monrovia since 2007 but a relatively stable but inadequate food consumption level for rural Liberia between 2006 and 2008.

While eight percent of households are considered to have poor food consumption score in 2008 in urban Liberia (Greater Monrovia specifically), only 3 percent of households indicated a similar consumption score in 2007. The proportion of the borderline cases had also increased in Greater Monrovia from 10 percent to 15

percent. This confirms the results of the interagency High Price Impact Assessment conducted in June/July 2008. There is strong indication that the increasing global food prices during 2008 and Liberia's high dependency on food imports have been underlying causes for this trend. In urban Liberia, 70 percent of households mentioned high food prices as a major shock during the past 12 months compared to only 38 percent in rural Liberia. Expected positive impacts from improvements in many other sectors including agriculture, education and health on the general food security situation have been hampered by the negative effects of the global food crisis and other external factors. These are also consistent with findings from the rapid high price assessment conducted in June 2008 that also indicated worsening food security situation among the urban populations.

Consumption data have been analyzed in order to describe the food consumption profiles of the 4 groups and to identify changes in consumption of specific food items / groups. For each food item/group, the table below (see table 9 below) reports the average weekly consumption. It compares consumption for the different food items over the previous two years for both rural Liberia and Greater Monrovia.

As shown table 9, the 2008 survey reveals the following:

- Stability in consumption of pulses, vegetables/fruits, and oil/fats nationally in addition to stability in consumption of bread, bush meat, eggs, pulses, vegetables/fruits oil/fats and sugar in rural Liberia as well as rice, fish, non-bush meat in urban areas.
- Decreased consumption of cassava/ other tubers and bulgur nationally as well as a decline in consumption of white flour/bread, bush meat, eggs and sugar in urban Liberia.
- An increase in consumption of rice and fish in rural Liberia. Poor consumption groups consumed less cassava, pulses and oil/fats in rural areas between 2006 and 2008. In rural areas, the poor food consumption group only showed an improvement in the intake of rice in rural Liberia.
- In rural areas, there was marked increase in the intake of meat by the "good food consumption" group over the two survey periods in rural Liberia. In urban areas, the "good food consumption" group recorded improved intake of pulses between 2007 and 2008.

Table 9: Changes in Food Consumption (2006-08)

i) Rural Liberia 2006 and 2008

	Rice		Cassava /tuber		Bulgur		White flour/ bread		fish		bush meat		Other meat		Eggs		Pulses		Vegs/ fruits		Oil, fats		Sugar	
FC Predictor	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008
Poor	3	5	3	2	3	0	0	0	3	3	1	1	0	0	0	0	1	0	3	3	4	3	0	0
Borderline	5	6	4	2	3	0	0	0	5	5	1	2	0	0	0	0	1	1	4	5	6	5	0	0
Fairly good	6	7	5	3	3	1	1	1	6	6	2	2	0	1	0	0	2	2	5	6	7	6	1	1
Good	7	7	5	3	3	1	3	3	7	7	2	3	1	2	1	1	3	3	6	7	7	7	3	3
Total	**5**	**6**	4	**2**	**3**	**0**	**1**	**1**	**5**	**6**	**2**	**2**	**0**	**1**	**0**	**0**	**2**	**2**	**5**	**5**	**6**	**6**	**1**	**1**

ii) Greater Monrovia 2007 and 2008

	Rice		Cassava /tuber		Bulgur		White flour Bread		fish		bush meat		Other meat		Eggs		Pulses		Vegs/ fruits		Oil, fats		Sugar	
FC Predictor	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
Poor	3	3	1	1	3	1	1	1	3	3	1	0	0	0	1	1	1	1	2	2	2	3	1	1
Borderline	5	5	2	1	3	1	2	1	5	5	1	0	1	1	1	0	2	1	3	4	5	5	1	1
Fairly good	6	6	2	1	3	1	2	2	6	6	2	0	2	2	2	1	2	2	5	5	6	6	2	2
Good	7	7	3	2	3	1	5	4	7	6	2	1	4	5	4	2	3	4	6	6	7	6	5	4
Total	**6**	**6**	**3**	**2**	**3**	**1**	**4**	**3**	**6**	**6**	**2**	**1**	**3**	**3**	**3**	**1**	**3**	**3**	**5**	**5**	**6**	**6**	**4**	**3**

4.2.2 Food Consumption Groups: new standard methodology

The Food Consumption Score (FCS) measures household food consumption over the last seven days. Likewise the previous score, the FCS is considered to be an adequate proxy for current food security.

The FCS is a composite score based on:

- dietary diversity (i.e., number of food groups consumed over the reference period by the household)

A new score (Food Consumption Score, FCS) was computed using the new standard WFP methodology. A brief explanation of the new methodology is hereinafter reported:

4.2.3 Food groups, weights and justification

For the computation of the FCS, food items are grouped into nine food groups: 1) cereals and tubers, 2) pulses,

Table 10: Food Groups and Justification (New Methodology)

Food groups	Weight	Justification
Main staples	2	Energy dense, protein content lower and poorer quality (PER less) than legumes, micro-nutrients (bound by phytates).
Pulses	3	Energy dense, high amounts of protein but of lower quality (PER less) than meats, micro-nutrients (inhibited by phytates), low fat.
Vegetables	1	Low energy, low protein, no fat, micro-nutrients
Fruit	1	Low energy, low protein, no fat, micro-nutrients
Meat and fish	4	Highest quality protein, easily absorbable micro-nutrients (no phytates), energy dense, fat. Even when consumed in small quantities, improvements to the quality of diet are large.
Milk	4	Highest quality protein, micro-nutrients, vitamin A, energy. However, milk could be consumed only in very small amounts and should then be treated as condiment and therefore re-classification in such cases is needed.
Sugar	0.5	Empty calories. Usually consumed in small quantities.
Oil	0.5	Energy dense but usually no other micro-nutrients. Usually consumed in small quantities

3) vegetables, 4) fruits, 5) meat, fish and eggs, 6) sugar, 7) oil and fats, 8) sugar, 9) condiments.

Food groups have standard weights that reflect the nutritional density of the food groups.

The computation of the FCS is based on the following steps:

1. Frequencies of food items of the same group are added, and all the values above 7 as recoded as 7.
2. The value obtained for each group is multiplied by its weight.
3. The weighted food group scores are added to compute the FCS.

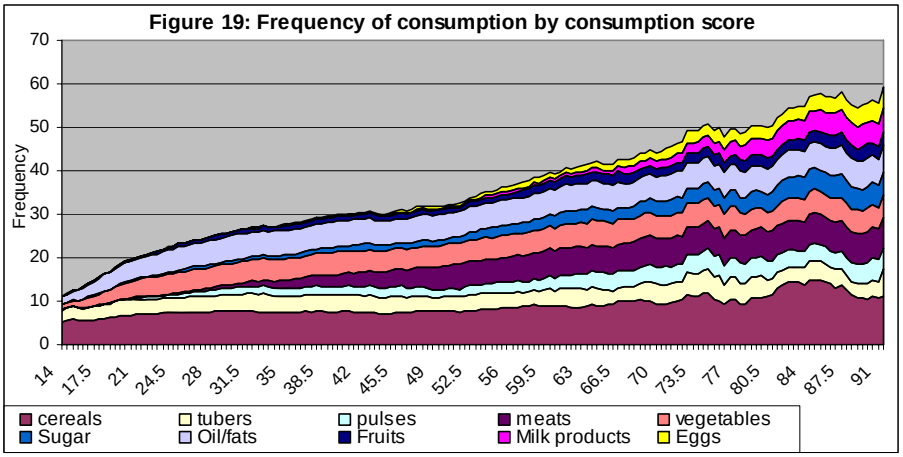
Table 11: Standard Threshold for Food Consumption Score

Standard thresholds	New standard for Liberia	Profiles
0-21	0- 24	Poor food consumption
21.5-35	24.01-38	Borderline food consumption
>35.5	38 and above	Acceptable food consumption

4. Using appropriate thresholds, the FCS is transformed into a categorical variable. The standard thresholds (21 and 35, see table 11) necessitate to be validated to ensure that they reflect country-specific food consumption patterns.

Using the new standard methodology, the FCS has been calculated for the 2008 surveys. Figure 18 describes the consumption patterns of the food groups by the food consumption groups for rural Liberia. It helps in capturing the profile of the food consumption groups and adapting the standard thresholds to the country. In particular, pervasive and high consumption of oil and/or sugar can "artificially" increase the FCS. In countries with high consumption of oil and/or sugar, it is recommended to increase the standard thresholds.

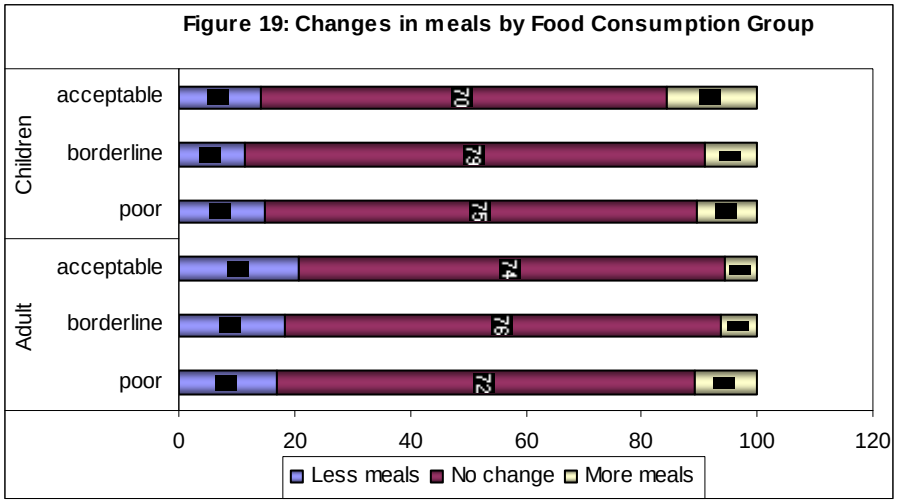
As shown in figure 19, the most frequently consumed food items include rice, oil/fats, vegetables and fish. The poorer food consumption group is generally consuming most food items less frequently as compared to acceptable food consumption group with exception of rice, oil and to some extent fish. In Liberia, oil/fats are consumed almost every day (mean of 5.5 in rural Liberia and 6 in Greater Monrovia) with frequent consumption even amongst the households with low FCS. Sugar is consumed less frequently compared to oil. On average, it is consumed 3 times per week, and its consumption is very rare among the households with low FCS. Such consumption patterns of oil and sugar suggest applying a shift in the standard thresholds from 21 to 24 and from 35 to 38. These cut-offs are used in this study in order to produce the new food consumption classification as reported in the table 11 above.



Adults in rural Liberia had more frequent meals

than their counterparts in urban areas (an average of 2 meals in rural Liberia versus 1.8 in urban places). Children on the other hand consumed meals more frequently than adults in both rural and urban Liberia. This is a positive observation from the nutritional perspective as children tend to have higher metabolism due to their activeness than adults. Like adults, children had more frequent meals in rural areas as compared to urban places (an average of 2.4 meals per child per day in rural versus 2.3 in urban areas). Overall, the analysis showed a strong positive association between the household food consumption score and the number of meals consumed by adults and children. The higher the food consumption score, the more frequent an adult or a child was likely to have had a meal. On average, adults living in households within the poor and borderline food consumption groups consume 1.9 and 2 meals per day respectively in rural Liberia, higher than urban areas with an average of 1.5 and 1.7 meals per day respectively for the two poorer food consumption groups. In rural Liberia, adults in households with acceptable consumption consume, on average, 2.2 meals a day compared to 2 for urban Liberia.

Figure 15: Changes in Meals by Food Consumption Group



Since the number of meals per day is associated with the food consumption score, it is worth reporting respondents' perception on the change in number of meals. Such belief can provide further insight in the change of food consumption and validate the results reported in section 4.2.1.

Overall, 19 percent and 13 percent of the households reported a decline in the number of meals consumed by adults and children respectively. Households whose number of meals for adults and children remained stable were similar at 74 percent.

There was not much variation in meals changes across the food consumption groups as presented in figure 20 above. Reduction of the frequency or number of adult meals was not influenced by sex of the household head. However, households whose heads are literate reported more reduction in the number of adult meals than those headed by illiterate people Although literate headed households may cope better, it is also significant that they tend to live in urban areas that were hard hit the impact of global food crisis in 2008. On the other hand, female headed households were less likely to have reduced number of meals for children under five years when compared to male headed households. The younger household heads were generally the most likely to have reduced meals for both adult and under-five as compared to households headed by those aged above 25 years.

4.2.4 Food Sources

During the assessments, households were asked to list the main sources of each food item to assess household's ability to obtain food from own production, purchase (cash / credit), payment, hunting/gathering, and gift/borrowing.

With exception of rice, cassava and vegetables in rural Liberia, the majority of households in both urban and rural settings depend on purchases of food items (see table 12 below)**.** Differences by demographic characteristics (i.e., sex, age, literacy of HH head) are generally small and not significant. Only the percentage of food coming from gifts is significantly higher among elderly-headed households compared to non-elderly headed households (3.1% versus 1.6%, $p<0.05$).

