2023 SIERRA LEONE ANNUAL AGRICULTURAL SURVEY REPORT

UNITY FREEDOM JUSTICE

STATISTICS SIERRA LEONE (Stats SL)

Credible Data for National Development

1 FOREWORD

The Government of Sierra Leone, through the Medium-Term National Development Plan (MTNDP 2024-2030), aspires to transform Sierra Leone into a prosperous nation by 2030. Agriculture, a mainstay of the national economy, and the current flagship program plays a pivotal role in achieving this goal. To support evidence-based decision-making and monitor progress towards the Sustainable Development Goals (SDGs), Statistics Sierra Leone (Stats SL) is committed to producing timely, accurate, and reliable agricultural statistics.

The Sierra Leone Annual Agricultural Survey (SLAASS 2023) is a key component of Stats SL's efforts to provide up-to-date information on the agricultural sector. The 2023 SLAASS, conducted in collaboration with the Ministry of Agriculture and Food Security (MAFS), builds upon the successes of previous surveys and aligns with international best practices.

The primary objective of the SLAASS is to collect comprehensive data on crop and livestock production, as well as other relevant agricultural indicators. This information is essential for policymakers, researchers, and other stakeholders to assess the performance of the agricultural sector, identify opportunities for improvement, and inform evidence-based interventions.

Stats SL acknowledges the invaluable support of the Food and Agriculture Organization of the United Nations (FAO) and other development partners in making this survey possible. We also express our sincere gratitude to the dedicated staff of Stats SL and MAFS for their hard work and commitment to data quality.

By investing in agricultural statistics, Sierra Leone can strengthen its food security, reduce poverty, and drive sustainable economic growth.

Signature: .....

Andrew Bob Johnny

Statistician-General, Statistics Sierra Leone

2 ACKNOWLEDGEMENT

The 2023 Sierra Leone Annual Agricultural Sample Survey (SLAASS) report provides a comprehensive overview of agricultural production and practices in Sierra Leone. This report was developed in accordance with international standards outlined in the Global Strategy to improve Agricultural and Rural Statistics (GSARS) and the Agricultural Integrated Survey (AGRIS) methodology, through the 50X2030 Initiative.

Statistics Sierra Leone (Stats SL) would like to express its sincere gratitude to the Food and Agriculture Organization of the United Nations (FAO) and the Ministry of Agriculture, Forestry and Food Security (MAFS) for their invaluable support and collaboration.

The 50x2030 Initiative, a multi-partner programme by the World Bank, FAO and International Fund for Agricultural Development (IFAD) has been instrumental in strengthening agricultural data systems in Sierra Leone. This Initiative aims to Close the Agricultural Data Gap by transforming country data systems in 50 countries in Africa, Asia, the Middle East and Latin America by 2030 and the Government of Sierra Leone is thankful for the support obtained from the Initiative.

Within Stats SL, a dedicated technical team, led by Momodu M. Kamara, the Head of Agriculture Section, oversaw the compilation and analysis of the survey data. The Institution extends its heartfelt thanks to all team members and stakeholders who contributed to the success of this survey.

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4 ACRONYMS AND ABBREVIATIONS

AASS	Annual Agricultural Sample Survey
AgH	Agricultural Household
EA	Enumeration Area
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GSARS	Global Strategy to improve Agricultural and Rural Statistics
HH	Household
IFAD	International Fund for Agricultural Development
MAFS	Ministry of Agriculture Food and Security
MTNDP	Medium-Term National Development Plan
NLE	New Leone
PSU	Primary Sampling Unit
SDG	Sustainable Development Goal
Stats SL	Statistics Sierra Leone
SLARI	Sierra Leone Agricultural Research Institute
SLAAS	Sierra Leone Annual Agriculture Survey
ToE	Training of Enumerators
ToT	Training of Trainer

5 KEY FINDINGS

There are about 1,256,456 agricultural households (AgH) in Sierra Leone with a total agricultural population of 6,666,029. The majority of these agricultural households (about 73 percent) are headed by males.

The main source of water for agriculture is rain water used by 48.3% of agricultural households.

Majors crops harvested in the country are: Rice, cultivated by 44.6% of AgH Cassava, cultivated by 14.4% of AgH Cocoa, cultivated by 9.6% of AgH.

The main livestock type raised by holdings is chicken and about 29% Percent of the agricultural households raise chicken in Sierra Leone., Bonthe is observed to have the highest proportion of poultry holdings with 86%, followed by Bo with 84%.

For the 2022/2023 agricultural season, 114.9 thousand agricultural holdings used inorganic fertilizers, while 98.6 thousand purchased the m. 60.3 thousand holdings reported using organic fertilizer, of which 36.7 thousand holdings purchased it.

Only 3.6% of household members attended formal training in agriculture.

Most of agricultural households are small-scale, since 75.6 % of the agricultural land own by small holders' farmers.

60% percent of agricultural population do not read or write.

More females worked in nearly every agricultural activity when compared to men. E.g. weeding recorded the highest participation, with 103.6 thousand females versus 95.9 thousand males.

181,728 of holdings received loans or subsidies for their agricultural activities.

6 INTRODUCTION

6.1 Background

According to the World Bank report 2022/23 and Feed Salone Strategy, 2023-2028, Agriculture is a key sector in Sierra Leone's economy, accounting for 57% of the country's Gross Domestic Product (GDP). The sector is also the main source of livelihood for approximately 65% of households and women make up about 70% of the agricultural labour force and play a critical role in food production. Out of the 5.4 million hectares of fertile land available, only 15% is currently under cultivation with an impressive 3000 cubic mm of rainfall over half the year. (World Bank report,2023).

Sierra Leone has launched its Medium-Term National Development Plan for 2024-2030, titled A Transformative Acceleration Agenda for Food Security, Human Capital Development, and Job Creation. This plan aims for the country to achieve lower- middle-income status by 2030 and focuses on food self-sufficiency, a skilled workforce, youth employment, economic growth, and an efficient public service

The Medium-Term National Development Plan (2024-2030) and the Feed Salone Strategy which aim to achieve food self-sufficiency by 2030 through enhanced agricultural productivity and commercialization, sustainable fisheries management, and access to nutritious foods identifies agriculture as a flagship program. For the second term of Dr. Julius Maada Bio's government agriculture is considered to be a key driver of growth with great potential to generate employment opportunities with positive multiplier effects on other sectors, including manufacturing and services.

Under the medium-term plan and the Feed Salone Strategy, commercialization of agriculture is expected to increase production and productivity along the value chains, agro-processing and marketing and serve as a launch pad to industrialization. To effectively monitor progress in carrying out the implementation of the plan and the Feed Salone Flagship program, timely and reliable statistics are required.

Although agriculture plays a critical role in Sierra Leone's economy, contributing significantly to GDP, poverty reduction and food security, the sector faces numerous challenges, including low productivity, limited access to finance, and a lack of skilled labor. These challenges,

coupled with the impacts of climate change, such as erratic rainfall patterns and extreme weather events, further hinder agricultural development and exacerbate poverty.

To address these issues, it is imperative to collect and analyse reliable agricultural statistics. These data will provide valuable insights into the factors affecting agricultural productivity, food security, and poverty reduction. By understanding the complex interplay between population growth, resource scarcity, gender disparities, and climate change, policymakers can develop evidence-based strategies to improve the sector's performance and ensure a sustainable future for Sierra Leone's agriculture.

In recognition of the critical role the agricultural sector plays in national development, Sierra Leone joined the 50x2030 Initiative in early 2023. This partnership focuses on establishing a sustainable annual agricultural surveys program. The program's primary aim is to generate high-quality, timely, and relevant agricultural data that directly addresses the country's needs. This data will be instrumental in achieving national development goals outlined in the Medium-Term National Development Plan 2024-2030 and by extension the Feed Salone Strategy, which lay emphasis on the agriculture sector through the Feed Salone Project.

The implementation of the 50x2030 activities in Sierra Leone relies on a variety of statistical undertakings. Two key examples are the Sierra Leone Listing Survey (SLLIST) and the Sierra Leone Annual Agricultural Sample Survey (SLAASS), both conducted in 2023. These surveys play a vital role in availing timely data for a better decision-making n the agricultural sector.

The Sierra Leone Listing Survey (SLLIST) plays a vital role in this report. It also serves as a foundational element for subsequent surveys, establishing a comprehensive sampling frame that will be utilized in future data collection efforts. By meticulously gathering data on various aspects, SLLIST lays the groundwork for further analysis and ensures the accuracy of subsequent surveys.

6.2 **Objectives of the survey**

The main objective of the Sierra Leone Annual Agriculture Survey (SLAAS 2023) was to generate up-to-date and precise data on the acreage and production of major crops, livestock numbers and products, and aquaculture. The data from this survey provides critical insights for farmers, agricultural businesses, government policymakers, and other key players to inform their decisions in both the short and long term.

Specifically, it involved:

i. To collect timely data on agricultural production and productivity at both national regional and district levels;
ii. To gather core data to help develop and review agricultural policies and to guide the implementation of agricultural plans at national and regional levels between agricultural sub-sectors; and
iii. To compile fundamental statistics that facilitate comparisons in the development of the agriculture sector across the country.

6.3 **Survey Methodology**

The survey employed a stratified random sampling technique to ensure a representative sample of agricultural households across all five regions and fifteen districts of Sierra Leone with the exception of Western Urban district. The survey focused on collecting data from heads of agricultural households, covering topics such as household demographics, land ownership, agricultural activities, livestock rearing, labor force composition, and participation in off-farm activities.

To ensure timely, reliable and quality output, the focus of the survey execution was to carry out an efficient statistical process, relying on modern technologies such as the use of Computer-Assisted Personal Interviews (CAPI). The main activities undertaken included survey organization; sampling design; tabulation and plan preparation; design of survey questionnaires; training of trainers/supervisors and enumerators; data collection; field supervision and consistency checks; and data processing.

6.3.1 Survey Implementation and Data Collection

Statistics Sierra Leone (Stats SL), in partnership with the Ministry of Agriculture, Food Security (MAFS), and the technical support of Food and Agriculture Organization of the United Nations (FAO), conducted the Sierra Leone Agricultural Sample Survey (SLAASS) 2023. The survey was overseen by a central team from both Stats SL and MAFS, responsible for planning, execution, and management.

The SLAAS 2023 collected data throughout the agricultural year, from January to December 2023. This period is divided into two seasons: the first season (December-March) and the second season (April-November). Agricultural households were interviewed twice during each season: once after planting and once after harvesting. Data was collected using Computer Assisted Personal Interviews (CAPI).

6.3.2 Sampling Design and Sample Size

A two-stage sampling method was employed to select households for the survey. The country was divided into districts and within each districts area called Enumerator Areas (EAs) were identified. A sample of EAs was then selected, followed by a sample of agricultural households (Ag HHs) within each chosen EA. The survey included households engaged in crop cultivation and/or livestock rearing, regardless of the scale of their operations. However, it did not cover non-household holdings, such as large-scale commercial farms, or sectors like aquaculture, forestry, and fisheries.

The survey generated national, regional, and sub-regional estimates. The total number of EAs selected for the survey was 520, with 5,200 households interviewed in all. For each EA, the field team had a list of 10 households. The detail of the sample design is attached as ANNEX 2.

6.4 Report Outline

The report comprises the following three chapters: Chapter one: Characteristics of agricultural households, Chapter two: Agricultural Production and Chapter three: Farm Income, Labor and Productivity, closed with conclusion and key recommendations.

7 CHAPTER 1: CHARACTERISTICS OF AGRICULTURAL HOUSEHOLDS

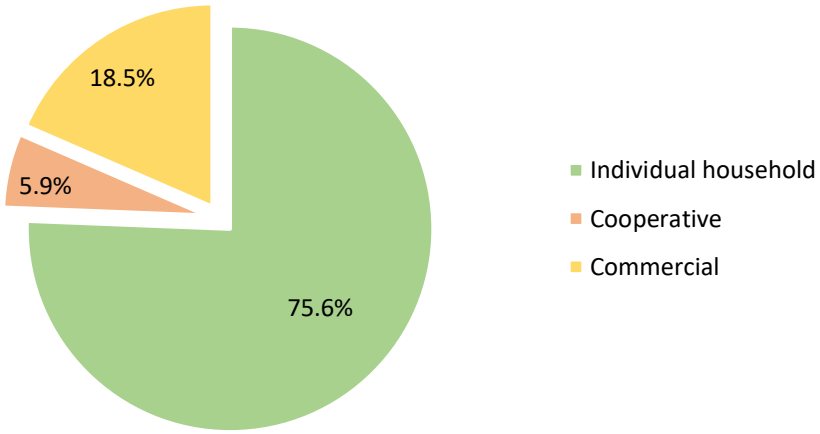
This chapter provides an extensive summary of the sociodemographic and economic traits of Sierra Leonean farming households. Important elements including the legal status of holdings, the distribution of the agricultural population by districts and regions, and the educational attainment of agricultural communities are all investigated through in-depth analysis and visual aids.

7.1 Section 1.1: Formal Structure of agricultural households

Predominance of individual households among agricultural households

Although land in Sierra Leone is owned by families under the country's land tenure system, the survey results make it evident from figure 1 that the majority of agricultural holdings are individual households. In fact, over half of agricultural holdings are run by individual households, while 24.4% of holdings are run by cooperatives or businesses for commercial purposes. The reasons can be that most businesses or the private sector do not engage in crop or animal rearing, or it might be because land-owning families are making it challenging for businesses to obtain agricultural property.

Figure 1.1: *Percentage Distribution of Agricultural Holdings by Legal Status in Sierra Leone*



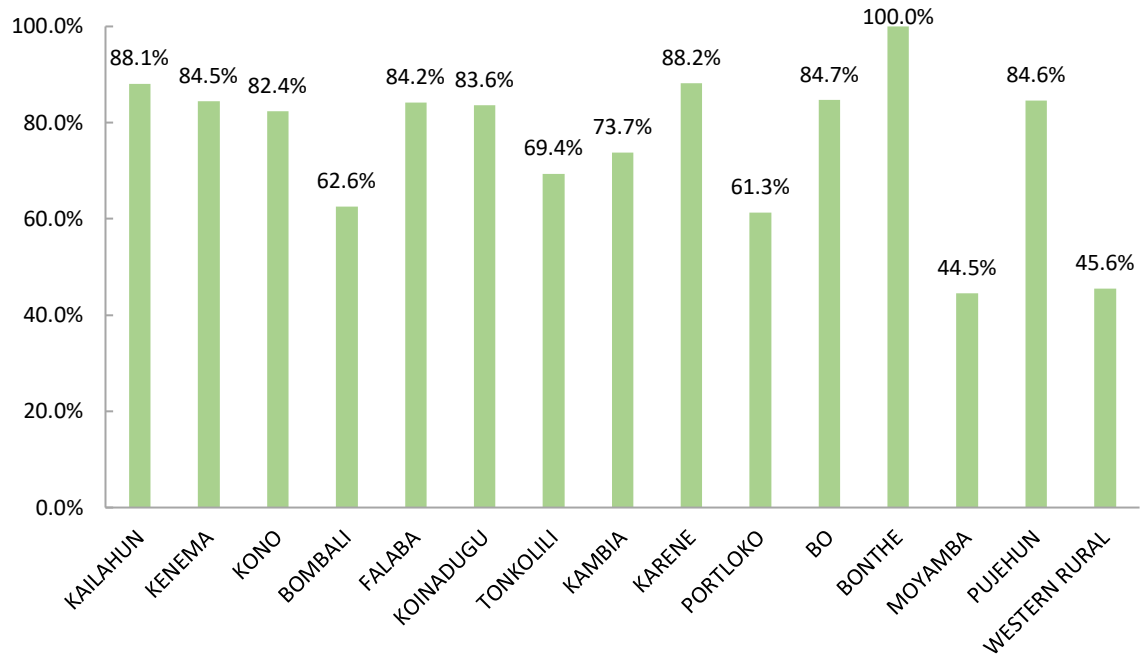
Source: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023

Majority of individual households in almost all districts

In almost all districts of Sierra Leone, families and communities prevail over the use of land either for agricultural or infrastructural propose

From the study, individual holders own and run an average of 75.6 % of the agricultural land. For example, in Bonthe district, 100% of agricultural holdings are owned by individual household, and in Moyamba and Western Rural districts, 44.5% and 45.6% recording the least of agricultural land owned and run by individual holders, respectively.

