Liberia Institute of Statistics & Geo-Information Services (LISGIS)

Household Income and Expenditure Survey 2014

Agenda for Transformation: Baseline Indicators

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Preface and Acknowledgements

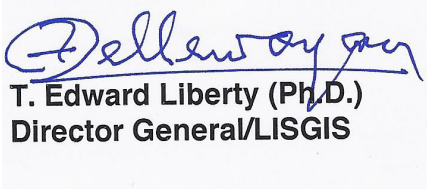
This report presents a baseline of indicators designed to monitor the implementation and progress of the Agenda for Transformation (AfT). The indicators presented are those sourced from a number of LISGIS surveys, including the recently completed 2014 Household Income and Expenditure Survey (HIES) and the 2013 Liberia Demographic and Health Survey (LDHS).

After a period of recovery and reconstruction, the AfT was created, an ambitious agenda whose aim is to drive forward medium-term sustained development aimed at transforming sectors within the economy. The AfT acts as a stepping-stone towards achieving the National Vision: Agenda 2030. High quality and frequent data is required to facilitate the Government of Liberia's pursuit to track indicators for the targets set forth in the AfT. The HIES 2014 design enables the monitoring of a number of prescribed indicators.

The data collection for the HIES 2014 came to a halt after 6 of the 12 planned months due to the outbreak of the Ebola Virus Disease (EVD) and the resultant state of emergency called by the president of Liberia. Slightly less than 50% of the target sample was enumerated, and thanks to the survey design, the six months of data collected are nationally representative on a quarterly basis. These statistics are presented without further delay to enable evidence-based policy planning, monitoring of the AfT and the newly launched Sustainable Development Goals (SDGs) Agenda 2030.

LISGIS would like to acknowledge the various stakeholder contributions that led to the successful completion of the survey, analysis and report writing. We would like to thank the sampled households for their patience and cooperation and for devoting time to the field personnel during the numerous visits and questioning. Our appreciation also goes to the field staff and data entry officers for the meticulous manner in which they discharged their duties. Many thanks go to the county authorities as well as the traditional and community leaders for the different ways in which they provided assistance ensuring the success of the fieldwork.

Again, we are grateful for the financial support received from the Government of Liberia, the World Bank and United States Aid for International Development (USAID); the European Union (EU), Swedish International Development Corporation (Sida) and the African Development Bank (AfDB) for this effort. Finally, the devoted services of the HIES project secretariat, LISGIS personnel, the report writers and all others who have contributed in varied ways towards the accomplishment of the survey and subsequent production of this report are accordingly acknowledged.



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List of Acronyms and Abbreviations

AfDB	African Development Bank
AfT	Agenda for Transformation
CPI	Consumer Price Index
CWIQ	Core Welfare Indicator
EA	Enumeration Area
EU	European Union
EVD	Ebola Virus Disease
FAO	Food and Agriculture Organisation
GIS	Geo-Information Services
GoL	Government of Liberia
HIES	Household Income and Expenditure Survey
HH	Household
ISCO	International Standard Classification of Occupations
LD	Liberian Dollar
LDA	Liberian Development Alliance
LEC	Liberian Electricity Company
LFS	Labour Force Survey
LISGIS	Liberian Institute of Statistics and Geo-Information Services
MFDP	Ministry of Finance and Development Planning
NGO	Non-Governmental Organisation
NKI	National Key Indicator
PTA	Parent Teacher Association
SIDA	Swedish International Development Agency
TTM	Trained Traditional Midwife
TV	Total Value
USAID	United States Agency for International Development
USD	United States Dollar
UV	Use Value
WB	World Bank

Executive Summary

Since 2003 Liberia has enjoyed peace and security, putting behind it an extended and brutal civil war came. Following the period of instability, the democratically elected governments have since created and implemented a number of plans and strategies aimed initially at enabling reconstruction and recovery in the country, and, more recently aimed at implementing sustainable forms of medium and long term development, and moving the country from low to medium income status. The government is developing a national vision, Liberia Rising 2030, which envisages a broad view of Liberia's economic, political, social and human development over the period until 2030. A pivotal component of the vision is for Liberia to have achieved middle-income status by the year 2030, an ambitious but not impossible target.

The previous poverty reduction strategy, Lift Liberia (2008-2011), recorded a number of accomplishments, the greatest achievement considered by some to be the maintenance of peace and security supported by the institutionalisation of the country's own security forces alongside the UN peacekeepers; these include the reformation of the Armed Forces of Liberia (AFL) and the Liberia National Police (LNP). Building upon the foundations set and progress made through Lift Liberia, the government of Liberia crafted the Agenda for Transformation, a medium-term economic growth and development strategy for the years 2013 to 2017, validated during a national conference in Gbarnga, Bong County, in December 2012.

The AfT outlines specific and measurable goals and objectives for Liberia between 2013 and 2017, in order to position Liberia on the path to achieving its longer-term goals and visions. The principles of the Paris Declaration, Accra Action Plan, and the New Deal for Engagement in Fragile States, are supported by the plan.

The AfT is a results-focused strategy, which requires strong monitoring and evaluation systems in place in order to track progress of the plan. The Liberia Institute of Statistics and Geo-Information Services (LISGIS) has a core position in the monitoring of the plan through the collection and provision of official national statistics, and coordination and vetting of official statistics from third party ministries and institutes.

LISGIS worked closely with the Liberia Development Alliance (LDA) of Ministry of Finance and Development Planning's (MFDP) in the design of such a monitoring framework. The monitoring framework was refined many times over, and the numerous initially proposed more than 220 indicators were consolidated to approximately fifty National Key Indicators (NKIs).

A Household Income and Expenditure Survey (HIES) was deemed an optimal tool in collecting household data to fill data gaps for some socioeconomic NKIs. Other NKIs are sourced from previous LISGIS surveys including the

Population and Housing Census (2008) and the Demographic and Health Survey (2013).

Results from the HIES and other surveys mentioned provide key baseline indicators for evidence based policy planning and monitoring of the AfT's results. This report presents NKIs that serve as a baseline for the AfT. Indicators under LISGIS' direct responsibility, whether sourced directly from LISGIS surveys or as indicated by LDA, are presented in this report.[1]

Three types of sources are used: information from international organisations, data from international surveys, and data from surveys conducted by LISGIS. The information on the gross national income per capita comes from the World Bank Database, while the United Nations Development Program compiles the Human Development Index.

It should be noted that the HIES 2014 was halted half way through data collection due to the Ebola Virus Disease (EVD) outbreak in 2014, and as such, there are not enough observations to produce indicators at the county level; however the HIES is currently being re-run, with data collection beginning on 14th January and continuing for a 12-month period. If there are no similar interruptions, the re-run will allow for county level estimates to be produced in 2017.

Headline national estimates for all indicators are presented in Table 1.

Table 1 Baseline National Key Indicators for the AfT

Indicator	Result	Source
Human Development Index	0.412	UNDP HDI Report 2015
Gross national income per capita	$700 (PPP)	WB Databank
Population	4,001,855	HIES 2014
Share of people living below poverty line	54.1%	HIES 2014
Unemployment Rate	2.8 %	HIES 2014
Informal Employment Rate	67.9 % (non-subsistence	HIES 2014

[1] The NKI 25 (yield of selected crops, livestock, and fish) is not included in this report. The HIES 2014 had to be halted early due to the outbreak of Ebola Virus Disease. As a consequence, fieldwork for the Agricultural component of the HIES was incomplete and insufficient for purposes of estimation. With the first Agriculture Recall questionnaire included in the HIES 2016 the foundations for a representative benchmark in the future have been put in place.

	agriculture)	
Vulnerable Employment Rate	74.1 %	HIES 2014
Literacy Rate	66.7% nationally 54.8% for women 80.6 % for men	HIES 2014
Share of people satisfied with their protection against crime	73.6 %	HIES 2014
Share of people satisfied with the quality of the judicial system	78.1 %	HIES 2014
Electrification rate	14.4 %	HIES 2014
Electrification rate (LEC only)	4.5%	HIES 2014
Share of children under 1 year who received Measles vaccine	74.2 %	LDHS 2013
Proportion of under-five mortality	94 deaths per 1,000 live births	LDHS 2013
Proportion of maternal mortality	1,072 deaths per 100,000 live births	LDHS 2013
Share of households within 60 minutes to a health facility	62.9 %	LDHS 2013
Proportion of vulnerable households receiving social transfers	12.1 %	HIES 2014

A. Agenda for Transformation Key Indicators

This section describes those National Key Indicators (NKIs) that make up the monitoring framework for the AfT, and are sourced from LISGIS data. Wherever possible, indicators are disaggregated at the region level, urban rural level, and by gender of household head.

It should be noted that the indicators based on the HIES and the LDHS are presented at differing region definitions. In particular, the HIES region counts Montserrado as a region in its entirety, while the South Central region contains Grand Bassa and Margibi counties (Table 2). However the LDHS defines South Central region to include Montserrado excluding Greater Monrovia along with Grand Bassa and Margibi Counties, while Greater Monrovia is counted as a separate region (Table 3).