Table 12: Source of Household Food Items

	Region	Own production	Hunting/ gathering	Bought using cash	Bought on credit	Gift	Received as payment
		% HH	% HH	% HH	% HH	% HH	% HH
	Urban	4.8	0.1	91.3	1.6	1.6	0.6
Rice	Rural	**63.0**	0.0	32.3	0.5	4.1	0.1
	Urban	8.5	0.1	87.7	0.8	2.9	0.0
Cassava/tubers	Rural	**68.2**	0.1	23.2	0.2	8.4	0.0
	Urban	0.5	0.3	94.9	1.6	2.6	0.2
Bulgur	Rural	0.0	0.0	89.0	0.2	10.6	0.1
	Urban	0.3	0.3	97.6	1.2	0.6	0.0
White bread	Rural	0.0	0.1	99.0	0.0	0.9	0.0
	Urban	0.9	2.2	94.6	0.9	1.4	0.0
Fish	Rural	7.4	**22.4**	68.9	0.4	0.9	0.0
	Urban	0.8	3.4	91.2	0.0	4.6	0.0
Bush meat	Rural	7.0	**30.6**	57.2	0.7	4.5	0.0
	Urban	0.1	0.3	96.7	1.7	1.1	0.1
Other meats	Rural	3.0	0.5	93.5	0.2	2.8	0.0
	Urban	0.4	0.0	98.9	0.0	0.5	0.2
Eggs	Rural	7.5	0.3	89.6	0.7	2.0	0.0
Milk/milk powder		0.4	0.3	98.8	0.3	0.1	0.0
		0.6	0.0	96.5	0.0	2.9	0.0
	Urban	8.8	0.3	87.1	0.5	3.3	0.0
Vegetables	Rural	**60.6**	0.1	22.9	0.2	16.1	0.1
	Urban	1.2	0.1	96.7	0.8	1.2	0.1
Oil/fats	Rural	21.6	0.5	75.0	0.4	2.2	0.2
	Urban	2.7	0.4	94.3	0.9	1.6	0.0
Pulses	Rural	**34.8**	0.1	52.7	0.4	12.0	0.1

4.2.5 Asset ownership and Wealth Index in Rural Liberia

'Wealth' is defined as the value of all natural, physical and financial assets owned by a household, reduced by its liabilities. Likewise a number of socio-economic surveys

(e.g., DHS), food security and vulnerability assessments frequently calculate a composite index (Wealth Index) and use it as a proxy indicator of household level wealth.

The Wealth Index (WI) is a composite index composed of key asset ownership variables. The variables selected for the computation of the WI are proxies capable of distinguishing relatively "rich" and relatively "poor". The value of the assets depends on the context of research. The selection of variables is therefore country-specific.

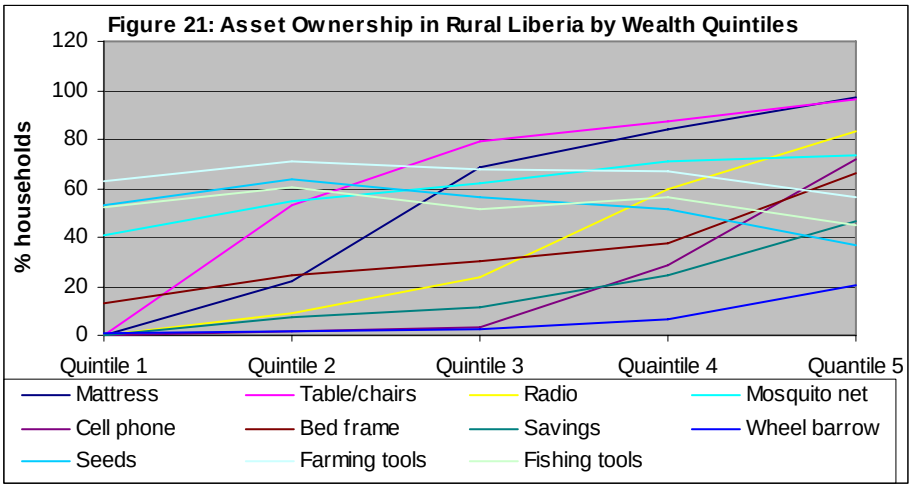
The following variables have been used for the computation of the Wealth Index: for Rural Liberia.

Table 13: Variables included in Wealth Index Creation

Wheel barrow	present=1	absent=0
Bed frame (wood, metal)	yes=1	no=0
Table/chairs	yes=1	no=0
Mattress	Yes=1	No=0
Radio	yes=1	no=0
Agricultural seeds	yes=1	no=0
Farm tools	yes=1	no=0
Cell phone	yes=1	no=0
Fishing tools	yes=1	no=0
Mosquito net	yes=1	no=0
Cash, other savings (*susu*[12] etc.)	yes=1	no=0

During the selection process, other variables were first considered and then excluded from the computation. Productive assets (i.e., cooler/ice box, bicycles, motorcycles, car/taxis, power saw, pressing iron, generators, television and even bank accounts) have been excluded because their distribution is extremely unbalanced, mainly with prevalence less than 5% but also because ownership of some of them depends on livelihoods (e.g. taxi, motorcycle etc.) rather than wealth.

The wealth index was then constructed using a principle component analysis (PCA) approach with the first principal component being taken to represent household wealth. Table 13 describes the contribution of each variable to the Wealth Index. In line with the standard procedure adopted in other food security and vulnerability analyses, the wealth index has been used to divide the population into wealth quintiles.



The figure 21 below describes the distribution of the assets used in the computation of the Wealth Index (WI) by the Wealth quintiles. It helps understanding the relationship

[12] *Susu* are equivalent of a savings club where members put in some money, may or may not earn interest and can be accessed by members in case of problems are or at will. It is not profit-making by nature by may undertake activities that improve members' welfare.

between the assets and the WI.

Further analysis was conducted to establish any relationship between the wealth indices[13] and the food security indicators namely, livelihood groups, food consumption scores and groups, expenditure computations as well as coping strategies. The table 14 shows that a higher proportion of employees, commercial traders, landlords, cash crop and food crop producers, skilled workers, as well as remittance receivers were more likely to fall in the fourth and fifth quintile groups within rural Liberia whereas casual laborers, those who depend on social support, rubber tappers, hunters and palm oil producers were more likely to be within the lowest and second lowest wealth quintile groups. Petty traders and food crop producers on the other hand were more likely to be in the medium wealth group.

Table 14: Household Wealth Status by Livelihood Group

	Wealth quintiles				
	Poorest	Poor	Medium	Rich	Richest
Employees	3.7	5.2	13.3	16.5	61.3
Petty traders	9.1	15.0	23.0	21.4	31.3
Casual Labourers	21.3	28.2	14.8	26.3	9.4
Skilled Labourers	7.3	13.7	19.8	24.8	34.4
Support receivers	26.4	21.7	27.2	15.2	9.5
Others__	7.2	16.2	20.3	20.3	36.1
Traders	3.3	4.0	4.3	21.1	67.2
Landlords	0.0	0.0	21.4	14.5	64.1
Food crop producers	20.9	26.3	23.0	17.5	12.3
Remittance receivers	14.0	21.0	9.6	23.4	32.0
Pensioners	0.0	14.8	16.5	28.5	40.2
Hunters	21.6	26.3	22.6	21.6	7.9
Palm oil & food crop producers	17.4	27.7	24.8	19.3	10.7
Rubber tappers	12.4	16.4	34.5	29.1	7.6
Charcoal	15.7	17.2	15.7	28.6	22.8
Fisherfolks	9.1	19.5	24.1	22.4	24.8
Cash & food crop producers	13.5	18.4	16.7	21.7	29.6

The survey confirms that wealth ranking is highly correlated to expenditures at household level. Higher wealth ranking is closely associated with higher amount of both food and non food expenditures. Whereas the "poorest" to the "medium" wealth groups spend a relatively higher proportion of their expenditure on food as compared to non-food commodities, households in the "rich" and "very rich" spend substantially more on non-food items than food commodities (see table 15 below).

Wealthier households were likely to have better food consumption score than the poorer households. Whereas the "richest" has a mean food consumption score of 46, "poorest" populations according to wealth ranking have a mean food consumption score of 33. The "richest" wealth group has a significantly higher food consumption score than even the "rich" wealth group whereas those within the "poorest" to "medium" wealth group show food consumption scores that is not statistically significantly different. At least 70 percent of households classified as "poorest" in terms of wealth have poor or borderline food consumption as compared to only 41 percent of "richest" households that indicate poor or borderline food consumption.

[13] The continuum of first to fifth quintiles is also represented as poorest to rich wealth groupings respectively and therefore used interchangeably.

Conversely 59 percent of households in the “richest” wealth group depict acceptable food consumption unlike the “poorest” wealth group with only 29 percent of households depicting similar characteristics.

Table 15: Wealth Group by Food Security Characteristics

	Food Security indicators					
Wealth Ranking	Mean per capita food expend (LD)	Mean per capita non-food expend (LD)	Mean FCS	Food Consumption Group		
				poor	borderline	Acceptable
"Poorest"	618	452	33.0	29.3	42.0	28.8
"Poor"	594	473	35.4	19.1	48.7	32.2
"Medium"	658	550	35.5	18.3	48.1	33.5
"Rich"	734	799	37.9	17.8	41.0	41.2
"Richest"	1029	1358	46.0	10.5	30.5	58.9

4.2.6 Socio-economic Profile of the Food Consumption Groups

One of the purposes of the vulnerability analysis is to identify socio-economic characteristics of the food consumption groups. In order to ensure comparability with the previous studies, the same key demographic and socio-economic indicators have been considered in the analysis. However, it is important to bear in mind that food consumption groups under analysis have been identified using new standard WFP methodology.

- ***Demographic factors***

Illiterate-headed households and households headed by chronically ill / disabled member are more likely to have ***poor food consumption*** (18.3% versus 11.8% for the literate HH head and 22.1% versus 14.1% for households that are not headed the chronically ill individuals).

Male-headed households and households headed by the young people (less than 25 years) are more likely ($p<0.05$) to show ***poor food consumption*** (14.8% for male-headed versus 12.4 for female-headed households and 17.8% for households headed by individuals less than 25 years versus 13.2% for the middle aged household heads).

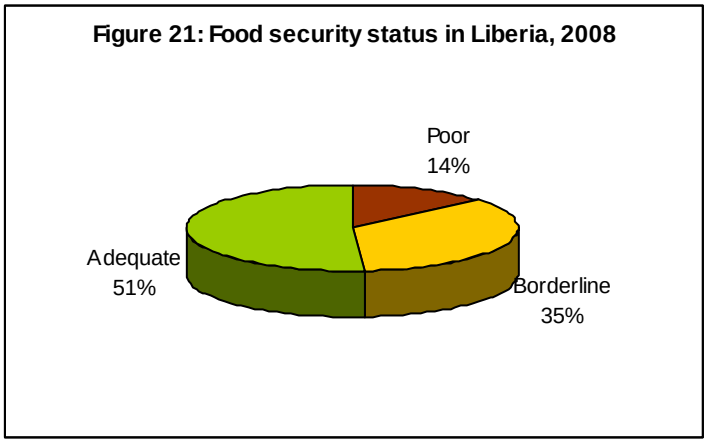
Households with members migrating out/in do not show statistically significant differences on the distribution of the food consumption profiles compared to households with no migration.

Distribution of food consumption groups does not change significantly by the number of income sources. However, households with one income source show slightly higher prevalence of borderline compared with households with three or four sources.

4.2. 7 Household Food Security Profiling

Using the standard WFP VAM food consumption analysis, 14.3 percent of all Liberians have poor food consumption and dietary diversity, meaning that an estimated 499,000 Liberians can be considered to be severely food insecure (see figure 22). In addition, 34.9 percent (about 1,218,000 Liberians) have borderline food consumption, meaning that they are moderately or highly vulnerable to food insecurity. Finally 50.9 percent are considered to have adequate consumption and can be considered to be food secure (about 1,776,000 Liberians).

Figure 16: Food Security Status in Liberia, 2008



Despite general improvements in other socio-economic indicators, food insecurity remains of high concern in Liberia. The 2006 CFSNS used a different methodology and classification system but the same input variables were utilized. In order to compare the food security situation from 2006 to 2008, the old methodology was applied for both datasets. The analysis reveals that food security in rural Liberia has remained at the same level with about every second household having poor or borderline food consumption. In Greater Monrovia, the food security situation worsened which confirms the results of the interagency High Price Impact Assessment conducted in June/July 2008.

4.2.8 Geographic Patterns of Vulnerable Groups

According to the 2008 census, 39 percent of Liberians live in urban communities (out of these, 74 percent in Greater Monrovia) and 61 percent in rural communities. As in 2006, food insecurity remains more severe in rural Liberia, 19.6 percent of households are considered to have poor food consumption compared to 7.5 percent in urban Liberia (6.2 percent in Greater Monrovia).