Figure 1.2: Percentage of individual household holdings in each district



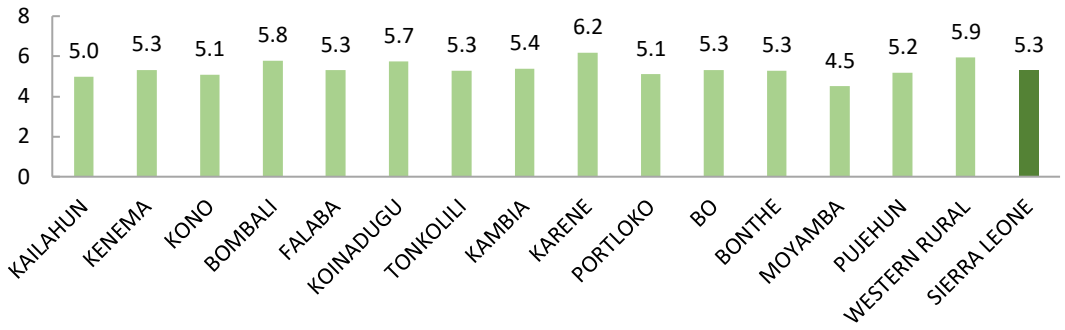
Source: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023

7.2

7.3 Section 1.2: Sociodemographic Characteristics of Agricultural Households

The study reveals that across fifteen agricultural districts in Sierra Leone the household size in most agricultural household is the same. Karene district is recording the highest (around 6 persons by agricultural household) and Moyamba the lowest with around 4 persons by agricultural households. The average agricultural household size in Sierra Leone is 5.3 this result is similar to the 2015 population and housing census where the average household size is 5.6

***Figure1. 2**: Average Household Size by District and at the National Level*



***Source:** Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Eastern Region has the highest number of agricultural populations

Overall, there are 6,666,029 agricultural population in Sierra Leone. The distribution of agricultural population is somewhat uneven across regions, with the Eastern and Southern regions recording the largest numbers. The Eastern Region has the highest number of agricultural populations, followed by Southern Region making a total of 3,662, 814 for these two regions. The Western Area has the lowest agriculture populations.

On another note, the female agricultural population outnumbers the male population in the Eastern region, North-Western region, Southern region and Western Area. For these regions, percentage of female agricultural population is higher than the percentage of male. The exception is North-Eastern region which records more men (50.1%) than women (49.9%). It is also worthy to note that, agricultural activities are not practices in the Western Urban and not included in the survey.

***Table 1.1**: Total Agricultural Population and Percentage Distribution by Region, District and Sex*

REGION / DISTRICT	Total Population	Percentage of Male	Percentage of Female	Total Percentage
EASTERN	**1,936,407**	**48.90%**	**51.10%**	**100.00%**
KAILAHUN	535,668	48.7%	51.3%	100.00%
KENEMA	779,607	48.5%	51.5%	100.00%
KONO	621,131	49.5%	50.5%	100.00%
NORTH-EASTERN	**1,325,077**	**50.10%**	**49.90%**	**100.00%**
BOMBALI	404,284	49.6%	50.4%	100.00%
FALABA	180,250	49.1%	50.9%	100.00%
KOINADUGU	202,351	54.4%	45.6%	100.00%
TONKOLILI	538,192	49.1%	50.9%	100.00%
NORTH-WESTERN	**1,190,184**	**46.80%**	**53.20%**	**100.00%**
KAMBIA	368,324	45.0%	55.0%	100.00%
KARENE	315,100	47.0%	53.0%	100.00%
PORTLOKO	506,760	48.0%	52.0%	100.00%
SOUTHERN	**1,726,407**	**48.90%**	**51.10%**	**100.00%**
BO	726,363	49.3%	50.7%	100.00%
BONTHE	269,725	49.9%	50.1%	100.00%
MOYAMBA	332,180	48.7%	51.3%	100.00%
PUJEHUN	398,140	47.5%	52.5%	100.00%
WESTERN AREA	**487,954**	**50.40%**	**49.60%**	**100.00%**
WESTERN RURAL	487,954	50.4%	49.60%	100.00%
SIERRA LEONE	**6,666,029**	**48.90%**	**%1.1%**	**100.00%**

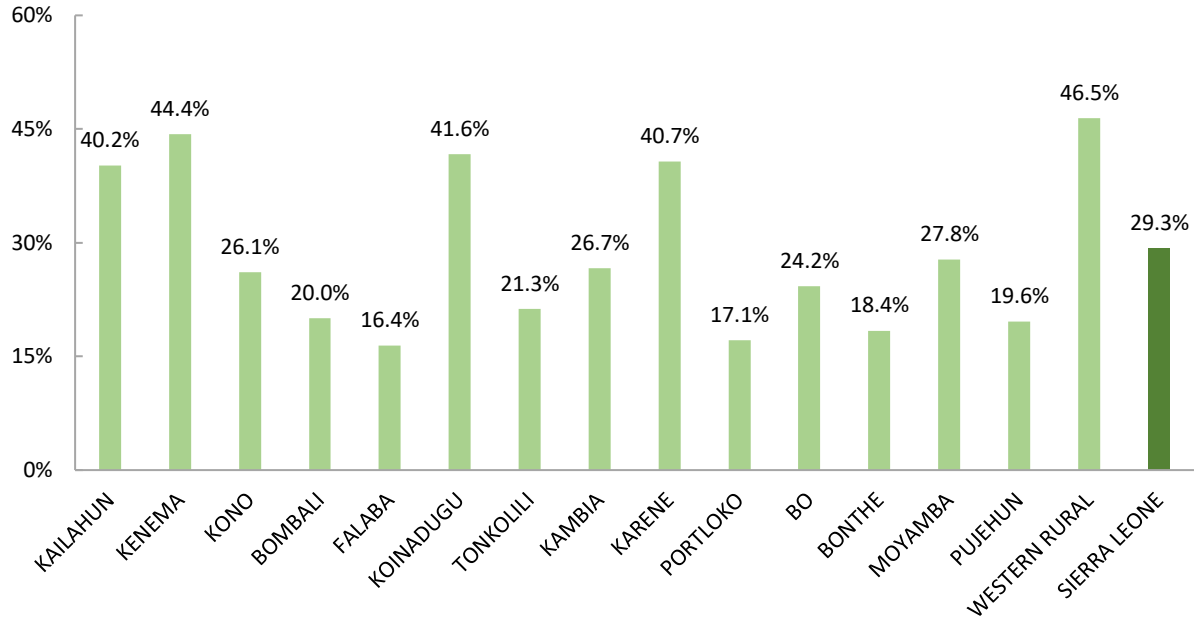
Source: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023

Greater percentage of agricultural population do not read or write.

In terms of education, the study reveals that more than half (60.3%) of the entire agricultural population in Sierra Leone do not have the ability to read or write in any language. The trend is the same for heads of household, for whom 29.3% have reading and writing abilities in at least one language. Figure 2.4 shows that 83.6% of the agricultural heads of household in Falaba district are illiterate, followed by Port Loko district 82.9%. The district with 46.5% of its agricultural population who can read and write is Western Area Rural, this can be associated

with the district proximity to the capital city. The average agricultural population in Sierra Leone who has the ability to read and write is 29.3% as reported in the figure below.

***Figure 1.4**: Percentage of Agricultural Household Heads with Reading and Writing Abilities in each District and at the National Level*

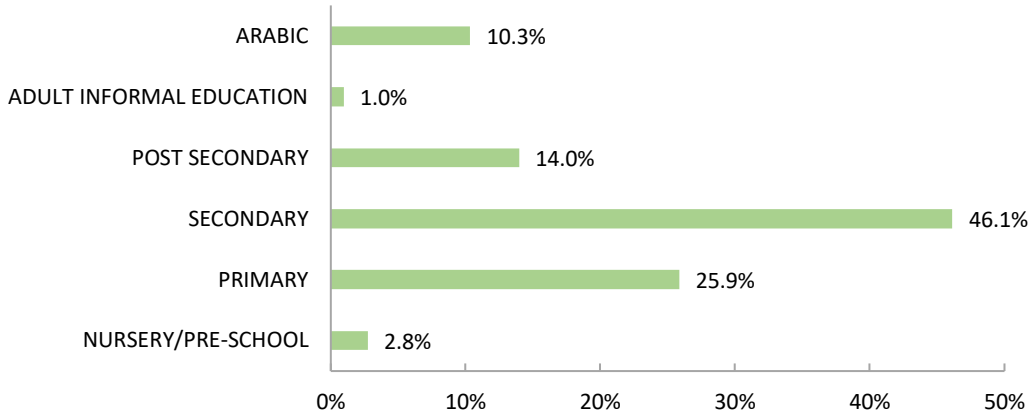


***Source:** Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

46.2% of agricultural household's heads has attained secondary education

According to the survey, majority of heads of agricultural households in Sierra Leone are not educated, only 2.8% for the entire agricultural household in the country have attended pre-school this can be associated to the fact that majority of the agricultural population are in the rural areas where nursery schools are not common. Adult informal education that was supposed to minimise the level of illiteracy among the farming population is accounts only for 1.0%. Again this can also be associated to the lack of willingness in the part of farmers or the unavailability of the facility. The figure above shows that 46.2% of agricultural household's heads has attained secondary education and 14.0% post-secondary.

Figure1. 5: *Percentage of agricultural households by the status of higher education attended by the head of the household*

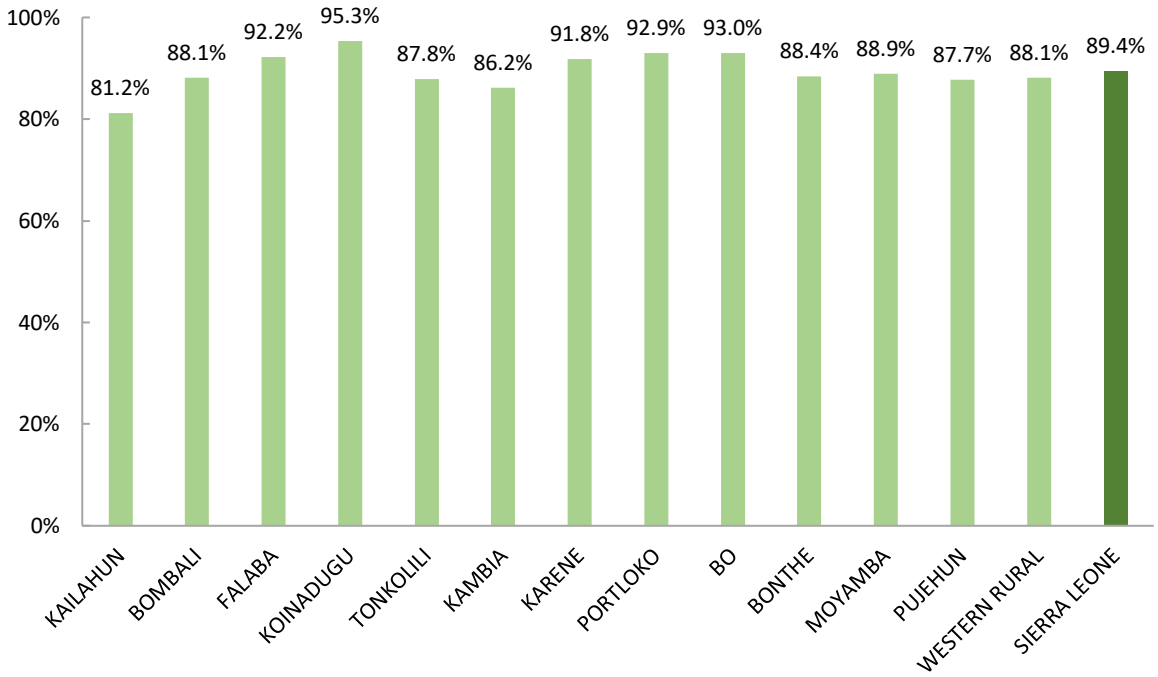


Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

The average population in Sierra Leone who have never attend formal training in agriculture is very alarming.

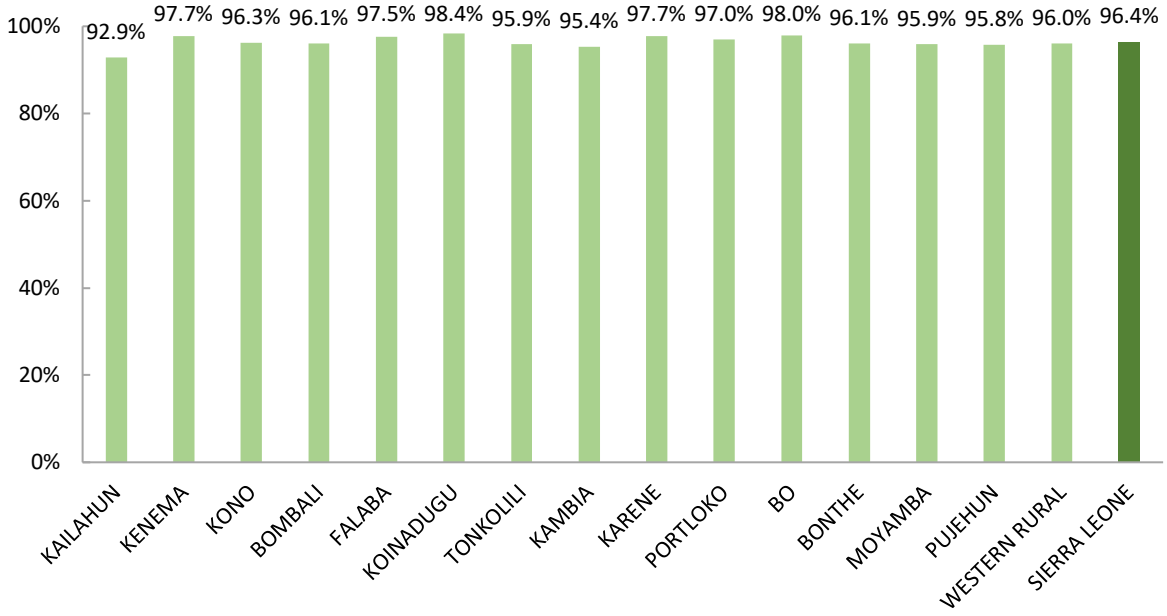
The figure below shows that 98.4% of the agricultural population in Koinadugu are without formal training in Agriculture and Kailahun district 92.9% showing the least. The study also indicated that the 96.4% of the total population in Sierra Leone has never attained formal training in agriculture.

Figure 1. 6*: Percentage of Heads of Agricultural Households without Formal Training in Agriculture, in each District and at the National Level*



Source: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023

Figure1.7: Percentage of Agricultural Population without formal training on Agriculture, in each District and at the National Level

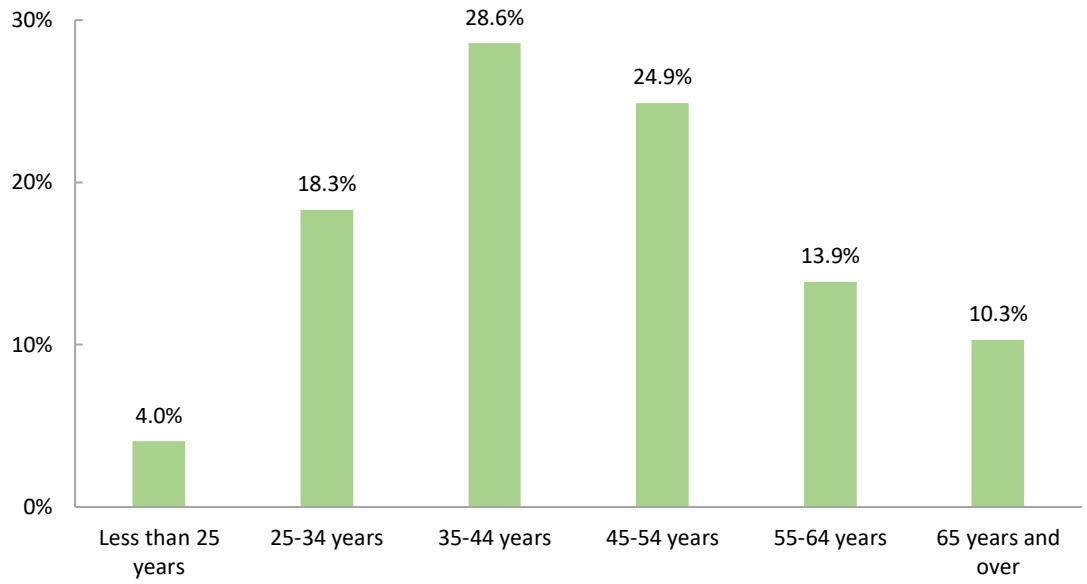


Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Majority of rural households in Sierra Leone are led by heads with working age.

The study indicates that 18.3% of the heads of agricultural households are between the youthful age 25-34 years, 28.6% are within the Adult population (35 – 44 years) and 10.3% are within the retiring age. This shows that the agricultural activities in rural households in Sierra Leone are led by heads with working age which can be considered as an advantage for agriculture in Sierra Leone.