Table 2 Region Definition – HIES 2014

Region	Counties
North Western	Bomi, Grand Cape Mount, Gbarpolu
South Central	Margibi, Grand Bassa
South Eastern A	River Cess, Sinoe, Grand Gedeh
South Eastern B	Rivergee, Grand Kru, Maryland
North Central	Bong, Nimba, Lofa
Montserrado	Montserrado

Table 3 Region Definition – LDHS 2013

Region	Counties
North Western	Bomi, Grand Cape Mount, Gbarpolu
South Central	Margibi, Grand Bassa, Montserrado excluding Greater Monrovia
South Eastern A	River Cess, Sinoe, Grand Gedeh
South Eastern B	Rivergee, Grand Kru, Maryland
North Central	Bong, Nimba, Lofa
Greater Monrovia	Greater Monrovia

a. National Key Indicator 01 – Human Development Index

The Human Development Index (HDI) is a measure of a country's development, which takes into consideration the development of people, as well as economic growth. In particular, the index is a composite measure of a country's living standard, as measured by GNI per capita, health and education. It can range from 0 to 1, where 1 is the maximum.

Table 4 shows the changes in the HDI in Liberia between 2000 and 2014, alongside that of eight countries in the West African region and the Sub-Saharan average.

While the Sub-Saharan average advanced by nearly a full decimal point (from 0.422 to 0.518) between 2000 and 2014, Liberia's HDI progressed by 0.71 percentage points (from 0.359 to 0.430). It should be noted that Liberia was still in civil war in the first years of this period. Post-war progress from 2010 to 2014, however, is higher than the Sub-Saharan average and only matched by Ghana and Sierra Leone.

Table 4 Human Development Index Score in Liberia and Selected Countries in the Region

	2000	2010	2013	2014
Liberia	0.359	0.405	0.424	0.430
Ivory Coast	0.398	0.444	0.458	0.462
Guinea	0.323	0.388	0.411	0.411
Sierra Leone	0.299	0.388	0.408	0.413
Burkina Faso*	..	0.378	0.396	0.402
Ghana	0.485	0.554	0.577	0.579
Mali	0.313	0.409	0.416	0.419
Nigeria*	..	0.493	0.510	0.514
Senegal	0.380	0.456	0.463	0.466
Sub-Saharan Africa	0.422	0.499	0.514	0.518

*Data for Burkina Faso and Nigeria is unavailable for the year 2000.

Source: UNDP – "Trends in the Human Development Index, 1990-2014"

b. National Key Indicator 02 – Gross National Income per Capita

Gross National Income (GNI) is the sum of the value added by a country's residents, both domestic and foreign, (i.e. primary income, employee compensation and rental income),as well as product taxes (excluding subsidies). The GNI is corrected by purchasing power parity (PPP) into international dollars to enable comparison across countries. The GNI is divided by the country's mid-year population to arrive at the per capita GNI.

Table 5 shows changes in the GNI per capita of West African countries between 2000 and 2014.The three countries most impacted by the Ebola Virus Disease, Liberia, Guinea and Sierra Leone, are the only ones not to see their GNI per capita increase between 2013 and 2014.

Between 2000 to 2014, Liberia's GNI per capita increased by nearly 30% from 540 US$ to 700 US$, while at the same time the Sub-Saharan average increased by nearly 100% (1770 US$ to 3396 US$). Nigeria's GNI per capita nearly tripled, moving from 1950 US$ to 5710 US$ over the same time period.

Over the last four years, 2010 to 2014, Liberia made larger gains in GNI per capita (18.6%) than the Sub-Saharan Africa as a whole (15.3%). In the same time period Burkina Faso grew the most in relative terms (33.1%) followed by Ivory Coast (31.3%).

Table 5 Per capita GNI (in PPP, current US$) for Liberia and selected countries

	2000	2010	2013	2014
Liberia	540	590	710	700
Ivory Coast	2140	2570	2890	3130
Guinea	880	1040	1140	1130
Sierra Leone	790	1330	1770	1770
Burkina Faso	820	1430	1560	1600
Ghana	1750	2970	3850	3900
Mali	950	1440	1420	1510
Nigeria	1950	4750	5380	5710
Senegal	1500	2120	2210	2300
Sub-Saharan Africa	1770	2945	3270	3396

Source: World Bank – World Development Indicators

c. National Key Indicator 03 – Population

Liberia is estimated to have a population of approximately 4.1million persons during the data collection period of the HIES 2014[2]. Table 6 further presents the data disaggregated by region. The majority of the population live in the South Central, Montserrado, and the North Central regions. These three regions account for approximately 75% of the population. Montserrado alone represents nearly one third of the population of Liberia (32.2%).

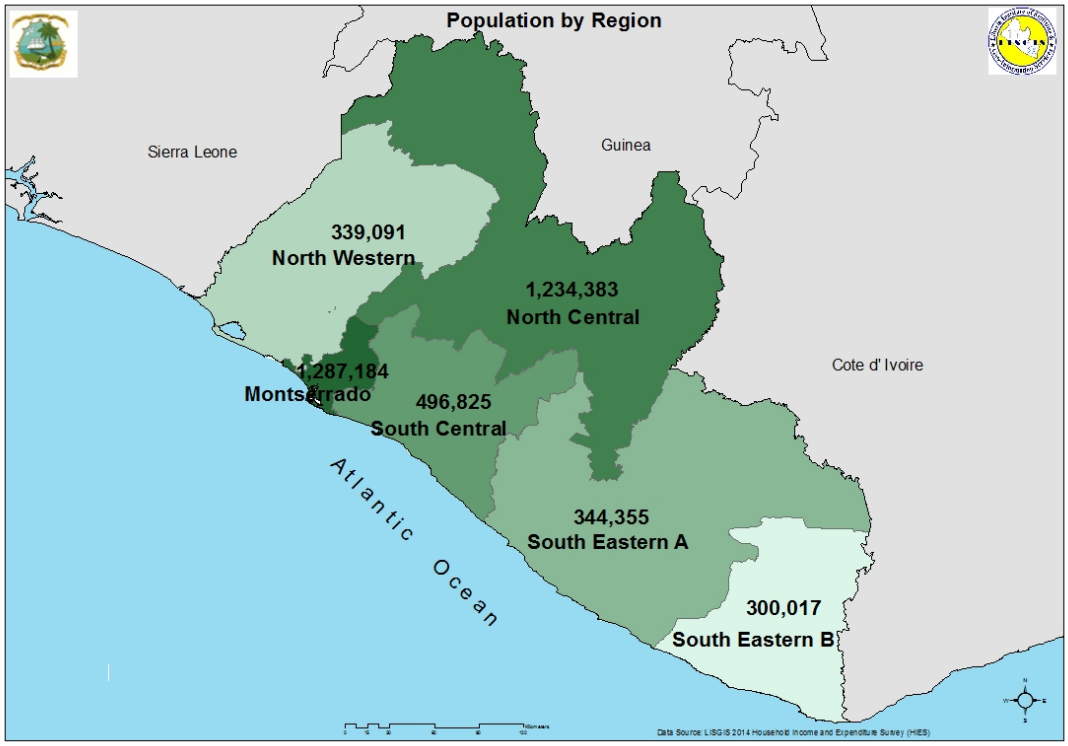


Table 6 Population estimates for 2015

	Population	
	Number	%
Liberia	4,001,855	100.0%
Area of residence		
Rural	1,623,583	40.6%
Urban	2,378,272	59.4%
Region		
Montserrado	1,287,184	32.2%
North Central	1,234,383	30.8%
North Western	339,091	8.5%
South Central	496,825	12.4%
South Eastern A	344,355	8.6%
South Eastern B	300,017	7.5%

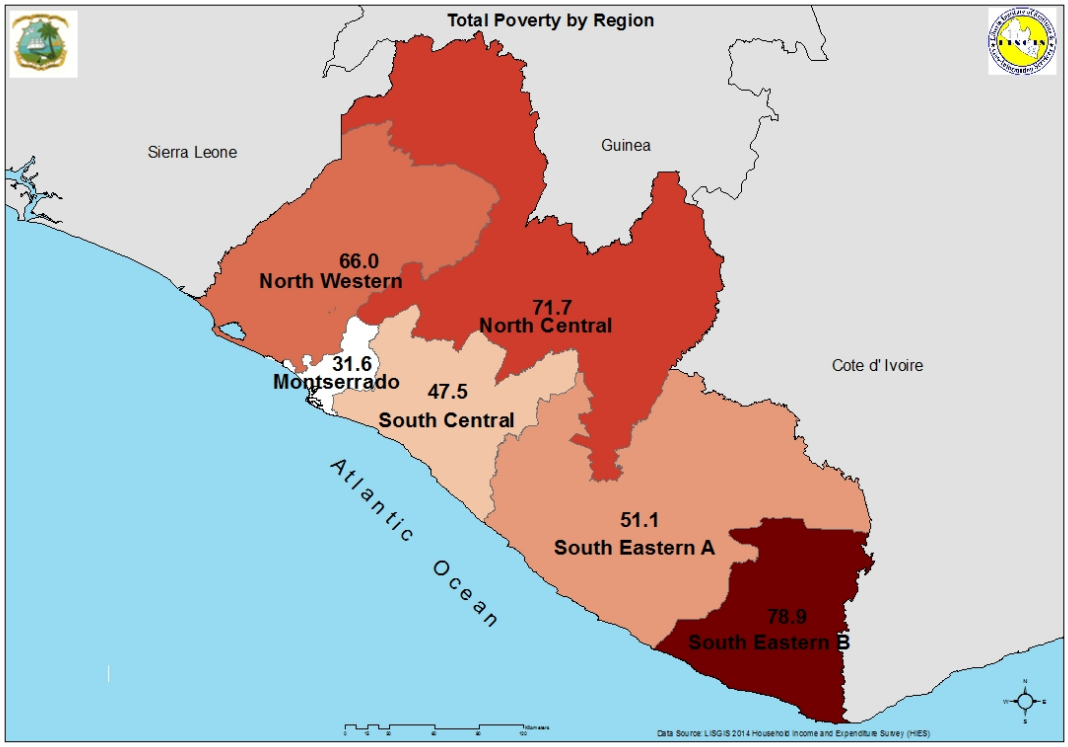
Source: 2014 Household and Income Expenditure Survey