Based on an analysis taking severity and time dimension into account, the study identified five different groups as presented in table 16 and description (see text below for the explanation of the categorizations):

Transitory food insecurity is a temporary sharp reduction in a population's ability to produce or purchase food and other essentials that may undermine long term development and cause loss of human capital from which it takes time to recover. In Liberia, transitory food insecurity is prevalent in northwest and central regions, which were once the 'bread baskets' of Liberia. Farmers in these regions face huge challenges in rehabilitating their infrastructure and increasing production. The challenges include seasonal food insecurity, huge labour demands beyond household capacity, a lack of capital, flooding, pest damage, high post-harvest losses, a lack of technical knowledge and poor roads. Women farmers face additional constraints, including a lack of access to productive resources such as land, credit and extension services. Furthermore, the recent and devastating caterpillar attacks illustrate how crop pests (insects, diseases) can threaten food security and increase vulnerability, given the limited coping capacity of the population. On the other hand **"chronic food insecurity"** refers to protracted inability by a household to produce or access food and other essentials as a result of long-term socio-economic, political and other much rooted causes. Chronic food insecurity is concentrated in counties within the south eastern region; the inter-related casual factors of food insecurity include geographic isolation, limited market access, poor infrastructure and chronic poverty.

In this survey, the five groupings are used as follows: a) **primarily using the Food consumption scores** (FCS) to categorize food insecurity status as i) Mean FCS >45- ("better off" or acceptable food security) ii) Mean FCS 35 to 44 - (moderate food insecurity) iii) Mean FCS < 35 - (Highly food insecure), and b) **Transitory versus chronic food insecurity** underpin the historical and prevailing knowledge of the areas based on documents (Liberia National Population Census, 2008, LISGIS economic indicator publications etc) collaborated with findings from the current analysis that looked at agricultural production indicators, access indicators etc). Transitory versus chronic food insecurity was validated through performing regression analysis with food consumption score as the dependent variable and socio-economic indicators e.g. Literacy status of HH head, household size, health status of HH head, access to farmland, access to improved water and sanitation, wealth index, CSI etc as the independent variables, Using the predicted FCS from this analysis and comparing it withy the actual FCS, households were validated as transitory or chronic food insecure. This provided another layer of categorization that led to five groupings.

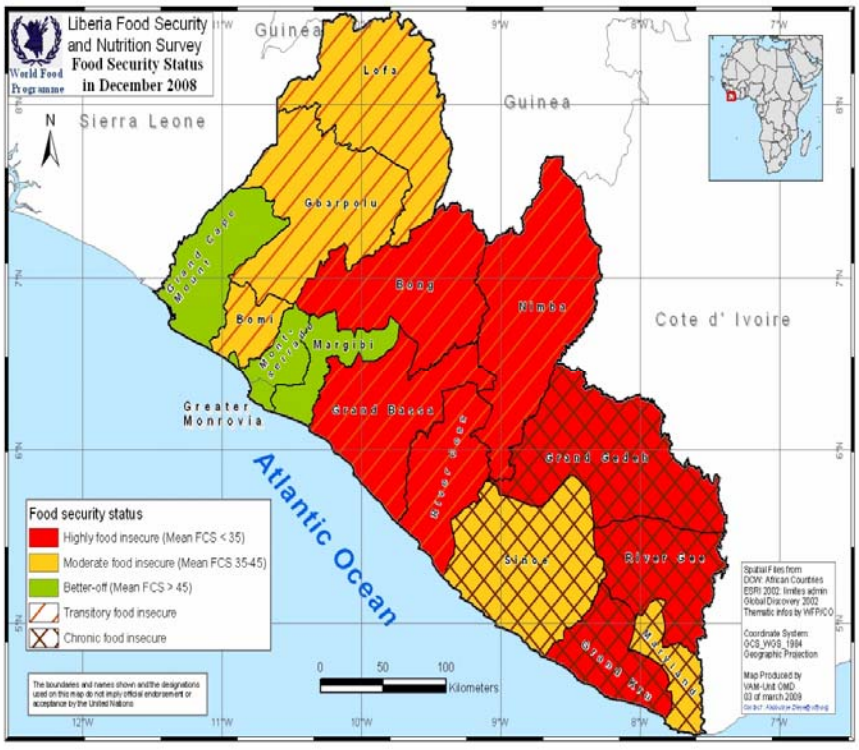
- **"***Better off" (42 percent of population): Greater Monrovia*, which makes up 29 percent of the total population, and counties in northwest coastal Liberia (*Margibi*, *Montserrado* and *Grand Cape Mount*) characterized by good market access and direct access to the sea are considered to be better-off. Despite this, they have experienced a negative trend in terms of food security between 2006 and 2008. Increasing food prices and high market dependency are the main underlying factors for this trend, and it is recommended that the food security situation should be closely monitored.

Table 16: Food Security Status (December 2008)

Type	Severity	Region	Mean FCS	poor	Border-line	Acceptable
	Better-off	Greater Monrovia	54.4	6%	20%	74%
	Better-off	Northwest coastal	48.1	7%	27%	66%
Transitory food insecure	Moderate	Northwest interior	38.9	8%	48%	45%
	Highly	Central interior	34.8	22%	48%	30%
	Highly	Central coastal	32.5	42%	30%	28%
Chronic food insecure	Moderate	Southeast coastal	42.0	10%	41%	49%
	Highly	Southeast interior	33.8	22%	52%	26%

- **"***Moderate transitory food insecure" (12 percent):*The northwest interior comprises *Lofa*, *Gbarpolu* plus *Bomi*. This region was highly food insecure in 2006 but is on the way to recovery. It was amongst the areas most heavily affected by displacement and fighting in the late phase of the civil crisis. Improvements have been achieved mainly through the rehabilitation of the agricultural sector that was totally disrupted during the civil crisis. While in 2006, 19 percent of households in this region were considered to have poor food consumption, it is now only 6 percent, an indication that households have been able to re-establish their livelihoods. Since, seasonality could play a factor as many households are now again depending on food crop production as one of their main livelihoods, it is strongly recommended to re-assess the situation during the annual agricultural lean season.

Map 3: Food Security Status Map



- **"***Highly transitory food insecure" (31 percent):* The central interior remains highly vulnerable to food insecurity – though it belongs to the traditional food basket of Liberia along with Lofa in northwest interior. Progress in terms of recovery has been slower compared to northwest Liberia, however, the potential for recovery to pre-crisis level within the next 2 to 3 years remain high and the general trend is positive. Central coastal was better-off in 2006, more in-depth analysis will be required to analyse the underlying causes for this negative trend.

- **"***Moderate chronic food insecure" (7 percent):* Southeast coastal region (*Maryland* and *Sinoe*) is characterized by moderate chronic food insecurity. Food insecurity is

mainly caused by geographic isolation and high living costs, however the general food security situation has improved between 2006 and 2008, an indication that investments in infrastructure during the past two years have had positive impacts on the general food security situation. Despite this positive trend, the situation has to be closely monitored as these counties are geographically cut-off on a regular basis during the rainy season.

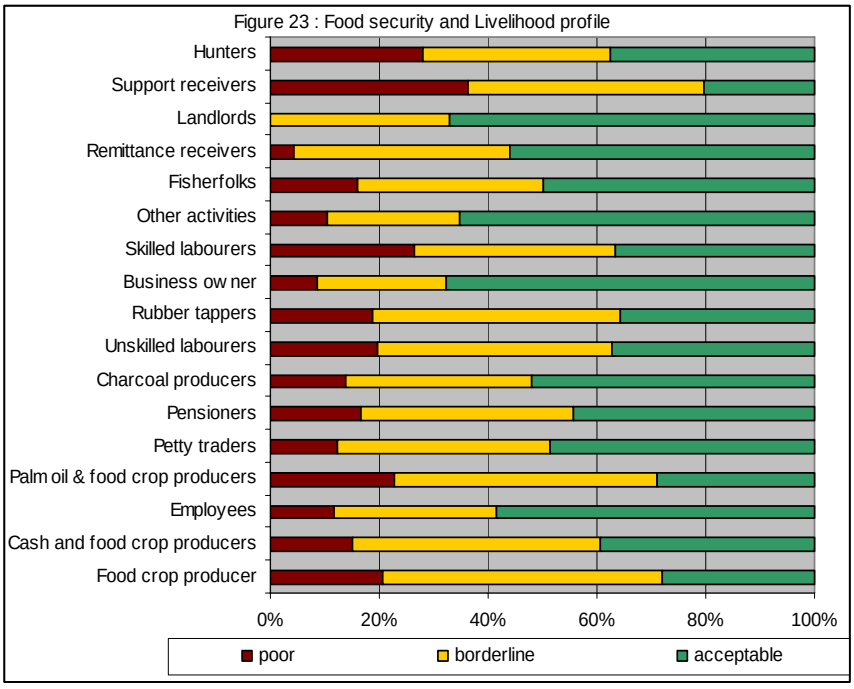
- **"***Highly chronic food insecure" (7 percent):* The southeast interior, characterized by geographic isolation and low market integration are considered to be highly vulnerable to chronic food insecurity, which require longer-term interventions.. Despite positive trends, they remain amongst the most food insecure in 2008.

4.2.9 Who are the food insecure households?

Household characteristics associated with rural transitory food insecurity include:

- Households headed by a young person (under 25). Whereas 18.8 percent of households headed by younger persons are severely food insecure, only 13.2 percent of those headed by persons aged 25-59 years are severely food insecure. These younger household heads were also more likely to be unemployed. On the other hand, those aged 25-59 years were more likely to have been in stable occupation in whatever field they chose, thus were more able to fend for themselves than the young. Households headed by the youthful group was everywhere in the country although more pronounced in regions like northwest interior and central interior as well as in Greater Monrovia.

Figure 17: Food Security and Livelihood Profile



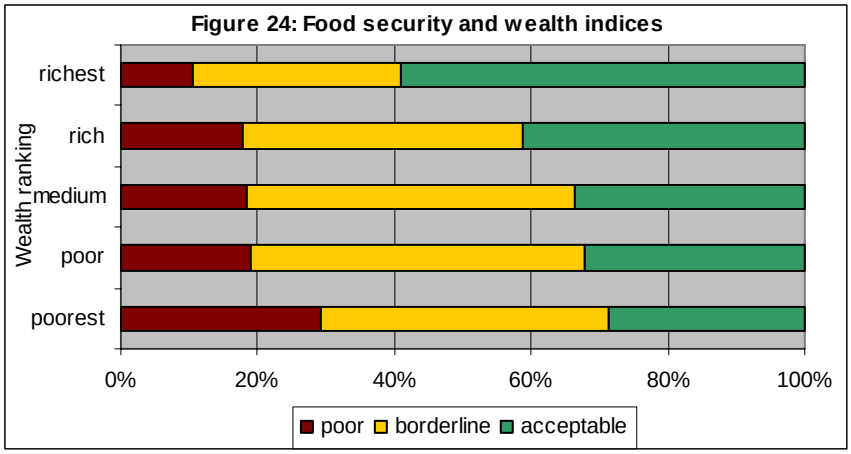
- Households headed by persons who are relying on casual income sources. Compared to those relying on skilled work most of whom (55%) had acceptable food consumption score, only less than a half (48.8%) had acceptable food consumption. The casual laborers are mainly affected since they are uncertain of the next day. Furthermore, with the downturn in the economy as a result of the global food and fuel crisis, they were reports of reduced opportunities for casual work. It is also significant that casual laborers are not

paid well. However this group would easily fair better if income opportunities improve.

- Households who live in makeshift shelter, in rooms, or squatter
- Households that settled down in 2008 and therefore missed the agricultural season. Although few, these were new returnees mainly to agricultural regions of Liberia (concentrated in Northwest and central interior regions).
- Households without vegetable gardens.
- Households relying on skilled and casual labor, support receivers and hunting (even if skilled, employment market may not offer sufficient opportunities) are more likely to have poor food consumption while better-off are households who rely on food and cash crop production, regular salaried employment and trading. The combination of food and cash cropping offers households additional buffer as income is generated from multiple sources. Traders are also able to get their profit margin so long as their commodities are sold. Their more adjustable to changes in the economy that those with relying on farming for example—who would be grounded should there be crop failure. On the other hand, hunting and casual work are quite uncertain.
- Farming households who suffered from animal pest and crop failure. Twenty eight of households whose farms had been destroyed by animal pests were classified as food insecure as compared to only 26% who had acceptable food consumption levels. Furthermore 27 percent of households that encountered crop failure had poor food consumption profile. These are mainly farming households concentrated in rural Liberia, specifically in Central interior, northwest interior and southeastern regions. These households largely depend on crop farming for survival and a shock affecting their livelihood has far reaching effects on them.