***Figure 1.8**: Percentage Distribution of heads of agricultural households in Sierra Leone by Age Category*



***Source:** Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023.*

8 CHAPTER 2: AGRICULTURAL PRODUCTION

Introduction

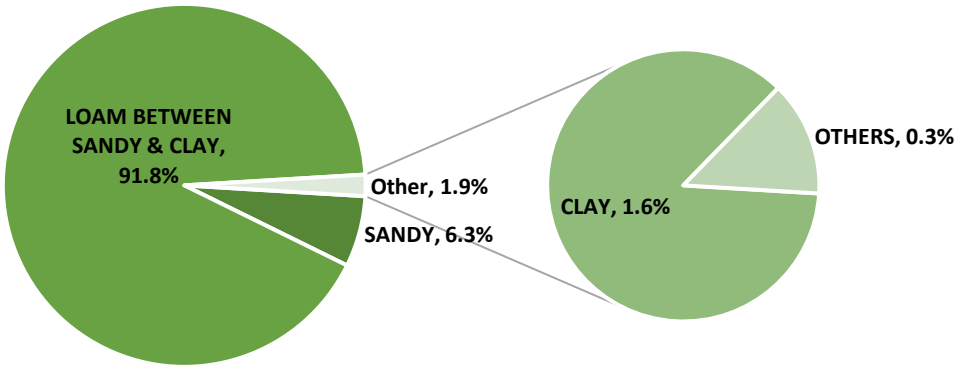
This chapter provides analysis on agricultural production patterns, focusing on the outcomes the survey. It highlights key findings on area under cultivation, crop yields, area, farming practices, input utilization and production constraints.

8.1 Section 2.1: Area under Cultivation and Soil Resources/Land and Soil Resources

Eastern region accounted for the largest number of parcels

The survey recorded a total of 1,948,178 parcels of land in 2023, nationwide. Analysis by region shows Eastern region accounted for the largest number of parcels representing 33.5% of the total parcels, followed by Southern region (22.5%),

Figure 2.1: *Percentage of parcels by predominant soil type, Sierra Leone, 2023*



Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Figure 2.1 describes the percentage of parcels by predominant soil type. Results indicated that the soil type of parcels are largely loamy accounting for 91.8% whilst sandy and clay soil constitute 6.3 percent and 1.6 percent, respectively.

Larger proportions of parcels (above 50 percent) had not experienced erosion

Analysis of extent of erosion experienced on parcels by district in Table 2.1 shows larger proportions of parcels (above 50 percent) had not experienced erosion in three districts (Western Area Rural, Kailahun and Kenema) during the year under review. These districts subsequently recorded lowest erosion rates (combined) at 42.0 percent, 44.8 percent and 45.4 percent; respectively. In contrast, Bombali and Karene reported highest (combined) erosion rates on parcels at 88.0 percent and 87.5 percent, respectively.

Table 3.1: *Percentage of parcels by extent of erosion experienced and district, 2023*

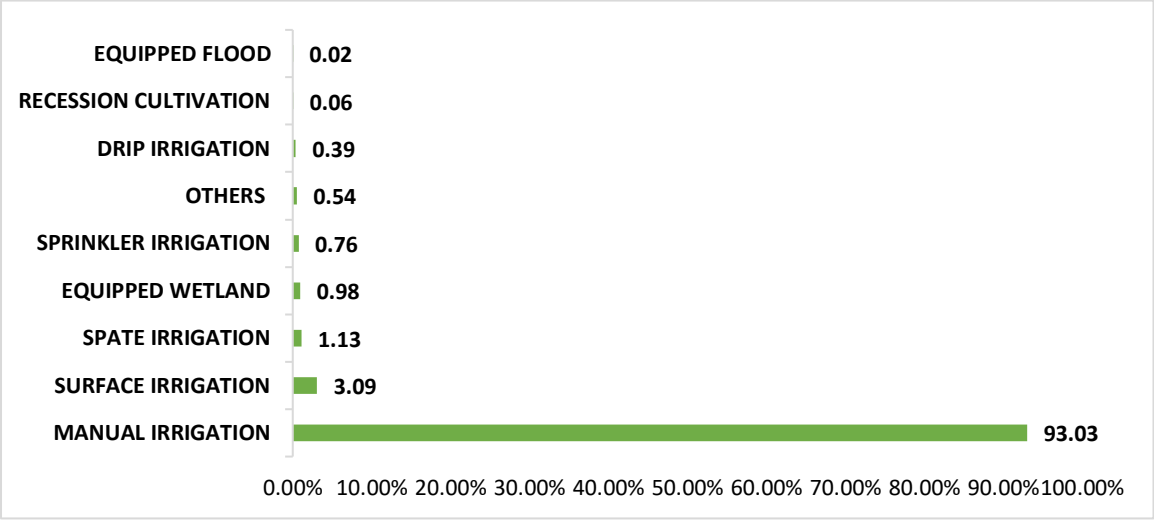
DISTRICT	EXTENT OF EROSION				TOTAL
	NO EROSION	LOW EROSION	MODERATE EROSION	HIGH EROSION	
KAILAHUN	55.2	35.8	6.0	3.0	100.0
KENEMA	54.6	37.5	7.2	0.6	100.0
KONO	43.9	54.2	1.4	0.6	100.0
BOMBALI	12.0	74.1	8.5	5.4	100.0
FALABA	25.4	61.8	7.0	5.8	100.0
KOINADUGU	41.5	41.8	4.1	12.6	100.0
TONKOLILI	28.8	58.1	9.5	3.6	100.0
KAMBIA	44.2	43.9	11.6	0.4	100.0
KARENE	12.5	79.8	6.4	1.4	100.0
PORTLOKO	27.3	53.9	17.7	1.1	100.0
BO	44.3	49.8	4.7	1.2	100.0
BONTHE	27.7	71.0	0.0	1.2	100.0
MOYAMBA	40.6	53.3	5.2	0.8	100.0
PUJEHUN	43.6	46.1	5.9	4.4	100.0
WESTERN AREA RURAL	58.0	40.5	0.8	0.7	100.0
SIERRA LEONE	**40.5**	**50.6**	**6.6**	**2.3**	**100.0**

Source*: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023.*

Greater proportion of parcels had got no irrigation infrastructure in 2023

The survey revealed that greater proportion of parcels - 69.2 percent - (1,347,378 parcels) had got no irrigation infrastructure in 2023; just 30.8 percent (600,800 parcels) had an irrigation infrastructure. Information on the type of irrigation used on parcels is given in Figure 3.3. Manual irrigation (93.03 percent) was the predominant type of irrigation used on parcels. Whilst surface irrigation, spate irrigation and equipped wetland were used on barely 5.20 percent of parcels (combined). The other irrigation types are used on less than 2 percent of parcels.

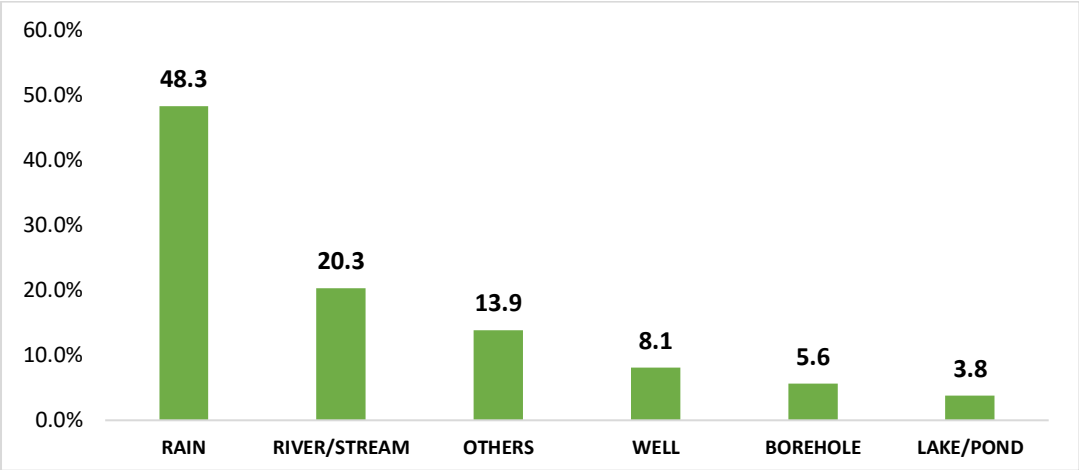
Figure 2.3: *Percentage of parcels by type of irrigation used in Sierra Leone, 2023*



Source*: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Figure2.3 shows percentage of parcels with various sources of water for agriculture. According to the survey, rain water was seemingly the main source of water (48.3 percent) on parcels for agriculture in 2023. This was followed by river/stream water (20.3 percent) and other sources (13.9 percent). Water was less sourced from well (8.1 percent), borehole (5.6 percent) and lake/pond (3.8 percent).

***Figure 2.3**: Percentage of parcels by source of water for agriculture, Sierra Leone, 2023*

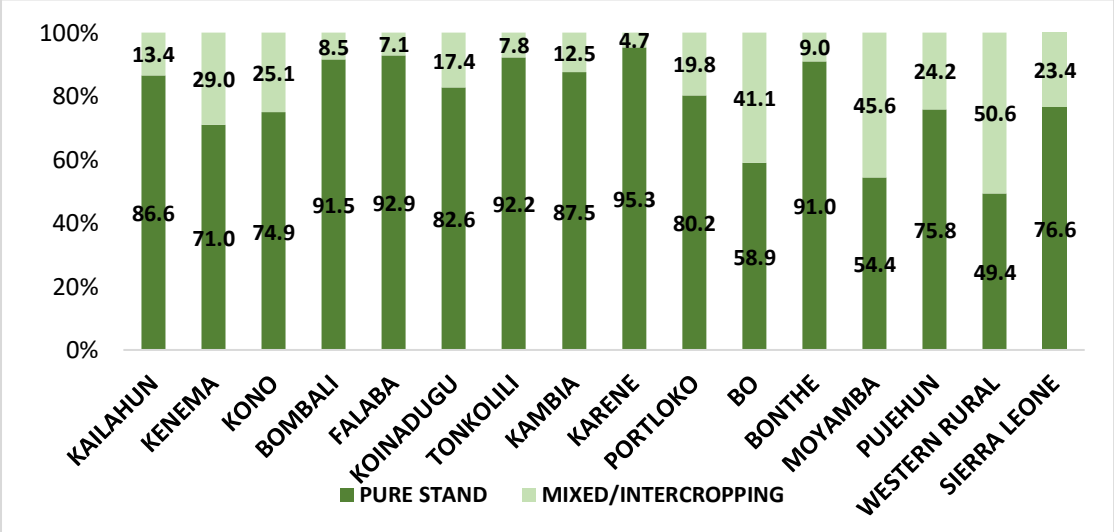


***Source:** Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023.*

Eastern Region has the highest number of plots

A total of 2,507,598 plots was recounted in 2023 during the survey. Of these, Eastern region had the largest number of plots at 796,710 representing 31.8%, Southern region recorded 512,183 plots (20.4%), North-Western region 491,518 plots (19.6%), Northern region 476,664 plots (19.0%) and Western Area Rural 230,523 plots (9.2%).

Figure 2.4: *Percentage of plots by type of cropping and district, 2023*

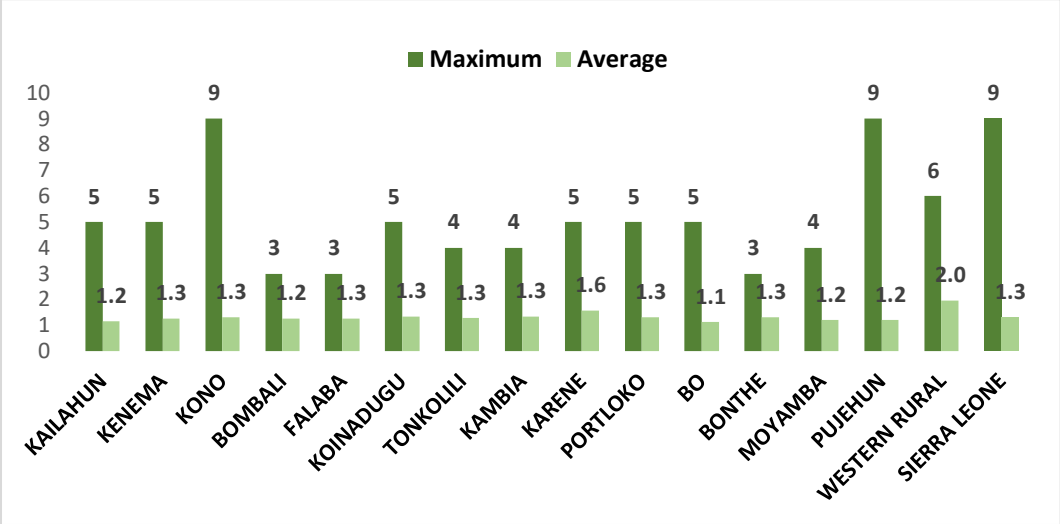


***Source:** Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

There is a maximum number of crops in a farm plot *by district.*

Figure2.5 shows number of crops in farm plots in Sierra Leone and by district. The survey data indicates that the maximum number of crops in a farm plot was 9 nationwide; with an average of around 1 (one) crop per plot. All districts accounted for around 1 (one) crop per plot, on average; except Western Area Rural which reported an average of 2 crops per plot. Obviously, 1 (one) crop was reported at minimum per plot nationally and in all districts. The maximum number of crops per plot, however, differs across districts. Results indicated that Kono and Pujehun districts reported 9 crops in farm plots at maximum, the highest. The other districts reported maximum crops per plot ranging 3 - 6 crops.

Figure 2.5: *Number of crops in farm plots in Sierra Leone and by district, 2023*

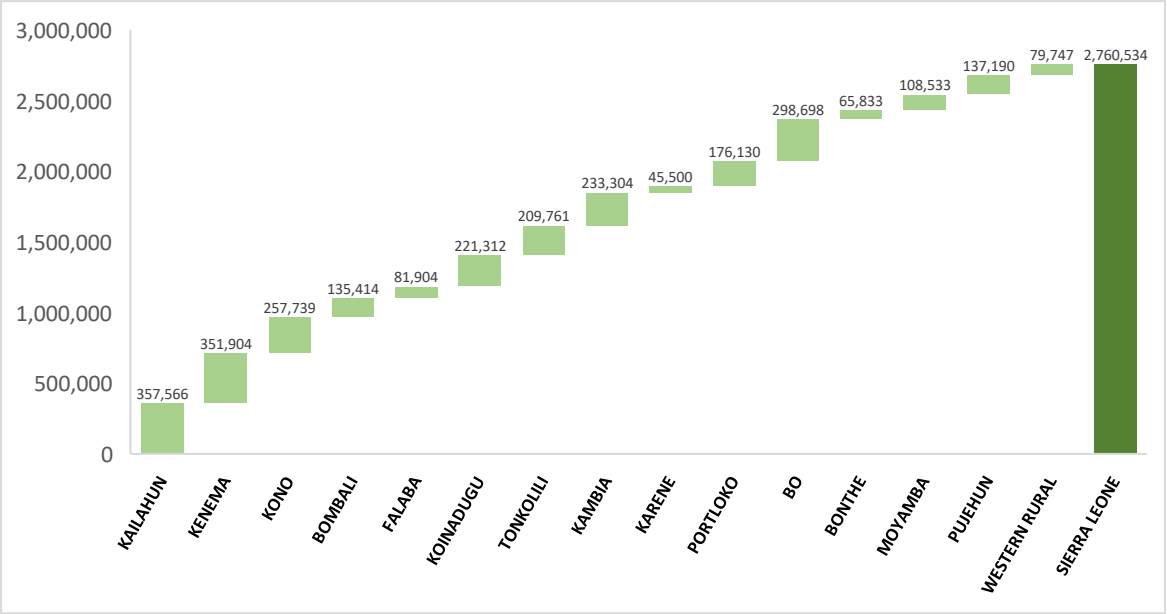


Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Eastern region recorded the highest crop area at 967,209 ha

The total crop area cultivated in 2023 was estimated at 2,760,534 hectares (ha) nationwide as shown in Figure 2.6. Across the regions, Eastern region recorded the highest crop area at 967,209 ha, representing 35.0 percent of the total crop area. This was followed by Northern region 648,391 (23.5 percent), Southern region 610,253 (22.1 percent), North-Western region 454,934 (16.5 percent) and Western Area 79,747 (2.9 percent), the least. Results at district level reveal Kailahun had the largest crop area of 357,566 ha; followed by Kenema 351,904 ha, Bo 298,698 ha and Kono 257,739 ha. Karene registered the lowest with crop area at 45,500 ha.