[2] Populations are post-stratified using regional population projections from the 2008 Housing and Population Census

d. National Key Indicator 05 – Poverty

Poverty is measured using the information on household consumption data from the 2014 Household Income and Expenditure Survey. An individual is considered to be living in poverty when their overall (food and non-food) consumption is below the poverty line. A detailed description of the construction of the poverty line is presented in the methodological annex.

At national level, slightly more than half the population are deemed to be poor (54.1%). Rural poverty is higher (70.0%) and urban poverty lower (43.3%), however the actual number of poor in rural and urban areas is roughly equal since the urban population is higher than rural population. Looking at the regional disaggregation, Montserrado has the lowest share of people living below the national poverty line (31.6%), followed by the rest of the South Central region (47.5%). Poverty is highest in the North Central region (71.7%) and the South Eastern B (78.9%) region.



It should be noted that the poverty estimate based on the HIES 2014 data is not directly comparable to the estimates based on the 2007 and 2010 Core Welfare Indicator Questionnaires (CWIQ). The lack of ability to compare stems from key differences in the design and implementation of the HIES and the CWIQ. Amongst others these include different recall periods referred to when asking about household consumption, the inclusion of food consumed outside of the household in the HIES and differing set of consumables in the

two surveys. A more detailed explanation can be found in the annex. Comparisons between these poverty estimates cannot give a reliable description of the evolution of poverty in Liberia over time.

Table 7 Distribution of population share living below the poverty line

	Share of poor
Liberia	54.1
Area of residence	
Rural	70.0
Urban	43.3
Region	
Montserrado	31.6
North Central	71.7
North Western	66.0
South Central	47.5
South Eastern A	51.1
South Eastern B	78.9

Source: 2014 Household and Income Expenditure Survey

Since data collection for the HIES 2014 was halted before completion due to the EVD outbreak, approximately half of the target sample was actually enumerated. As a result there are not enough observations available to produce poverty estimates at the county level. Furthermore, impacts of seasonality on consumption data are not reflected since the data collection occurred in the six-months prior to Liberia's harvest season for rice, and did not cover the major end of year festive period. As a result, the estimates are susceptible to bias.

In order to construct estimates truly reflecting Liberia's seasonal consumption patterns and disaggregated by county, enabling more geographically informed policy decisions, LISGIS will repeat the HIES with the intention to complete a full 12-months of data collection as per the sample design. Data will be collected throughout 2016 for the rerun of the HIES. Two poverty numbers will be constructed using the HIES 2016 data. The first will be based on the full 12-months of data, aiming to achieve the objectives mentioned above. The second poverty estimate will be based on the first six months of data collected in the HIES 2016, enabling a comparable estimate between the two surveys.

e. National Key Indicator 06 – Employment and Unemployment Rates

Indicators on unemployment, informal employment, and vulnerable employment are used to measure the status of the labour market in Liberia.

Unemployment covers the share of the labour force available to work but who cannot find employment. A person is counted as unemployed if they did not do any work in the past seven days yet is still available to work if a job was offered to them. Someone in full time education would not count as unemployed even if they have not worked in the past week, since they are considered unavailable for labour market participation. Informal employment refers to the share of employed workers with a job either under informal circumstances or in the informal sector. Vulnerable employment covers the part of the employed labour force that, despite having a job, are not in a stable employment situation. For more details please see the methodological appendix.

The national unemployment rate is 2.8% (see Table 8). Furthermore, unemployment is largely an urban phenomenon, where the unemployment rate is 4.5%, as opposed to 0.6% in rural areas. By region, Montserrado is estimated to have the highest unemployment rate (5.4%), while the North Central region has the lowest (0.7%).

It should be noted that given the stringent definition of unemployment, unemployment in Liberia appears considerably low since most individuals need to find a way to survive, even if this is in a highly vulnerable and unstable type of employment. In the case of Liberia, measures of the vulnerable and informal employment provide meaningful information about the labour market, illuminating the fact that most of the employed population is in vulnerable or informal employment.

Table 8 Distribution of unemployment by region and stratum

	General	Urban	Rural
Liberia	2.8	4.5	0.6
Region			
Montserrado	5.4	5.8	0.0
North Western	1.2	3.6	0.9
North Central	0.7	1.0	0.4
South Central	3.1	5.7	0.4
South Eastern A	2.9	8.4	0.7
South Eastern B	3.1	5.5	1.6

Source: 2014 Household and Income Expenditure Survey

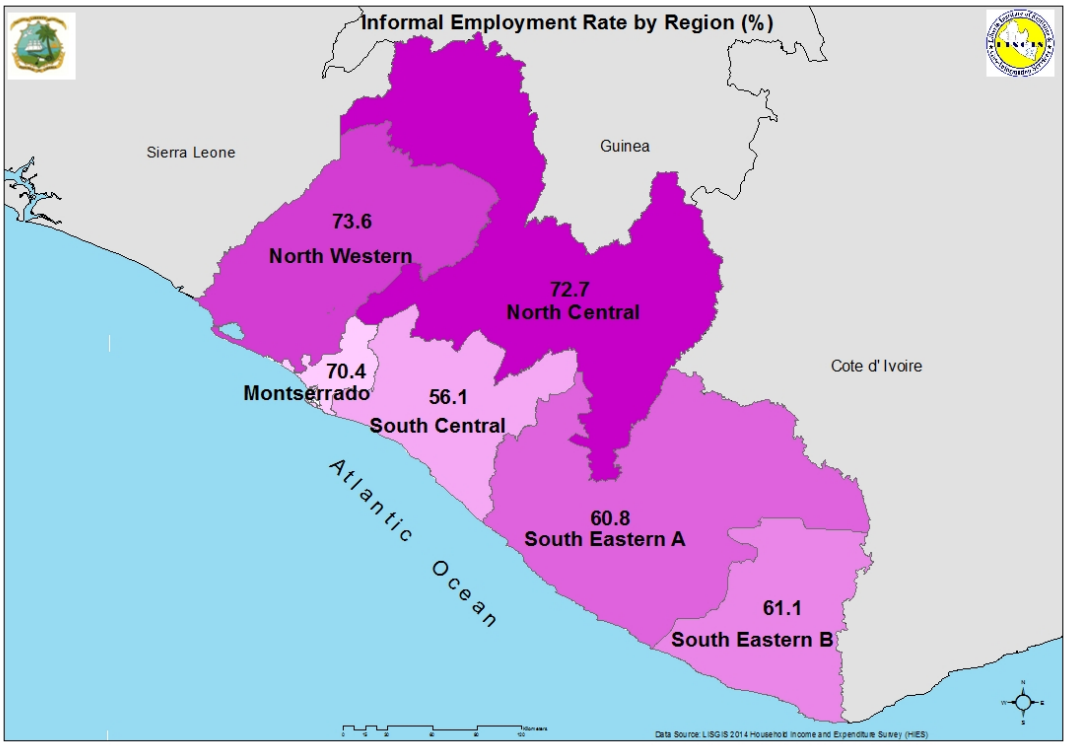
The informal employment rate (Table 9) considers only the non-subsistence agricultural sector, since this type of farming in Liberia is small scale and informal. Agricultural wageworkers, for example in palm oil concessions, are included. The informal employment rate is estimated to be 67.9% nationally.

Table 9 Distribution of the informal employment rate (non-agriculture) by region and stratum

	General	Urban	Rural
Liberia	67.9%	69.4%	63.2%
Region			
Montserrado	70.4%	71.7%	45.6%
North Western	73.6%	80.4%	71.9%
North Central	72.7%	71.7%	74.8%
South Central	56.1%	59.0%	48.9%
South Eastern A	60.8%	67.9%	54.8%
South Eastern B	61.1%	54.6%	68.8%

Source: 2014 Household and Income Expenditure Survey

Informal employment is higher in urban areas than in rural areas (69.4% versus 63.2%). If the percentage for rural Montserrado (for which there are only 20 observations in the survey) is discarded, the lowest informal employment rate is in the South Central region (56.1%) and the highest is in the North Central region, where the share of informal employment is estimated to be as high as 73.6%.

