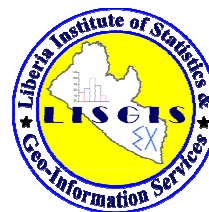




REPUBLIC OF LIBERIA



2008 POPULATION AND HOUSING CENSUS

Analytical Report on POPULATION SIZE AND COMPOSITION

**LIBERIA INSTITUTE OF STATISTICS AND GEO-INFORMATION SERVICES (LISGIS)
MONROVIA, LIBERIA
SEPTEMBER 2011**

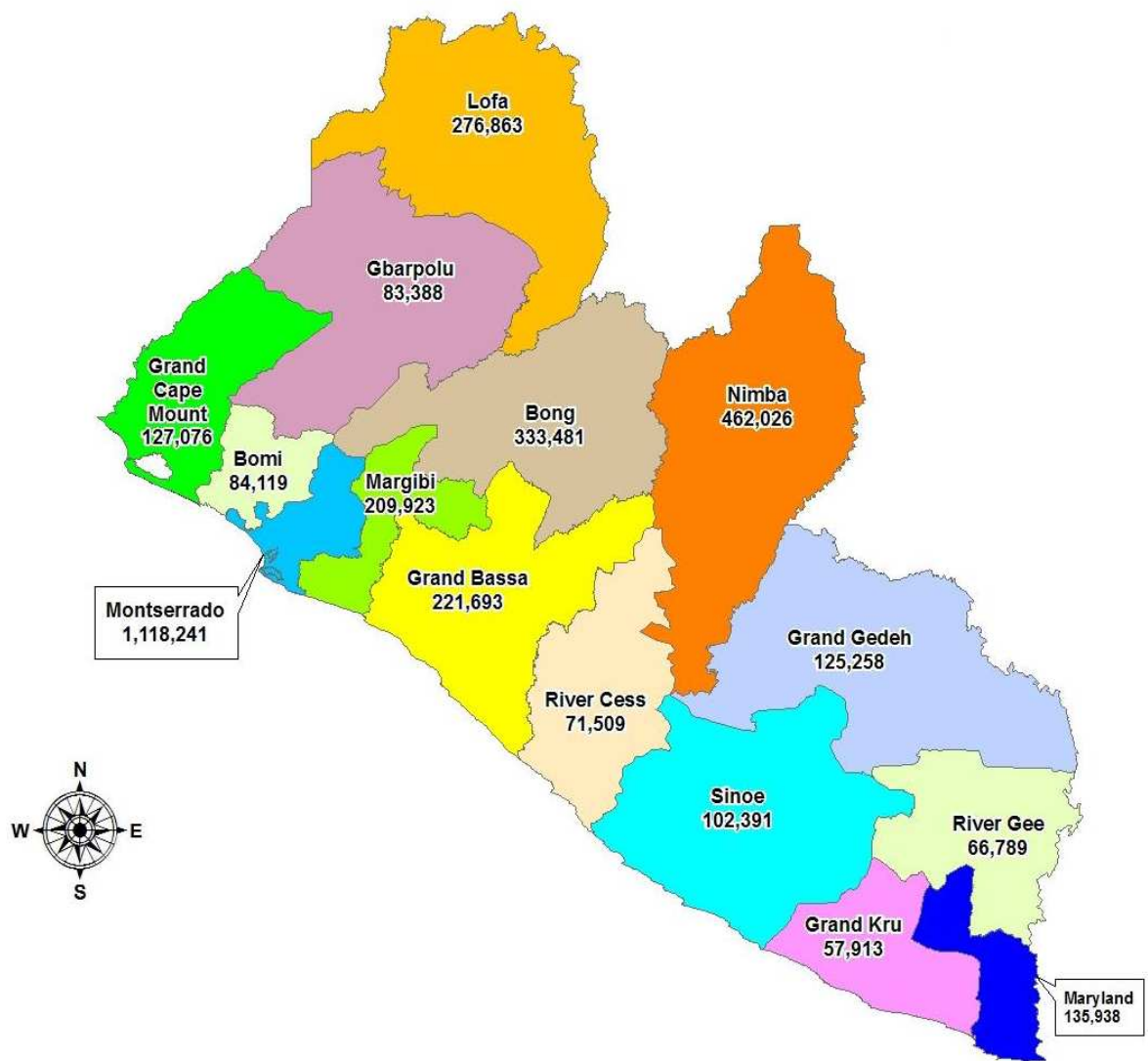


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FOREWORD

The post-war socio-economic planning and development of Liberia is a pressing concern to Government and its development partners. Such an onerous undertaking cannot be actualized with scanty, outdated and deficient databases. Realizing this limitation, and in accordance with Article 39 of the 1986 Constitution of the Republic of Liberia, The President of Liberia approved, on May 31, 2007, "An Act Authorizing the Executive Branch of Government to Conduct the National Census of the Republic of Liberia".

The Population and Housing Census is the major source of demographic and social-economic statistics in Liberia. The country has conducted three scientific population and housing censuses at intervals of about ten years since 1962. The latest census being the fourth was conducted in 2008 as a post war census. This census collected household-based data on the socio-economic conditions of the population as well as agriculture and other community based information.

The country currently finds itself at the crossroads of undergoing major rehabilitation and reconstruction. Virtually, every aspect of life has become an emergency and in resource allocation, crucial decisions have to be taken in a carefully planned and sequential manner.

The Liberia Institute of Statistics and Geo-Information Services (LISGIS), has published the 2008 Census results in different reports at different times and with varying degrees of detail. The Monograph Series provide more detailed and subject-oriented analysis of the census data which relate the findings to our national development policies and targets. This Monograph on Population Size and Composition contains information on the household composition, age-sex distribution, cultural composition, growth and spatial distribution of the population.

Finally, LISGIS appeals to the people of Liberia to make maximum use of the census data as a basis for evidence-based policy debate and design; decision-making at every level of society; investment and business transactions; and for many other purposes.



T. Edward Liberty

DIRECTOR GENERAL (LISGIS)

ACKNOWLEDGEMENT

The success of this first post-war census was a result of the dedicated efforts of the Census Commission, the Development Partners, the Board of Directors, the Management and staff of the Liberia Institute of Statistics and Geo-Information Services (LISGIS), Government line ministries and agencies, county officials and local authorities, the 11,618 field staff who were deployed throughout the country and the millions of Liberians and Foreign Residents who responded.

Several International and local analysts have worked assiduously at various stages to translate the data from statistical tables to report formats that can easily be utilized by the Government, International agencies, our development partners, other data users and the general public.

We recognize the immense efforts of the lead Consultant, Mr. James P.M. Ntozi and four Research Assistants: Dr. Yeko Mwanga, Mr. John M.A. Mbeire, Mr. Charles Lwanga and Mr. Abel Nzabona. We also give credit to the laudable assistance and dedicated services of Mrs. Dorothy D. Johnson (TOKTEN Consultant, LISGIS), fourteen local analysts and their research assistants, through fervent training, workshops, seminars and emerging with the fourteen individual reports of the 2008 National Population and Housing Census. The sectionalized reports include:

- Administrative Report
- Population Size and Composition
- Fertility and Marriage Patterns
- Mortality
- Migration and Urbanization
- Population Projections
- Youth and Adolescents
- Gender Dimensions
- Education and Literacy
- Labour Force and Employment
- Persons with Disabilities and the Elderly
- Housing Conditions and Housing Facilities
- Population in Agriculture
- Poverty Dimensions

The 2008 National Population and Housing Census programme is adjudged to have been executed within acceptable limits of the highest international standards, using state-of-the-art technology and expertise at all stages of the census operations. The extra resources and other support have been coming from a plethora of organisations whose contributions and moral support are herein acknowledged.

We also extend our thanks and appreciation to the United Nations Population Fund for their continuous support all throughout the tenure of the 2008 Census activities, from the stages of planning, execution, analysis and the completion of the fourteen final reports. They have contributed varied levels of assistance, from logistics to the provision of technical expertise.

On behalf of the Census Commission and the Board of Directors of LISGIS, I would like to extend my thanks and appreciation to the Government of Liberia and our development partners for providing the required resources for conducting this census. My thanks also go to all local institutions and Analysts that worked with LISGIS to implement and conclude the census programme. Special appreciation for making the census a success goes to Dr. Toga McIntosh, former Chairman of the Commission, the Census Commissioners, the Census Secretariat and other local and international professionals, all categories of census field staff, office staff and all respondents who provided the required information.

A handwritten signature in dark ink, appearing to read 'Amara Konneh', with a stylized, cursive script.

Hon. Amara Konneh
Minister of Planning and Economic Affairs
and Chairman of the Census Commission

Facts Sheet

Population	Male (%)	Female (%)	Both Sexes (%)	Number
Population	50.0	50.0	100.00	3,476,608
Urban	49.1	50.9	100.00	1,633,824
Rural	50.9	49.1	100.00	1,842,889
Number of Households	Urban	Rural	Total	Number
	48.8	51.2	100.0	670,295
Average Household size	4.7	5.3	5.1	
Male Headed Households	69.7	76.1		
Female Headed Households	30.3	23.9		
Children Headed Households	0.091	0.06		
Relationship in the Household				
Head of Household			20.0	
Spouse			11.1	
Sons/Daughter			44.0	
Other relative			15.0	
Non-household Population	Urban	Rural	Total	Number
	43.4	56.6	100.00	51,367
Dependency Ratio			83	
Largest single ethnic group in Liberia				
Kpelle			20.3	
Bassa			13.4	
Grebo			10.0	
Citizenship Status				
Liberian			98.0	
Religious Composition				
Christianity			86.0	
Islam			12.2	
Others			1.8	
Population Density of Liberia			90 persons per square miles	
Population Growth			2.1	

Executive Summary

The overall objective of analyzing population size and composition of Liberia's population is to describe the age – sex structure and its household and cultural composition using the 2008 National Population and Housing Census.