Figure 2.6: *Total crop area (in hectare) by district, 2023*



Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

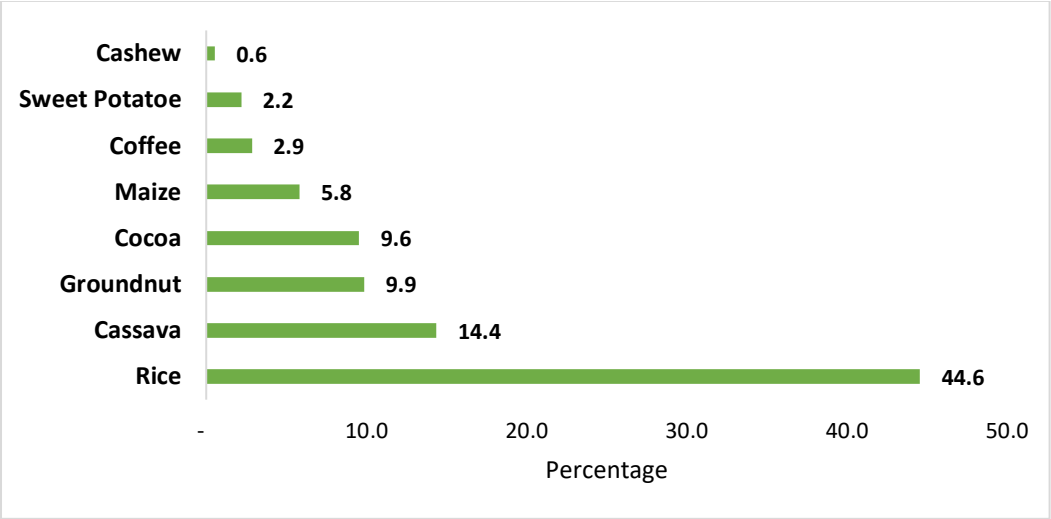
8.2 Section 2.2: Crop, Aquaculture and Forest Production

8.2.1 Crop Cultivation

Analysis of crop cultivation was limited to the eight major crops as specified by the Ministry of Agriculture and Food Security (MAFS). The major crops include rice, cassava, sweet potatoes, maize, cocoa, coffee, cashew and groundnut.

Data suggest 89.8 percent of the total plots (2,760,534) was cultivated with the eight major crops. Figure3.8 shows the percentage of plots by major crop grown. Results indicated was grown on greater portion (44.6 percent) of plots being cultivated than any other crop. Cassava ranked second crop grown at 14.4 percent, groundnut third (9.9 percent) and cocoa fourth (9.6 percent). Cashew was least crop grown at 0.6 percent.

Figure 2.7: *Percentage of plots by major crop grown in Sierra Leone, 2023*



Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Crop plantation months

Majority of the crops are cultivated in the moths of April to July

Table 2.2 shows percentage of plots by crop plantation month. It was revealed from the survey that greater plots of maize (81.0 percent), rice (91.6 percent), groundnut (87.4 percent) and sweet potato (78.8 percent) were cultivated in the months of April to July whilst most plots of cassava (89.6 percent) was cultivated in March to July. Cocoa (99.5 percent) was predominantly cultivated in February whereas the bulk of plots for coffee (98.9 percent) and cashew (100 percent) were cultivated in February or April.

Table 2.2: *Percentage of plots by crop plantation month in Sierra Leone, 2023*

	MAJOR CROPS							
Crop plantation month	Maize	Rice	Ground nut	Sweet potatoes	Cassava	Cocoa	Coffee	Cashew
JANUARY	1.1	0.2	0.1	3.0	0.8	0.0	0.0	0.0
FEBRUARY	2.7	0.2	0.5	2.3	1.6	99.5	45.2	14.3
MARCH	4.3	2.1	3.4	3.0	13.2	0.1	0.0	0.0
APRIL	19.0	16.8	23.4	14.4	39.6	0.1	53.7	85.7
MAY	30.4	33.7	33.1	25.8	21.7	0.3	0.0	0.0
JUNE	20.1	23.0	15.1	22.0	7.8	0.0	0.0	0.0
JULY	11.4	18.2	15.9	16.7	7.3	0.0	1.1	0.0
AUGUST	6.5	4.2	5.0	10.6	4.8	0.0	0.0	0.0
SEPTEMBER	1.1	1.1	2.3	2.3	1.0	0.0	0.0	0.0
OCTOBER	2.7	0.3	0.9	0.0	1.0	0.0	0.0	0.0
NOVEMBER	0.0	0.2	0.4	0.0	0.4	0.0	0.0	0.0
DECEMBER	0.5	0.1	0.0	0.0	0.8	0.0	0.0	0.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Cocoa was the cultivated tree crop, under the study year.

Table 2.3 shows number of various tree crops plots grown by crops plantation year. Cocoa was largely cultivated (1,054,388) than any of the tree crops and was mostly cultivated in the year 2021 according to the survey. This was followed by oil palm/eendunga (969,638) which was largely cultivated in 2023 and coffee (316,566), cultivated almost equally in 2021 and 2023. The least tree crop grown were paw-paw and naartjie, each 1,246 grown in 2023. Overall, the highest number of tree crops were grown in 2023 whilst 2022 accounted for the least number of tree crops (mainly oil palm) grown.

Table 2.3: *Number of tree crops plots grown by crop plantation year in Sierra Leone, 2023*

Tree crops	YEAR OF PLANTATION			TOTAL
	2021	2022	2023	
COCOA	1,048,156	0	6,232	1,054,388
COFFEE	152,051	0	164,514	316,566
CASHEW	8,724	0	52,345	61,070
LEMON AND LIMES	0	0	4,985	4,985
MANGOS	0	0	9,971	9,971
ORANGES	9,971	0	17,448	27,419
OTHER FRUITS AND NUT	9,971	0	43,621	53,592
PAW-PAW	0	0	1,246	1,246
NAARTJIE	0	0	1,246	1,246
GRAPES	1,246	0	1,246	2,493
GUAVA	0	0	4,985	4,985
OIL PALM/EENDUNGA	1,246	1,246	967,145	969,638
ALL	**1,231,365**	**1,246**	**1,274,986**	**2,507,598**

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

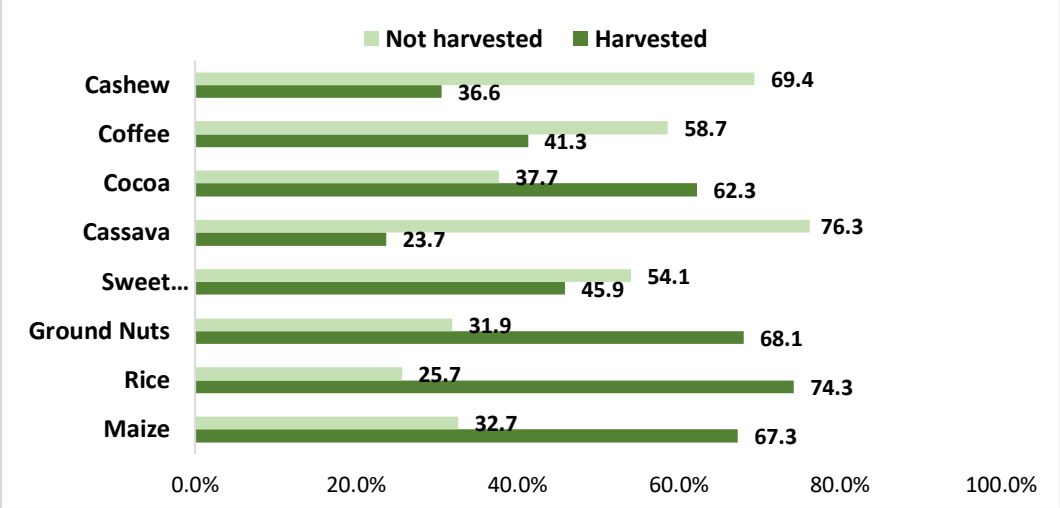
Major crop harvested

Rice recorded the highest percentage being harvested at 74.3 percent.

Figure2.8 shows the percentage of major crops harvested during the survey period (November – December 2023). Among the major crops harvested, rice recorded the highest percentage being harvested at 74.3 percent. Groundnut registered the second highest at 68.1 percent. The least crop harvested in the period was cassava, reported at 23.7 percent. Results further suggest significant percentages of the crops were not harvested during the survey period, ranging from 25.7 percent for rice to 76.3 percent for cassava, the highest. However, it is

important to note here that these crops were not harvested since they were not matured for the harvest during the survey period but are surely harvested later.

Figure 2.8: *Percentage of major crops harvested in Sierra Leone, 2023*



Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

August to November are the peak months of harvesting major crops

Table 2.4 presents the months of harvesting the major crops in 2023. Results indicated the peak months of harvesting maize, rice and groundnut are August-November, October-December, and August-October; respectively; during which majority of these crops were harvested. Cocoa was mostly harvested in August-December, most of sweet potatoes and coffee were harvested in November-December, each; whilst cashew was popularly harvested in May.

Table 2.4: Months of harvesting major crops in Sierra Leone, 2023

Months	MAJOR CROPS							
	Maize	Rice	Ground nut	Cassava	Sweet Potato	Cashew	Cocoa	Coffee
January	0.0	0.7	0.0	0.6	0.5	1.9	0.2	0.5
February	0.0	0.1	0.1	0.9	0.6	4.9	0.0	0.0
March	0.5	0.6	0.2	0.8	0.5	4.7	0.0	0.0
April	4.3	0.4	2.7	1.0	4.5	1.2	0.0	0.0
May	0.4	1.5	3.7	1.6	1.8	11.7	0.7	0.6
June	2.7	1.0	2.1	1.7	3.6	1.7	2.8	0.4
July	5.6	1.3	4.8	1.1	1.8	4.7	7.4	1.3
August	10.9	2.5	17.8	3.2	6.1	0.0	25.8	2.4
September	17.3	8.9	20.1	3.2	6.5	4.1	26.8	4.9
October	13.8	21.9	11.6	3.4	7.5	2.5	25.5	5.6
November	17.7	44.1	7.9	6.2	11.2	4.1	29.8	17.5
December	5.4	15.6	4.7	4.8	9.2	1.0	16.3	27.0

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

The main reason for not harvesting major crops during 2023 agricultural season is presented in Table2.5. According to results, the majority of five annual crops (maize, rice, groundnut, cassava, sweet potato) were not harvested at time of survey possibly because they were not mature for harvest (not harvest season). Whereas most of cashew, cocoa and coffee were not harvested for other reasons (not specified). Among other reasons specified, delayed/deferred harvest as well as lack of labor were mainly responsible for not harvesting the aforementioned crops. Whilst pests/diseases were the main reason for not harvesting cashew, cocoa and coffee.

Table 2.5: *Main reason for not harvesting major crops during 2023 agricultural season, Sierra Leone, 2023*

Main reason	MAJOR CROPS							
	Maize	Rice	Ground nut	Cassava	Sweet Potato	Cashew	Cocoa	Coffee
Too little rain/Drought	6.2	2.7	0.5	1.0	1.7	0.0	0.9	0.8
Too much Rain/flood	1.6	2.9	1.6	0.6	1.4	4.4	6.4	6.8
Rain came too early	0.0	0.6	0.0	0.2	2.5	0.0	0.4	0.6
Rain came too late	0.0	0.7	0.5	0.3	0.4	0.0	0.0	0.0
Erratic/Irregular rainfall	0.9	0.4	0.0	0.1	0.3	1.7	0.4	1.2
Pests/Diseases	5.5	1.3	2.0	1.3	2.0	24.9	23.6	17.1
Fire	2.9	0.2	1.0	0.2	0.0	0.0	0.9	2.8
Disagreement on land ownership	1.0	0.3	0.2	0.0	0.3	0.0	0.8	0.4
Crop Theft	0.6	0.4	0.4	0.6	0.9	0.0	0.8	0.0
Unable to work due to Sickness	5.1	1.4	4.5	1.1	2.9	0.0	0.0	0.8
No Available Labor	11.9	3.5	8.9	2.5	8.3	0.0	1.0	1.2
Not harvest season	43.4	63.0	67.7	73.0	62.5	4.0	0.9	0.0
Delayed/Deferred harvest	13.8	10.1	7.8	14.8	9.7	2.4	5.8	11.8
Others	7.1	12.4	5.1	4.4	7.2	62.6	58.0	56.3
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023.*

Crop production in Sierra Leone, 2023

Rice was the highest crop produced, followed by potatoes.

The results on production of crops was limited to the eight major crops as previously specified in the previous section. Table 2.6 shows production of major crops, area cultivated and yield in 2023. Rice was the highest crop produced at 1,407,905,536 kilogram (kg). Production of sweet potato ranked second highest (266,696,160 kg) whilst coffee was least produced at 2,333,162 kg. With regards are cultivated, rice accounted for the largest land area cultivated at 704,820 ha and coffee accounted for the least area cultivated at 1,607 ha. In terms of yield, sweet potato recorded the highest yield at 7,905 kg/ha whilst rice was estimated at 1,998 kg/ha.

Table 2.6: *Production of major crops, area cultivated and yield; Sierra Leone, 2023*

Crop	Production, Acreage and Yield in SL ILP 2023		
	Production (kg)	Area (ha)	Yield (kg/ha)
Maize	25,294,234	15,985	1,582
Rice	1,407,905,536	704,820	1,998
Groundnut	121,881,136	97,014	1,256
Sweet potato	266,696,160	33,736	7,905
Cashew	2,784,903	13,467	207
Cocoa	12,079,939	35,229	343
Coffee	2,333,162	1,607	1,452

Source: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023.

8.2.2 Aquaculture production

Aquaculture is known as aquafarming and is an alternative to catching wild fish that can take place in marine or inland areas. Aquaculture production is the output of aquatic organisms such as fish, crustaceans, mollusks and aquatic plants raised for consumption.

Fish accounted for the highest number of species raised

Table 2.7 shows aquaculture species raised and holdings reporting in 2023. According to the survey, total quantity of species raised was estimated at 14,383,561 reported in 15,596 holdings. Fish accounted for the highest number of species raised (12,569,157) in 11,789 holdings whilst crustaceans were least raised (379,153) in 1,306 holdings. Also, no clams/mollusks were reportedly raised.

***Table** 2.7: Aquaculture species raised and holdings reporting in Sierra Leone, 2023*

Species	Number of holdings reporting species	Total quantity of species raised (in kg)
Fish (tilapia/catfish)	11,789	12,569,157
Crustaceans	1,306	379,153
Clams/mollusks	0	0
Others	2,501	1,435,251
TOTAL	**15,596**	**14,383,561**

***Source:** Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Fish recorded the highest being captured

Table 2.8 shows capture fishing and holdings reporting in 2023. The total quantity of species collected was 184,967,623 reported in 78,747 holdings. Of the species collected, fish recorded the highest at 182,271,152 with 75,215 holdings reporting the species. Whilst 2,696,471

crustaceans were collected from 3,531 holdings but no clams/mollusks and other species were collected.

Table 2.8: *Capture fishing and holdings reporting in Sierra Leone, 2023*

Species	Number of holdings reporting species	Total quantity of species collected (in kg)
Fish (tilapia/catfish)	75,216	182,271,152
Crustaceans	3,531	2,696,471
Clams/mollusks	0	0
Other	0	0
TOTAL	**78,747**	**184,967,623**

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey*

8.2.3 Forestry production

Firewood was predominant wood-based product and consistently the highest forestry product being collected.

Forestry production was categorized into wood-based and non-wood-based products as displayed in Table 3.9. According to the survey, the total quantity of forestry products collected in 2023 was 21,955,217,516 kg reported from 407,724 holdings. Results indicated that the bulk of forestry products collected was wood-based, which accounted for 96.8 percent (21,255,492,268 kg) of the total quantity of products. Whilst non-wood-based products represented barely 3.2 percent (699,725,248 kg). Firewood was predominant wood-based product and consistently the highest forestry product being collected, recorded at 21,057,942,419 kg. Amongst the non-wood-based products, other non-wood product (376,316,271 kg) was mostly collected. This was followed by palm wine (122,188,906 kg), coconuts (88,011,261 kg), honey (50,643,612 kg) and snails (37,266,659 kg).