Figure 18: Food Security and Wealth Indices

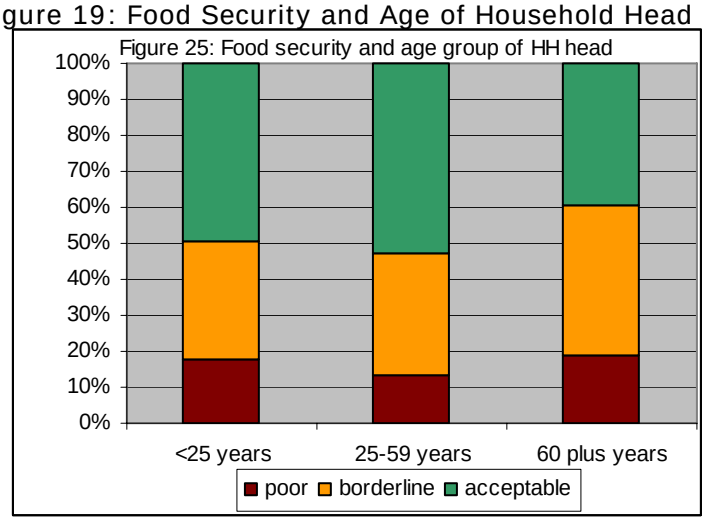
- Households with very low purchasing power and low asset ownership. As illustrated in figure 24, the higher the wealth index (the richer a household) was, there less food insecure was that household. While the 59 percent of households with the highest wealth ranking (the fifth quintile) had acceptable food consumption score, only 29 percent of the lowest wealth quintile should the same consumption level. Assets in rural Liberia included agricultural tools and seeds, wheelbarrow, fishing tools shares/subscriptions in *susu* clubs etc. More assets especially of readily disposable assets make the household more adjustable to changes in food supply and would easily exchange assets for food. Being able to own more assets may also mean the household had more disposable income as some assets can only be acquired after obtaining the basics like food.



Household characteristics associated with rural chronic food insecurity: This phenomenon is more common in southeastern regions of Liberia as well as the northwest interior region. The characteristics include:

- Households headed by elderly above 60. As shown on figure 25, whereas 23 percent of households headed by persons aged 60 years and above are food insecure in rural areas, only 18 percent of those whose heads are aged 25-59 years are food insecure. The elderly are more likely to have been unemployed and had larger families to cater for. In addition, these households showed higher prevalence of illness among household heads.

Figure 19: Food Security and Age of Household Head



- Households with illiterate head and spouse. The illiterate household heads are less likely to have been engaged in skilled employment and were predominantly food crop producers. Whereas 21 percent of households headed by illiterate persons.
- Households with unemployed head. These are households who arrived either in 2007 and 2008. They are yet to fully engage in agricultural production, citing lack of access to farming land, or lack of farming tools or sickness of household members etc. They were mainly common in southeast interior. Some of them were initially involved in farming plantations but lost their jobs.
- Households who squatter. These are individuals or households with not access to cultivable land. In case of farming, these households cultivate minimal acreages. Squatters are common around urban centers, especially in northwest interior region.
- Households without livestock, including poultry. These households were particularly noticed in southeastern regions. Whereas only 13 percent of the households with some form of livestock reported severe food insecurity, some 19 percent of those without livestock were severely food insecure.
- Farming households who suffered from animal pest. As discussed earlier, households that had been affected by animal pest attack more food insecure since they in most cases lost a livelihood source.
- Livelihood profiles and asset ownership also had a bearing on food insecurity as discussed in previous sections. Households that relied mainly on support as well as those with very low asset ownership (as reflected their asset scores) were more food insecure.

Household characteristics associated with urban food insecurity include:

- The main livelihood sources in urban Liberia are salaried employment and petty trading but also significant levels of casual labor mainly in the construction and commercial sectors. Households with unemployed head, those depending on social support or person relying on casual income.
- Households with illiterate head and spouse. Although literacy levels are much higher in urban Liberia (Liberia National Population Census, 2008), those who are illiterate are many in Greater Monrovia and other urban centers. The

illiterates were more likely to be unemployed and be casual laborers whose payment is not enough to make ends meet. These households were also more likely to be living in shanties or likewise squatting making them prone to malnutrition

- Households with disabled members and disabled household head Whereas 10% of households with disabled members faced severe food insecurity, only 7 percent of households with not disabled member faced the same condition.
- As shock at household level especially that related to loss of employment was a major contributor to food insecurity in urban areas of Liberia. About 12 percent of households that had experienced loss of employment in the six months prior to the survey reported severe food insecurity.
- Asset ownership remains one of the determinants of food insecurity at household level even in urban Liberia. Assets mainly reported in these areas included cell phones, mattresses and radio. As indicated in figure 24 above, households with relative income poverty and low asset ownership reported high levels of food insecurity.

4.3 Vulnerability to shocks and coping strategies

Food security is dynamic and vulnerable to changes over time. This makes it critical to assess a household's vulnerability to risks and shocks. A household's ability to respond and/or absorb the risks and shocks also determines the extent of severity of a food security problem.

Households were asked to mention four shocks that they experienced over the past three months. They were also asked to list the coping strategies that they applied to overcome the negative impact of such shocks.

4.3.1 Exposure to risks and shocks

Overall, the overwhelming majority (96%) reported that they had experienced one shock or another during the three months leading to the survey.

The most common shock experienced in the three months leading to the survey was the impact of increasing food prices at 52 percent. As is expected, populations in Greater Monrovia were the most affected with about three-quarters indicating that they have been affected by food price crisis of 2008. The region least affected by increases in food prices was Northwest interior. This same region reported the most dramatic increase in uptake of rice production.

The second most reported shock in the three months leading to the survey was also associated with rising global prices leading to difficulties in acquiring food and other basic needs. Nationally, some 45 percent of the households reported inadequate money to purchase food. This was commonly reported by residents of Central coastal Liberia (Grand Bassa and River Cess- 69%), followed by Northwest coastal region (50%) and Greater Monrovia (45%).

Other problems commonly experienced were sickness in a household (30%) followed by high cost of transport (14%) and animal pests (12%). Greater Monrovia was once again affected most by rising fuel/transport costs (23%) followed by the Northwest interior and northwest coastal, all at 15 percent. The use of transport and even fuel for domestic use is more common in urban areas and its neighboring

regions, thus the impact would be more severe unlike in most parts of rural Liberia that hardly depend on purchased fuel for domestic use. Instead, rural areas reported reliance on local sources of fuel, mainly palm oil.

Animal pest or bird infestation was generally reported in the agriculturally active counties in northwest interior, Central coastal and southeast interior. This shock in particular has extreme effects on production and therefore on local availability of foods.

4.3.2 Household coping strategies

Coping strategies used by households were categorized into four:

- Dietary change like eating less preferred but less expensive food, reducing number of meals etc.
- Increasing short-term food access e.g. borrowing, consuming seed stock, purchasing on credit, increasing consumption of wild foods etc.
- Decreasing numbers of people to feed e.g. through out-migration of family members
- Rationing strategies e.g. skipping meals, limiting portion sizes, only feeding children and not adults etc.

Overall, households were likely to employ increase reliance on less preferred but inexpensive food (61%) when faced with any shock that affects their access to food. This coping strategy was followed by adverse ones:-limiting portion sizes of meals consumed by household members (39%), reducing number of meals consumed in a day (32%) and restricting consumption of adults for the sake of a child in a household (19%)

Nationally, the majority of households were affected by either high food prices or not having adequate purchasing power. These households were likely to switch to intake on less preferred but inexpensive foods (69%). This coping strategy does not in itself have adverse effect on the nutrition situation of an individual, but is socially undesirable. However alternative coping strategies employed to respond to rising food prices were those with adverse effects on the nutritional status. They included limiting portion sizes of meals (50%), reducing number of meals eaten in a day (42%), and restricting consumption by adults in order to feed children (25%) in that order.

In the earlier section, it was indicated that sickness of a member was a major shock to about three quarters of the households. The households affected by sickness were also likely to rely on less preferred but less expensive food (58%) or use adverse coping strategies like limiting portion sizes of food (35%) or reducing number of meals consumed in a day (30%).

In the agricultural communities that had been affected by pests/destruction of crops by animals, communities mainly relied on less preferred but inexpensive food items (58%) and to some extent limiting the portion sizes of meals, as their coping strategies. Rarely did these households employ other adverse coping strategies such as consumption of their seed stocks.

On regional perspectives, residents of Greater Monrovia were the most likely (at least four-fifth of households in Greater Monrovia respondents) to have relied on less preferred but inexpensive foods as a way of coping with the shocks. It is notable that Greater Monrovia bore the greatest burden of high food prices in 2008, mainly due to their urban economy—thus, more vulnerable to global shocks. Other counties that were more likely to rely on less preferred food commodities included Southeastern interior counties (78%), northwest interior counties (65%) and southeast coastal (59%).

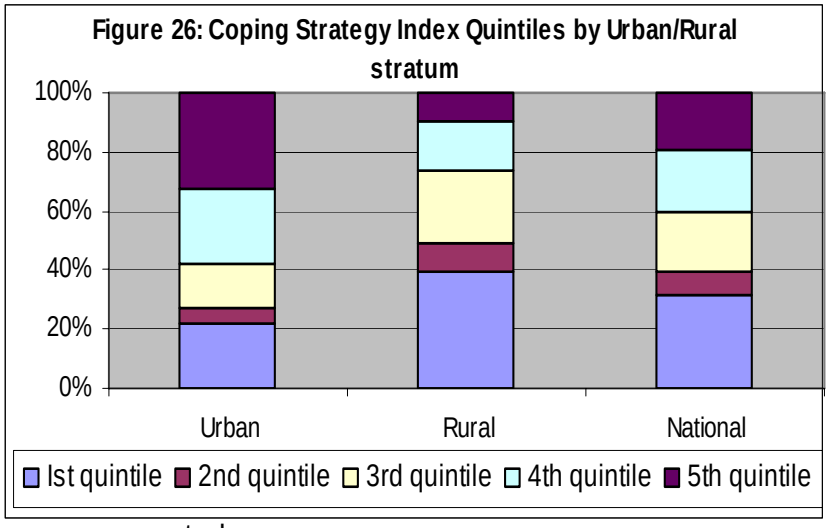
Consumption of seed stocks was very rare (10%) even in agricultural productive regions where households would normally keep seed stocks. This is positive but also confirms that agricultural regions were relatively less affected by shocks and thus did not need to employ adverse strategies.

Although the "good food consumption" group was less affected by shocks, when affected, the coping strategies were generally similar with other food consumption groups. The common coping strategies were employed by the population irrespective of the food consumption group once affected by a shock.

The findings indicate that female headed households were more likely to rely on less preferred but inexpensive foods and borrowing from friends/relatives food should they experience a shock. However, there was no gender difference in the uptake of adverse coping strategies like limiting amount of food intake through restricting adult consumption, reduction of number of meals, reducing portion sizes etc. Households headed by literate individuals were also more likely to rely on less preferred foods than their counterparts who are illiterate.

4.3.3 Coping Strategy Index

Figure 20: Coping Strategy Index Quintiles by Rural/urban Strata



Coping strategy indices have been constructed as a continuous variable taking into account the frequency and severity of the diet-related coping strategies whose answers were elicited from respondents. The higher the score, the more frequent a household uses severe coping strategies. From the index, quintiles were computed.

Thus, high quintile represents higher coping strategy index. Nationally, the mean CSI was 5.3. Greater Monrovia reports the highest mean CSI at 9.7. The high CSI score would mean households in Greater Monrovia use severe diet related coping strategies more frequently. On the other hand, Central coastal and central interior reports a mean CSI of only 2.1 and 2.3 respectively. There are no comparative indices on coping strategy from previous studies in Liberia making it difficult to establish a trend.

Nationally, about 40 percent of the households fall within the high to very high coping strategy index quintiles and almost a similar proportion (39%) fall within the very low to low CSI quintiles (see Figure 26). Urban areas have the higher proportion of households falling within the fourth and fifth quintile (58%) as compared to rural households with only 26% falling within the same quintiles. Greater Monrovia reported almost three-quarters (71%) falling within the fourth and fifth quintiles. This confirms earlier findings that indicated urban areas to have been worst affected by the impact of 2008 global rise in food prices.

Table 17: Coping Strategy Indices by Livelihood Group

	Mean CSI	CSI Quintiles				
		very low	low	medium	high	very high
Employees	6.0	31.0	5.3	15.6	24.6	23.6
Petty traders	7.7	19.1	7.7	16.7	**25.2**	**31.3**
Casual Labourers	7.8	23.8	3.9	18.3	**21.9**	**32.1**
Skilled Labourers	6.4	27.1	6.1	17.9	25.8	23.1
Support receivers	8.7	18.9	6.6	15.3	18.2	41.0
Other	2.2	51.3	17.2	11.1	17.3	3.2
Traders	4.3	42.7	8.8	12.4	19.2	16.9
HH renting out	6.6	23.9	6.5	15.9	32.6	21.1
Food crop producers	3.5	36.9	8.4	25.1	19.0	10.6
Remittance receivers	6.6	10.6	9.3	26.5	31.1	22.4
Pensioners	7.0	15.6	0.0	36.8	14.7	32.9
Hunters & food crop producers	2.9	37.7	11.5	28.0	16.7	6.0
Palm oil & food crop producers	2.6	36.4	13.7	29.2	15.6	5.1
Rubber tappers	4.8	29.4	6.9	27.3	17.3	19.2
Charcoal and food crop producers	4.3	33.7	5.9	27.1	17.7	15.6
Fisherfolks and food crop producers	2.9	59.4	9.4	10.8	9.3	11.1
Cash & food crop producers	2.7	50.6	8.3	22.5	10.9	7.8

As shown in table 17, households whose livelihoods is petty trading, casual work, those depending on remittances or other supports and pensioners were more likely to cluster around the fourth and fifth CSI quintiles as opposed to households who depend commercial trading, food crop producers mixed with cash crop production or palm oil production or hunting or fishing who were likely to have clustered around the first and second CSI quintiles. Employees that are predominantly in Monrovia had almost equal proportion of households in first and second CSI quintile as was in the fourth and fifth quintile, probably due to the impact of high global food prices that disproportionately affected urban areas.