Analysis of household composition show that the average household size of Liberia was 5.1 persons having declined from 6.1 in 1984; and at county level, household size was highest in Maryland. Besides, nearly a quarter of the households were headed by females while at county level, female headship was highest in Lofa County and lowest in Gbarpolu County. Surprisingly, there was a small proportion of households headed by children less than 15 years despite having had a civil war for over two decades.

While also, all the population were counted from their households, a smaller proportion was enumerated in other institutions. The analysis reveals that the country's carrying capacity or the population density stands at 90 persons per square mile and that of Montserrado County was the highest among the 15 counties.

By examining the age structure, it was found that the population is young and youthful and will continue to fuel further population growth for many years to come. This is due to the population's nature of fertility regime which is impacting the population momentum. The high population growth in the face of small resource base has implications towards the poor social indicators in the country especially in education, health, agriculture, environment and sanitation and, housing particularly in urban areas. These indicators are not expected to improve in the near future if population growth continues at the present rate.

Although one would have expected more men to have died during the civil conflict, however, high sex ratios in favor of men were observed in most of the counties. There were 17 major ethnic groups and of these, the Kpelle were found to be the largest (20.3%), followed by the Bassa (13%). Christians were found to be the largest religious group (85.6%), followed by the Muslims (12.2%). Several direct and indirect actions are being conveyed to the government. First, the large population momentum can be moderated by increasing family planning, reducing fertility and increasing the age at marriage. Secondly, the lopsided spatial population

distribution can be addressed through programme that would encourage people back to the rural areas.

Chapter One

Background

1.1 Introduction

This report presents the analysis of the population size and distribution of Liberia's population data collected during the 2008 National Population and Housing Census (NPHC). The census questionnaire shown in the administrative report was used to collect information on population and household related variables such as household and cultural composition, age and sex distribution and, on the geographic distribution of the population. In addition, the report discusses emerging issues from the age – sex structure, household composition, cultural composition, population distribution and policy implications. Furthermore, it draws supplementary information from other documents to provide a clear picture of what needs to be done by the Government of Liberia to attain its short and long term development goals.

1.2 Objectives

The overall objective of this report is to describe the age – sex structure of the population and its household and cultural composition by analyzing information collected from the 2008 National Population and Housing Census. The specific objectives are to:

- To examine the age-sex distribution, housing characteristics and cultural composition of Liberia's population.
- To provide information for future planning and policy formulation. This would enable both Government and the private sector to incorporate demographic factors in planning for social and economic development.
- To analyze key challenges the age-sex structure poses; and
- To suggest policy recommendations.

1.3 Methodology

The most commonly used measures for analyzing population size and composition are sex ratios, percentages, indices such as, average and median size, and graphical presentations. For example, populations pyramid showing the age and sex structure of the population uses percentages of males and females to the total population. Such a graphical presentation would show whether the population is young, adult or aging. If drawn in single years, it may

be used to show errors in age reporting. On one hand, Household characteristics displayed using percentages are used to show household headship by gender and age. On the other hand, ratios and percentages would be used to show general disparities by various characteristic and provide information on the quality of the census data and trends in population growth over time.

1.4 Quality of Data

The 2008 National Population and Housing Census on which this report is based, provided information on population size and household characteristics of all members enumerated on the night of 20/21 March 2008. Whereas the census process paid attention to quality management and enhancement as it is often done in the world over, Census data are prone to content errors. The quality of data in many cases is known to be compromised by poor measurement of some variables such as age which is reported to suffer from digit preference or avoidance, age misreporting and upgrading to mid-year. While this report will summarize some of the techniques used in detecting and assessing the magnitude of error, many of these are discussed in the projection report.

1.5 Organization of Report

The report is divided into six chapters: Chapter one presents the objectives, methodology used, and data quality issues. Household composition and age-sex distribution are analyzed in chapters two and three respectively. Chapter four examines the cultural composition. In chapter five population distribution issues were discussed. Finally, chapter six analyses some of the policy issues to be considered by the government and other institutions and Data users.

Chapter Two

Household Composition

2.1 Introduction

The importance of analyzing household composition is that it is a major determinant of the demographic characteristics of the population. For instance, size and composition may have a profound influence on social and economic characteristics of the members. Household size may determine access to health services, education services, and consequently, impacting other demographic variables such as mortality and fertility. A household is defined in terms of a family (a couple with or without children), related or unrelated people living and eating together or could be a person living alone. Household composition may be affected by government policies and actions geared towards reducing population growth, for instance, the one child policy in China. This chapter presents four substantive sections on household size; household headship; relationship to the head of the households; and non-household population.

2.2 Household Size

The average household size is a measure of the number of persons per household and is obtained by dividing the household population by the number of households in a specified study category. Since the Census employed a *de facto* approach, information given in this report portrays the household size as at the census night (20th /21st March 2008); and might be slightly different from the mean number of usual members.

The average household size is important in the planning process because many people are found in such social arrangement. Table 2.1 shows the spatial distribution of households and their average sizes in Liberia. There were 670,295 households of which 48.7 percent were in urban areas. The average household size in Liberia was 5.1 persons. It was higher in rural areas (5.3 persons) compared to urban centers (4.9 persons). Probably because of an increase in urbanization, modernization, education and individualism, the mean household size for Liberia declined by about 16 percent (from 6.1 in 1984 to 5.1 in 2008); this implies that now, there were smaller numbers of people living and sharing a meal together in 2008 than twenty years ago.

At the county level, the average household size ranged between 4.0 and 7.0 people; with Maryland having the highest (7.0 persons) which is far higher than the national average. This could be due to three reasons: the rural nature of the county; migration as a result of job search; and rapid increase in population growth since 1974 (LISGIS, 2009). Possibly because of urbanization, Montserrado County which contains Monrovia city and largely affected by rural-urban migration for employment and education has an average size of 4.8; the national average household size of 5.1 persons was surpassed in nine of the fifteen counties.

Table 2.1: Distribution of Households, Household Population and Average Household Size by Residence, 2008

Residence/ County	Households		Household Population		Average household size
	Number	Percent	Number	Percent	
Rural	343273	51.2	1813719	53.0	5.3
Urban	327022	48.7	1611522	47.0	4.9
County					
Bassa	47440	7.0	217230	6.3	4.6
Bomi	20508	3.0	83033	2.4	4.0
Bong	69810	10.4	328668	9.5	4.7
Cape Mount	23950	3.5	124777	3.6	5.2
Gbarpolu	14533	2.1	80186	2.3	5.5
Grand Gedeh	18143	3.0	122913	3.5	6.8
Grand Kru	8969	1.3	57650	1.6	6.4
Lofa	49642	7.4	273990	7.9	5.5
Margibi	45095	6.7	207146	6.0	4.6
Maryland	19254	2.8	134279	3.9	7.0
Montserrado	232585	34.6	1105246	32.2	4.8
Nimba	80734	12.0	454881	13.2	5.6
River Gee	9822	1.4	64330	1.8	6.5
Rivercess	13981	2.0	69844	2.0	5.0
Sinoe	15829	2.3	101068	3.0	6.4
Total	670295	100.0	3425241	100.0	5.1

2.3 Household Headship

Distinction of household heads by sex is important because it is often associated with household welfare. For instance, female-headed or children headed households are believed to be poorer than male-headed households (U.S. Bureau of the Census, 2000). With increasing economic hardship particularly during periods characterized by increasing level of unemployment even among educated Liberians, increase in female or child headship may influence demographic indicators such as mortality and fertility.

Table 2.2 presents the results of household headships by residence and sex. The table shows that 27 percent of the households were headed by female. This is high because a large proportion of households being in urban areas (49 percent) where nearly 30 percent of the households were headed by females. At county level, the percentages of households headed by females ranged from the highest 33 percent in Lofa to lowest 20 percent in Gbarpolu. The main reason for this difference is that Lofa was a battle ground for a long time during the civil conflict and many men lost their lives in combat while Gbarpolu was on the sideline of the conflict.