Table 2.9: *Forestry production and holdings reporting, Sierra Leone, 2023*

Products		Number of holdings reporting products	Total quantity of products collected (in kg)
Wood-based	Firewood	340,874	21,057,942,419
	Other woods	8,611	197,549,849
Non-wood based	Coconuts	3,856	88,011,261
	Jackfruit	81	189,574
	Honey	9,613	50,643,612
	Palm wine	6,245	122,188,906
	Medicinal plants	9,727	13,123,402
	Tea leaves	1,590	4,830,953
	Snails	3,580	37,266,659
	Wild pigs	246	76,900
	Sand	3,529	7,077,708
	Other non-wood	19,771	376,316,271
TOTAL		**407,724**	**21,955,217,516**

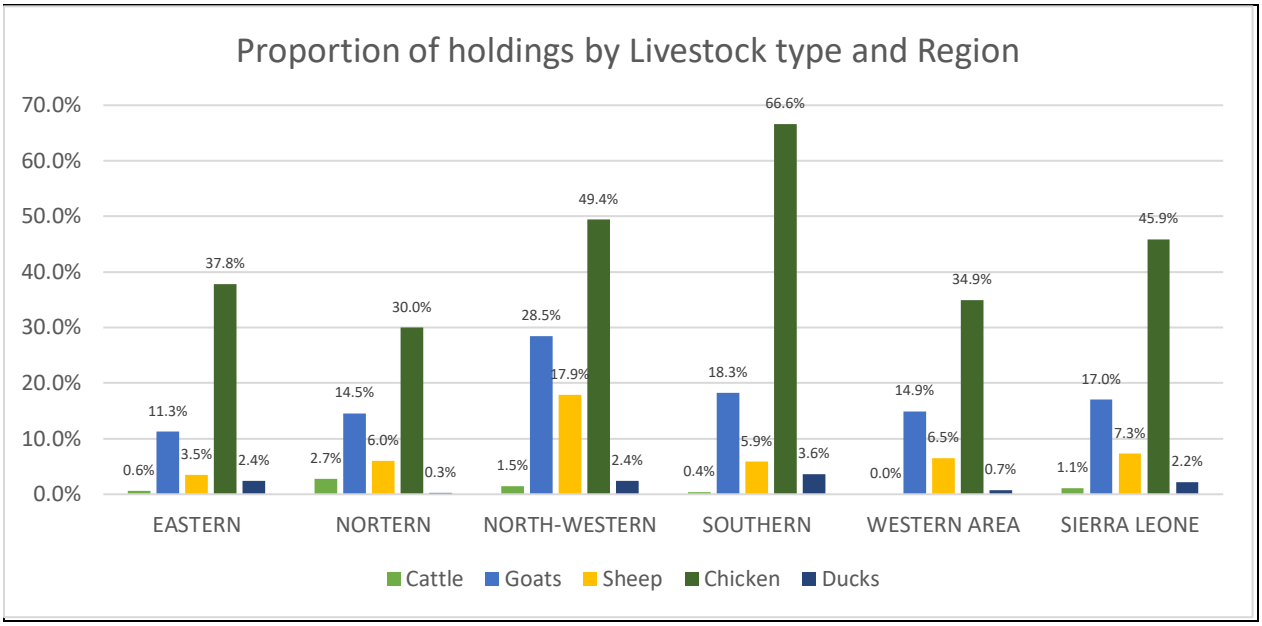
Source: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023

8.3 Section 2.2: Livestock production

Chickens are the largest holding of livestock, seconded by goats.

The figure below shows the proportion of holdings of Livestock by type and region in Sierra Leone. The chart indicates a significant proportion of chickens above 29% are held in all the five regions with the Southern region holding 66.6% and the Northern holding the least of 30%. The chart also points out the second largest proportion of holding of livestock are Goats, North-West has the largest of 28.5% and Eastern region has the least of 11.3%. It also shows that Cattles are the least proportion of livestock holdings in all the five regions with Western Area having the least of 0.01% of cattle.

Figure 2.9: *Proportion of holdings by Livestock type and Region*

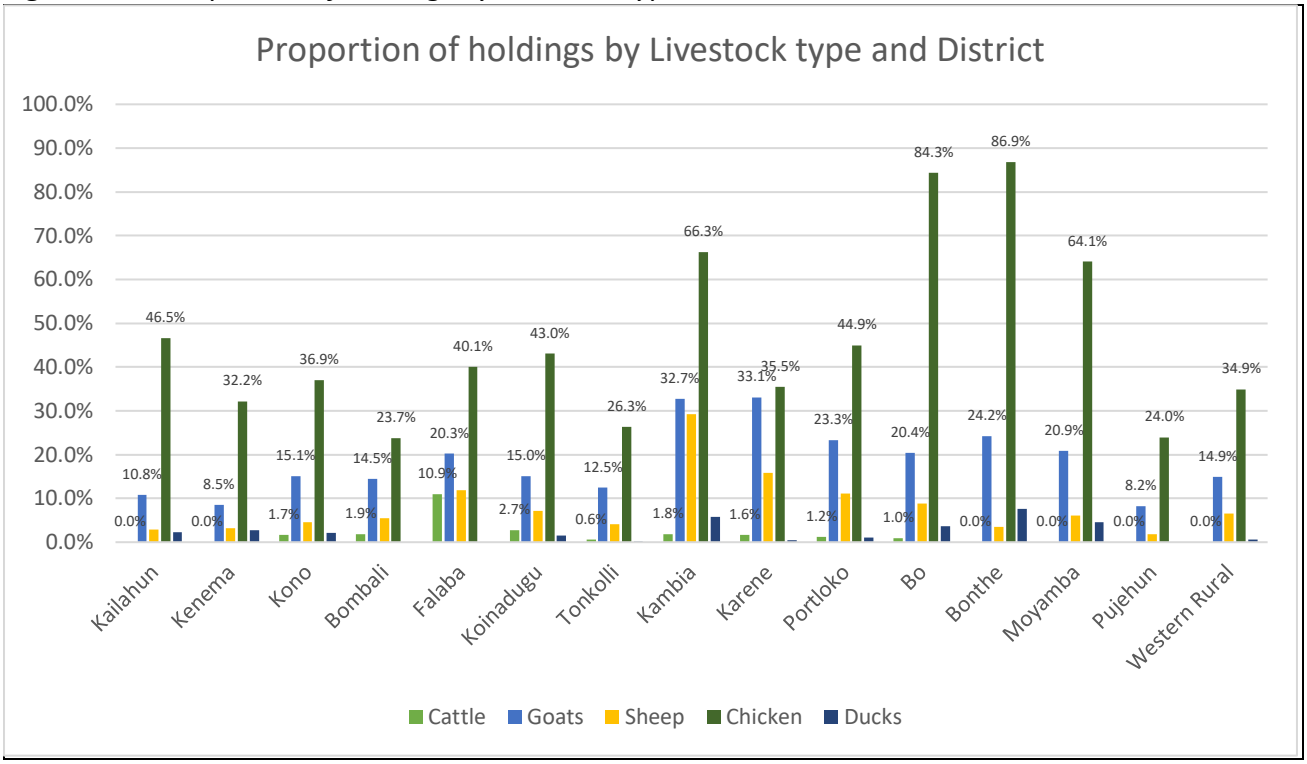


Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Sierra Leone is characterized by high proportion of poultry breeding and low cattle rearing

The figure below depicts the proportion of livestock type, poultry breeding is the common livestock raising agricultural activity in every district in Sierra Leone. Bonthe is observed to have the highest proportion of poultry holdings with 86 percent, followed by Bo with 84 percent and Kambia 66 percent and Moyamba 64 percent closely trailing behind Kambia. The proportion of goat raised in Sierra Leone is the second largest proportion of live stock holding, as 33.1 percent in Karene, 32.7 Percent in Kambia and the least in Pujehun with 8.2 percent. The proportion of livestock holding for sheep is higher in Kambia district with 32.7 percent and Karene , Portloko and Falaba almost with same proportion of holdings in these districts Cattle rearing is less prominent among livestock holding as compared to the proportion of breeding poultry , goat and sheep, Falaba district account for 10.9 percent whilst other districts have infinitesimal proportion of cattle rearing. Ducks among others lives stock have the lowest proportion of holding in Sierra Leone with exception of Bonthe 0.09, 0.07 for Moyamba and Kambia, 0.06 percent respectively.

Figure 2.10: *Proportion of holdings by Livestock type and District*



Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Disparity between the proportion of Male managers, Female mangers and children managers for bulls

The male managers of Bulls are 70.4% and Female managers,15.8% and children,13.8% portrays verse disparity between the male, female and children Bull managers.

The percentages in Table 3.10 depicts that, for the rearing of Bulls by Region district and gender, the Eastern region shows no rearing of bulls. In the Northern Region only two district account, 73.5 percent of male rear bull and 26.5 percent of women rear bulls in Falaba and Koinadugu with 74 percent, and Kambia district 50 percent, and finally Bo district 54.8 percent and 45.2 percent for children respectively.

Other districts such as Kailahun, Kenema and Kono in the eastern region, Bombali northern region and Karene and Portloko in the north western region and Bonthe, Moyamba, Pujehun in the southern region reported no proportion of managers of bulls.

Table 2.10: *Proportion of Livestock Managers for Bulls by Region, District and Gender*

	Men	Women	Children
EASTERN	100.0%	0.0%	0.0%
Kailahun			
Kenema			
Kono	100.0%	0.0%	0.0%
NORTHERN	73.5%	26.5%	0.0%
Bombali			
Falaba	73.3%	26.7%	0.0%
Koinadugu	74.1%	25.9%	0.0%
Tonkolli			
NORTH-WESTERN	50.0%	0.0%	50.0%
Kambia	50.0%	0.0%	50.0%
Karene			
Portloko			
SOUTHERN	54.8%	0.0%	45.2%
Bo	54.8%	0.0%	45.2%
Bonthe			
Moyamba			
Pujehun			
WESTERN AREA			
Western Rural			
SIERRA LEONE	**70.4%**	**15.8%**	**13.8%**

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

The proportion of managers for Cows in the table above shows that the country has a reasonable representation of 49.1 percent and 32.4 and 18.5 percent male, Female and children managers for cows. Bo district in the southern province records the highest proportion of male managers for Cows, 100 percent and followed by Kambia in the North West region with a proportion of 81.7 percent and no Female managers for cows in both districts. However, in the Eastern region's female managers for cows, 51.9 percent is greater than the male managers, 37.0%. There are 8 districts that records neither male nor female proportion managers for Cows. In the north western region, the proportion of children manager for cow, 27.0% is greater than female managers reported to be 17.8 percent.

Table2.11: P*roportion of Livestock Managers for Cows by Region, District and Gender*

	Men	Women	Children
EASTERN	37.0%	51.9%	11.1%
Kailahun			
Kenema			
Kono	37.0%	51.9%	11.1%
NORTHERN	47.0%	38.0%	15.0%
Bombali	70.8%	29.2%	0.0%
Falaba	37.9%	41.4%	20.7%
Koinadugu			
Tonkolli	40.5%	40.5%	19.1%
NORTH-WESTERN	55.2%	17.8%	27.0%
Kambia	81.7%	0.0%	18.3%
Karene	51.6%	27.0%	21.4%
Portloko	38.3%	22.0%	39.7%
SOUTHERN	100.0%	0.0%	0.0%
Bo	100.0%	0.0%	0.0%
Bonthe			
Moyamba			
Pujehun			
WESTERN AREA			
Western Rural			
SIERRA LEONE	49.1%	32.4%	18.5%

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

The district with highest proportion of managers for Cocks/ Broilers is Bo

The country's proportion of managers for cocks/ broilers recorded at 12.4% 62.9% and 24.7% for male, female and children respectively. It is further observed that the Female managers of Cocks/Broilers far outweighs male and children managers for Cocks/broilers.

Livestock manages for cocks/ Broilers as depicted in table 3 shows in the western area rural have the highest male managers for cock/ broilers, 15.7% and closely followed by northern region with 15.5%. The east and North West equals at the same 12.0%. Furthermore, the southern region has the greater proportion of Female managers for Cock/Broilers 68.9% closely competing with northern region with 66.0. The district with highest proportion of managers for Cocks/ Broilers is Bo, 80.9% with Kailahun Pujehun and Bombali closely following.

Table 2.12: *Proportion of Livestock Managers for Cocks/Broilers by Region, District and Gender*

	Men	Women	Children
EASTERN	12.0%	67.4%	20.6%
Kailahun	5.6%	76.6%	17.8%
Kenema	8.2%	59.7%	32.1%
Kono	20.6%	65.8%	13.6%
NORTHERN	15.5%	66.0%	18.5%
Bombali	10.8%	69.0%	20.1%
Falaba	19.6%	56.2%	24.2%
Koinadugu	16.7%	66.9%	16.4%
Tonkolli	15.5%	69.1%	15.4%
NORTH-WESTERN	12.8%	48.8%	38.5%
Kambia	11.0%	47.3%	41.7%
Karene	22.6%	40.0%	37.4%
Portloko	7.5%	58.4%	34.1%
SOUTHERN	10.9%	68.9%	20.3%
Bo	14.1%	80.3%	5.6%
Bonthe	9.9%	52.1%	38.0%
Moyamba	8.3%	65.3%	26.4%
Pujehun	3.9%	73.2%	22.9%
WESTERN AREA	15.7%	63.8%	20.5%
Western Rural	15.7%	63.8%	20.5%
SIERRA LEONE	**12.4%**	**62.9%**	**24.7%**

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

The proportional distribution shows more women managers for hens/layers than men

The table below shows the proportion of Livestock Managers for Hens/ Layers by region, district and gender. The proportional distribution shows more women managers for hens/layers ranging from 49.7% to 79.2 than men ranging from 5.0% to 15.6% in the entire sixteen (16) districts and all the five (5) regions in Sierra Leone. The North-Western Region has the highest proportion of Livestock Children Managers Hens/ Layers of 35.7% and Bonthe District has the highest proportion of Children Managers of 42.5% and Bo has the least of 3.0%.

***Table 2.13**: Proportion of Livestock Managers for Hens/Layers by Region, District and Gender*

Region/ District	Men	Women	Children
EASTERN	**8.3%**	**69.5%**	**22.2%**
Kailahun	5.0%	76.9%	18.1%
Kenema	5.5%	63.9%	30.7%
Kono	14.9%	67.3%	17.7%
NORTHERN	**13.4%**	**69.9%**	**16.7%**
Bombali	11.2%	66.9%	21.9%
Falaba	14.3%	68.8%	16.8%
Koinadugu	11.5%	69.7%	18.7%
Tonkolli	15.6%	72.9%	11.5%
NORTH-WESTERN	**12.3%**	**52.0%**	**35.7%**
Kambia	15.0%	48.1%	36.9%
Karene	15.6%	43.3%	41.1%
Portloko	6.2%	63.1%	30.7%
SOUTHERN	**10.4%**	**69.3%**	**20.3%**
Bo	12.2%	84.8%	3.0%
Bonthe	7.8%	49.7%	42.5%
Moyamba	9.9%	74.0%	16.2%
Pujehun	12.9%	60.5%	26.6%
WESTERN AREA	**14.8%**	**79.2%**	**6.0%**
Western Rural	**14.8%**	**79.2%**	**6.0%**
SIERRA LEONE	**10.9%**	**66.5%**	**22.6%**

***Source:** Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Karene district indicates the highest proportion of Children managers

The table below presents the Proportion of Livestock Managers for Goats by Region, District and Gender. It shows more men managers for Goats in the Eastern, Northern, and Southern of 53.6%, 54.1% and 53.0% respectively and more women managers for Goats in the Western Area, Western Rural and North-Western Region of 68.5%, 68.5% and 35.1% respectively. Western Area and Western Rural districts have the highest proportion of women managers of 68.5% for goats, followed by Bombali district of 41.3% and Pujehun district has the least proportion of women managers of 8.0%. The table also indicates Karene with the highest proportion of Children managers of 35.8% for goats and Bo district has the least proportion of children managers of 5.9% for goats.