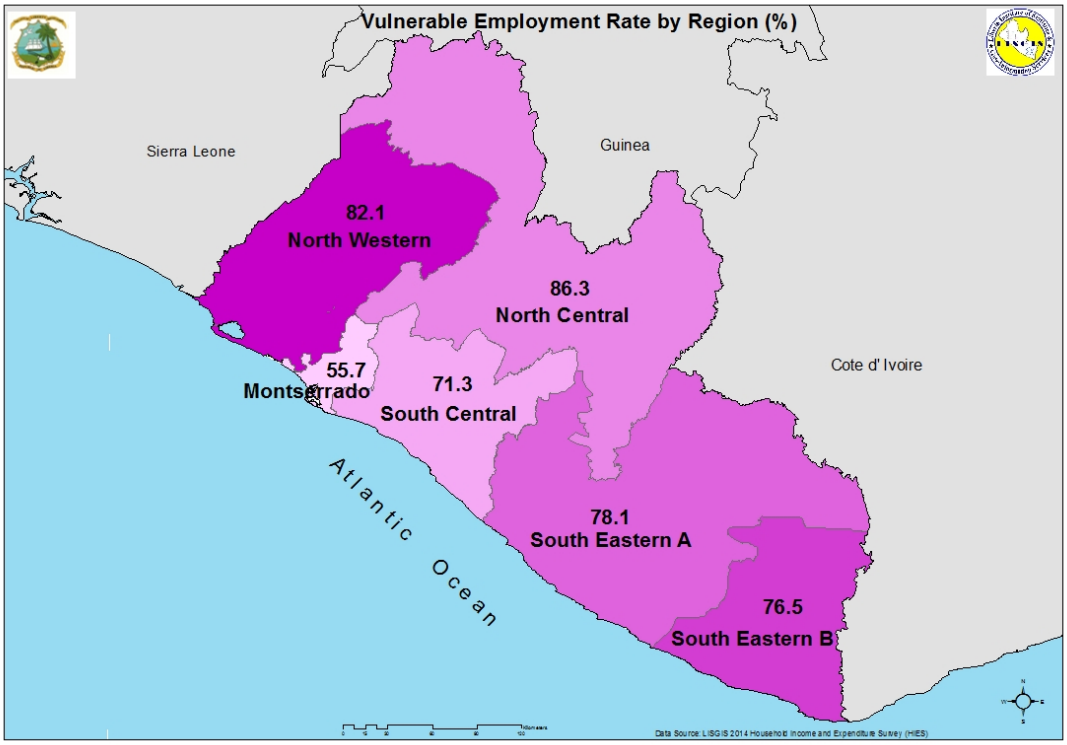


The vulnerable employment rate stands at 74.1% nationally (see Table 10). A larger share of the employed population is considered vulnerable in rural Liberia (85%) than in urban areas (65%). Montserrado is the region with the lowest share at (55.7%), while the North Central area has the highest (86.3%).

Table 10 Distribution of the vulnerable employment rate by region and stratum

	General	Urban	Rural
Liberia	74.1	65.0	85.0
Region			
Montserrado	55.7	55.7	54.7
North Western	82.1	79.3	82.5
North Central	86.3	80.1	91.9
South Central	71.3	62.4	80.0
South Eastern A	78.1	67.9	81.8
South Eastern B	76.5	62.2	85.7

Source: 2014 Household and Income Expenditure Survey



f. National Key Indicator 07 – Literacy

This indicator aims at assessing the degree of literacy among the population of Liberia. The HIES 2014 captured literacy ability based on respondent's self-evaluation of their ability to read and write either in English or any other language[3]. The literacy rate is measured based on responses for those aged between 15 and 49.

The national literacy rate is estimated to be 66.7% (Table 11), indicating that just over two thirds of Liberians are able to read and write. Urban residents are more likely to be literate than rural residents (76.0% versus 50.1%). Though the gap between males and females has been declining in recent years, it still remains large. An estimated 80.6% of males are literate, while for females the proportion is much lower at 54.8%.

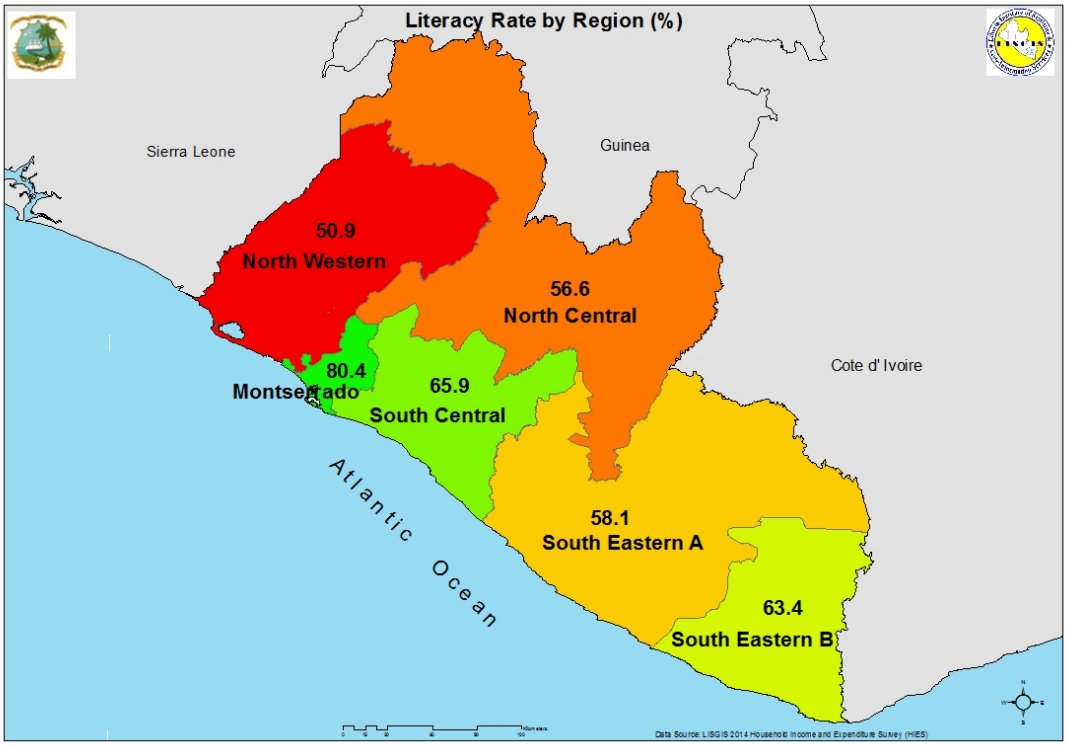
Table 11 Literacy rates by gender, geographic area and region

Characteristic	%
Liberia	66.7%
Area of residence	
Urban	76.0%
Rural	50.1%
Gender	
Males	80.6%
Females	54.8%
Region	
North Western	50.9%
North Central	56.6%
South Central	65.9%
South Eastern A	58.1%
South Eastern B	63.4%
Montserrado	80.4%

Source: 2014 Household and Income Expenditure Survey

Significant regional differences exist; the North Western region has the lowest literacy rate, at 50.9%, whilst Montserrado County has the highest at 80.4%.

[3] The literacy rate is not comparable to that based on the LDHS 2013 due to differences in methodology; the HIES literacy rate is based on self-reported ability to read and write, whilst the LDHS bases literacy rate on evidence based ability to read.


Literacy Rate by Region (%)
Sierra Leone
Guinea
Cote d' Ivoire
50.9
North Western
56.6
North Central
80.4
Montserrado
65.9
South Central
58.1
South Eastern A
63.4
South Eastern B
Atlantic Ocean
Data Source: LISGIS 2014 Household Income and Expenditure Survey (HIES)

g. National Key Indicator 08 – Satisfaction with Protection Against Crime

This indicator aims at assessing the degree of satisfaction of Liberians with their protection against crime. The indicator is based on data from the 2014 Household Income and Expenditure Survey and uses the answers of respondents 15 years old and above. Any person stating that they were at least somewhat satisfied with their protection against crime was counted as satisfied. For more details please see the methodological appendix.

Table 12 evidences that, at national level, 73.6% of Liberians are satisfied with protection against crime provided to them. A smaller proportion is satisfied in in urban areas (70.4%) than in rural areas (78.5%). There is no significant difference in satisfaction between households lead by men and those headed by women.

Table 12 Share of population satisfied with the protection against crime

	% Satisfied
Liberia	73.6
Area of residence	
Urban	70.4
Rural	78.5
Gender of Household Head	
Male	73.3
Female	73.8

Source: 2014 Household and Income Expenditure Survey

h. National Key Indicator 11 – Satisfaction with Judicial System

This indicator aims at assessing the degree of satisfaction of Liberians with the quality of the judicial system available to their household. The indicator is based on the 2014 Household Income and Expenditure Survey and uses the answers of respondents 15 years and above. Any person stating that they were at least somewhat satisfied with the quality of judicial system available to them was seen as satisfied. For more details please see the methodological appendix.

78.1% of Liberians are satisfied with the quality of the judicial system (Table 13). Additionally, the degree of satisfaction appears to be fairly stable across urban and rural areas, being only slightly smaller in urban areas (77.1%) compared to rural areas (79.8%). The difference between households where the head is male and those with a female head is even smaller (77.5% and 78.7% respectively).