Table 2.2: Distribution of Households by Sex of Head and Residence, 2008

County	Number of Households	Percent of households headed by males	Percent of households headed by females	Number of Households headed by children	Percent of households headed by children
Urban	327022	69.67	30.33	298	0.091
Rural	343273	76.06	23.94	191	0.056
Bomi	20508	70.8	29.2	31	0.151
Bong	69810	72.7	27.3	45	0.064
Grand Bassa	47440	79.2	20.8	24	0.051
Cape Mount	23950	73.4	26.6	30	0.125
Grand Gedeh	18143	75.2	24.8	5	0.028
Grand Kru	8969	74.2	25.8	3	0.033
Lofa	49642	67.0	33.0	55	0.111
Margibi	45095	76.1	23.9	41	0.091
Maryland	19254	73.9	26.1	18	0.093
Montserrado	232585	71.1	28.9	164	0.071
Nimba	80734	72.3	27.7	52	0.064
River Cess	13981	79.5	20.5	3	0.021
Sinoe	15829	78.6	21.4	10	0.063
River Gee	9822	74.8	25.2	2	0.020
Gbarpolu	14533	80.5	19.5	6	0.041
Liberia	670295	72.9	27.1	489	0.073

A small number of households, 489 (0.07%) were headed by children less than 15 years of age. This low figure is surprising given the effects of the civil war which claimed many of their parents' lives. However, unlike how HIV/AIDS affected countries, Liberia's civil conflict killed more men than women and hence left women instead of children to head households. Overall, male children headed more households (51.5 percent) than females and at the county level, among males, this proportion was exceeded in five of the fifteen counties while among females, it was in four counties (see Table 2.3). By residence, female children

headed households (58%) are more than male children headed households (42%) in urban centers and the reverse is true for the rural areas (34% versus 66%).

Table 2.3 Percentage of Households Headed by Children (less than 15 Years) by Sex, 2008

County	Number of Households headed by children	Population Distribution		Percent distribution	
		Male	Female	Male	Female
Urban	298	125	173	41.9	58.05
Rural	191	127	64	66.5	33.51
Bomi	31	18	13	58.1	41.9
Bong	45	16	29	35.6	64.4
Grand Bassa	24	9	15	37.5	62.5
Cape Mount	30	22	8	73.3	26.7
Grand Gedeh	5	2	3	40	60
Grand Kru	3	1	2	33.3	66.7
Lofa	55	32	23	58.2	41.8
Margibi	41	20	21	48.8	51.2
Maryland	18	11	7	61.1	38.9
Montserrado	164	73	91	44.5	55.5
Nimba	52	32	20	61.5	38.5
River Cess	3	3	0	100	0
Sinoe	10	8	2	80	20
River Gee	2	1	1	50	50
Gbarpolu	6	4	2	66.7	33.3
Liberia	489	252	237	51.5	48.5

2.4 Relationship in the Household

The analysis of relationship of members of the household to its head is important because it indicates the type of relatives and other persons that live in the household and are supported by the head and this may be linked to the welfare of the household. Table 2.4 summarizes the results of how the household members are related to the head. Notable in the table is that most members belonged to the nuclear family including sons and daughters (44%), spouses (11.1%) and head of household (19.6%). Other relatives (14.6%) belonged to the extended family. As expected, non relatives and servants accounted for a low percentage of the total household members. This pattern is true regardless of the type of residence (see Annex A, Table 2.5A).

Table 2.4: Distribution of Household Population by Sex and Relationship, 2008

Relationship	Male	Female	Total
Head	28.6	10.6	19.6
Spouse	0.6	21.6	11.1
Son/daughter	45.2	42.8	44.0
Other spouse	0.0	1.1	0.6
Parent	0.4	1.4	0.9
Grand child	6.0	5.9	6.0
Servant	0.2	0.2	0.2
Ward	0.6	0.5	0.6
Other relative	15.2	13.9	14.6
Non relative	3.2	1.9	2.5
Total	100.0	100.0	100.0

2.5 Composition of the Non- Household Population

Out of the 3.48 million persons enumerated in Liberia during the 2008 National Population and Housing Census, 51,467 were not enumerated in households thus, were classified as non-household population. Non household population lived in institutions, which include educational institutions, homes for the destitute, convents, mental institutes, prisons, military and police barracks, hotels, nurses' homes, health facilities, leper colonies and orphanages. In addition, bush society and floating population belonged to this group. This population accounted for nearly 1.5 percent of the total population. Table 2.5 shows that nearly 36 percent of the non-household populations were enumerated in educational institutions while about 24 percent were part of the floating population. Each of the other categories had less than 10 percent of the non-household population. The non-household population was rural dominated (56.6%).

Table 2.5 Distribution of Non – Household Population by Sex and Type of Institution, 2008

Population Type	Urban (%)	Rural (%)	Percentage distribution	Total (N)
Educational	20.2	79.8	35.7	18320
Home for Destitute	46.3	53.7	3.3	1717
Convent	29.2	70.8	4.3	2190
Mental Institute	57.6	42.4	0.7	337
Prison	73.8	26.2	1.4	714
Bush society	5.4	94.6	7.1	3636
Barrack(Military/police)	76.5	23.5	3.0	1538
Hotel	91.7	8.3	2.0	1026
Nurses' Home	36.6	63.4	4.4	2278
Health facility	69.0	31.0	4.1	2108
Leper colony	51.0	49.0	1.6	819
Orphanage	68.7	31.3	8.9	4582
Floating Population	68.4	31.6	23.6	12102
Total	43.4	56.6	100.0	51367

2.6 Summary

The average household size of Liberia was 5.1 persons, and has declined since the previous census of 1984. At county level, average household sizes ranged from 4.0 in Bomi to 7.0 in Maryland. At national level, nearly a quarter of households were headed by females while at county level, the percentage ranged from the highest 33 percent in Lofa to the lowest 20 percent in Gbarpolu. Almost all of the population was enumerated in households during the Census. Only 1.5 percent of Liberia's population was not in the households, instead were in other institutions.

Chapter Three

Age – Sex Distribution

3.1 Introduction

The age structure presents the distribution of the population by age for both males and females and is usually divided into three important categories: those below the age of 15 years, aged 15-64 years and those aged at least 65 and over. The under 15 years and 65 years or older constitute the dependent population, while those aged 15-64 are the productive population. The age distribution is important in the socioeconomic development planning process because the needs of each age group differ. Besides, the breakdown is more useful when evaluating potential gender issues; for example, the number of males and females may be used to determine the extent of equal access to social services such as education and health. In addition, the age data of a population is important because social behavior among individuals is considerably affected by age. This chapter has six main sections including: sex composition; quality of age data; age distribution; age composition of some selected groups; trend of broad age groups and, the summary and conclusion.

3.2 Sex Composition

The index used for measuring the sex composition of the population is the sex ratio. It is defined as the number of males for every 100 females. A ratio higher than 100 depicts an excess of males and less than 100, an excess of females in the population; and if it is close to 100, then it indicates that such a country has not experienced wars or sex selective migration or both in the recent past. In practical terms, the ratio gives an indication of presence or absence of sex bias in the treatment of people in society which could result in sex-selective mortality. For example, some cultures have a preference for male children leading to female infanticide. Such cultures have sex ratios at young ages heavily skewed in favour of males. There were about 100.2 males in Liberia for every 100 females at the time of the 2008 census compared to 102.0 in 1974 and 102.4 in 1984. These ratios mean slightly more males than females for the last three decades with a declining trend in the last 24 years, which is a reflection of the effects of civil conflict that led to more deaths of male than females. Table 3.1 summarizes sex ratio for the 2008 reported and smoothed Liberia's population by age group.

Table 3.1 Sex Ratio by Age, Liberia, 2008

	Reported Population				Smoothed Population			
	Male	Female	Total	Sex Ratio	Male	Female	Total	Sex Ratio
All ages	1,739,945	1,736,663	3,476,608	100.2	1739945	1736663	3476608	100.2
0-4	270,564	263,911	534,475	102.5	276,384	274886	551270	100.5
5-9	251,411	250,520	501,931	100.4	245,591	239546	485136	102.5
10-14	214,859	206,807	421,666	100.4	215,480	206709	422188	102.5
15-19	189,407	186,288	375,695	103.9	188,786	186387	375173	104.2
20-24	161,951	180,979	342,930	101.7	163,741	178062	341803	101.3
25-29	141,006	150,852	291,858	89.5	139,216	153769	292985	92.0
30-34	107,326	112,306	219,632	93.5	112,332	120455	232787	90.5
35-39	99,136	104,400	203,536	95.6	94,130	96251	190381	93.3
40-44	81,670	74,067	155,737	95.0	81,093	73634	154727	97.8
45-49	63,827	54,980	118,807	110.3	64,404	55413	119817	110.1
50-54	44,870	38,070	82,940	116.1	43,418	35810	79228	116.2
55-59	30,975	25,485	56,460	117.9	32,427	27745	60172	121.2
60-64	25,473	27,357	52,830	121.5	25,392	26540	51932	116.9
65-69	19,250	20,557	39,807	93.1	19,331	21374	40705	95.7
70-74	12,343	13,403	25,746	93.6	14,131	15579	29711	90.4
75-79	11,580	11,333	22,913	92.1	9,792	9157	18948	90.7
80+	14,297	15,348	29,645	102.2	14297	15348	29645	106.9

By examining county sex ratios, Table 3.2 shows an increasing trend in sex ratio between 1984 and 2008. The table reveals that 10 out of the 15 counties have the higher sex ratio than the national average. However, a decrease in the number of males compared to females was observed in Lofa, Bassa and Montserrado. This could be due to two reasons: Lofa and Grand Bassa were heavily affected by the Liberian Civil War, while many females migrated from rural counties to Montserrado for safety.