Table 2.14: *Proportion of Livestock Managers for Goats by Region, District and Gender*

Region/Distict	Men	Women	Children
EASTERN	**53.6%**	**29.3%**	**17.0%**
Kailahun	62.0%	25.6%	12.3%
Kenema	55.2%	20.5%	24.3%
Kono	48.5%	36.2%	15.3%
NORTHERN	**54.1%**	**32.5%**	**13.4%**
Bombali	49.2%	41.3%	9.4%
Falaba	54.7%	26.4%	18.9%
Koinadugu	54.2%	29.0%	16.8%
Tonkolli	57.6%	30.9%	11.5%
NORTH-WESTERN	**29.9%**	**35.1%**	**35.0%**
Kambia	23.9%	38.3%	37.8%
Karene	32.6%	31.6%	35.8%
Portloko	33.3%	36.1%	30.6%
SOUTHERN	**53.0%**	**27.8%**	**19.3%**
Bo	74.4%	19.7%	5.9%
Bonthe	31.8%	37.1%	31.2%
Moyamba	55.3%	30.1%	14.5%
Pujehun	57.6%	8.0%	34.4%
WESTERN AREA	**15.8%**	**68.5%**	**15.8%**
Western Rural	**15.8%**	**68.5%**	**15.8%**
SIERRA LEONE	**44.2%**	**32.7%**	**23.1%**

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

The proportional distribution shows more men managers for sheep in the East, North, and Southern regions

The table below presents the Proportion of Livestock Managers for Sheep by Region, District and Gender in Sierra Leone. The proportional distribution shows more men managers for sheep in the East, North, and Southern regions of 57.6%, 52.5% and 63.5% respectively. The Western Area and Western Rural has 100% of women managers for sheep followed by North-Western region with 45.3% of women managers. Kailahun district has the highest proportion of men managers for sheep of 73.3% and the least proportion of women managers for sheep of 11.4%

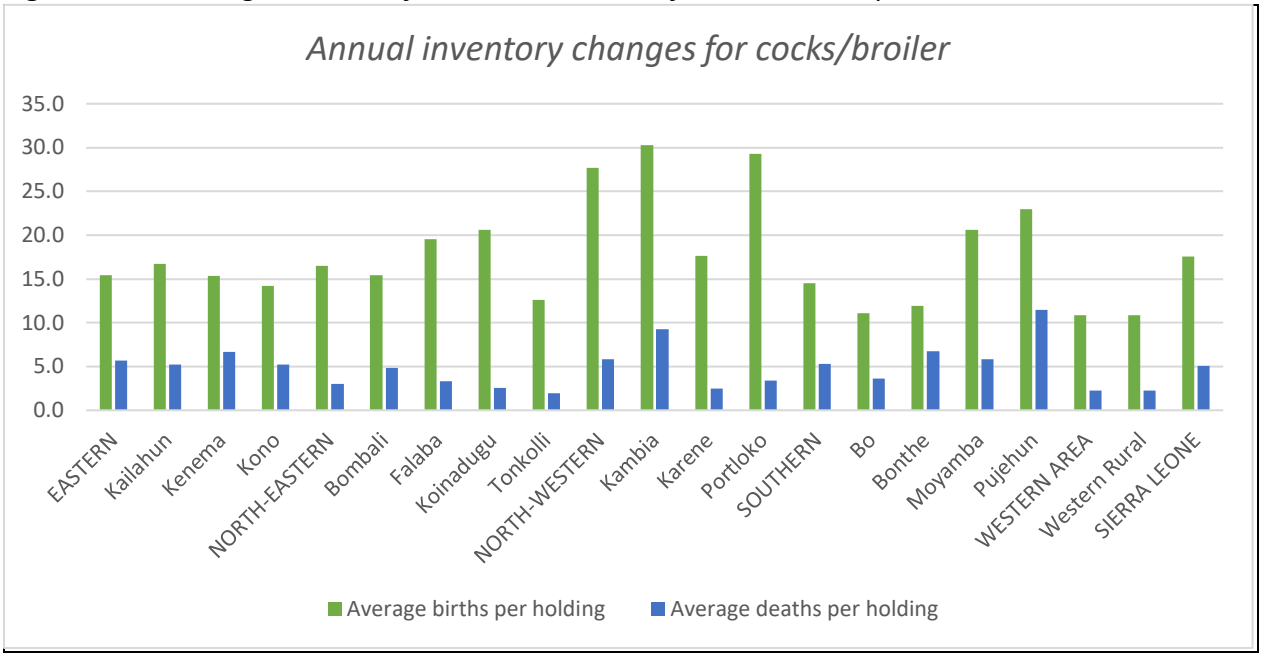
Table 2.15: *Proportion of Livestock Managers for Sheep by Region, District and Gender*

Region/District	Men	Women	Children
EASTERN	**57.6%**	**26.5%**	**15.9%**
Kailahun	73.3%	11.4%	15.3%
Kenema	48.6%	31.0%	20.4%
Kono	57.0%	30.0%	13.0%
NORTHERN	**52.5%**	**28.9%**	**18.6%**
Bombali	35.7%	47.1%	17.1%
Falaba	53.7%	21.3%	25.0%
Koinadugu	64.9%	17.6%	17.6%
Tonkolli	64.0%	23.3%	12.7%
NORTH-WESTERN	**23.4%**	**45.3%**	**31.3%**
Kambia	14.7%	49.2%	36.1%
Karene	28.6%	35.8%	35.5%
Portloko	37.3%	48.2%	14.4%
SOUTHERN	**63.5%**	**23.7%**	**12.8%**
Bo	89.3%	10.7%	0.0%
Bonthe	32.1%	30.8%	37.1%
Moyamba	43.4%	47.5%	9.1%
Pujehun	11.8%	20.1%	68.1%
WESTERN AREA	**0.0%**	**100.0%**	**0.0%**
Western Rural	**0.0%**	**100.0%**	**0.0%**
SIERRA LEONE	**39.5%**	**38.2%**	**22.3%**

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

The figure below shows that the average births per holding is greater than the average deaths per holding for all districts and regions. The highest births of birds were recorded in Kambia and Port Loko districts in the North-Western region while the highest incident of deaths was recorded in the Pujehun district, Southern region.

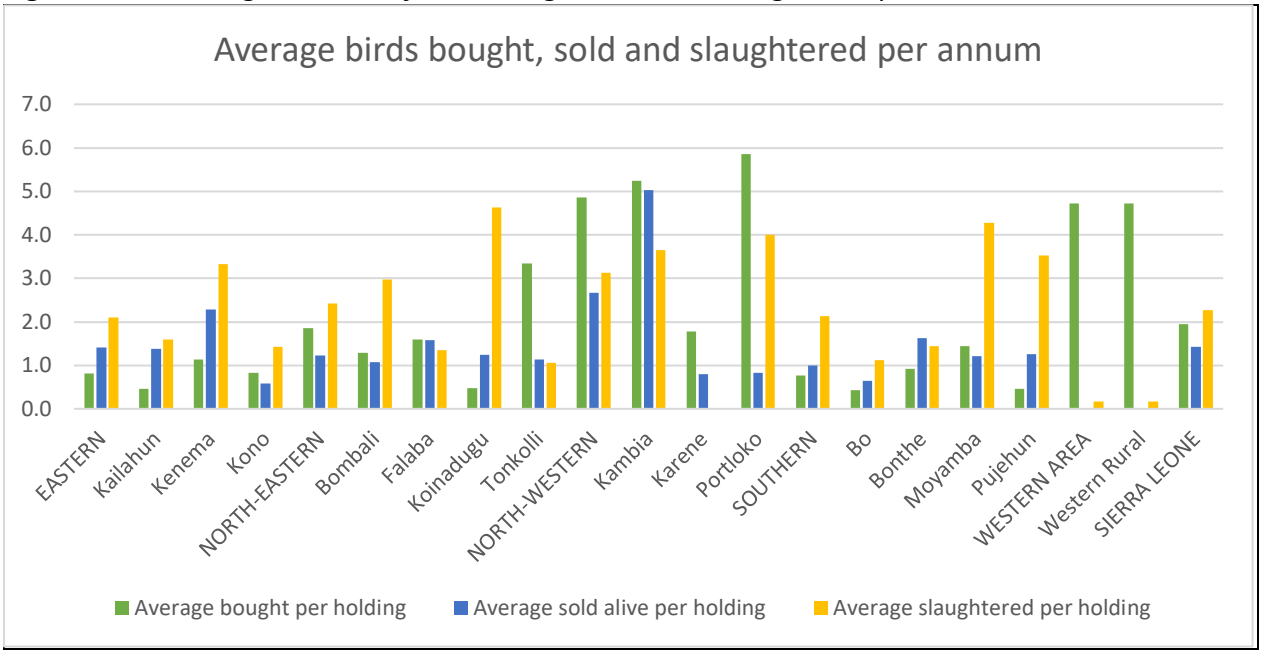
***Figure 2.11*:** *Average number of births and deaths of cocks/broilers per annum*



***Source**: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

The Figure above shows that the average number of birds bought, sold and slaughtered were very high in the Kambia district while the average number of birds bought was high in Port Loko and Western Rural districts. Also, the average number of birds slaughtered in Koinadugu, Port Loko, Moyamba and Pujehun was very high.

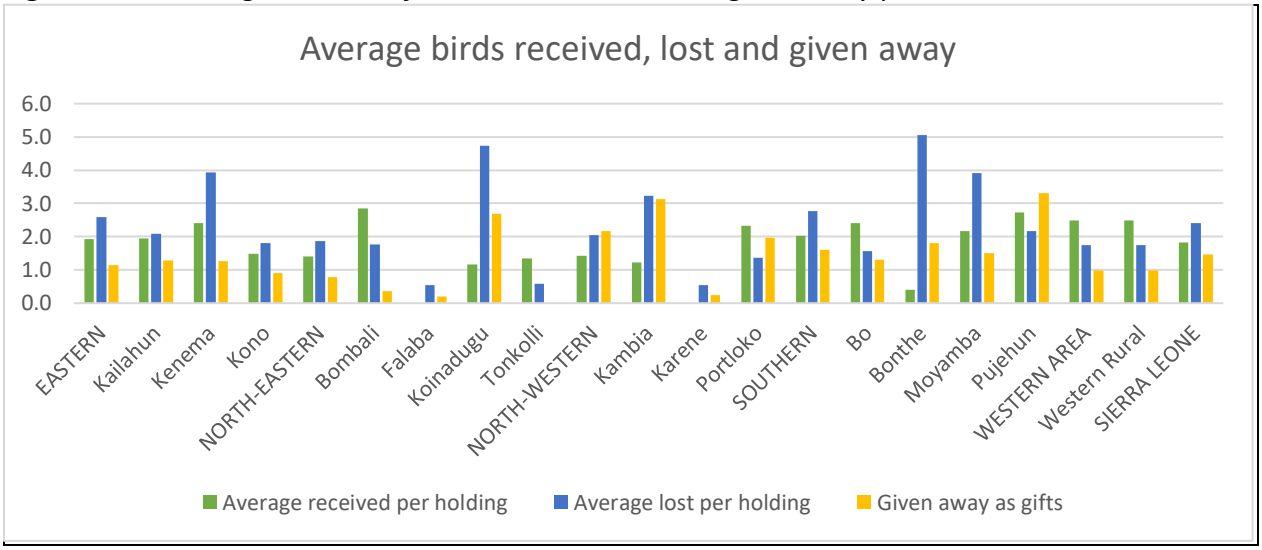
Figure 2:12: *Average number of birds bought, sold and slaughtered per annum*



Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Figure2.13 shows that the average number of birds lost was high in Kenema, Koinadugu, Bonthe and Moyamba districts which was followed by Kambia district. The average number of birds given as gift was high Koinadugu, Kambia and Pujehun districts. While the average number of birds received was high in Kenema, Bombali, Port Loko, Moyamba, Pujehun and Western Rural Area district.

Figure 2.13: *Average number of birds received, lost and given away per annum*



Source: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023

CHAPTER 3: INPUTS, FARM INCOME, LABOR AND PRODUCTIVITY

This chapter examined farm income, labor, and productivity in Sierra Leone. It analyzed access to agricultural inputs, loans, and labor force, presenting the findings at national or district level, depending on the indicator.

8.4 Section 3.1: Access to Agricultural Inputs and Loans

A high prevalence of organic fertilizer use compared to other types of input

Table 3.1 below shows a high prevalence of organic fertilizer use compared to other types of input for almost all crop categories. What's more, fertilizer use for each category varies from one crop to another. The study shows categories by crop type, including cereals, legume crops, oilseed crops, roots/tubers, tree crops, and vegetables. Sorghum shows the highest fertilizer usage among cereals, with 29.3% of households using organic and 27.3% using inorganic fertilizers, with no pesticides used. In the legume crop category, beans reported the highest use of fertilizers, with 9.3% organic and 3.2% inorganic, and a very low use of pesticides at 0.3%. For roots and tubers, sweet potatoes show more significant usage at 19.7% organic and 16.8% inorganic. While pesticide use is 2.9% among tree crops, the use of organic fertilizer, inorganic fertilizer, and pesticides is higher for oranges (9.8%, 7.4%, and 5.4%), respectively. In the vegetable category, usage rates are notably higher, especially for tomatoes (34.5% organic, 25.9% inorganic), with low pesticide use (1.1%).

Table 3.1: *Percentage of agricultural households using fertilizer and pesticide by type and type of crop in Sierra Leone, 2023*

Crop Category	Crop Name	Organic fertilizer	Inorganic fertilizer	Pesticide
Cereals	Maize	19.0	17	6.4
	Millets	4.2	0.8	0.8
	Rice	7.3	5.8	4
	Sorghum	29.3	27.3	0
Leguminous crops	Beans	9.3	3.2	0.3
	Peas	4.3	0	0
Oil seed crops	Ground Nuts	7.7	4.4	2.5
Roots/Tubers	Cassava	8.7	6.3	2.6
	Sweet Potatoes	19.7	16.8	2.9
	Yams	1.8	1.1	0
Tree Crop	Cashew	1.7	0	0
	Cocoa	3.4	1.3	0.7
	Coffee	5.2	1	0.7
	Mangos	0	0	14.2
	Oranges	9.8	7.4	5.4
	Palm	1.4	1.3	1.1
Vegetables	Cabbages	0	0	0
	Cucumber	11.1	24.5	0.8
	Eggplant	25.6	23.7	2.4
	Onion	26.3	23.3	3.1
	Pepper	22.8	17.5	9.4
	Pumpkin	7.9	4.2	0
	Tomatoes	34.5	25.9	1.1

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Greater percentage of inorganic fertilizers used is being purchased

Table 3.2 highlights the widespread use and purchased of inorganic fertilizer, among agricultural holdings for the 2022/2023 agricultural season in Sierra Leone. It reveals that 114.9 thousand agricultural holdings used inorganic fertilizers, while 98.6 thousand purchased them. However, 60.3 thousand holdings reported using organic fertilizer**,** of which 36.7 thousand holdings purchased it. In pesticide usage, 38 thousand holdings used them, of which 35.6 thousand made purchases. In terms of quantities, the average inorganic fertilizer used per holding is 709 kg, while the average purchased amount is 1,178 kg. For organic inputs, the average usage is 1,030 kg, with a slightly higher average purchase of 1,053 kg. Pesticide usage averages 211 kg per holding, with an average purchase of 304 kg.

Table 3.2: *Number of holdings reporting input and average quantity used/purchased by type of fertilizer, Sierra Leone, 2023.*

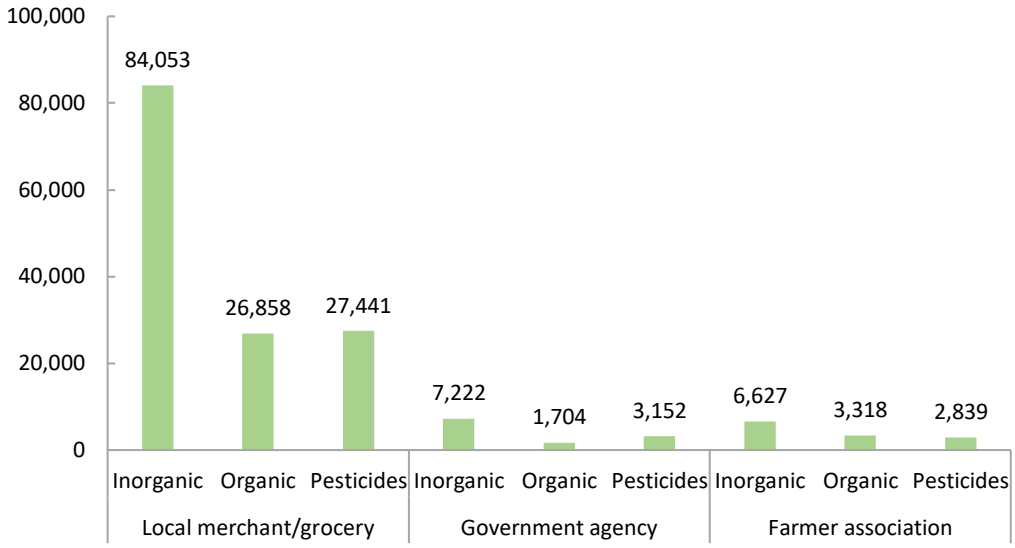
District	Number of holdings reporting the input			Average quantity of input *(in kg per holding)*		
	Inorganic	Organic	Pesticides	Inorganic	Organic	Pesticides
Input used	114,868	60,291	38,484	709	1,030	211
Input purchased	98,551	32,671	35,642	1,178	1,053	304

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Main fertilizer and pesticide supply from local merchant/grocery

The results in figure 4.1 show a strong dependence on local merchants for a variety of agricultural inputs. In fact, local merchants or groceries are recorded as the primary suppliers of input purchased. This source records 84.1 thousand holdings purchasing inorganic fertilizers. It also provides organic inputs and pesticides, with 26.9 thousand and 27.4 thousand holdings purchasing these, respectively. In contrast, farmer associations recorded even fewer holding purchases, with 6.6 thousand holdings for inorganic inputs, 3.3 thousand with organic inputs, and 2.8 thousand with pesticides.