Table 13 Share of population satisfied with the judicial system

	% Satisfied
Liberia	78.1%
Area of residence	
Urban	77.1%
Rural	79.8%
Gender of Household Head	
Male	77.5%
Female	78.7%

Source: 2014 Household and Income Expenditure Survey

i. National Key Indicator 20 – Electrification Rate

The electrification rate measures Liberians access to electricity. In this case, people are considered to have access to electricity if they do so through the Liberian Electricity Company's (LEC) grid, by means of generator (private or community) or via solar panels. For more details please see the methodological appendix.

Nationally, only 14.4% of the population have access to electricity (see Table 14). Additionally, household access to power is nearly exclusively an urban good. Slightly above one in five homes in urban areas have access to electricity (21.5%), while only 3.7% of rural homes do.

As could be expected, the electrification rate is highest in Montserrado. Apart from the South Central region, no region has electricity access rates above 10%. The lowest rate is recorded in North Central, with only 2.7% of the regional population having access to electricity in their homes.

Table 14 Share of the population with access to electricity

	% Electrified
Liberia	14.4
Area of residence	
Urban	21.5
Rural	3.7
Region	
North Western	8.2
North Central	2.7
South Central	10.2
South Eastern A	5.5
South Eastern B	3.9
Montserrado	32.3

Source: 2014 Household and Income Expenditure Survey

j. National Key Indicator 41 – Measles Vaccination Rate

The measles vaccination rate estimates the share of children of one year of age (12 to 23 months) who have been vaccinated. Table 15 shows that the vaccination rate was 74.2% in Liberia in 2013. This means that approximately three-quarters of all one-year-olds had been vaccinated.

Vaccination rates are higher in urban areas than in rural areas, although the gap has narrowed since 2007. There are no significant differences between the vaccination rates of male and female infants. Looking at the regional disaggregation[4], the vaccination rate is highest in the North Western Region (81.5%) and lowest in the South Eastern B area of the country (60%).

Table 15 Share of children vaccinated against measles by socio-geographic characteristics

	2007	2013
Liberia	63.0	74.2
Area of residence		
Urban	76.7	77.6
Rural	56.4	70.4
Gender of Household Head		
Male	61.3	73.8
Female	65.0	74.6
Region		
North Western	67.8	81.5
South Central	..	77.2
South Eastern A	51.7	66.7
South Eastern B	40.0	60.0
North Central	59.8	72.6

Source: Demographic and Health Surveys of Liberia

The implementation of the DHS program in a wide range of countries allows for comparison of vaccination efforts in Liberia and selected West African Nations (Table 16). Among the three countries with which Liberia shares a border, only Sierra Leone is estimated to have a higher vaccination rate for measles at 78.6%. Nigeria's rate is the lowest of all selected countries (42.1%), while Ghana has a significantly higher vaccination rate than any other country (89.3%). Note that the data for Guinea and Ivory Coast is less recent.

[4]Note that the data for South Central for 2007 is not reported. This is because the 2007 Demographic and Health Survey had the South Central region split into different areas, so they cannot be directly compared.

Table 16 Share of children vaccinated against measles in Liberia and selected regional countries

	% Vaccinated
Liberia (2013)	74.2
Ivory Coast (2011)	64.5
Guinea (2012)	61.8
Sierra Leone (2013)	78.6
Ghana (2014)	89.3
Nigeria (2013)	42.1

Source: Demographic and Health Survey Program

k. National Key Indicator 42 – Under Five Mortality Rate

The under-five mortality rate captures the probability a child will die before its fifth birthday. It is usually presented in the number of deaths per 1,000 children born, as in Table 17. On average in Liberia, 94 of every 1,000 children born will die before the age of five. This indicator is based on information on children born in the five years before the interview.

The information is further disaggregated by stratum and region. It is important to note, however, that, in order for there to be enough observations, at the disaggregated level, all births in the 10 years prior to the interview are used to calculate the under-five mortality rate. Expanding the time frame further into the past worsens the ratios, as progress has been made over the last decade. This is why both the urban and the rural mortality rates are above the national level.[5]

The under-five mortality rate is lower in urban areas, where 106 children born out of every 1,000 are expected to die before they reach five, than in rural areas where the rate is 120 in every 1,000 live births. The North Central region has the lowest rate at 97 deaths in every 1,000 live births, and the highest rate is in South Eastern B (143 per 1,000 live births). The South Eastern B region is also the only region where the ratio increased in comparison to 2007.[6]

Table 17 Under 5 mortality per 1,000 by socio-geographic characteristics

	2007	2013
Liberia	110	94
Area of residence		
Urban	131	106
Rural	146	120
Region		
North Western	142	141
South Central	..	112
South Eastern A	132	113
South Eastern B	121	143
North Central	142	97

Source: Demographic and Health Surveys of Liberia

[5] As an example, 94 out of 1,000 live births in the years from 2013 to 2009 died before reaching the age of five. In urban areas, 106 out of 1,000 live births in the years from 2013 to 2004 died before their fifth birthday.

[6] Note that the data for South Central for 2007 is not reported. This is because the 2007 Demographic and Health Survey had the South Central region split into different areas, so they cannot be directly compared.

Using the national average, that is, the number calculated with only the births in the five years prior to the interview, Table 18allows for comparison between Liberia and five West African nations. Only Ghana has a lower ratio than Liberia (60 per 1,000 live births). Sierra Leone shows the worst ratio of the selected regional countries (156 per 1,000 live births). It should be noted that the data for Guinea and Ivory Coast are not as recent.

Table 18 Under 5 mortality per 1,000 in Liberia and selected regional countries

	Mortality per 1,000
Liberia (2013)	94
Ivory Coast (2011)	108
Guinea (2012)	123
Sierra Leone (2013)	156
Ghana (2014)	60
Nigeria (2013)	128

Source: Demographic and Health Survey Program

I. National Key Indicator 43 – Maternal Mortality Rate

This indicator measures the likelihood of a woman dying during pregnancy or in the aftermath of the termination of a pregnancy. The maternal mortality rate indicator is available at the national level through the LDHS in 2007 and 2013 (Table 19). Of 100,000 women giving birth (or terminating their pregnancy otherwise), 1,072 are estimated to die during birth or following the termination.

It can be seen that the rate has increased slightly. This increase is not sufficient to state that the situation has worsened, as the difference is within the margin of error. However it is sufficient to claim that the likelihood of pregnancy related deaths has not decreased over the last years.

Table 19 Maternal mortality rate per 100,000

	2007	2013
Liberia	994	1072

Source: Demographic and Health Surveys of Liberia

Comparing Liberia to selected West African nations (see Table 20) it can be seen that only Sierra Leone has a worse rate, with 1,165 deaths per 100,000 pregnancy terminations. Nigeria has the lowest rate with 576 per 100,000. There is no information for Ghana in the latest survey.

Table 20 Maternal mortality rate per 100,000 in Liberia and selected neighbouring countries

	Mortality per 100,000
Liberia (2013)	1,072
Ivory Coast (2011)	614
Guinea (2012)	724
Sierra Leone (2013)	1,165
Ghana (2014)	..
Nigeria (2013)	576

Source: Demographic and Health Survey Program

m. National Key Indicator 44 – Accessibility of Health Care

This indicator measures the ability of Liberian households to reach a health care facility within 60 minutes.

It should be noted that this indicator is based solely on information from LDHS respondents who walked to the nearest health care facility. Other methods of transport vary too much in speed and thus the distance covered in 60 minutes will be significantly different. Table 21 presents the frequency of mode of transportation used to reach the nearest health care facility.

At national level, 64.6% of Liberians walk to their health care centre. Public transport is the second most frequent mode of transport used by 29.8% of the population. Other methods of transport, including private car or motorcycle, bicycles, amongst others, are used by approximately 5% of the population. In both urban and rural areas, about 95% of trips to health care facilities are taken by walking and public transport. However, walking is much more common in rural areas (75.3%) than in urban Liberia (56.4%).

Table 21 Distribution of method of transportation to the nearest health care centre

	Liberia	Urban	Rural
Car / Motorcycle	4.2	5.6	2.4
Public transport	29.8	36.9	20.6
Walking	64.6	56.4	75.3
Bicycle	0.8	0.8	0.7
Wheelbarrow	0.0	0.0	0.1
Other	0.2	0.1	0.3

Source: Demographic and Health Survey of Liberia 2013

It can be seen from Table 22 that 62.8% of people are estimated to have a health care centre within 60 minutes walking distance. The proportion reaches 85.7% in urban areas (where 46.3% can reach a centre in less than 20 minutes). In rural areas only 40.6% of people can reach the health care centre nearest to them within a sixty-minute walk. 27.4% of the rural population need between 61 and 120 minutes and nearly one in three (31.9%) are recorded to take more than two hours walking to the nearest health care centre.