4.4 Food Utilization: Mother and Child Health and Nutrition

This section includes findings related to maternal and child health, infant and young child feeding, and maternal and child nutritional status. A total of 3,754 children aged 0-59 months were surveyed, of which 3,287 children aged 6-59 months were measured. Following data cleaning, only information from 3,435 children was considered of which 49.6% were male and 50.4% were female, representing a male to female ratio of 1.00. Children not considered for final analysis was due to factors like incomplete measurement taken (e.g. only weight measurement), incomplete responses on some children, flagging of some cases due to unusual measurement etc. The age distribution of children is normal for children aged 6-59 months in developing countries as shown in table 18.

Table 18: Age Distribution of Children 6-59 months, 2008

Age range (months)	Frequency	Percentage
6-11	343	10.4%
12 – 23	788	24.0%
24 – 35	738	22.5%
36 – 47	779	23.7%
48 – 59	638	10.4%
6 – 59	3287	

4.4.1 Child Morbidity

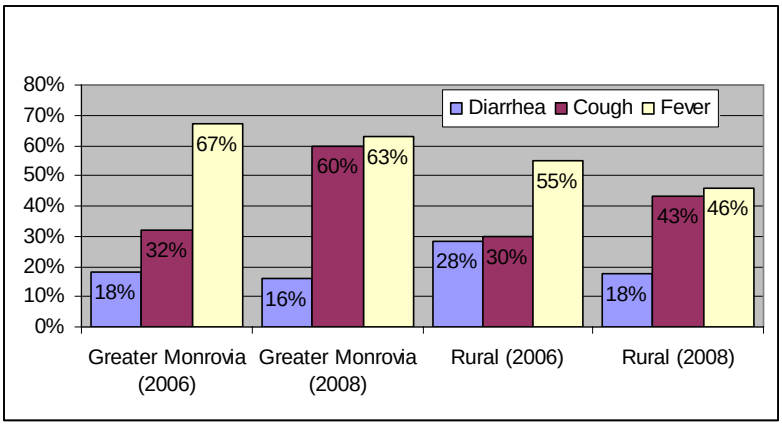
Respondents were asked the occurrences of common childhood illnesses in the two weeks prior to the survey. Overall, 18.6% had suffered at least one of the illnesses queried (cough, diarrhea, and fever) in the two weeks prior to the survey. At least 11.4% had suffered from all three illnesses.

Table 19: Child Morbidity, 2008

	Diarrhoea	Cough	Fever
Northwest coastal	9.0%	28.2%	28.6%
Northwest interior	14.5%	49.2%	52.0%
Central coastal	8.2%	39.4%	46.2%
Central interior	17.9%	33.5%	41.1%
Southeast coastal	41.9%	70.9%	80.4%
Southeast interior	31.6%	70.9%	69.0%
Greater Monrovia	15.5%	59.8%	63.2%
Total	17.3%	47.8%	52.0%

As presented in table 19, fever was the most common illness (52%) followed by cough (48%) and diarrhoea (17%), in the two weeks prior to the survey. All three diseases were most often reported in the Southeastern coastal and interior regions. The region least affected by fever and cough was the Northwest coastal region. Diarrhea was least common in the Central coastal region.

Figure 21: Trends in Child Morbidity (2006-08)



With the exception of diarrhoea, the reported cases of cough and fever were higher in urban Liberia compared to rural Liberia.

In the 2006/7 Countrywide and Greater Monrovia Comprehensive FSNS, the most common reported illness was fever. Although the proportion of children who reported fever or diarrhea appeared to decrease between 2006 and 2008 as h shown in figure 27, a greater proportion of children reported cough in the 2008 survey compared to the 2006 surveys. This could be explained by seasonal changes.

4.4.2 Child feeding practices

During the survey, the infant feeding habits of all children 0 – 24 months were investigated to report on the following core infant and young child feeding indicators: exclusive breastfeeding, continued breastfeeding at 12 – 15 months and complementary feeding at 6-8 months. The findings as shown in table 20.

Table 20: prevalence of Recommended Feeding Practices, 2008

	Sampled Age Range (months)	**Prevalence**		
		Urban Liberia	**Rural Liberia**	**Total**
Exclusive breastfeeding under 6 months	<6	36.2%*		
Continued breastfeeding at 12-15 months	12-15	72.4%	77.8%	76.0%
Complementary feeding (Introduction of solid, semi-solid or soft foods)	6-8	55.4%	79.5%	72.3%
Infant formula feeding	<6	19.4%[14]		
Infant formula feeding	0-23	19.2%	1.7%	8.8%

*For Greater Monrovia only

Exclusive Breastfeeding

As a global public health recommendation, infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. The exclusive breastfeeding indicator shows the percentage of infants 0-<6 months who are currently being exclusively breastfed, i.e. who are receiving only breast-milk and

[14] Data fro Greater Monrovia only

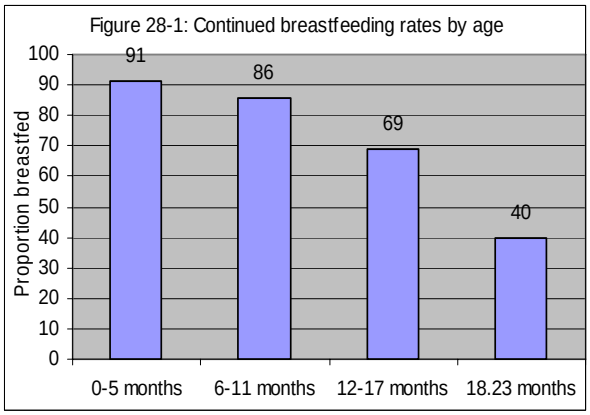
no water, other liquids or solids. Drops or syrups of vitamins, mineral supplements or medicines do not interfere with exclusive breastfeeding.

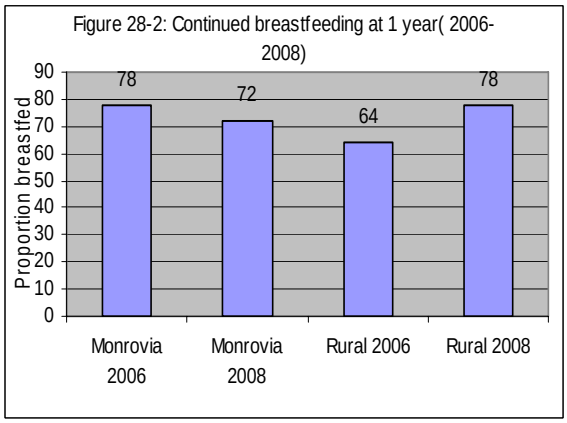
As seen in table 19 the prevalence of exclusive breastfeeding at 6 months of age is only 36.2% compared to 30.5% in 2006. The proportion of infants exclusively breastfeed decreases with age. The rates of exclusive breastfeeding at 4 and 6 months are 41.5% and 21.6% for Greater Monrovia.

Continued Breastfeeding

It is recommended that children be breastfed for at least one year and preferably up to 2 years of age or beyond. Overall, continued breastfeeding rate until 1 year (proportion of children aged 12-15 months who were breastfed in the 24 hours preceding the survey) was reported at 76% while continued breastfeeding rate at 2 years (proportion of children aged 20-23 months breastfed in the 24 hours preceding the survey) was estimated at 40%. As expected, breastfeeding rate declined as children advanced in age as shown on figure 28-1. As shown in figure 28-2 in Monrovia, the rates of continued breastfeeding have remained almost the same between 2006 and 2008. In Rural Liberia, a greater proportion of children were still breastfed at 12 months in 2008 than 2006.

Figure 22: Continued Breastfeeding Rates

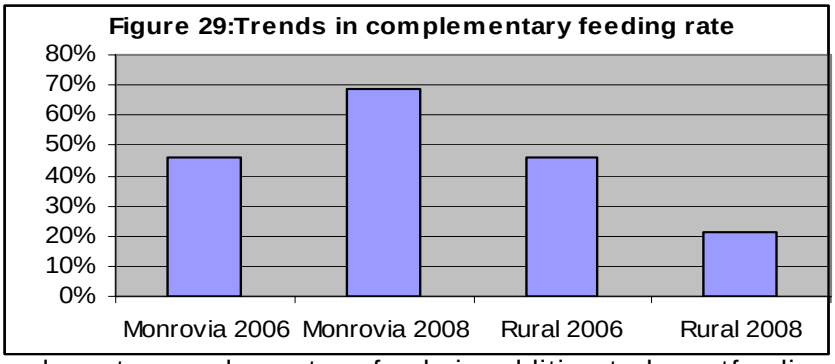




.

Complementary Feeding Rate

Figure 23: Trends in Complementary Feeding Rate



The timely complementary feeding rate indicator gives an overall measure of the degree by which women have complied with the recommendation that infants aged 6-<10 months receive appropriate and adequate complementary foods in addition to breastfeeding and is an assessment of feeding patterns of children in the age group 6 to 9 months. 'Solids' are referred to as food of semi-solid or solid consistency such as porridge and gruels but does not include fluids such as fruit juices.

As shown in figure 29, the survey estimated the timely complementary feeding rate at 27.7%. This is largely due to the poor rate of introduction of complementary foods observed in rural Liberia. As indicated in figure 29 whereas the rate of complementary feeding increased in Monrovia between 2006 and 2008, it declined by 25% in rural Liberia, indicating that only one in five children received other foods in addition to breastfeeding at the recommended age.

Figure 24: prevalence of Timely Complementary Feeding rate by Region

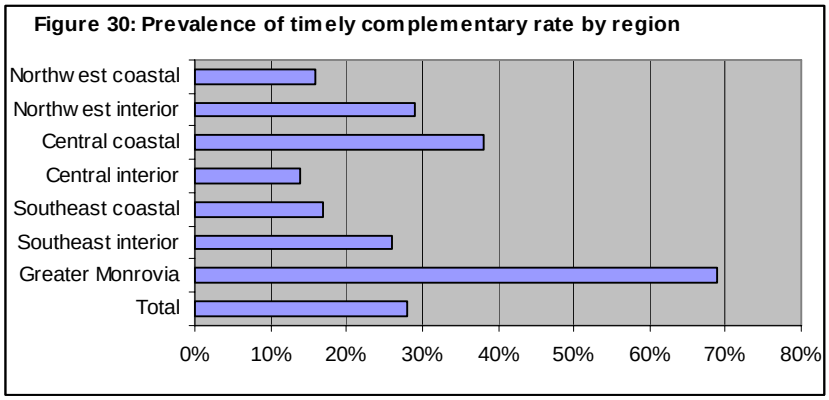
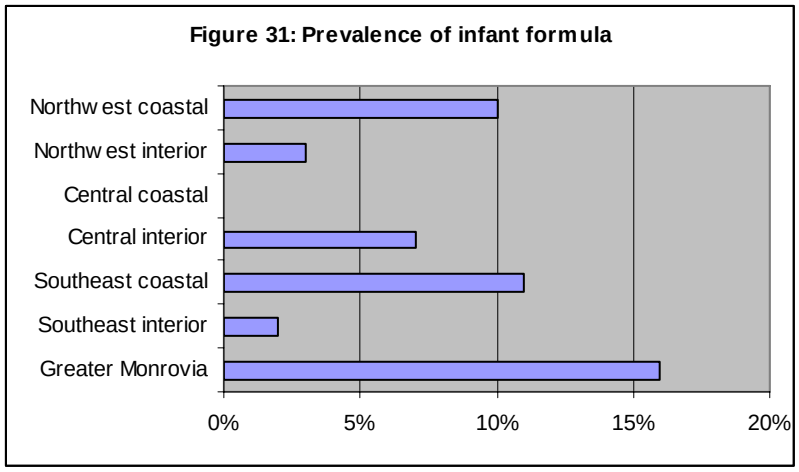


Figure 30 below presents the complementary feeding rate by region. This ranges from 14% in Central interior to 69% in Greater Monrovia.

Consumption of infant formula

Figure 25: Prevalence of Usage of Infant Formula



As shown in figure 31, the survey revealed that 12.0% of children in the 0-23 month age range were fed with infant formula. Children aged 0 -5 months were formula fed more (19.4%) than any other age group (other age groups only ranged from 8% -13%). Greater Monrovia reported a more likelihood for formula feeding (16%) as compared to other regions, probably reflecting the influence of urban life.