Table 3.2 Sex Ratio by County, 2008

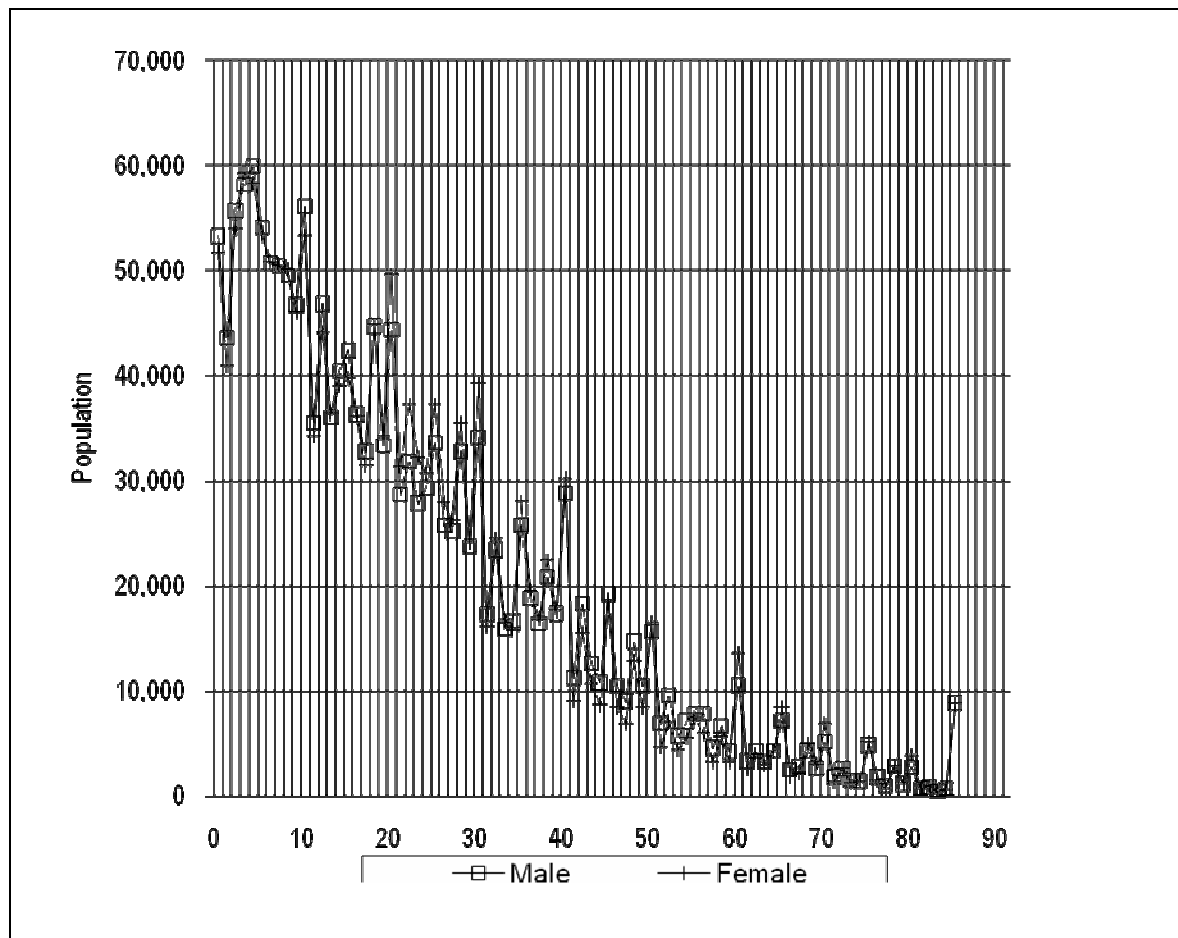
Residence	1984	2008
Bomi	108.0	104.3
Bong	96.3	97.8
Grand Bassa	109.6	100.1
Grand Cape Mount	89.2	105.7
Grand Gedeh	96.3	107.8
Grand Kru	91.8	104.9
Lofa	107.8	93.3
Margibi	100.9	101.7
Maryland	98.9	108.9
Montserrado	117.8	96.7
Nimba	95.9	99.2
RiverCess	99.0	108.6
Sinoe	103.1	115.0
River Gee	96.2	109.2
Gbarpolu	101.7	111.2
Total	102.0	100.2

3.3 Quality of Age Data

Quality of census data is an important feature as it increases its reliability, potential use and the benefits derived from it. Despite this important aspect, census data in the world over is prone to errors, and common among these are age and sex misreporting and digit preference. This section provides a brief evaluation of the age-sex distribution of the population of Liberia using the 2008 census data to assess the accuracy of age reporting and smooth the reported population data. A number of methods were used to detect irregularities in the reported age data including, indices of age misreporting, measures of digit preference and PAS smoothing. Figure 3.1 indicates the existence of age misreporting as well as digit preference; and the preferred digits were 0, 5, 8 and 2.

Using SINGAGE spreadsheet [4], further analysis was done. Age misreporting errors are also presented in Figures 3.1. The peaks on the curves indicate the most preferred ages (digit preference) in reporting while the troughs indicate digit avoidance (under reported ages). Figure 3.1 further shows that the peaks and troughs are higher for ages reported below 60 years, indicating that both males and females aged below 60 years misreported their ages, thus calling for age smoothing. Other key indicators which were used to assess the accuracy of age reporting are the age ratio score, sex ratio score and age accuracy index and are summarized in Table 3.2

Figure 3.1 Population Distributions in Single Years by Sex, 2008



In demographic analysis, age reporting is deemed to be satisfactory if the data has an accuracy index less than 20. However, Table 3.3 shows that the value of the age – sex accuracy index of the data was 31.8, which indicates that age reporting was inaccurate. Because of this, attempts were made to correct the irregularities in age and sex data as well as for digit preference using the **PAS** module known as **AGESMTH** spreadsheet [4]. This module employs five smoothing techniques including the Carrier Farrag; Karup-King Newton, United Nations, Strong moving average and the Arriaga light smoothing which adjusts the population distribution in the first and last 10 year age groups and incorporates the outcome into 5 year age groups. Results of the smoothing process are displayed in Table 3.4 by method used. The table shows that apart from the results of **Strong** moving average, others are well above acceptable value of 20, confirming earlier findings.

Table 3.3 Summary of Indices Measuring the Accuracy of 2008 Census Data

Index	Value
Age ratio score for males	4.1
Age ratio score for females	8.8
Sex ratio score	6.3
Age-sex accuracy index	31.8

Table 3.4 Summary of Indices Measuring the Accuracy of 2008 Census Data

Index	Reported Population	Smoothed				
		Carrier Farrag	K-King Newton	Arriaga	United Nations	Strong moving
Sex ratio score	6.97	6.94	6.85	6.84	6.21	3.18
Male age ratio score	4.26	3.02	3.18	3.15	2.66	1.63
Female age ratio score	9.35	5.15	5.44	5.24	4.67	2.20
Accuracy index	34.51	29.00	29.18	28.91	25.97	13.38

In order to get a broad picture about the magnitude of preference, Whipples, Myers and the Bachi indices were computed. Table 3.5 and 3.6 give a summary of the results. Table 3.5 gives Whipples index of 1.42, Myers index of 19.6 and Bachi index of 11.8 for both sexes. All the three support the earlier argument that the 2008 census data was less satisfactory.

Table 3.5 Indices of Age Misreporting, 2008

Index	Male	Female	Both Sexes
Whipples	1.36	1.48	1.42
Myers	17.7	21.4	19.6
Bachi	10.5	13.5	11.8

Results of digit preference summarized in Table 3.6 give the impression of higher concentration of age reporting around digits: 0, 5, and 8; and in ages: 10, 20, 30, 40, 50 and 60, confirming what Figure 3.1 displayed.

Table 3.6 Indices of Digit Preference by Sex and Method, 2008

Index	Myers Index			Bachi Index		
	Male	Female	Both sexes	Male	Female	Both sexes
0	4.3	5.8	5.0	5.4	7.6	6.5
1	-2.5	-3.0	-2.7	-3.1	-4.1	-3.6
2	0.3	0.2	0.2	0.3	-0.3	0.0
3	-2.0	-1.9	-1.9	-2.2	-2.3	-2.2
4	-1.1	-1.6	-1.4	-1.5	-2.1	-1.8
5	2.2	2.6	2.4	2.9	3.8	3.4
6	-0.9	-1.1	-1.0	-0.9	-1.2	-1.1
7	-1.6	-2.0	-1.8	-1.8	-2.2	-2.0
8	2.1	2.2	2.1	1.9	2.2	2.0
9	-0.8	-1.0	-0.9	-0.9	-1.1	-1.0

To correct for these irregularities in age and sex data, a powerful Arriaga light smoothing method was employed. The advantage Arriaga method has over other techniques is that it makes adjustment in the first and last 10 year age groups and incorporates the outcome into 5 year age groups; and it is based on the assertion that a second degree polynomial goes through the middle of the three consecutive 10 year age groups. Table 3.7 summarizes the results of Arriaga method. In the table, the last three columns are smoothed population distributions for males, females and both sexes.