Figure 3.1: *Number of Agricultural Holdings by Input Type and Sources of Input in Sierra Leone, 2023*



Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Table 3.3 shows borrowing practice and payment performance of loan activities among agricultural holdings in Sierra Leone. A total of 181.7 thousand agricultural holdings accessed loans during the year 2023, with an average cash loan amounting to NLe 18.6 thousand and in-kind loans averaging NLe 9 thousand. However, 86.7 thousand holdings repaid their loans, which represents around 47.7% of the total number of borrowers. In terms of repayment, the average cash repayment stood at NLe 14.5 thousand, which is lower than the average cash loan received. On the other hand, repayment in kind averaged Nle 12.9 thousand, which exceeded the initial in-kind borrowing amount.

Table 3.3: *Number of holdings taking or repaying loans and average amount of loans received and repaid in Sierra Leone, 2023*

Loan taken	*Number of holdings that took loans*	*181,728*
	Average amount of loans received in cash (in Nle)	18,639
	Average amount of loans received in kind (in Nle)	8,988
Loan repaid	Number of holdings that repaid their loans	86,743
	Average amount repaid in cash (in Nle)	14,464
	Average amount repaid in kind (in Nle)	12,930

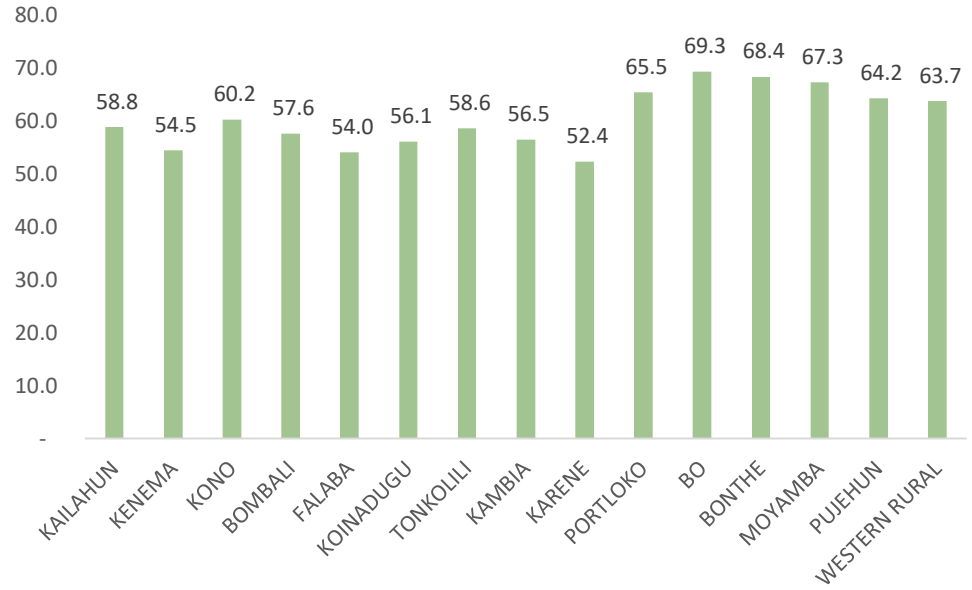
Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

8.5 Section 3.2: Agricultural Labor Force

Bo District has the highest level of involvement of household members participating in agricultural work.

Figure 3.2 shows a comparative analysis of labor contribution of household members engagement in farm activities across various districts in Sierra Leone. Bo District has the highest level of involvement, with 69.3% of household members participating in agricultural work. On the other hand, the district with the lowest engagement of household members in agricultural activities is Karene District with 52.4%.

***Figure 3.2**: Percentage of agricultural household members responsible for the farm activities, within district*

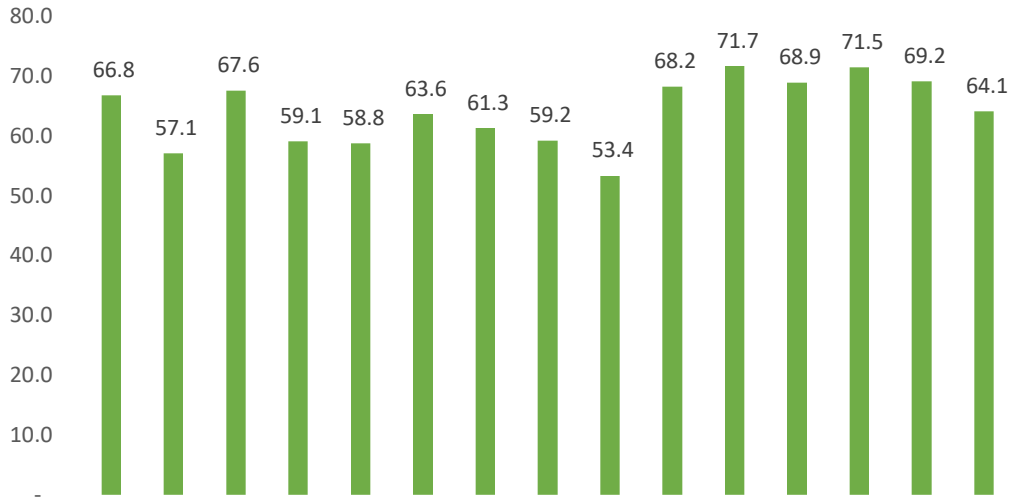


***Source:** Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Bo district has the highest percentage of household members working daily on farms.

Figure 3.3 shows insight into the level of household engagement in farming activities in different districts, highlighting areas where agriculture is a central activity for households. The district with the highest percentage of household members working daily on farms is Bo District at 71.7%, followed closely by Moyamba District with 71.5%. On the other hand, the district with the lowest daily participation rate is Karene at 53.4%.

***Figure 3.3**: Percentage of agricultural household members working daily on the farm, by district.*



***Source:** Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

According to the statistics in Table 3.4, Bo District recorded the highest for both male and female household members who worked in agricultural holdings across districts. With Bo District 249.9 thousand males and 244.1 thousand females working in agricultural holdings. Falaba District, on the other hand, recorded the least number of workers, with 66.8 thousand females and 60.9 thousand males working in holdings.

Table 3.4: *Number of Household members older than 5, by sex, worked in holdings by District*

District	Total Households	Household members work on the holding			Percentage of households members work on holding
		Male	Female	Total	
KAILAHUN	107,209	144,904	146,337	291,241	36.8
KENEMA	146,516	171,712	177,504	349,216	42
KONO	122,172	150,806	138,279	289,085	42.3
BOMBALI	70,013	108,026	115,385	223,411	31.3
FALABA	33,970	60,872	66,762	127,634	26.6
KOINADUGU	35,231	64,934	58,714	123,648	28.5
TONKOLILI	102,068	134,210	129,701	263,911	38.7
KAMBIA	68,574	100,889	120,829	221,718	30.9
KARENE	50,917	93,630	99,779	193,409	26.3
PORTLOKO	99,349	154,358	170,740	325,098	30.6
BO	136,608	249,876	244,116	493,992	27.7
BONTHE	51,072	95,335	86,957	182,292	28
MOYAMBA	73,650	78,900	81,701	160,600	45.9
PUJEHUN	77,014	122,013	127,095	249,107	30.9
WESTERN RURAL	82,091	165,295	175,111	340,406	24.1

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Table 3.5 provides a clear picture of the average work hours across various districts, with Moyamba District leading in both male and female contributions, recording the highest hours per member (1,064 for males and 940 for females). However, Western Rural records the lowest average hours, with 356 for males and 287 for females.

Table 3.5: *Average number of hours worked during the year per member by sex, by district*

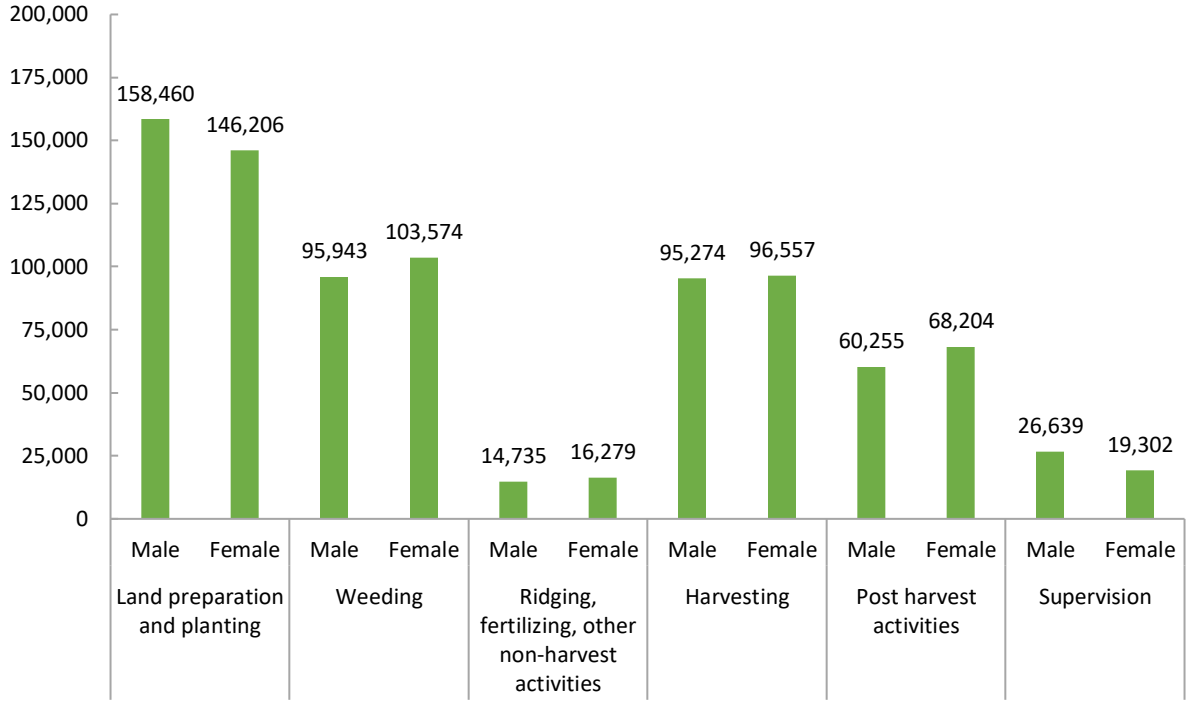
District	Male	Female	Total
KAILAHUN	407	346	377
KENEMA	670	583	627
KONO	814	776	795
BOMBALI	767	680	724
FALABA	741	750	746
KOINADUGU	694	852	773
TONKOLILI	601	516	559
KAMBIA	458	345	402
KARENE	853	761	807
PORTLOKO	478	415	447
BO	672	552	612
BONTHE	571	472	522
MOYAMBA	1,064	940	1,002
PUJEHUN	997	860	929
WESTERN RURAL	356	287	322

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

More females worked in nearly every agricultural activity when compared to men.

Among these activities, weeding recorded the highest participation, with 103.6 thousand females versus 95.9 thousand males. On the other hand, males lead in land preparation and planting recording (158.5 thousand males vs. 146.2 thousand females).

Figure 3.4: *Number of household workers older than 5 by activities and by sex at national level*



***Source**: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Majority of both hired and free/exchange workers are engaged in livestock labor, compared to household members.

The findings in Table 3.6 shows that the majority of both hired and free/exchange workers are engaged in livestock labor, compared to household members. With Both free/exchange and hired workers have the highest average number of workers, with each category averaging 4 workers per agricultural household. However, for days worked in the last 3 months, adult females worked the most, with an average of 38 days. Regarding hours worked per day, hired workers averaged the most, with 4 hours per day, while children worked the least, averaging 2 hours per day, likely due to balancing school and labor.

***Table 3.6:** Average number of workers, typical days worked and typical hours worked, per agricultural household by worker type, Sierra Leone, 2023*

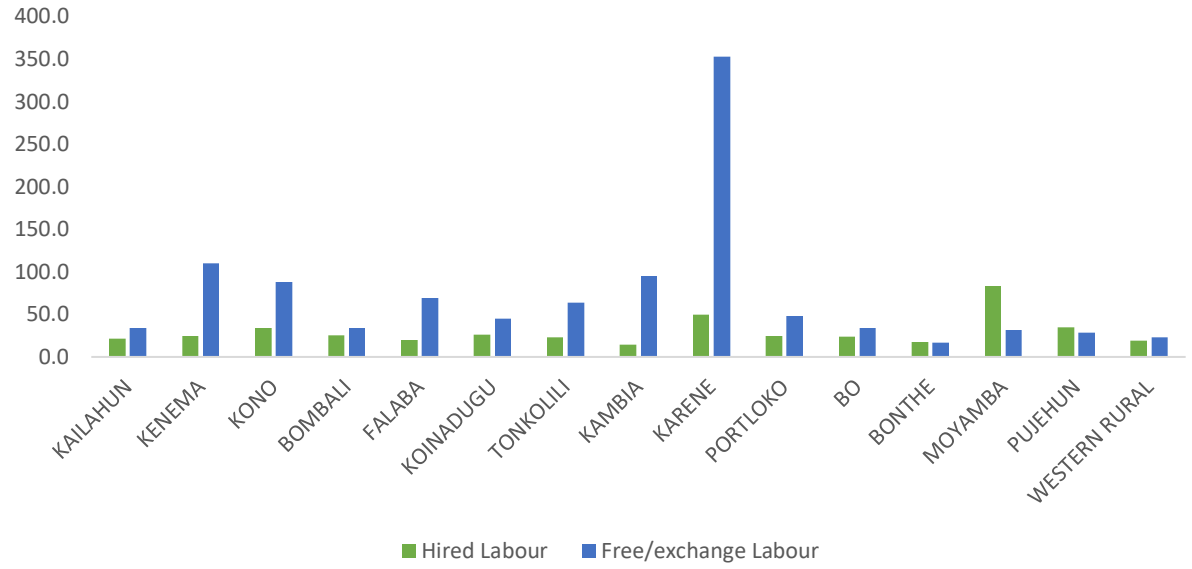
	Number of workers involved			Number of typical days worked in the last 3 months			Number of typical hours worked per day in the last 3 months		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Household members-Adult males	1	90	2	1	90	31	1	10	3
Household members-Adult females	1	90	2	1	90	38	1	10	3
Household members-children	1	22	2	1	90	36	1	10	2
Free/exchange workers	1	10	4	1	90	6	1	6	3
Hired workers	1	15	4	1	90	18	1	10	4

Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Moyamba district recorded the highest average of 83.1 hours worked by hired workers.

According to the data in Figure 3.5 Moyamba District had the highest number of hired workers, while Karene District had the most free/exchange workers. Moyamba District recorded the highest average of 83.1 hours worked by hired workers, whereas Western Rural had the lowest at 19.2 hours. For free/exchange labor, Karene District recorded the highest average with 352.6 hours, while Bonthe District had the lowest, with just 17.7 hours per worker.

Figure 3.5: Average hours worked per worker in agricultural household by work type by district.

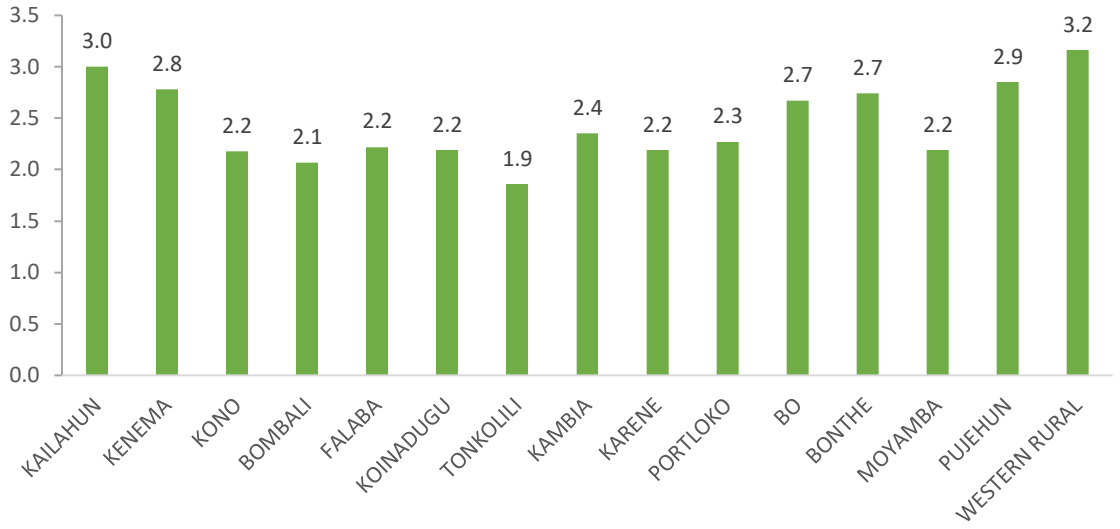


Source: *Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

Figure 3.6 reveals notable disparities in the daily wage rates for hired labor across Sierra Leone's districts.