4..4.3 Nutritional Status of Children

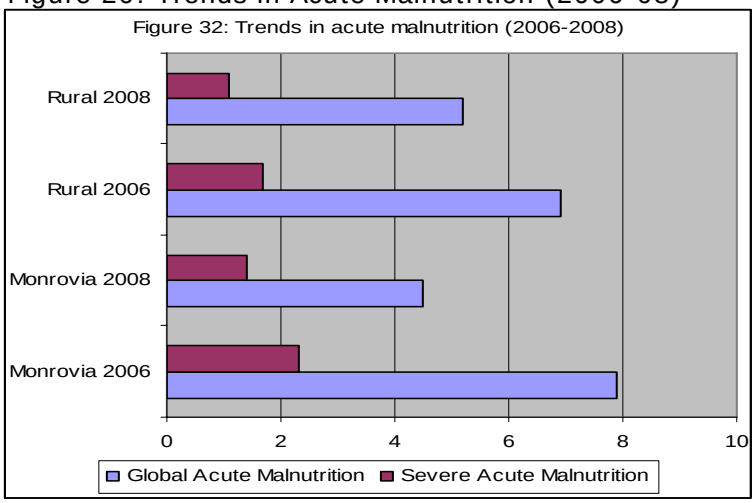
The nutritional status of 3,287children aged 6-59 months was measured using the following anthropometric indicators: age, weight, height and mid upper arm circumference (MUAC). The indicators were used to calculate weight-for-height, height-for-age, weight-for-age and malnutrition. These nutritional status indicators were defined using the new WHO child growth standard references.

Table 21: Nutrition Status of Children by Region

	Acute Malnutrition		Chronic Malnutrition		Underweight	
	Global	Severe	Global	Severe	Global	Severe
Northwest coastal	4.0%	1.3%	37.2%	11.9%	16.8%	4.1%
Northwest interior	2.3%	0.3%	43.5%	12.8%	15.2%	1.8%
Central coastal	4.3%	0.7%	41.0%	18.5%	18.8%	5.0%
Central interior	5.2%	1.0%	36.0%	16.1%	18.1%	3.4%
Southeast coastal	6.2%	0.9%	32.4%	11.5%	14.1%	3.2%
Southeast interior	11.2%	2.2%	41.5%	13.0%	25.5%	5.2%
Greater Monrovia	4.5%	1.4%	30.1%	11.6%	13.5%	3.3%
Total (%)	**4.9**	**1.1**	**36.1**	**13.5**	**16.6**	**3.5**

Wasting

Figure 26: Trends in Acute Malnutrition (2006-08)



Wasting or weight-for-height is a measure of acute malnutrition, which is the result of reduced energy intake over a short period of time due to either food shortage or infections (in the immediate sense). Weight for Height Z-scores were obtained by examining a child's weight and height against the new WHO reference growth[15] data and determining how many standard deviations (SD) that child is away from the median weight. Wasting is an indicator that is often used to assess the severity of emergency situations because it is highly related to mortality. It is the most reliable indicator for acute child malnutrition. All children with oedema are normally automatically considered severely malnourished.

Using the new WHO growth reference standards, 4.9% of all Liberian children under-5 are acutely malnourished or wasted. Of this total 1.1% have severe acute malnutrition and 3.8% have moderate acute malnutrition as represented in table 21.

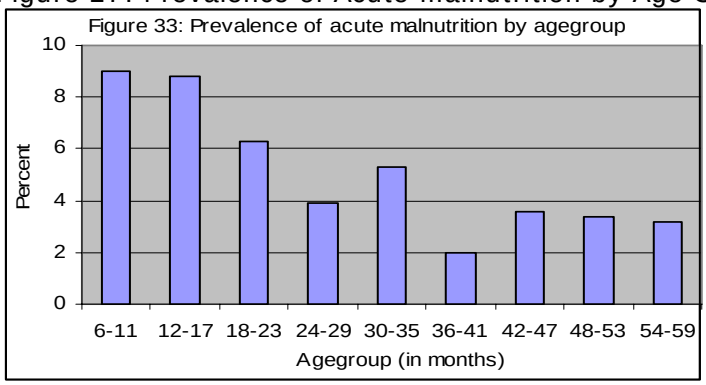
Global Acute Malnutrition < 5%	Low/Acceptable
Global Acute Malnutrition 5 – 9.99 %	Medium/Alert
Global Acute Malnutrition 10 – 14.99%	Serious or high
Global Acute Malnutrition ≥ 15%	Critical or very high

[15] WHO Multicentre Growth Reference Study Group: WHO Child Growth Standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development. Geneva, World Health Organization, 2006. Available at: http://www.who.int/childgrowth/standards/technical_report/en/index.html

This means that at any one time, about 6,888 children are in need of treatment for severe acute malnutrition and 23,780 in need of treatment for moderate acute malnutrition. Overall, malnutrition rates are higher in rural Liberia. Based on the WHO classification of severity of malnutrition (described in the text box) the rates of global acute malnutrition in rural Liberia are poor at 5.2 percent compared to acceptable in urban Liberia (4.4 percent).

The analysis of trends in acute malnutrition (as shown in figure 32) in both rural Liberia and Greater Monrovia indicate that the prevalence of malnutrition continues to be below the critical threshold of 10 percent. Between 2006 and 2008, there has been a significant improvement in rates of global acute malnutrition in Greater Monrovia. This indicates that the increase in food prices has not had a negative impact on the nutritional status of children under-5 in Greater Monrovia.

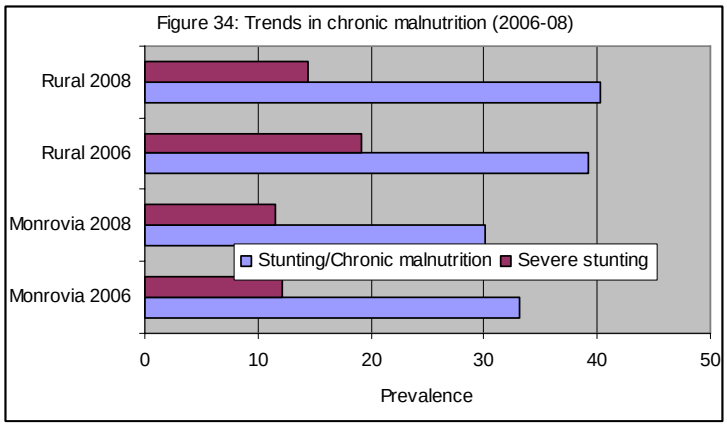
Figure 27: Prevalence of Acute malnutrition by Age Group



There is a significant difference between the rates of wasting in boys (6.5%) and girls (3.9%). This observation confirms previous findings (CFSNS 2006) that also highlighted the boys as more malnourished. As shown on figure 33, the prevalence of wasting is highest in the 6-18 months age group, followed by a decline between 19 and 41 months (with a rise around 3 years). These trends are different from those indicated in the 2006 CFSNS where the highest rates of wasting were seen in the 12-23 month age group indicating that malnutrition is appearing early in Liberian children.

Chronic malnutrition (Stunting)

Figure 28: Trends in Chronic Malnutrition (2006-08)



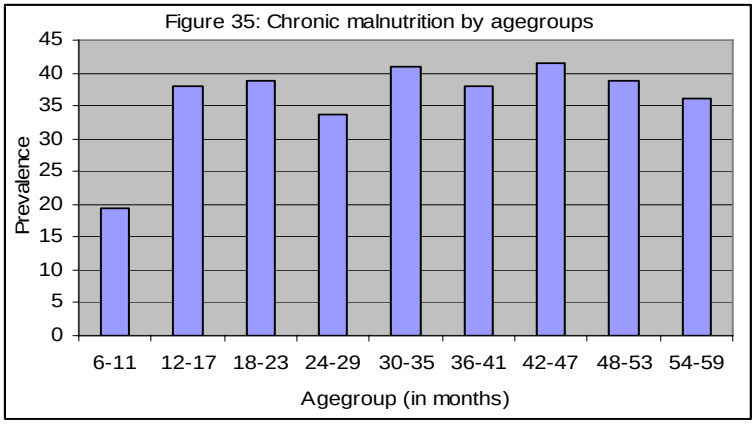
As presented in figure 34, overall, chronic malnutrition or stunting levels are estimated at 36.1%. This figure is serious by WHO standards of classification[16] of malnutrition while 13.5% have severe chronic malnutrition.

There has been no significant improvement in rates of chronic malnutrition in Greater Monrovia since 2006. In rural Liberia, the prevalence of chronic malnutrition is at the critical

[16] Chronic malnutrition levels less than 20% is considered low, 20 to 29 % considered medium, 30 – 39% considered high while ≥ 40% is considered very high or critical as per the standards.

threshold of 40 percent. Stunting in childhood is associated with impaired mental development and poor school performance and leads to reduced adult size and reduced physical capacity. These factors have a considerable impact on economic productivity and poverty at the national level.

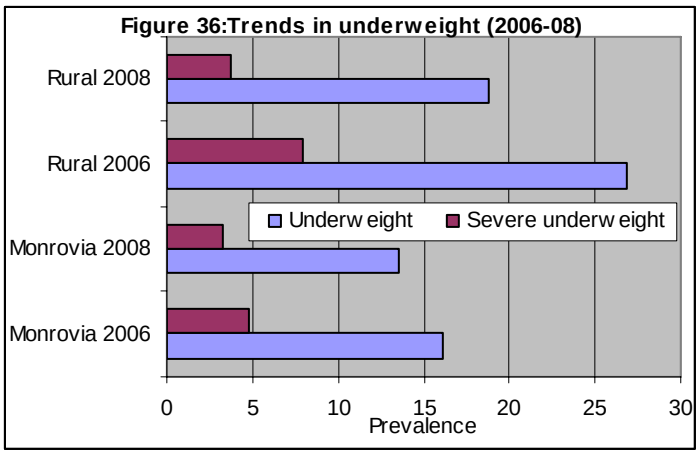
Figure 29: Chronic Malnutrition by Age Group



Examined by sex, the survey indicated that male children were more likely to be stunted than female children. (40.7% for males versus 36.2% for females) as depicted in figure 35. When examined by age, global stunting rates remain relatively the same at levels above 30% from 12 months of age as presented in figure 35.

Underweight

Figure 30: Trends in Underweight (2006- 08)



Underweight indicated by weight for age is a composite measure of both chronic and acute malnutrition, and thus captures aspects of both stunting and wasting. Z-scores are obtained by examining a child's weight and age against the WHO[17] reference growth data and determining how many standard deviations (SD) that child is away from the median. The weight for age index of a child is expressed as a z-score with children falling below –2 z-scores regarded as underweight and those below –3 zscores as severely underweight. For reference purposes, prevalence of underweight < 10 percent is considered low, 10 – 19 percent is medium, 20 – 29 percent is high, while ≥30 percent is considered critical.

In Liberia, underweight (a composite indicator of acute and chronic malnutrition) is estimated at 16.6% as shown in figure 36. This level is considered high by WHO child growth standards. Prevalence of underweight remain higher in rural Liberia compared to Monrovia and, as with stunting and wasting, underweight is more common in boys (20.0%) than in girls (15.5%).

[17] WHO Multicentre Growth Reference Study Group: WHO Child Growth Standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development. Geneva, World Health Organization, 2006. Available at: http://www.who.int/childgrowth/standards/technical_report/en/index.html

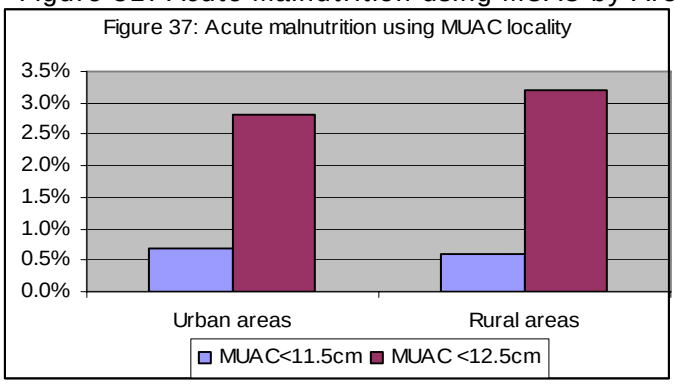
Mid-upper arm circumference

The nutritional status of children 6-59 months was also assessed using the Mid-upper arm circumference (MUAC) measurement. Using the new cut-off points (<11.5cm as severe acute, 11.5cm ≤12.5cm as moderate, 12.5 ≤ 13.5cm as at risk) for acute malnutrition, 0.6% of children had a MUAC of less than 11.5cm or severe acute malnutrition and 2.4% had a MUAC of between 11.5 and 12.5cm or moderate acute malnutrition. These findings are presented in table 22.