Table 3.7 Reported and Smoothed Population Distribution by Age and Sex, 2008

	Reported Population			Smoothed Population		
	Male	Female	Both Sexes	Male	Female	Both Sexes
All ages	1,739,945	1,736,663	3,476,608	1739945	1736663	3476608
0-4	270,564	263,911	534,475	276,384	274886	551270
5-9	251,411	250,520	501,931	245,591	239546	485136
10-14	214,859	206,807	421,666	215,480	206709	422188
15-19	189,407	186,288	375,695	188,786	186387	375173
20-24	161,951	180,979	342,930	163,741	178062	341803
25-29	141,006	150,852	291,858	139,216	153769	292985
30-34	107,326	112,306	219,632	112,332	120455	232787
35-39	99,136	104,400	203,536	94,130	96251	190381
40-44	81,670	74,067	155,737	81,093	73634	154727
45-49	63,827	54,980	118,807	64,404	55413	119817
50-54	44,870	38,070	82,940	43,418	35810	79228
55-59	30,975	25,485	56,460	32,427	27745	60172
60-64	25,473	27,357	52,830	25,392	26540	51932
65-69	19,250	20,557	39,807	19,331	21374	40705
70-74	12,343	13,403	25,746	14,131	15579	29711
75-79	11,580	11,333	22,913	9,792	9157	18948
80+	14,297	15,348	29,645	14297	15348	29645

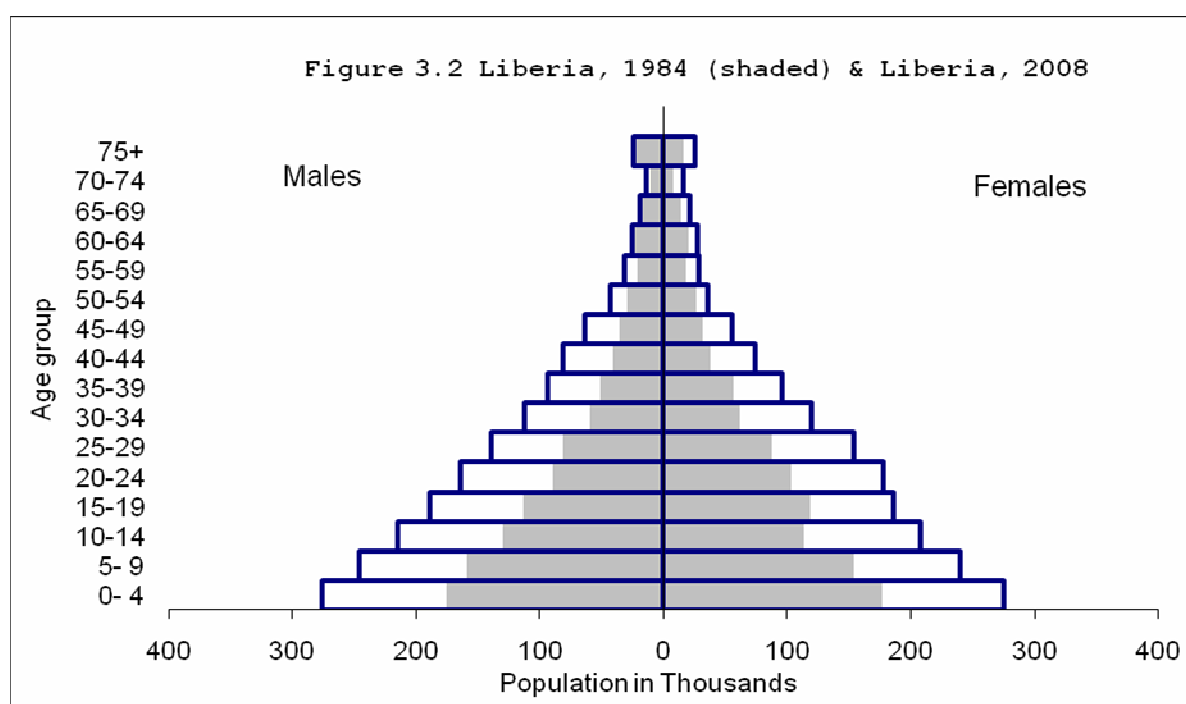
Arriaga Method was used to generate smoothed population

3.4 Age Distribution Overtime

The age structure in Figure 3.2 presents the distribution of the population by age for both males and females using the 1984 and 2008 (smoothed) censuses. The figure shows that there has been no change in Liberia's age structure for the last two decades. The structure is young and a large proportion (42 percent) is below the age of 15 years. Because of previous high levels of fertility, the structure has had and still has inbuilt population momentum which from 1984 (see shaded pyramid) has fueled population growth through the period 1984 – 2008 and will influence further growth in future for many years as the young go through their reproductive life. This implies that no matter what happens to the

level of fertility, the population will still grow for many years to come. Some of the future implications this structure has includes:

- It creates a high child dependency ratio that places a heavy burden on the working population and constrains the provision of basic social services.
- There will be many young couples having children, even when fertility reduces to nearly replacement level (2 children per couple), the population will still grow for some time and will delay opportunities for a demographic dividend.



3.5 Age Composition of Selected Subgroups

There are several sub-groups in a population, such as by age, sex, residence, marital status, religion, education, occupation and ethnicity. For the purpose of this section, only broad age-sex groups and rural-urban residence will be considered.

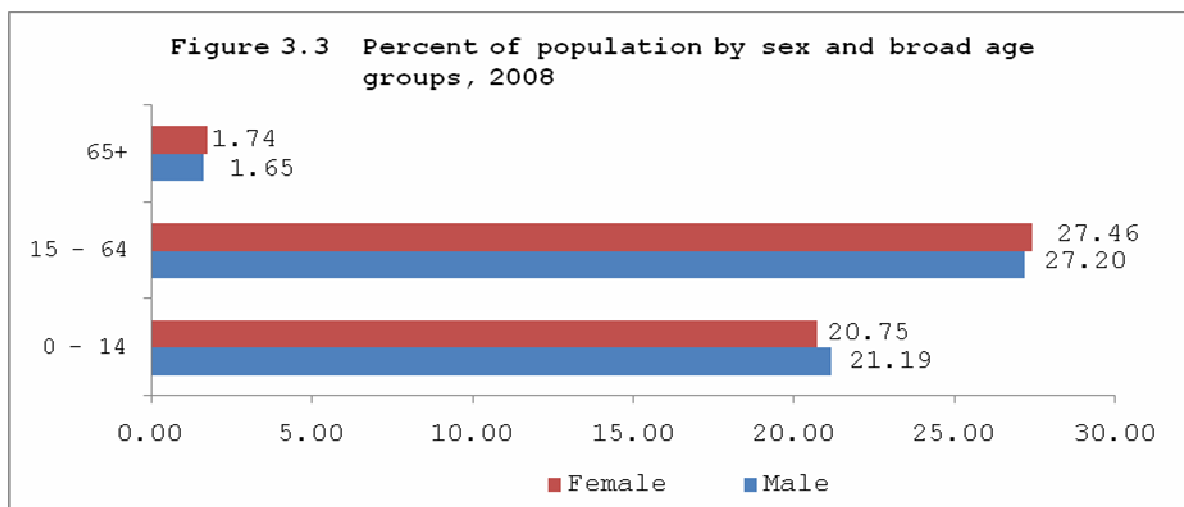
3.5.1 Urban – Rural Residence

The importance of distributing population by type of residence (or by urban and rural) is to get a clear picture about differences in some of the demographic indicators we observe, or differences in social arrangements. It is argued that rural people carry with them rural characteristics than urban people in terms of life experience. Therefore, this form of analysis explains why information gleaned from data may take on a different pattern. Planners need this form of information to plan for the ever-increasing demand on urban infrastructures and the need for urban employment.

Results from the 2008 census indicate that there were 1,633,719 persons in the urban areas (about 47 percent compared to 39, in 1984) and of these, nearly 51 percent were females compared to 48 percent in 1984. The change in the sex distribution is attributed to rural- urban migration and education. In analyzing the age structure of the two populations, urban-rural feature which emerged is that the respective population proportions were only different for ages below 9 years and above 60 years; and the insignificant difference for other ages is because large proportion of the population (47%) lived in urban areas (See Table 3.6A, Annex A).

3.5.2 Population by Broad Age Groups

Analysis between sexes seemed to be insignificant when the comparison involved broader age groups (Figure 3.3). As described earlier, the population of Liberia was very youthful with nearly 42 percent under 15 years and 3.4 percent, 65 years and over. With such a youthful age structure, the population is vulnerable to high levels of population momentum, growth and, dependency. Figure 3.3 indicates that only 55 percent of the population was in the economically active age group which implies that for every 100 persons in economically active ages (i.e., 15-64 years), there were corresponding 83 dependents for both sexes; 84 dependents per 100 males and 82 dependents per 100 females.



3.6 Summary

The results of the analysis of the census data show that although tremendous preparation was done in organizing the census, content errors in forms of age misreporting and digit preference existed in Liberia's 2008 census data. This could have been because of untruthful response from interviewees. The age structure of the population was young and will continue to fuel further population growth due to the demographic momentum. Because of the young age structure, the dependency ratio was high (83 percent). In addition, the population had high sex ratio in several counties signifying more males than females in most of the age groups.

Chapter Four

Cultural Composition

4.1 Introduction

Cultural composition including ethnic and religious beliefs have been used to cultivate moral values that form the core of humanity; to promote tolerance and appreciation of other people's identity, peace in families, homes, communities and nations. Besides, elements of these two are used to transmit knowledge on several developmental aspects which improve the quality of life of the people. Ethnic and religious compositions create increased social solidity, strengthen cultural identity and promote bio-cultural identity, solidarity and cooperation that are important in the development process. One of the important aspects of cultural composition in demographic analysis is that it shapes and determines the family; also it has influence on the demographic characteristics such as fertility and mortality. This chapter examines size and distribution of population by ethnicity, citizenship status, religious composition, and concludes with the summary.