Table 22 Distribution of the time walking to the nearest health care centre

	Liberia	Urban	Rural
Less than 20 minutes	30.5%	46.3%	15.1%
20-40 minutes	19.4%	28.1%	11.0%
41-60 minutes	12.9%	11.3%	14.5%
61-120 minutes	17.7%	7.7%	27.4%

More than 120 minutes	19.4%	6.7%	31.9%
Less than 60 minutes	62.8%	85.7%	40.6%

Source: Demographic and Health Surveys of Liberia

n. National Key Indicator 45 – Vulnerable Households Receiving Social Transfers

This indicator aims at assessing the support vulnerable households receive from social stakeholders, both public and private. A household is classified as vulnerable if it reported at least one instance in the last 12 months when it did not have enough food to feed itself.

Table 23 shows that 49% of all households are deemed vulnerable and out of these, 12.1% received transfers. The proportion receiving transfers increases to 15.7% in rural Liberia and is estimated to be 8.6% in urban areas.

Households lead by women are deemed vulnerable in 51.3% of the cases and those lead by men in 48.1%. Out of those, 12.8% of the vulnerable households with a male head received some sort of social support, while 10.3% of the vulnerable households lead by women did.

In South Eastern B region 71.1% of the households are estimated to be vulnerable, with 13.6% of these receiving transfers. In the North Western region, a much higher proportion, 41.4%, of the vulnerable households (61% of all households) received transfers. In Montserrado, only 32.7% of the households are vulnerable and 2.6% of these households receive transfers.

Table 23 Share of vulnerable households receiving transfers

	Proportion Vulnerable	Vulnerable receiving transfers
Liberia	49.0	12.1
Area of residence		
Urban	41.6	8.6
Rural	60.3	15.7
Gender of Household Head		
Male	48.1	12.8
Female	51.3	10.3
Region		
North Western	61.0	41.4
South Central	51.9	10.3
South Eastern A	58.0	16.8
South Eastern B	71.1	13.6
North Central	55.5	8.4
Montserrado	32.7	2.6

Source: 2014 Household and Income Expenditure Survey

B. Methodological Appendix

The indicators presented during this report rely on definitions and calculations that are presented in more detail in this appendix. Firstly, a general introduction to the weighting procedure is given, followed by detailed explanations for each indicator, which follow the same order as the presentation of the indicators in the previous section.

Weighting procedure

All calculations for this document are done using the statistical software STATA under the svy set framework.[7]

This framework includes the weighting of the results. Weighting is different from survey to survey and exact details can be found in the survey reports (for example, for the Liberia Demography and Health Survey (LDHS), see the LDHS 2013 Final Report)[8]. For the 2014 HIES, see the Basic Information Document for a detailed account of the weighting procedure.

The weighting accounts for the likelihood of selection and ensures that results are not distorted. In general, a minimum number of observations from each sampling unit need to be taken. Beyond this, it is often economically not beneficial to include more data from units with more population. Instead, the results of the units (with smaller yet sufficient observations) can be scaled up.

National Key Indicator 01 – Human Development Index

The HDI is calculated in two steps.[9] First, to ensure the indicator lies between 0 and 1, the ranges for the different dimensions of the HDI are set. These are shown in Table 24.

Table 24Human Development Index dimensions

Dimension	Indicator	Min.	Max.
Health	Life expectancy (years)	20	85
Education (I)	Expected years of schooling	0	18
Education (II)	Mean years of schooling	0	15
Standard of living	Gross national income per capita (PPP 2011$)	100	75,000

The education dimension has two components. The arithmetic mean of these two gives the education index used in the HDI.

[7] For more details about the survey setting in STATA see the *STATA Survey Data Reference Manual* (StataCorp. 2013. Stata: Release 13. Statistical Software. College Station, TX: StataCorp LP.).

[8] This report is publicly available under the DHS Program website.

[9] The explanation presented here is based on the Technical Note in the Human Development Report 2015, available at the UNDP's Human Development Reports website.

The ranges for education are built on UN projections (in the case of mean years of schooling) or the time it usually takes to earn a master's degree (for the expected years of schooling).

The income range is based, for the lower bound, on an estimate of the unmeasured subsistence and nonmarket production. The upper bound is based on the empirically (roughly) agreed fact that beyond US$75,000 there is hardly any gain in human development.

The goalposts of life expectancy, the proxy for health, are based, on the lower end, on the fact that no country had a life expectancy of less than 20 years in the 20th century. 85 years, on the upper end, is an estimated maximum life expectancy (at birth).

The second step is the actual calculation. For each dimension the index is calculated as

$$\frac{\text{actual value} - \text{minimum value}}{\text{maximum value} - \text{minimum value}}$$

where the education dimension is, as mentioned before, the arithmetic mean of the expected education index and the mean education index.

Finally, the last calculation is to take the geometric mean of the three dimensions, i.e.

$$\text{HDI} = (\text{life expectancy dim.} \times \text{education dim.} \times \text{income dim.})^{1/3}$$

National Key Indicator 02 – Gross National Income per Capita

The Gross National Income (GNI) per capita measures the value of all goods and services generated within a specific time period using production values in the hands of residents. This includes both domestic and foreign value (i.e. primary income, employee compensation and rental income repatriated from foreign residents is included), as well as product taxes (excluding subsidies). For example, income generated by a factory owned by non resident foreigners would not be included while income from a factory owned by a resident would count towards Liberia's GNI.

The calculation is thus

+ Sale value of goods and services
– Import and inputs
+ Product taxes
– Subsidies
+ Net receipt of primary income

All the values are normalised using purchasing power parity in international dollars. An international dollar has the same purchasing power per GNI as a United States dollar in the United States, meaning it can grant the same level of consumption. The GNI is divided by the country's midyear population to arrive at the per capita GNI.

National Key Indicator 03 – Population

Population is estimated using the HIES 2014 data by scaling up the number of persons in each region by an associated weighting factor to produce a population representative at the region level. The weighting factor takes into account the differing likelihoods of selection of a household in each stratum, as well as possible non-response. It should be noted that populations are post-stratified using regional population projections from LISGIS' 2008 Population and Housing Census[10].

National Key Indicator 05 – Poverty

There are three elements required to perform poverty analysis:

a. A single dimensional, measureable welfare indicator that can be used to rank the population according to well-being.
b. An appropriate poverty line on the same scale as the above welfare measure that can be used to classify individuals as poor or non-poor.
c. A set of measures that aggregate and describe the combination of the welfare indicator and poverty line.

The presented poverty measure is the poverty headcount ratio, a commonly used index that indicates the share of the poor, or those living below the poverty line, of the total population.[11]

The calculation starts with setting a food poverty line. The poverty line used is termed the absolute poverty line, and is based on the minimum level of consumption of both food and non-food items required to live a basic and healthy life. To achieve this the nutritional requirements to be a healthy and active participant in society need to be calculated. On a per day basis, the minimum caloric requirements usually range from 2100 to 3000 calories, contingent on the climate and general level of activity. The minimum calorie requirements are determined to be 2400 per day in Liberia, which is consistent with the regional average and the values used in the 2007 CWIQ analysis. Caloric conversion factors are done using general factors from the

[10] For further information refer to the HIES 2014 Basic Information Document
[11] The description of the calculation of the poverty line given here is based on the explanation of the methodology given in the methodological appendix to the HIES 2014 Statistical Abstract.

Food & Agricultural Organization since no specific Liberian conversion rates were available.

Sensitivity analysis of the food poverty line to higher and lower minimum calorie requirements was performed and the monetary equivalent value shown in Table 25.

Table 25 Daily calories conversion rate

Calories per adult equivalent per day	2100	2400	2700	3000
Food poverty line in LD per adult equivalent per month	2,613	2,986	3,359	3,732

Following the methodology employed for the 2007 CWIQ, the non-food poverty line is calculated using the food poverty line and the Engel's curve methodology.

This approach takes those whose food-consumption is within five percent above or below the food poverty line as the reference population. For that population, the ratio of food consumption to total consumption is estimated. This ratio is then multiplied to the average value of food consumption for the reference population. Then both food and non-food consumption values (in LD) are added to generate the overall poverty line.

The resulting food poverty line is 35,888.38 LD and the overall poverty line is 62,963.63 LD per adult equivalent per year.

Comparability with 2007 CWIQ

The previous poverty numbers for Liberia were generated by the 2007 Core Welfare Indicator Questionnaire. While this analysis to the extent possible tries to replicate that methodology, there are a number of important differences and therefore the poverty levels cannot be directly compared. See Wodon (2012) for a full description of the 2007 methodology. Differences between 2007 (based on CWIQ) and 2014 include:

1. Regular consumption vs Recall. In the 2007 CWIQ survey the questions asked about the average number of months per year and average consumption, while the 2014 HIES survey asked specifically about recall periods (either 7 days, 30 days, or 12 months).

2. The 2014 HIES includes Food Consumed Away from Home, which was not included in the 2007 CWIQ.

3. The 2007 CWIQ had separate poverty lines for urban and rural areas but did not include spatial price deflators. The 2014 HIES uses Fisher Price Deflators for county differences and produces only one poverty line.

4. The 2007 CWIQ used the 2nd through the 9thdeciles of the consumption distribution used for the poverty line calculations while the 2014 HIES uses the 2nd through the 7th.