Table 22: Malnutrition among Children based on MUAC

	Severe Acute Malnutrition <11.5 cm	Moderate Acute Malnutrition <12.5 cm >11.5 cm	Global Acute malnutrition < 12.5 cm
Northwest coastal	1.0%	4.0%	5.0%
Northwest interior	0.2%	1.4%	1.6%
Central Coastal	1.0%	1.4%	2.4%
Central interior	0.3%	1.9%	2.2%
Southeast coastal	0.0%	2.1%	2.1%
Southeast interior	1.3%	2.9%	4.2%
Greater Monrovia	0.7%	2.6%	3.3%
Total	0.6%	2.4%	3.0%

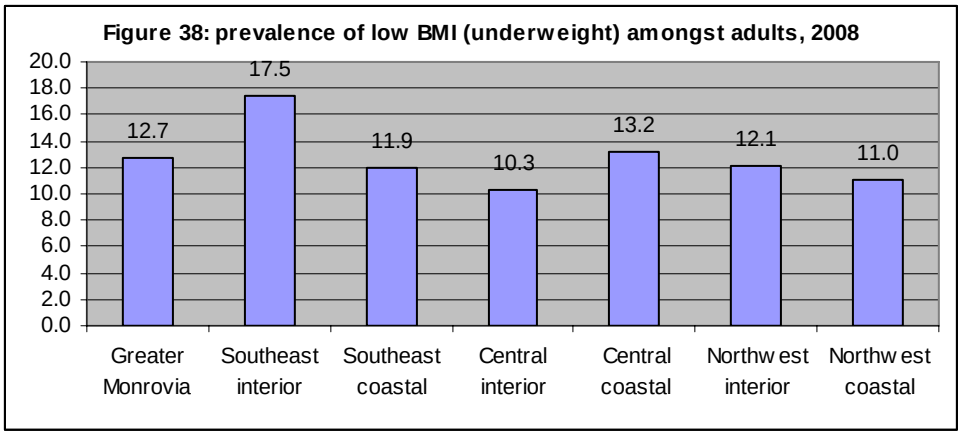
Figure 31: Acute Malnutrition using MUAC by Area



The figure 37 shows the rates of severe and moderate acute malnutrition in urban and rural - Liberia. Based on the new MUAC cut-offs described above, the rates of global acute malnutrition in urban and rural Liberia are 2.8% and 3.2% respectively. Severe acute malnutrition rates using MUAC was also low at less than 1 percent in both urban and rural Liberia.

4.4.4 Nutritional status of women of childbearing age

Figure 32: Prevalence of Underweight among Adults, 2008



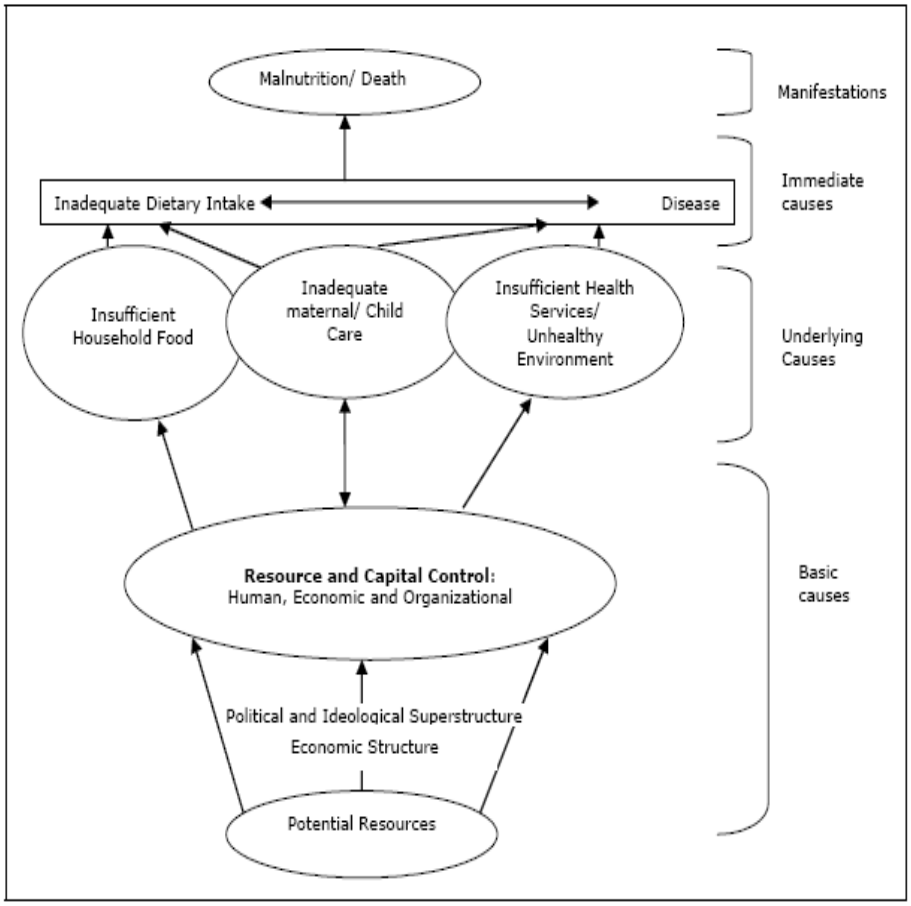
Nutritional status of women of reproductive age was assessed by using the Body Mass Index (BMI). The analysis

indicated that 12.9% of women had low BMI. Women from the southeast interior region (Grand Gedeh, River Gee and Grand Kru), had the highest rates of underweight compared to other regions.

Between 2006/7 and 2008, there was no significant change in rates of low BMI in rural and urban Liberia. The analysis indicated that 13.7% and 11.8% of women in rural and urban Liberia respectively (see figure 38), had low BMI compared to 13.0% and 12% in 2006/7.

4.4.5 Causes of malnutrition

Figure 33: Conceptual Framework for Analysing Malnutrition



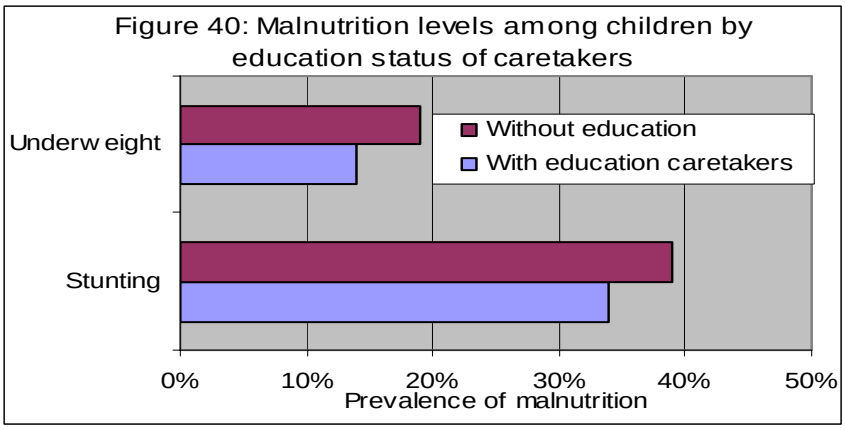
Source: UNICEF, 1987

To complement the understanding of the three dimensions of food security and to understand the potential causes of malnutrition in Liberia, the survey utilized the known UNICEF's conceptual framework (see figure 39) on the causes of malnutrition. The framework provides practical means for analysing malnutrition and causes in a holistic manner relevant to both development and emergency contexts. As presented in the framework, malnutrition is a complex; intergenerational condition that is caused by a variety of both micro and macro socio-political, economic, and health-related factors. Macro determinants of malnutrition are: generalized poverty, poor governance, and political, ideological and economic instability. Micro causes include inadequate infant and child feeding practices, inadequate hygiene, poor water and sanitation, disease, and inadequate food intake and food insecurity. At the immediate level, malnutrition results from either infection or inadequate food intake.

Statistically significant relationships were identified between malnutrition and key demographic, employment, social and health factors discussed below.

Demographic factors

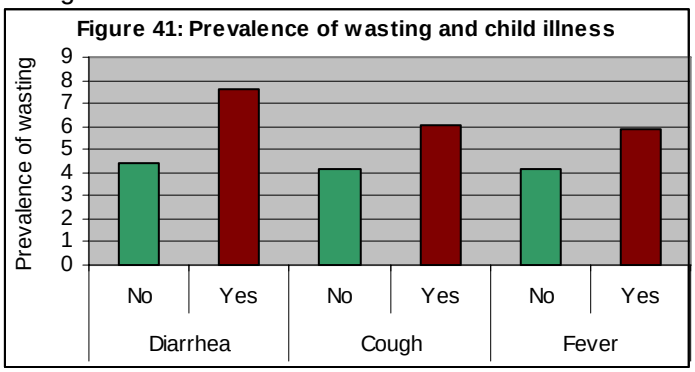
Figure 34: Child Malnutrition and Education status of Caretakers



Education status of the mother or caretaker has an influence on the nutrition status of the child. As shown in figure 40, children whose mothers or caretakers had no education were more likely to be underweight and stunted (19% and 39% respectively) as compared to 14 percent and 34 percent respectively for children whose mothers or caretakers have some level of education.

Health factors

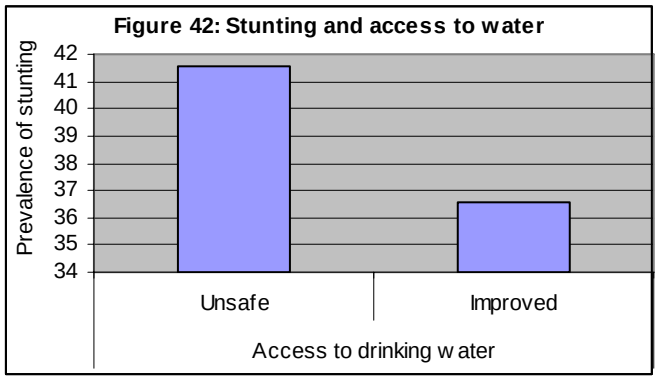
Figure 35: Child Malnutrition and Illness



As shown in figure 41, children with the following characteristics were more likely to be **wasted:** (1) children who had suffered diarrhea in the 2 weeks preceding the survey ($p<0.05$); (2) children who had an acute respiratory tract infection during the same period ($p<0.05$); (iii) had had fever in the two weeks prior to survey. Children whose mothers had lower BMI (<18.5) were also likely to have been wasted.

Children with the following characteristics were more likely to be **underweight:** (1) children who had an acute respiratory tract infection in the 2 weeks preceding the survey ($p<0.05$); (2) children who had a fever during the same period ($p<0.05$).

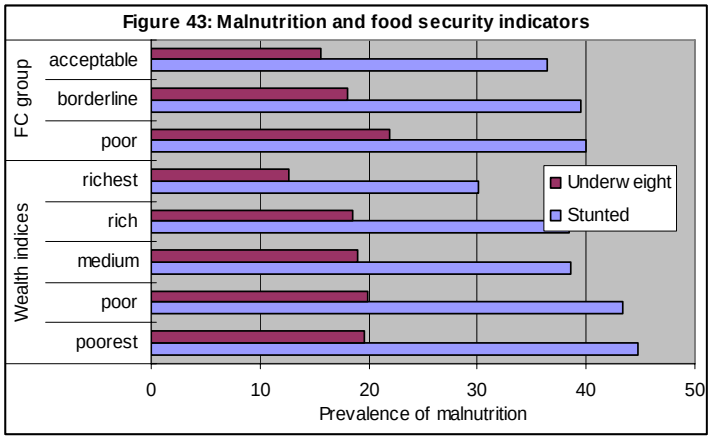
Figure 36: Chronic Malnutrition and Access to Water



Children from household with the following characteristics were more likely to be **stunted:** (1) households with poor access to safe water ($p<0.05$). Access to improved drinking water is a medium to long term project. As shown in figure 42, failure to improve the water condition has far reaching nutrition implication on chronic malnutrition.

Wealth and asset factors

Figure 37: Malnutrition and Food Security Indicators



Food security indicators especially food consumption score and wealth ranking of a household has significant influence on underweight and stunting levels but little or no influence on wasting. As shown in figure 43, children from households with poor food consumption profile are more stunted (40% compared to 36% amongst acceptable food consumption profile) and underweight (21% compared to 15% amongst acceptable consumption profile). Similarly, children from the first wealth quintile (poorest) were more stunted (45% against 30% for the children from fifth wealth quintile (richest) and underweight (20% against 13% for children from richest households).

5 PART V: RECOMMENDATIONS

5.1 Conclusion and summary

This food security and nutrition survey covered households in seven regions of Liberia (Greater Monrovia included). In order to improve food security in Liberia, a multi-faceted approach is recommended to address all factors causing food insecurity and malnutrition based on the analysis presented in this report. This section presents an integrated food security and nutrition response while highlighting priority interventions, target groups and where to intervene.

Some interventions have are cross cutting for food security and nutrition. For example, encouraging education enrolment through school feeding especially take ration for girls will prevent early motherhood and will therefore have a positive impact on children's well being and nutritional status. At the same time, short-term hunger stings preventing children from being attentive will also be addressed.