4.2 Ethnicity

Ethnicity is defined as a segment of a society whose members are thought of by themselves and or others to have a common origin and to share important segments of a common culture. They in addition, take part in shared activities in which common origin and culture are of significant ingredients. These are inscriptive differences in terms of colour, appearance, language, religion, or some other indicators of common origin or some combination seen as salient to their identity.

4.2.1 Size and Distribution of Population by Ethnicity

The 2008 Census classified Liberians into seventeen well-defined major ethnic groups and a number of other Liberian and African tribes. Table 4.1 shows that there were seventeen ethnic groups with a population of over one hundred thousand persons each, and these collectively constituted 94 percent of Liberia's population. The Kpelle were the largest single tribe (20.3%) followed by the Bassa with 13 percent, while Grebo was the third largest (10%).

4.2.2 Trends in the Major Liberia Ethnic Groups

By investigating the ethnic trend, Table 4.1 shows 7 most populous ethnic groups during the period 1984 to 2008. The Kpelle have been the largest tribe since 1984 to 2008. The Kru who were the fifth largest tribe in 1984 were the sixth largest in 2008. On the contrary, the Mano who were the sixth largest tribe in 1984 became the fifth while the Lorma maintained their seventh position; the minority was the Dey with less than 0.5 percent.

Table 4.1 Distribution of Liberian Population by Ethnic Group, 1984 -2008

Ethnicity	Percentage Distribution		Population in 2008
	1984	2008	
Kpelle	19.42	20.29	705554
Bassa	13.85	13.42	466477
Grebo	8.96	10.03	348758
Gio	7.84	7.97	276923
Mano	7.1	7.87	273439
Kru	7.33	6.04	209993
Lorma	5.65	5.13	178443
Kissi	4.03	4.83	167980
Gola	3.96	4.40	152925
Vai	3.57	4.03	140251
Krahn	3.78	4.00	139085
Mandingo	5.1	3.18	110596
Gbandi	2.82	3.03	105250
Mende	0.78	1.34	46413
Sapo	-	1.25	43327
Belle	0.51	0.76	26516
Dey	0.36	0.34	11783
Other Liberian ethnic group	1.15	0.60	20934
Other African tribe	1.6	1.36	47453
Non African tribe	2.19	0.13	4508
Liberia	100	100.00	3476608

4.3 Citizenship

Liberia is characterized by a high ethnic diversity. Her constitution recognizes and respects the diverse ethnic groups, freedom of worship, ideological, political and cultural diversity. The 2008 National Population and Housing Census collected data on citizenship, non-Liberians and Ethnic grouping of Liberians. Similar information was collected from earlier censuses. As seen from Table 4.2, the majority of the populations enumerated in 2008

census (98.0%) were Liberians, 1.96 percent foreigners and less than 1 percent for others. This is similar to what was observed in the previous censuses.

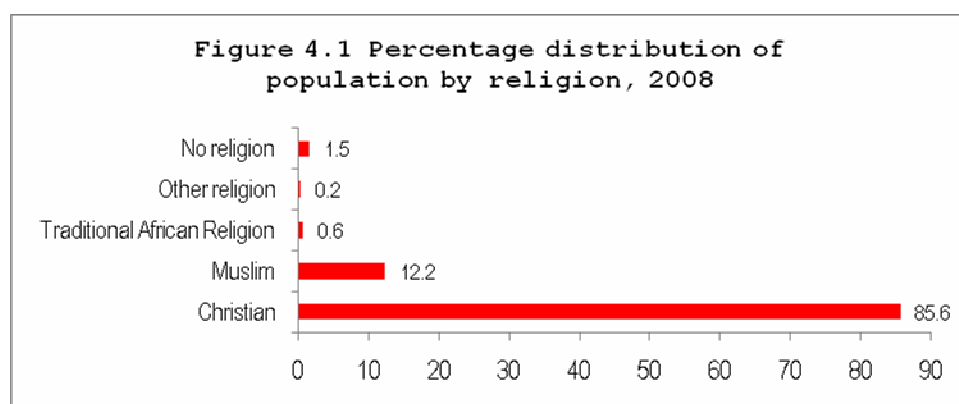
Table 4.2 Distribution of Liberian Population by Citizenship, 2008

Citizenship	Percentage distribution	Population in 2008
Liberian	97.95	3405250
Foreigners	1.96	68242
Others	0.01	446
Not stated	0.08	2670
Total	100.00	3476608

4.4 Religious Composition

Religion is defined as a spiritual belief in and reverence for supernatural powers. It is a system of thought, feeling, and action that is shared by a group and that gives the members an object of devotion and a code of behaviour by which individuals may judge the personal and social consequences of their actions. It is a frame of reference by which individuals relate to their group and the universe.

The analysis of religious composition is useful because it may have an influence on the mean age at childbearing, number of children and total fertility rate. From Figure 4.1, it is noted that the large majority of populations in Liberia were Christians (85.6%) and 12.2 percent were Muslims. African Traditional religions and other religions reported less than one percent of the population while about 1.5 percent did not belong to any religion.



The distribution of population by religion and type of residence in Table 4.3 indicates that Christians had higher proportion in urban than in rural areas while the reverse is true for the

Muslims. In terms of gender, more female Christians were in urban areas than males and the reverse is true for Muslims; and rural areas registered equal proportions. In both urban and rural areas, the Muslim faith ranked second just like it was at national level.

Table 4.3 Population Distribution by Religion and Residence, 2008

Religion	Urban		Rural		Population in 2008	
	Male	Female	Male	Female	Urban	Rural
Christian	86.9	87.8	84.5	84.5	1417751	1557924
Muslim	12.4	11.5	12.0	12.2	202672	222013
Traditional African Religion	0.1	0.1	1.0	1.0	2318	17816
Other religion	0.1	0.1	0.2	0.2	2261	3165
No religion	0.5	0.5	2.3	2.1	8822	41866
Liberia	100.0	100.0	100.0	100.0	1633824	1842784

4.5 Summary

Nearly all of the people enumerated were Liberians. There were 17 major ethnic groups with a population of over one hundred thousand persons, and they collectively constituted 94 percent of the native Liberian population. Like in 1984, the Kpelle were the largest single ethnic group followed by the Bassa in 2008. Christians were the largest religious belief in Liberia with 85.6 percent of the total population while 12.2 percent of the population was of the Muslim faith.

Chapter Five

Population Distribution

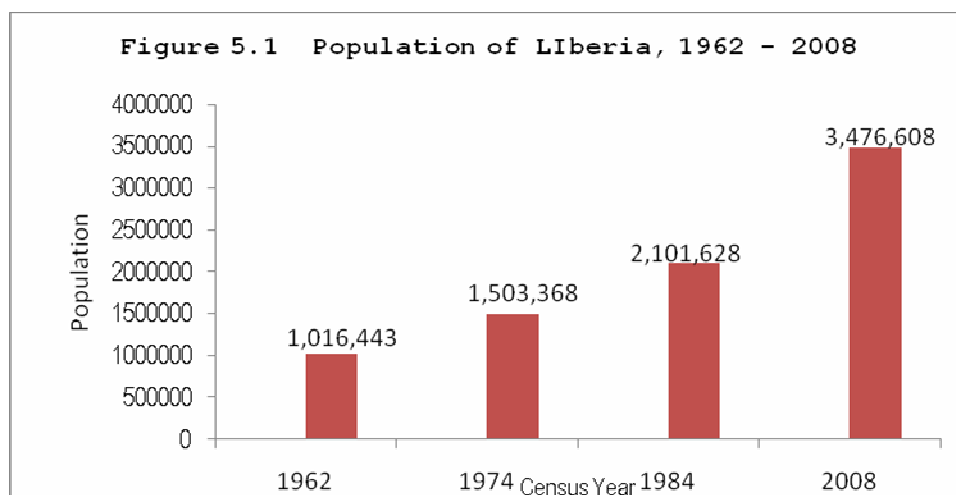
5.1 Introduction

The size, quality and growth of the population have been used to formulate present and future development programmes in the world over. From the economic point of view, population growth whether at micro or macro level should be in tandem with economic growth and development if a society is to develop fast. It is determined by the balance between levels of fertility, mortality and migration of a geographically defined area. In practice, population censuses are the main sources of demographic data in general and information on population size, distribution and growth in particular.

In the process of recovering from the effects of the civil conflict, Liberia has a Poverty Reduction Strategy (PRS, Pillars I-IV) whose main aim is to accelerate progress towards achieving the millennium development goals (MDGs). It spells out the significant issues including national security; economic revitalization, governance and rule of law, and infrastructure basic services. Under Pillar II, PRS emphasizes the importance of eradicating extreme hunger and poverty which stands at 63.8 percent. The implication is to ensure that the population of the country is healthy and supportive of the country's population goals and objectives. PRS also stresses the importance of reflecting population issues in development planning at all levels. Thus, decision of individuals and couples to utilize the limited resources of the country should take into consideration the needs of future generations. This chapter analyses the size of the population of Liberia, its distribution, trends and growth patterns over time.