5. The consumption basket in the 2007 CWIQ included spending on the 28 food products most often consumed which represented just over 87 percent of total household spending on food in the country. The 2014 HIES uses all items which comprise at least one percent of total spending on food, leading to a basket of 25 items representing about 83 percent of consumption. Among these 25 items are four categories of food consumed outside the household (meals, snacks, alcoholic beverages, and non-alcoholic beverages).

6. In both the 2007 CWIQ and the 2014 HIES, the average number of calories per adult equivalent were higher than expected. In the 2007 CWIQ, the amounts actually consumed for all products in the survey are adjusted in order to yield exactly a total of 2,400 Kcal per equivalent adult per day. Then the total cost of purchasing the resulting food basket was estimated using the survey prices observed in the community questionnaire of the survey. In the 2014 HIES, the total spending and the aggregated prices from the consumption section of the questionnaire were used to adjust the quantities.

National Key Indicator 06 – Employment and Unemployment Rates

The calculations performed here are in line with the definitions set out in the 2010 Labour Force Survey (LFS).[12] This means that only respondents aged 15 and above are taken into account (HIES collects employment data for everyone 10 or above).

The calculation of the unemployment rate requires a definition of an unemployed person. According to international standards, a person should show three characteristics to be unemployed. Firstly, the person should not be employed. Any person who had a job in the last seven days or will definitely return to a job is seen as employed (any “yes” response to questions 8 or 10 in section E, Labour module). Secondly, the person must be available to work, meaning would accept employment if they were offered any (“yes” response to question 11). Thirdly, the person must be actively looking for work (by being registered at unemployment office, for example) to be actually counted as unemployed.

This last characteristic is usually not included in environments where the labour market is strongly underdeveloped, which is considered the case for Liberia. This was the procedure used in the LFS as well.

[12] The report on Liberia’s LFS 2010 is available from the International Labour Office website.

The calculation for the unemployment rate is then:

Numerator	Number of people unemployed
Denominator	Number of people either employed or unemployed

The calculation of the informal employment rate follows the definitions set out in the LFS 2010, shown in the box below.

LFS Definition of informal sector and informal employment in Liberia

The following are the agreed definitions for use in Liberia:

Employment in the informal sector

Exclude persons employed in the agriculture sector (Section A in ISIC rev 4)
Exclude persons producing goods or services for household's own use (ISIC division code 98)
Exclude persons coded as professionals (ISCO-08 major group 2)
Exclude persons working in establishments registered with the Ministry of Commerce or the Ministry of Foreign Affairs
Exclude persons working in establishments with 5 or more persons

Informal employment

As above, but:
Include persons producing goods or services for household's own use (ISIC division 98)
Exclude any person who benefits from employer's contribution to pension/retirement fund or paid leave or where the employer deducts income tax from the salary/wage

Source: LFS 2010

However, some of the definitions cannot be exactly recreated using the HIES 2014 data. For example, there is no information on whether the employer of a person is an establishment registered with the Ministry of Commerce or the Ministry of Foreign Affairs.

Thus, for the sake of this work the formal employment is coded as those working as professionals (ISCO-08 major group 2), those working for the government (who surely work at a registered establishment), and those working in an establishment with 5 or more people.

In addition to cover the last case presented in the box (cases with pension or taxes deducted from salary) the following cases are seen as formal: Either the position has a pension or health benefits or is a permanent position with a contract.

The calculation of informal employment is thus:

Numerator	Number of people classified as informal
Denominator	Number of people employed

Finally, those in vulnerable employment are defined as being either employed on their own account or working as a contributing family worker to either the family farm or the household's non-agricultural business.[13]

For the HIES 2014 this means looking specifically at question 9 of section E, where respondents are asked to define their main employment. However, these characteristics are not recorded for the people who stated they would return definitely to a job although they did not do any work in the last 7 days. The ratios should still give a robust estimate as the cases left out are but a minority. Absolute numbers will, however, not coincide.

Table 26 shows the possible answers and their codes, as well as the unweighted frequencies for the cases where respondents are classified as employed and are above 14 years of age.

Table 26Distribution of the responses to question regarding the main job

Specific question: Define your main work in the last 7 days

Answer	Answer code	Frequency
Paid employee	1	1095
Self-employed (non agric) with employees	2	122
Self-employed (non agric) without employees	3	1215
Unpaid family worker (non agric)	4	344
Unpaid family worker (agriculture)	5	1664
Work on own farm	6	3054
Unpaid apprenticeship	7	42
Missing	.	381

The self-employed are those working on their own farm (answer code 6) or in a non-agricultural business, regardless of whether they have employees or not (answer codes 2 and 3). In addition family workers in both agriculture and other fields are thought to be vulnerable (answer codes 4 and 5).

The calculation of vulnerable employment is thus:

Numerator	Number of people classified as vulnerable
Denominator	Number of people employed

[13] See page 10 in LFS 2010 report.

National Key Indicator 07 – Literacy

The indicator is based on data from the Education Module in the 2014 HIES. The section is administered to those respondents who are five years old or above. In cases where a child cannot answer all questions on their own, or is not present, a household member (preferably the main care giver in the household) can answer on behalf of a respondent.

In particular the indicator is derived from questions 4 and 5 of Section C, the Education module, in the questionnaire. These record self-reported assessments of respondents' abilities to read and write in both English (Q4) and any other language (Q5). Only responses for those between 15 and 49 years (inclusive) in age are used to construct the indicator.

Hence the indicator is calculated as the ratio:

Numerator	Instances where respondent (above 15 years of age) has responded that they can read AND write in English or any other language
Denominator	All respondents (above 15 years of age), for which the response to Q4 and Q5 is non-missing

National Key Indicator 08 – Satisfaction with Protection Against Crime

The indicator uses information on the geographic characteristics of a household (Section A), and on household members' age and gender (Section B). This information is used alongside the household members response to question 3 in the subjective welfare section (Section G) to calculate the indicator and allow for disaggregation.

Table 27 shows a frequency tabulation of the (unweighted) answers and the answer codes.

Table 27 Distribution of responses to question regarding protection against crime

Specific question: How satisfied or dissatisfied would you say you are with your protection against crime/safety?

Answer	Answer code	Frequency
Very Satisfied	1	1259
Satisfied	2	3761
Somewhat Satisfied	3	1423

Neither Satisfied Nor Dissatisfied	4	608
Somewhat Dissatisfied	5	514
Dissatisfied	6	770
Very Dissatisfied	7	254
Not Applicable	8	45
Missing	.	9455

Note that the response for 9,455 individuals is missing. This is because the question is only addressed to those 15 years of age or above *and* who were physically present during the enumeration and thus could answer for themselves.

The relevant decision for this indicator is to define the options that should count as being "satisfied". For this indicator, everyone stating to be very satisfied, satisfied, and somewhat satisfied is deemed to be satisfied (answer codes 1, 2, and 3).

Hence the indication is calculated as the ratio:

Numerator	Instances of hh_g_03_7 with answer codes 1, 2, and 3
Denominator	Instances of hh_g_03_7 with answer codes 1 through 7

Note that the people who answered "not applicable" (answer code 8) are not included in the calculation. Missing observations (recorded for those under 15 or those who could not be interviewed directly) are also not included.

National Key Indicator 11 – Satisfaction with Judicial System

The indicator takes the information on the household characteristics (section A), which is the same for everyone in a single household, and attaches these details to the household roster (section B). Then the household characteristics as well as the information on age and gender of every respondent to the HIES are added to the information in section.

The relevant variable is question 3, sub-question 8 in the section on subjective welfare (section G). Table 28 shows a frequency tabulation of the (unweighted) answers and the answer codes.

Table 28 Distribution of responses to question regarding the satisfaction with judicial system

Specific question: How satisfied or dissatisfied would you say you are with your satisfied with the judicial system available to your household?

Answer	Answer code	Frequency
Very Satisfied	1	1377
Satisfied	2	3667

Somewhat Satisfied	3	1350
Neither Satisfied Nor Dissatisfied	4	659
Somewhat Dissatisfied	5	413
Dissatisfied	6	725
Very Dissatisfied	7	179
Not Applicable	8	265
Missing	.	9455

Note that the biggest part of the answers are said to be “missing”. This is because the question is only addressed to those 15 or above who were present during the interview and thus could answer for themselves.

The relevant decision for this indicator is to define the options that should count as being “satisfied”. For this indicator, everyone stating to be very satisfied, satisfied, and somewhat satisfied is deemed to satisfied (answer codes 1, 2, and 3).

Hence the calculation is the ratio

Numerator	Instances of hh_g_03_8 with answer codes 1, 2, and 3
Denominator	Instances of hh_g_03_8 with answer codes 1 through 7

Note that the people who answered “not applicable” (answer code 8) are not included in the calculation. Missing observations (recorded for those under 15 or those who could not be interviewed directly) are also not included.

National Key Indicator 20 – Electrification Rate

The indicator takes information from the household identification section to obtain socio-demographic data on the household. The indicator draws as well from the household member roster to identify the household head and record the head’s gender and age. The key source of the indicator is the section on housing, water, and sanitation (section J).

After extracting the household identification information, the first issue arises with the definition of the household head. The HIES 2014 includes observations on 4,088 households. However, there are 4,104 people stating they are the head of a household: For sixteen households, two household heads have been recorded.