In summary, a multi-faceted approach is recommended to address food insecurity in Liberia that includes:

• Increasing food availability through targeted agricultural interventions in areas of greater potential. Interventions may include continued farmland rehabilitation especially for staple food production, encouraging crop diversity, improved storage and conservation, and improved marketing through programs like the newly started Purchase for Progress initiative (P4p);

• Improving healthy intake and utilization by promoting access to basic health care services, and access to clean water and sanitation combined with awareness campaigns on infant and young child feeding practices, food preparation, dietary diversity and micronutrients;

• In the short-term, improving people's access to food through food-for-work activities (referred to as livelihood asset rehabilitation in WFP), supporting malnourished mothers and children under two years through supplementary feeding programs to prevent inter-generational malnutrition; and supporting education through food-for-education activities; and

• Strengthening the institutional capacity to manage national and local development interventions and resources devoted to the improvement of food security and nutrition – including strengthening the food security and nutrition monitoring system.

These recommendations structured in response to specific food insecurity conditions along the rural urban divide as described below:

5.2. Recommended interventions to address transitory food insecurity in rural Liberia:

- Expand skills-enhancing and literacy programs targeting female and unemployed household heads;
- Formulate policies that encourage women's access to land, credit, inputs and extension services in order to revitalize agriculture and reduce poverty in Liberia;
- Introduce adequate skill-enhancing programs addressing persons with special needs;
- Increase households' access to livestock and poultry;

- Expand agricultural extension services to improve pest-management and post-harvest losses;
- Continue school-feeding in counties in southeast Liberia in the context of a development program while developing hand-over strategies to the national/local Government and communities organizations through capacity-building activities, including strengthening of PTAs; and
- Consider to implement a food safety net program targeted in most food insecure counties to address seasonal hunger during the lean season using schools as an entry point. Southeast region should be targeted as food supply and market access in these counties is highly constrained during the lean season.

5.3 Recommended interventions to address chronic food insecurity in rural Liberia Country:

- Expand skills-enhancing and literacy programs targeting female and unemployed household heads;
- Introduce adequate skill-enhancing programs addressing persons with special needs;
- Increase households' access to livestock and poultry;
- Expand agricultural extension services to improve pest-management and post-harvest losses;
- Continue school-feeding in counties in southeast Liberia in the context of a development program while developing hand-over strategies to the national/local Government and communities organizations through capacity-building activities, including strengthening of PTAs; and
- Consider to implement a food safety net program targeted in most food insecure counties to address seasonal hunger during the lean season using schools as an entry point. Southeast interior should be targeted as food supply and market access in these counties is highly constrained during the lean season.

5.4 Recommended interventions to address urban food insecurity:

- Expand skills-enhancing and literacy programs targeting unemployed household heads;
- Introduce adequate skill-enhancing programs addressing persons with special needs;
- Target households who live squatter settlements with special social and employment programs;
- Develop and implement social safety nets strategies which target the most vulnerable urban groups.

5.5 Recommended interventions to address malnutrition:

- Target "Window of opportunity**"** – pregnancy and infants from birth to 24 months
- Acute malnutrition: Continue to address pockets of high acute malnutrition through therapeutic and supplementary feeding programs (Primary target areas: Southeast region. Therapeutic feeding: SAM levels >1%);
- Chronic malnutrition: Strengthen malnutrition prevention activities **-** Promote the essential nutrition actions - (exclusive breastfeeding, from 6 months complementary feeding and bf to 24 months, adequate iron, vitamin A and iron

intake, feeding of the sick and malnourished child, maternal nutrition) - WASH promotion; Literacy

- Expand essential nutrition actions, such as micro-nutrient supplementation, vaccinations, promotion of good infant and young child-feeding practices, etc. within the basic package of health services throughout Liberia

5.6 Key food security indicators for monitoring

One of the objectives of the survey was to identify key food security and other related indicators that can be monitored overtime to ensure a coherent response to food insecurity issues. The survey findings set forth a coherent framework for food security monitoring but also proceeds to identify key indicators necessary to assess household food security and nutritional status as presented in figure 44. Some indicators are to be collected at macro level (national/sub-national), household and individual level with a clear time dimension stated. The survey also identifies different sources of the food security and nutrition data to respond to specific component of the monitoring framework as presented in table 23. Indicators should be collected on a regular basis, i.e. bi-monthly or quarterly, in order to detect seasonal changes and other trends over time. Joint efforts will be required to ensure the timely collection of all relevant indicators.

Figure 38: Time and Frequency of FSN Data Collection Activities

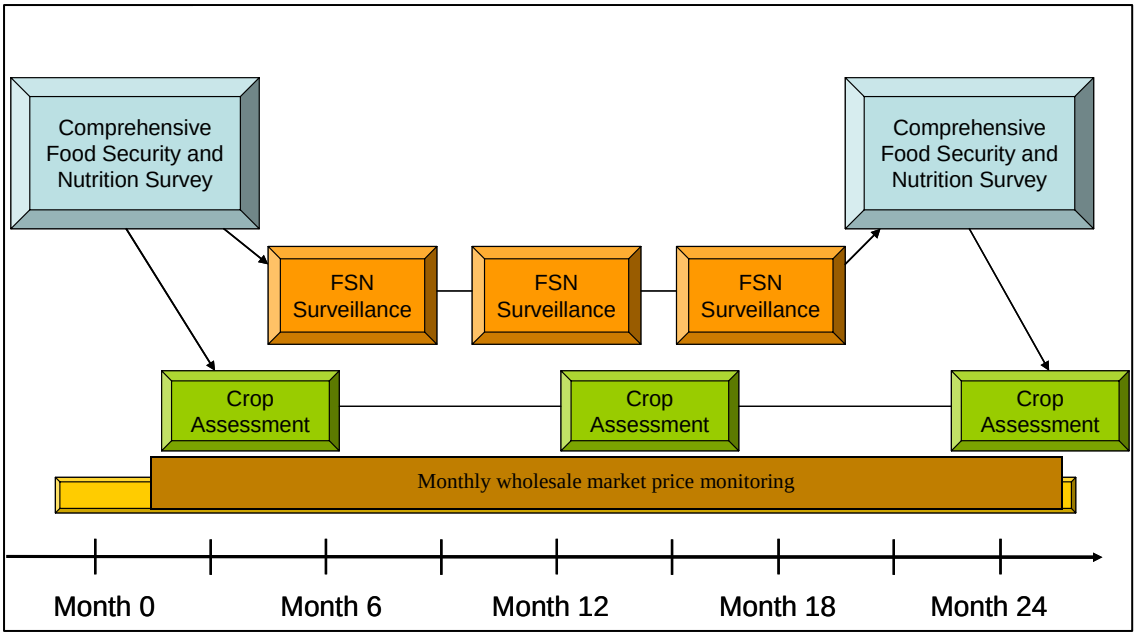


Table 23: Type, Frequency, and Sources of Data

A: Secondary data from line Ministries, etc.

Dimensions	Indicator FSNS	Frequency	Source
Contextual information	Political, economic, natural, social, human rights related trends/risks, food security/nutrition related interventions	Monthly	Line ministries, media, UNMIL, UN, NGOs
Availability	Imports/exports National stocks (duration) National/regional production	Monthly Monthly Annual	Min. of Commerce Min. of Commerce Min. of Agriculture, FAO
Utilization	Growth monitoring and nutrition screening (if available), child morbidity	Quarterly	Min. of Health

B: Primary data to be collected at HH-level with various frequencies

Dimensions	Indicator FSNS	Frequency
Access	Food consumption and sources	Every 6 months
	Coping strategy index	Every 6 months
	Household income activities/livelihoods	Every 6 months
	School attendance	Every 6 months
	HH expenditures	Every 2 years
	HH wealth quintiles	Every 2 year
	HH food production and constraints	Every year (annual)
Utilization	Nutrition data (MUAC, BMI, oedema)	Every 6 months
	Diarrhoea	Every 6 months
	Nutrition data (W/H, W/A, H/W)	Every 2 years
	Child morbidity	Every 6 months
	Access to services	Every 2 years
	Care practices	Every 2 years

In summary, the recommendations for the monitoring system are:

- Support the government with the implementation of the food security and nutrition monitoring system in rural and urban Liberia. Assess key food security and nutrition indicators (FCS, CSI, market prices, MUAC, BMI) on a bi-annual basis (during dry and rainy season);
- The food security and nutrition monitoring system that is now in place should be strengthened. The capacities of government agencies such as the Ministries of Agriculture and Health and Social Welfare should be built to ensure that the system that is currently supported by international partners such as the WFP is sustained when their support is no longer available. This is necessary for improving Liberia's management of food emergencies;
- A follow-up countrywide food security and nutrition survey (possibly by 2010) should be conducted to determine success and challenges of programs currently under that will inform future interventions and to update food security and nutrition knowledge base.

Annex 1: Employment by Region and Gender of HH Head

	Sex of HH head								
	Male					Female			
	Employment status of HH head					Employment status of HH head			
	Wage/ salary	Casual (hourly /daily)	Self-employed	Unpaid work	Unemployed	Wage /salary	Casual (hourly /daily)	Self-employed	Unpaid work
Northwest coastal	29.6%	6.4%	57.4%	2.5%	4.0%	17.6%	5.7%	67.5%	0.0%
Northwest interior	5.7%	1.3%	86.9%	0.7%	5.3%	1.2%	4.7%	86.8%	0.8%
Central coastal	15.1%	3.3%	76.6%	0.0%	5.0%	14.4%	0.0%	79.7%	0.0%
Central interior	18.6%	3.0%	68.2%	2.3%	7.8%	4.2%	3.1%	66.5%	5.6%
Southeast coastal	29.7%	6.0%	61.7%	0.4%	2.1%	4.5%	1.5%	85.4%	0.0%
Southeast interior	10.1%	0.9%	81.4%	0.0%	7.5%	2.5%	0.8%	78.6%	0.7%
Greater Monrovia	40.4%	13.6%	32.9%	0.5%	12.7%	17.1%	0.5%	53.4%	0.6%
Total	25.1%	6.5%	59.5%	1.1%	7.8%	10.5%	2.3%	67.0%	1.5%
Urban	41.6%	11.5%	34.7%	0.8%	11.4%	16.8%	1.3%	56.0%	1.3%
Rural	12.7%	2.8%	78.0%	1.4%	5.0%	4.1%	3.4%	78.4%	1.7%

Annex 2: External Assistance by Livelihood Group

	Skills-training	Free education	School-meal	Nutrition program	Food-for-work/ training	Cash-for-work	Cash transfers	Health care	Micro-credit	Seeds, fertilizer
Employees	7	18	17	2	1	3	2	12	0	1
Petty traders	6	25	25	1	0	1	1	18	2	1
Casual Labourers	4	21	22	1	2	4	0	25	1	1
Skilled Labourers	4	26	26	1	1	1	0	17	1	1
Support receivers	1	16	19	1	1	1	0	11	1	1
Other	2	33	30	0	2	2	0	36	0	0
Traders	6	22	19	1	0	1	1	16	2	0
HH renting out	9	23	21	0	4	9	6	17	0	0
Food crop producers	5	52	48	6	3	2	2	**40**	2	**8**
Remittance receivers	5	26	23	0	2	2	3	25	0	2
Pensioners	0	20	26	0	0	7	0	22	0	0
Hunters & food crop producers	4	54	49	2	2	2	1	38	1	3
Palm oil & food crop	5	51	47	2	2	2	2	**44**	0	3

producers										
Rubber tappers	3	35	28	0	0	3	1	33	1	2
Charcoal and food crop producers	7	**59**	**58**	3	5	3	1	36	3	**9**
Fisherfolks and food crop producers	9	48	53	2	4	3	0	**39**	2	5
Cash & food crop producers	4	**59**	**58**	3	4	1	3	50	3	5

Annex 3: % of HHs Reporting Increased Expenditure by Region

		Food	Housing	Educ-ation	Farm inputs	Energy	Health	Transport	Busines inputs
Urban	Northwest coastal	91	36	58	0	67	39	70	83
	Northwest interior	87	56	80	62	64	51	86	77
	Central coastal	91	24	73	21	64	34	80	48
	Central interior	87	22	68	25	48	52	40	42
	Southeast coastal	94	52	76	78	91	61	82	64
	Southeast interior	87	39	73	52	84	33	56	71
	Greater Monrovia	97	59	89	29	90	73	89	61
	urban	**95**	**51**	**83**	**32**	**83**	**66**	**83**	**59**
Rural	Northwest coastal	61	14	43	50	37	55	65	68
	Northwest interior	57	32	49	56	38	50	73	48
	Central coastal	42	3	25	39	27	44	70	40
	Central interior	73	20	34	50	29	55	57	27
	Southeast coastal	85	25	54	72	67	56	83	66
	Southeast interior	84	33	24	53	81	50	84	57
	Rural	**65**	**20**	**38**	**51**	**39**	**52**	**68**	**45**
Total	Northwest coastal	66	18	46	49	42	52	65	70
	Northwest interior	59	33	52	56	40	50	74	51
	Central coastal	52	7	36	36	34	42	72	42
	Central interior	76	20	42	46	33	54	54	32
	Southeast coastal	88	35	61	73	76	58	83	65
	Southeast interior	85	34	35	53	81	46	79	61
	Greater Monrovia	97	59	89	29	90	73	89	61
	National	**79**	**34**	**58**	**48**	**59**	**58**	**75**	**52**