5.2 Trends in Population Growth

The population of Liberia was 3,476,608 persons in 2008 having increased from 1,016,443 persons in 1962 reflecting an increase of about 3.4 folds in 46 years. Since 1984, the population increased from 2,101,628 persons to 3,476,608 persons, an increase of nearly 65 percent (or 1.65 times) (see Figure 5.1). The increase in population was fueled by high population growth rate of 3.3 percent from 1962 to 1974 which remained almost unchanged at 3.4 percent between 1974 and 1984. By 2008, the growth rate had reduced to 2.1 percent, which is still high.



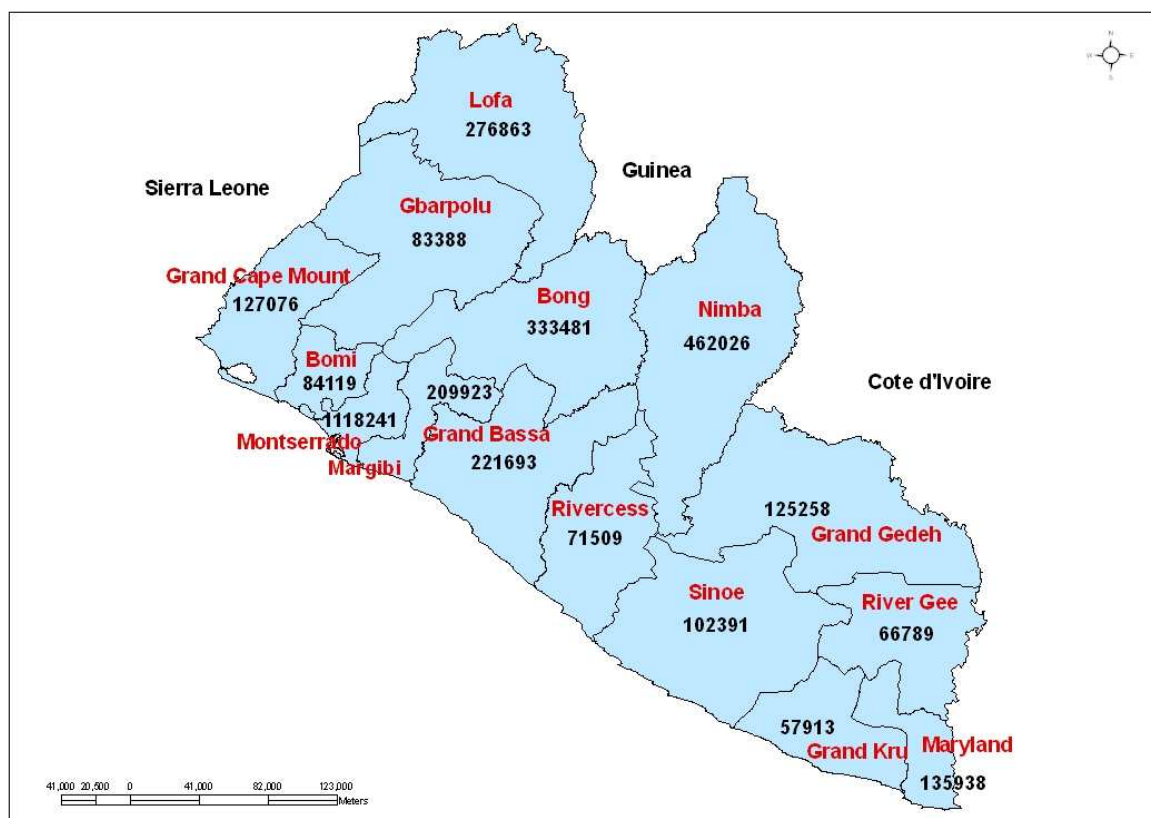
5.3 Spatial Distribution of the Population

The distribution of the population by county during the two previous census years is shown in Table 5.2. According to the 2008 census, Montserrado county had the largest share of the population at about 32.2 percent, followed by Nimba at 13.3 percent, and Bong at 9.6 percent. While Montserrado's population increased during the period 1984 - 2008, nine other counties (over half of all counties) experienced a decrease in their individual share of the national population (see Table 5.1). This was due to two major reasons: Lofa and Nimba experienced high levels of mortality due to civil conflicts; and the rest of the counties were affected by outward migration to other places for safety. The distribution of 2008 population by county is also depicted by the map in Figure 5.2

Table 5.1 Distribution of Population by County, 2008

County	Population Distribution		Percentage Distribution	
	1984	2008	1984	2008
Bomi	66,420	84119	3.16	2.42
Bong	255,813	333481	12.17	9.59
Bassa	159,648	221693	7.60	6.38
Cape Mount	79,322	127076	3.77	3.66
Grand Gedeh	63,028	125258	3.00	3.60
Grand Kru	62,791	57913	2.99	1.67
Lofa	199,242	276863	9.48	7.96
Margibi	151,792	209923	7.22	6.04
Maryland	69,267	135938	3.30	3.91
Montserrado	491,078	1118241	23.37	32.16
Nimba	313,050	462026	14.90	13.29
Rivercess	37,849	71509	1.80	2.06
Sinoe	64,147	102391	3.05	2.95
River Gee	39,782	66789	1.89	1.92
Gbarpolu	48,399	83388	2.30	2.40
Liberia	2,101,628	3,476,608	100.00	100.00

Figure 5.2 Distribution of Liberia's Population by county, 2008



5.4: Population Density

Population density is a statistical measurement of the man-land relationship expressed in terms of number of persons per square kilometers or miles. In addition, it measures the carrying capacity of a distinct area. Table 5.2 gives the population densities of the various counties in 1984 and 2008. In 2008, the population density of Liberia was 90 persons per square miles representing a 60.7 percent rise over the figure of 56 attained in 1984.

Population density is classified into four categories at county level as: very densely populated (over 1000); densely populated (100-210); moderately population (50-99) and sparsely populated (below 50). As expected of a highly urbanized area, Montserrado County was the most densely populated county in Liberia with a density of 1,514 persons per square mile and with the smallest land area (Figure 5.3). This is because Montserrado hosts the capital city of Liberia, Monrovia, which attracts many people in search of employment. In addition, Monrovia has an abundance of social amenities, the busiest seaport, better communication and transport connections, greatly endowed in terms of physical infrastructure and, is the business capital of the country. Also, most people who ran

away from rural areas and went to stay in Monrovia for safety reasons, have not gone back to where they came from after the civil conflict.

Other densely populated counties were Margibi, Maryland, Bomi and Nimba with densities falling between 100 - 210 persons per square mile. With the exception of Nimba County, each of the other three counties had relatively small land areas with high population totals which resulted in the high densities. Some of the reasons for the high density in Margibi and Nimba counties are, better transport and communication facilities, fertile soil for agricultural activities, local alluvial mining activities, presence of international mining and agricultural companies, and opportunities for trade with neighboring West African countries. In addition, Margibi and Bomi are sub-urban counties close to Monrovia, the capital city. Despite being far from the capital city, the trend in Maryland is explained by four main factors: high fertility of 6.5 children per woman; highest household size of 7.0, cross border trade and the fertile soil suitable for agriculture.

The counties that hold moderate population concentrations (50-99 persons per square mile) generally have large land areas; and they included Bong, Lofa, Grand Bassa and Grand Cape Mount. The driving force of attraction to these areas is the local alluvial diamond and gold mining, making the counties host mining and agricultural companies, fertile arable lands for farming, moderate transport and communication facilities, second sea port in the country and, local trade.

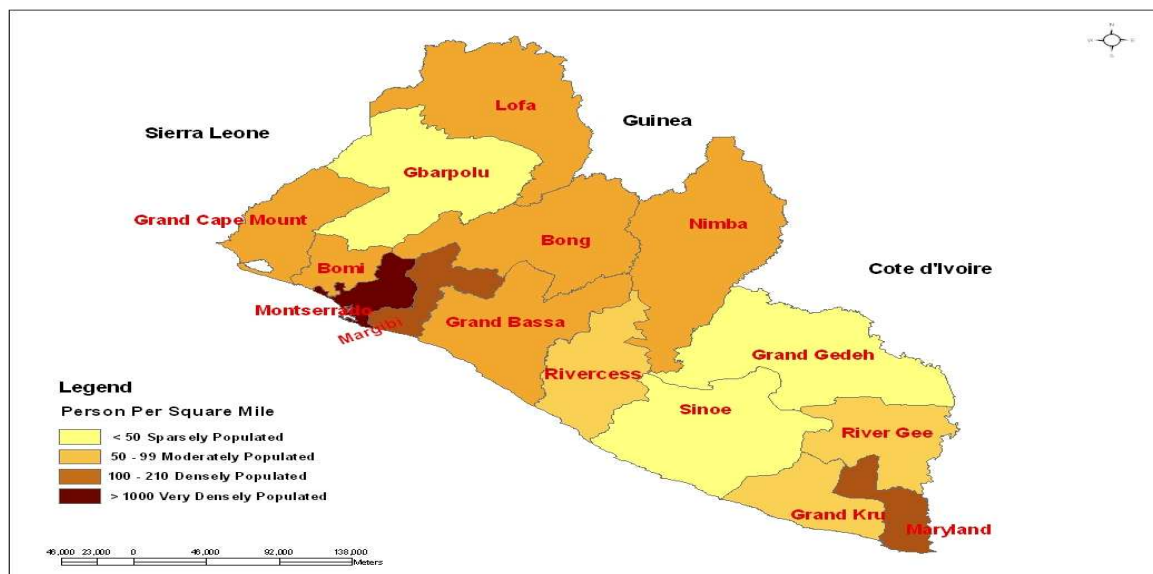
The sparsely populated counties were Gbarpolu, Grand Gedeh, Grand Kru, River Cess, River Gee and Sinoe, with densities between 22 and 40 persons per square mile. Some of the reasons why they were sparsely populated are poor communication services, heavy forest cover in parts of Grand Gedeh, Sinoe, River Gee and Gbarpolu, insufficient physical infrastructure and social amenities, and generally low employment opportunities.