The questionnaire specifically states that the first person listed for each household should be the head. Whenever there were more than one household heads recorded, the first household member listed in the roster was selected as the “true” household head.

The dataset with the household characteristics, together with the age and gender information of the household head is merged with the dataset from section J. Table 29 shows a frequency tabulation of the (unweighted) answers and the answer codes. The vast majority, 3,566 households, state that they have no main source of electricity at all.

Table 29 Distribution of responses to the question regarding the access to electricity

Specific question: What is HH main source of electricity?

Answer	Answer code	Frequency
None	1	3,566
Community Generator	2	122
Own Generator	3	124
Electricity from Power Supplier (LEC)	4	100
Solar Panels	5	13
Car / Motorcycle Battery	6	139
Other	7	21
Missing	.	3

There are two decisions to take. Firstly, what to do with the households that answered “other”, for which there is no other information and, secondly, how to calculate the indicator.

An analysis of those who have access to the LEC network reveals that 85% of these households state that they use electricity as their main source for lighting (question 16 in section J). Hence, Those households that reply “other” to question 15 are deemed to have access to electricity if their main source for lighting is electricity (answer code 2 for question 16; hh_j_16).

The indicator for the general access to electricity is thus calculated as the ratio:

Numerator	Instances of hh_j_15 with answer codes 2, 3, 4, 5 and instances of hh_j_15 with answer code 7 if the same household has answer code 2 for hh_j_16
Denominator	Instances of hh_j_15 with answer codes 1 through 7

The indicator for the access to electricity from LEC only is the ratio:

Numerator	Instances of hh_j_15 with answer

	code 4
Denominator	Instances of hh_j_15 with answer codes 1 through 7

Note that no numerator or denominator includes the 3 cases where the information is missing.

National Key Indicator 41 – Measles Vaccination Rate

The indicator takes the information on the immunization of children aged between 12 and 23 months at any time before the interview. This means that it does not matter for this recording whether the immunization took place before the 12th month (as it should) or somewhat later.

The question allows for the following answer codes in the data set recode, shown in Table 30 along with the (unweighted) frequencies:

Table 30 Distribution of answers to question regarding measles vaccination

Specific question: Has [Name of the Child] received a measles vaccination?

Answer	Answer code	Frequency
No	0	2801
Yes - Vaccination date marked on vac. card	1	1581
Yes – Vaccination reported by mother	2	2614
Yes – Vaccination marked on card, no date	3	12
Don't know	8	41
Not applicable	9	9
Missing	.	23786

As can be seen, the vast majority is missing. The dataset contains the information on all the children ever born to the women of ages 15 – 49. For most cases the question was not posed.

The calculation requires restricting the sample to the children who were between 12 and 23 months at the moment of interview. This is done using the date of the interview (variable v008) and the date of birth (variable b3). The current age (or hypothetical for the children who unfortunately passed away) is the difference between these dates.

A child is recorded as having received the vaccination if it is recorded on the vaccination card or the mother reports the child has indeed been immunized (answer codes 1, 2, and 3).

Hence the calculation is the ratio

Numerator	Instances of children 12-23 months where h9 is coded 1, 2, and 3

Denominator	Instances of children 12-23 where h9 is coded 1 through 9

National Key Indicator 42 – Under Five Mortality Rate

The calculation of this indicator uses the Birth Recode of the LDHS. This contains all the children ever born to the interviewed women. To get a sense of the recent state of health provision only the population who was under 5 at any point in time in the five years before the interview is included.

The included observations are divided into age groups (in months) of 0, 1-2, 3-5, 6-11, 12-23, 24-35, 36-47, 48-59. Note that at most an observed individual born exactly five years before the interview would be included in all age groups while a child born shortly before the interview could only be counted in the first group.

The death risk at each group is measured as the number of deaths over the number of survivors in each age group. A child may only be partly included in an age group (for example if it was 40 months of age when the reporting period started). For all these cases where an observation is not captured fully over the whole range the assumption is made that these cases contribute one-half to either death or survival in the given age group.

The only exceptions are the observations in the most recent age group. A child of 4 months at the time of interview should contribute, if still alive, 1 “survival unit” to the age group 0 months, 1 to the age group 1-2, and – since they have not fully grown out of the age group 3-5, only 0.5 to this group. However, since this is the last age group they were in at the time of interview, this is the only case were they contribute one full unit to that group.

If the death risk is subtracted from 1, one obtains the survival probability. The age-specific survival rates are then multiplied by each other. This number is again subtracted from 1 and then multiplied by 1,000 to obtain the under 5 mortality rate per 1,000 live births.

The disaggregated data does not provide a sufficiently large sample to ensure robust estimates. Thus, disaggregated data refers to observations in the 10 years prior to the survey. This increases the mortality rate. While the under 5 mortality rate was 94 per 1,000 live births in the years 0-4 before the survey (2013-2009), it was 132 per 1,000 live births for the time 5-9 years before the survey (2008-2004) and even 185 per 1,000 live births for the time 10-14 years before.

National Key Indicator 43 – Maternal Mortality Rate

The calculation of the indicator relies on the answers collected in the survey of women aged 15-49 about the women’s sisters and their death during or after

pregnancy. This method is chosen since the record on pregnancy related health issues are not sufficiently comprehensive and rigorous.

Each women interviewed in the LDHS is asked about her siblings and about specific characteristics of the siblings. Additionally, in case a sister is reported as having died, the interviewed women are asked whether their death was related to a pregnancy (variable mm9_01 to mm9_20). If the women report that a sister died while pregnant, during delivery, or in the 2 months after termination, then a death is classified as a “maternal death”.

Data is divided into five-year age groups starting with 15-19 year-olds to 45-49 year-olds. For all sisters the number of years passed in each age group are recorded for the seven years prior to the interview

Note that a woman can spend time in up to three five-year age groups during seven years. Note also that sisters who died only contribute to the years of exposure up to their unfortunate demise.

The age group risk is then the ratio of the number of maternal deaths in an age group over the years all sisters spent in that age group. These ratios are then further weighted by the share of (women) respondents in the survey in each age group (itself weighted according to the survey design). This is used as an approximation to the age group distribution in the population at large.

The weighted risk ratios are summed up over all age groups and multiplied by 100,000. One last step is required to take into account the number of births in a country. The sum of the ratios times 100,000 is divided by a fertility rate (also calculated in the DHS). Thus, the average number of births per woman is considered.

There is no regional or other type of disaggregation since respondents are not asked about the location of residence of their sisters (which would require a detailed account of all location during the different age groups).

National Key Indicator 44 – Accessibility of Health Care

The indicator takes the information from the household dataset of the LDHS. The variable recording the time spent getting to the health facility is sh127, variable sh126 asks about the usual method of transportation used to reach a health facility. Thus, the time until getting to a health facility cannot be directly compared, since some state it takes them 30 minutes by public transport, others 25 minutes by bicycle.

To ensure comparability and measure welfare from a poverty perspective, the calculation is based on the time it takes a person to walk to a health facility. This option of transport should be available to everyone who states that they usually use an alternative method of transport. The indicator tries to capture

the time to the nearest health facility when respondents are not too sick to walk. 64.6% of the respondents state that they walk to the health facility nearest to them.

The variable used to calculate the indicator codes a value of 1 if the person walking states that it takes them 60 minutes or less to reach the health facility. A value of 0 is recorded if it takes them more than that. People who do not know how long it takes them are not taken into account.[14]

Hence the indicator is calculated by the ratio:

Numerator	Instances when it takes a household walking 60 minutes or less to reach the health facility
Denominator	Instances when it takes a household any recorded time to reach a health facility walking

National Key Indicator 45 – Vulnerable Households Receiving Social Transfers

The calculation for this indicator requires two sets of definitions. Firstly the definition of what should be seen as a vulnerable household needs to be taken. Secondly, the coding of what constitutes a social transfer needs to be performed.

The concept of a vulnerable household is fluid and difficult to grasp. The International Red Cross offers some suggestions, but no strict guidelines do exist.[15] It is generally agreed upon that vulnerability is strongly related to poverty.

A single, simple marker of vulnerability is chosen from the section on food security (section I). A household is classified as vulnerable if it reported at least one instance in the last 12 months when it did not have enough food to feed itself. 2,306 households (unweighted observations) are described as vulnerable in this fashion.

The information on social transfers is taken from the first part of section N, which covers assistance received by households over the past 12 months from private, government, or non-government institutions. The relevant fact here is that these are institutions and can be seen as social stakeholders.

[14] Note that the LDHS Final Report does take people who state “don’t know” as taking more then 60 minutes walking to get to the health facility. That is why there are slight differences between this indicator and the numbers recorded in LDHS 2013.

[15] For information from see the website of the International Red Cross.

Many households receive other transfers from friends and relatives, but these are purely individual. Hence they are not included.

A household is considered as receiving social transfers if they report receiving support (either in cash or in-kind) in at least one of the categories listed in the questionnaire (rows A to K in questions 1).

The indicator is then the weighted ratio:

Numerator	Number of households classified as vulnerable that receive social transfers
Denominator	Number of vulnerable households