Table 5.2 Distribution of Population Density by County, 2008

County	Land Area in Sq Miles	Population Distribution		Area Density (Sq Mile)	
		1984	2008	1984	2008
Bomi	757.40	66,420	84119	89	111
Bong	3478.42	255,813	333481	76	96
Bassa	3141.76	159,648	221693	53	71
Cape Mount	1869.33	79,322	127076	43	68
Grand Gedeh	4358.69	63,028	125258	15	29
Grand Kru	1570.61	62,791	57913	42	37
Lofa	3919.39	199,242	276863	52	71
Margibi	1018.56	151,792	209923	146	206
Maryland	930.17	69,267	135938	78	146
Montserrado	738.52	491,078	1118241	676	1514

Nimba	4600.12	313,050	462026	70	100
Rivercess	2225.01	37,849	71509	17	32
Sinoe	3912.59	64,147	102391	17	26
River Gee	2065.36	39,782	66789	20	32
Gbarpolu	3904.88	48,399	83388	13	21
Liberia	38490.81	2,101,628	3,476,608	56	90.3

Figure 5.3 Distribution of Liberia's Population Density by County, 2008



5.5 Summary and Conclusions

Liberia's population increased 3.4 times from 1962 to 2008, a period of 46 years. Although the population growth rate decreased between 1984 and 2008, the increase in total population of 1.65 folds is high. The carrying capacity or the population density of Liberia stood at 90 persons per square mile which is high. The density varied from 21 in Gbarpolu to over 1,500 persons per square mile in Montserrado County.

Chapter Six

Policy Implications and Way Forward

6.1 Introduction

This chapter presents the conclusions of the study as derived from the 2008 census analysis undertaken. It also presents the key findings along four main issues including (i) household composition; (ii) age-sex distribution; (iii) cultural composition; and (iv) population distribution. The last section of the chapter presents policy implications and the way forward to enable government and the private sector to take demographic factors into account in planning for social and economic development.

6.2 Summary of Key Findings

The average household size of Liberia was 5.1 persons and had declined from 6.1 in 1984. Analysis at county level indicated that the average household was highest in Maryland. As for household headship, nearly a quarter of the household were headed by females while at county level, female headship was highest in Lofa and lowest in Gbarpolu. Though Liberia

had a civil war for many years, it is surprising to note that a small proportion of households were headed by children.

While the majority of the population was counted from their households, a smaller proportion was enumerated in other institutions and nearly 47 percent were in urban areas. As for population density, Liberia's carrying capacity stood at 90 persons per square mile and that of Montserrado County was the highest among the 15 counties.

By examining the age structure, it was found that the population was young and will continue to have a positive effect on population growth for many years to come. This is due to the population's nature of fertility regime which is impacting the population momentum.

Despite the civil conflict, high sex ratios were observed in several counties implying more males than females in most of the age groups. There were 17 major ethnic groups and of these, the Kpelle were found to be the largest, followed by the Bassa. With regard to religious beliefs, Christians were found to be largest, followed by the Muslims.

6.3 Policy Implications

Liberia has a young age structure, which is critical to her development goals of improving people's standards of living and reducing poverty levels. What happens to fertility in the future will have a major impact on the ability of the government to achieve the desired goals of the Poverty Reduction Strategy (PRS). Furthermore, the young population structure will increase the cost of education and health care services as the demand increases due to the ever increasing population of school age children and population at high risk of ill health.

Urban areas especially Monrovia were used as safety nets by rural migrants during the civil war. This has led to a high carrying capacity for Montserrado County which is unable to provide good infrastructures, water and sanitation facilities, adequate housing, health, educational and recreation facilities for the future. In addition, there are also few employment opportunities in the urban areas making the unemployed migrant youths susceptible to crime, thereby, increasing the chances for greater social crisis in these urban areas.

6.4 Way Forward

There are several direct and indirect actions which the government of Liberia may want to use to mitigate the impact of population momentum and lopsided spatial distribution. These include:

6.4.1 Actions that Address the Demographic Momentum

- Empower women in decision making concerning adoption of family planning methods by eradicating psychological, cultural, socio-economic and health barriers to family planning.
- Increase the participation of women in tertiary education so as to close the gender gap.
- Address the gender gaps in formal employment so as to reduce the dependence of women on men.
- Develop information, education and communication strategies that would incorporate various social groups including in and out of school adolescent boys and girls, youths, married couples, sex workers and persons with disabilities.
- Increase access to fertility regulation services and sexual and reproductive health services for adolescents and youths and empower service providers to provide high quality services to adolescents and youths through appropriate training and provision of resources and space.
- Enforce laws that prevent early marriage.
- Provide an environment which justifies reduction of fertility so as to make couples regard low fertility as advantageous in the short and long run by quickly reducing further infant and childhood mortality.

6.4.2 Actions that Address Spatial Distribution of Population

To address the problem of lopsided spatial population distribution, the following actions are recommended:

- Address the problem of unprecedented rural-urban migration especially in Montserado by addressing push factors of sending areas such as poverty, poor communication and infrastructure.
- Address the county imbalances in development by creating county equalization programmes.
- Develop private and public partnership in providing infrastructure for urban development.

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Appendices

Table 2.5A: Distribution of Household Population by Sex, Relationship, Residence, 2008

Relationship	Male		Female		Total
	Urban	Rural	Urban	Rural	
Head	29.1	28.1	11.8	9.4	18.9
Spouse	0.7	0.5	19.3	23.6	11.9
Son/daughter	41.7	48.1	40.8	44.7	46.5
Other spouse	0.0	0.0	0.8	1.4	0.7
Parent	0.3	0.5	1.2	1.6	1.1
Grand child	5.7	6.2	5.8	6.0	6.1
Servant	0.2	0.2	0.2	0.2	0.2
Ward	0.7	0.5	0.7	0.4	0.4
Other relative	19.0	12.0	17.6	10.5	11.3
Non relative	2.5	3.8	1.6	2.2	3.0
Total	100	100	100	100	100

Table 3.6A Age Distribution of Liberia's Population by type of Residence

Age group	Urban		Rural	
	Number	Percent	Number	Percent
0-4	222515	6.4	311960	9.0
5-9	223463	6.4	278468	8.0
10-14	213401	6.1	208265	6.0
15-19	194108	5.6	181587	5.2
20-24	179514	5.2	163416	4.7
25-29	147231	4.2	144627	4.2
30-34	109644	3.2	109988	3.2
35-39	96553	2.8	106983	3.1
40-44	73707	2.1	82030	2.4
45-49	52906	1.5	65901	1.9
50-54	37208	1.1	45732	1.3
55-59	23595	0.7	32865	0.9
60-64	20255	0.6	32575	0.9
65-69	14448	0.4	25359	0.7
70+	25276	0.7	53028	1.5
Total	1633824	47.0	1842784	53.0

Explanatory Notes on Population Analysis Spreadsheet (PAS)

PAS system is a set of Excel spreadsheets that have been developed to help in analyzing demographic data and preparing population projections. It has a set of spreadsheet for demographic analysis and the PAS menu with macros to facilitate the use of spreadsheets.

In constructing Liberia National Population Projections, the following PAS modules have been used;

AGESMTH: This spreadsheet corrects irregularity in age and sex data, and digit preference. It uses five smoothing techniques including the Carrier Farrag, Karup-King Newton, United Nations, strong moving and the Arriaga light smoothing which adjusts the population distribution in the first and last 10 year age groups and incorporates the outcome into 5 year age groups.

SINGAGE: This spreadsheet detects and evaluates irregularities which could be due to age misreporting and digit preference.

MOVEUP:	The spreadsheet estimates the population by age and sex for a desired date. The total population at a desired date is derived based on the reported population at a specified date, age specific central death rates by sex, age specific fertility rates, and the annual net number of migrants. The population by age and sex is then proportionally adjusted to the total population at a desired date.
TFRLST.XLS:	The spreadsheet interpolates and extrapolates total fertility rate using the logistic function to generate trends in fertility patterns for the projection period.
LTPOPDTH.XLS:	The spreadsheet computes a life table from deaths and population by age and has an option for using an independently estimated infant mortality rate. Also, it produces a life table based on central $n m_x$ values smoothed by moving average of the logarithms.
EOLGST.XLS:	This spreadsheet interpolates and extrapolates life expectancies at birth by sex. It fits a logistic function using 2 to 17 life expectancies at birth given the values of upper and lower asymptotes.
GBAL:	The spreadsheet estimates the completeness of reporting of adult deaths using the Brass growth balance equation method. Estimates are based on fitting a straight line to certain points on the graph of the birth rate versus the partial death rate. It allows the user to estimate two lines using the group mean method.



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