It reveals significant district disparities, with Western Rural District emerging as the highest. The results, recorded Western Rural as the highest wage rate district at 3.2, followed closely by Kailahun District at 3.0. On the other hand, Tonkolili District reports the lowest wage rate at 1.9.

Figure 3.6: *Average wage rate (USD) per day of hired labour by district*



***Source**: Stats SL/MAFS, Sierra Leone Annual Agriculture Survey 2023*

9 CONCLUSION AND RECOMMENDATIONS

Sierra Leone's agricultural sector is a vital driver of economic growth, food security and poverty reduction. However, the sector faces various challenges, including low productivity, low use of modern farming techniques, limited access to finance, and vulnerability to climate shocks. These factors hinder productivity and economic growth.

The government's Medium-Term National Development Plan and the Feed Salone Strategy aim to address these issues and achieve food self-sufficiency. The 50x2030 Initiative, through surveys like SLLIST and SLAASS, is providing essential data to inform policy decisions and monitor progress. By leveraging the insights gained from these surveys and implementing targeted interventions, Sierra Leone can unlock the full potential of its agricultural sector. This will contribute to a more prosperous and food-secure future for the nation.

9.1 **Limitations**

The Sierra Leone Annual Agriculture Sample Survey 2023 offers valuable insights into the nation's agricultural landscape. However, it's important to acknowledge certain limitations inherent to the survey methodology. These include potential sampling error, non-response bias, and data quality issues that may impact the survey findings. Additionally, seasonal variations in agricultural practices and the challenges of capturing informal sector activities can influence the survey's findings. While the survey provides useful aggregate data, more detailed analysis at the regional or sub-sector level may be constrained by data limitations.

9.2 **Recommendations:**

1. Promote Crop Diversification Initiatives: In response to the limited crop diversity highlighted in the report, targeted programs should be implemented to encourage farmers to diversify their crop production. This can be achieved through training, provision of diverse seeds, and technical support to enhance resilience and profitability in agricultural systems.

2. Enhance Women's Participation in Agricultural Decision-Making: Recognizing the underrepresentation of women in decision-making processes, policies should be established to ensure gender-inclusive governance in agriculture. This includes empowering women through leadership training, reserving seats for women in agricultural committees, and fostering women-led initiatives.

3. Introduce Fertilizer Subsidy Programs: Considering that a significant percentage of agricultural household's purchase fertilizers, the government should develop subsidy schemes to reduce costs. This will enhance access to fertilizers, improve crop yields, and alleviate financial burdens on smallholder farmers.

4. Invest in Large-Scale Farming Enterprises: Given that 75% of agricultural households operate on a small scale, it is critical to provide investment opportunities for large-scale farming. This can include public-private partnerships, infrastructure development, and incentives for commercial farming ventures to boost productivity and economic growth.

5. Expand Access to Agricultural Loans: Since a considerable number of farmers who accessed agricultural loans successfully repaid them, efforts should be made to increase the availability and affordability of such loans. Financial institutions should collaborate with the government to develop farmer-friendly loan products and promote financial literacy to ensure efficient utilization.

6. Empower Women in Agriculture: Since women play a vital role in Sierra Leone food systems, implement policies and programs to promote women's land rights and access to agricultural

inputs and services. Support women's organizations to strengthen their voice and influence in agricultural decision-making.

7. Adopt Climate Resilience Programs: The finding shows that, some districts and crops shows variation in crops productions, cultivation, and yields due to seasonal change**,** strengthen early warning systems for climate variability and promote risk management strategies to mitigate agricultural losses.

10 GLOSSARY

Agriculture Household: Refers to a household where one or more persons are holder(s). In peasant farming there will normally be a one-to-one correspondence between the farming household and the holding.

Agricultural Holding: Refers to an economic unit of agricultural production under single management. It consists of all livestock kept and all land used for agricultural production without regard to title.

Agricultural Production: Refers to growing and harvesting of different types of crops. It also includes keeping of livestock and poultry.

Aquaculture: Means the practice of breeding and raising aquatic organisms in a controlled aquatic environment.

Crop Production: Crop production is the process of growing plants for food, fiber, fuel, or other uses. It involves a range of activities, including land preparation, planting, cultivating, harvesting, and storing crops.

Economically Active: Economically active refers to people of working age (usually 15-60years old) who are either employed or unemployed. In agriculture, this refers to people who are involved in agricultural production or related activities, regardless of their employment status. This can include both paid workers and unpaid family laborers.

Non-Permanent Agricultural Workers: These are workers who are employed in agriculture on a temporary or seasonal basis. They may be hired for specific tasks, such as harvesting a particular crop, or they may work for a set period during the growing season.

Permanent Agricultural Workers: These are workers who are employed in agriculture on a full-time or long-term basis. They typically receive a regular salary or wage and benefits such as health insurance and paid leave.

11 REFERENCES

1. National Medium-Term Development Plan, (NMTDP-2024-2030)
2. Sierra Leone Economic update,2023, World Bank.
3. Feed Salone Strategy, 2023-2028.
4. Sierra Leone Agricultural Listing Survey, report, 2023.

12 ANNEX 1: STATISTICAL TABLES

Table 2.1 : Number of parcels by district and predominant soil type, 2023

DISTRICT	PREDOMINANT SOIL TYPE									
	SANDY		LOAM BETWEEN SANDY & CLAY		CLAY		OTHERS		TOTAL	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
KAILAHUN	1,091	0.6%	193,690	97.9%	2,989	1.5%	0	0.0%	197,770	100.0%
KENEMA	31,773	12.3%	214,540	82.8%	12,897	5.0%	0	0.0%	259,210	100.0%
KONO	8,072	4.1%	184,847	94.7%	233	0.1%	2,132	1.1%	195,284	100.0%
BOMBALI	3,327	2.7%	119,711	97.3%	0	0.0%	0	0.0%	123,038	100.0%
FALABA	248	0.5%	48,160	97.8%	824	1.7%	0	0.0%	49,233	100.0%
KOINADUGU	1,058	1.6%	65,579	98.0%	254	0.4%	0	0.0%	66,891	100.0%
TONKOLILI	11,303	7.6%	136,905	92.2%	321	0.2%	0	0.0%	148,529	100.0%
KAMBIA	6,274	5.1%	107,280	86.9%	8,734	7.1%	1,124	0.9%	123,412	100.0%
KARENE	0	0.0%	81,577	99.7%	206	0.3%	0	0.0%	81,783	100.0%
PORTLOKO	12,747	8.9%	129,062	90.3%	1,090	0.8%	0	0.0%	142,899	100.0%
BO	1,991	1.0%	198,244	98.2%	418	0.2%	1,191	0.6%	201,844	100.0%
BONTHE	5,561	10.0%	49,854	90.0%	0	0.0%	0	0.0%	55,415	100.0%
MOYAMBA	3,810	4.4%	81,909	94.9%	614	0.7%	0	0.0%	86,332	100.0%
PUJEHUN	3,244	3.4%	88,732	93.5%	2,307	2.4%	618	0.7%	94,901	100.0%
WAR	32,761	26.9%	87,755	72.1%	1,122	0.9%	0	0.0%	121,638	100.0%
NATIONAL	**123,260**	**6.3%**	**1,787,843**	**91.8%**	**32,010**	**1.6%**	**5,066**	**0.3%**	**1,948,178**	**100.0%**

Table 2.2: Percentage of parcels by irrigation type and district, 2023

DISTRICT	IRRIGATION TYPE									
	MANUAL IRRIGATION	SPRINKLER IRRIGATION	DRIP IRRIGATION	SURFACE IRRIGATION	EQUIPPED WETLAND	EQUIPPED FLOOD	RECESSION CULTIVATION	SPATE IRRIGATION	OTHERS	TOTAL
KAILAHUN	99.04%	0.00%	0.00%	0.66%	0.00%	0.00%	0.00%	0.00%	0.30%	100.00%
KENEMA	98.54%	0.28%	1.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
KONO	97.39%	0.44%	0.00%	0.71%	0.79%	0.00%	0.00%	0.13%	0.54%	100.00%
BOMBALI	87.93%	0.80%	0.00%	6.94%	2.82%	0.00%	0.33%	0.00%	1.18%	100.00%
FALABA	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.73%	0.00%	93.27%	100.00%
KOINADUGU	98.66%	1.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
TONKOLILI	87.92%	0.77%	0.40%	5.80%	4.74%	0.00%	0.00%	0.00%	0.36%	100.00%
KAMBIA	80.06%	3.44%	0.00%	16.50%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
KARENE	75.68%	0.00%	1.11%	2.48%	0.00%	0.00%	0.00%	20.74%	0.00%	100.00%
PORTLOKO	90.20%	0.00%	1.11%	7.74%	0.00%	0.00%	0.00%	0.95%	0.00%	100.00%
BO	97.41%	0.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	100.00%
BONTHE	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
MOYAMBA	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
PUJEHUN	88.83%	0.00%	0.00%	8.63%	0.00%	2.54%	0.00%	0.00%	0.00%	100.00%
WAR	97.77%	2.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%

NATIONAL	**93.03%**	**0.76%**	**0.39%**	**3.09%**	**0.98%**	**0.02%**	**0.06%**	**1.13%**	**0.54%**	**100.00%**

Table 2.3: Percentage of parcels by district and water source for agriculture, 2023

	WATER SOURCE						
DISTRICT	**WELL**	**BOREHOLE**	**LAKE/POND**	**RIVER/ STREAM**	**RAIN**	**OTHERS**	**TOTAL**
KAILAHUN	4.1%	3.1%	0.6%	1.7%	90.5%	0.0%	100.0%
KENEMA	7.3%	9.1%	1.7%	27.9%	53.9%	0.0%	100.0%
KONO	2.9%	3.5%	2.7%	31.5%	12.6%	46.8%	100.0%
BOMBALI	1.0%	0.5%	0.0%	9.2%	89.1%	0.2%	100.0%
FALABA	0.0%	3.5%	0.0%	14.7%	80.1%	1.7%	100.0%
KOINADUGU	2.1%	0.0%	0.0%	0.0%	97.9%	0.0%	100.0%
TONKOLILI	4.4%	0.2%	2.8%	29.4%	63.2%	0.0%	100.0%
KAMBIA	5.6%	1.1%	21.5%	24.2%	47.3%	0.3%	100.0%
KARENE	8.5%	3.9%	0.8%	20.1%	66.4%	0.4%	100.0%
PORTLOKO	21.2%	7.0%	19.9%	10.2%	20.5%	21.1%	100.0%
BO	9.9%	1.7%	1.1%	14.5%	0.4%	72.4%	100.0%
BONTHE	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
MOYAMBA	11.8%	3.6%	0.8%	21.5%	61.6%	0.7%	100.0%
PUJEHUN	0.0%	20.5%	0.0%	2.0%	77.5%	0.0%	100.0%
WESTERN RURAL	33.5%	24.6%	0.5%	25.4%	15.9%	0.0%	100.0%
NATIONAL	**8.1%**	**5.6%**	**3.8%**	**20.3%**	**48.3%**	**13.9%**	**100.0%**

ANNEX 2: Sample design

Sierra Leone National Agricultural Sample Survey 2023
Samples Design

This document presents an overview of samples designs of survey operations conducted in the framework of the 2023 Sierra Leone National Agriculture Sample Survey 2023 in the framework of the 50x2030 Initiative including sample surveys of agricultural holdings in both household and non-household sectors and the market survey for non-standard measurement units.

13 SURVEY OF FARMS IN THE HOUSEHOLD'S SECTOR

This is a comprehensive survey of agricultural holdings in the household sector (farming households) using 50x2030 survey instruments customised in the context of Sierra Leone

13.1 Estimation domains

Estimation domains are administrative areas from which reliable estimates are expected. The district was considered as estimation domain in the design of the National Agriculture Sample Survey. All districts were considered except the Western Urban because of very low level of agricultural activities there.

13.2 Population units

Population units for this operation are households with members practicing own account agricultural activities ("farming households").

13.3 Sampling method and units

The sampling method for farming households is a stratified two stage sampling. The primary sampling unit (PSU) is the enumeration area (EA) as designed for the 2015 population and housing census (PHC) and the secondary sampling unit (SSU) is the farming household.

13.4 Sampling frame

The sampling frame the PSUs consists in the full list of EAs developed by Statistics Sierra Leone in the framework of the 2015 population and housing census (PHC). The frame was built using the agricultural module of the 2015 PHC with at various information EA level including the number of households practicing farming and total land size collected by declaration during the PHC. The frame for the SSUs is the full list of farming households in the sampled EAs, developed from a listing operation conducted in September 2023.

13.5 Stratification

The sampling frame was stratified by urban/rural criteria in each district (estimation domain/analytical stratum). An implicit stratification was also performed through sorting the frame of EAs by geography, population and land size before the systematic selection.

13.6 Sample size and allocation

Sample sizes were calculated for each district considering requirements of reliable estimates of agricultural area.

The classical formula below is used for the calculation of sample size of farming households:

$$m_d = \widetilde{D}_{eff} \times \frac{1}{g} \times \frac{CV_{yU_d}^2}{cv^{*2}}$$

Where:

- $CV_{yU_d}^2$ is the population CV of the households' agricultural land (y) in the district d computed from 2017 GCA data.
- cv^{*2} is maximum relative error accepted for the survey (5%-20%, depending on the contribution of domain to total agricultural population and area).
- $\widetilde{D}_{eff}$ is an estimate of the design effect fixed at 2.5.
- g is the expected response rate (90% considered).

The number of farming households to be surveyed in each PSU is fixed to 10. Therefore, the size of the sample of PSU n_d is the size of the sample of the households divided by 10.

$$n_d = \left[\frac{m_d}{10}\right] + 1$$

In each district, the sample of EAs was allocated in strata (urban/rural) proportionally to the numbers of farming households computed in the frame.

Province	District	Rural	Urban	Total
Eastern	Kailahun	56	19	75
	Kenema	55	10	65
	Kono	62	3	65
North West	Kambia	22	11	33
	Karene	6	10	16
	Port Lok	35	12	47
Northern	Bombali	16	2	18
	Falaba	11	4	15
	Koinadug	10		10
	Tonkolil	38	13	51
Southern	Bo	43	2	45
	Bonthe	12		12
	Moyamba	28	2	30
	Pujehun	28	2	30
Western	Western Rural	2	6	8
Total		424	96	520

13.7 Sample selection

The stratified sample of EAs was selected with a systematic sampling probability proportional to size with the number of farming households at EA level as measure of size. In each of sampled EAs, a sample of 10 farming households (when available) were selected with a systematic random sampling.

13.8 Estimation procedures and sampling error

Estimators formulas are presented here in line with the sample design (stratified two stage sampling with enumeration areas (EAs) as PSUs and farming households as SSUs).

Notation

h = stratum

H = total number of strata

i = EA

N = total number of EAs

I_h= total number of EAs in the *r*-th stratum

j = farming household

M_{hi}= total number of farming households that will be actually listed in the *i*-th EA

$M = \sum_h \sum_i M_{hi}$= total number of farming households in the country

F_{hi}= total number of farming households of the *i*-th EA in the sampling frame

$F_h = \sum_i F_{hi}$, is the total number of farming households listed in the sampling frame in stratum *h*

n_h= number of sample EAs selected in stratum *h*

m_{hi}= number of sample farming households selected in *i*-th EA in stratum *h*

y_{hij}= value of the target variable *Y* observed on the *j*-th farming household, in *i*-th EA in stratum *r*

Estimators

The probability of selecting the farming household *j* in the sample is is the product of the probability of selection of the EA *i* in which it is located ($n_h \frac{F_{hi}}{F_h}$) and its probability of selection in the EA *i* ($\frac{m_{hi}}{M_{hi}}$).

Thus, the design *weight* assigned to the farming household *j* selected in the *i*-th EA in stratum *h* is:

$$w_{hij} = \left(\frac{n_h F_h}{F_{hi}}\right) * \left(\frac{m_{hi}}{M_{hi}}\right)$$

The design weights will be adjusted and calibrated as need be.

An estimate of the total amount of Y for the entire population may be computed with the following formula:

$$\hat{Y} = \sum_h \sum_i \sum_j w_{hij} y_{hij}$$

The mean of Y is can be estimated with two different estimators:

- *Simple mean*

$$\hat{\bar{Y}} = \hat{Y}/M$$

- *Weighted sample mean*

$$\tilde{\bar{Y}} = \frac{\hat{Y}}{\sum_h \sum_i \sum_j w_{hij}}$$

Variance

A simple approximate estimation of variance can be obtained with the following estimator, provided by Särndal, Swensson, and Wretman (1992, p. 154), which overestimates the actual variance as it considers a selection of cluster with replacement.

$$\tilde{V}(\hat{Y}) = \sum_{h=1}^{H} {M_h}^2 \frac{1}{m_h(m_h - 1)} \sum_{i=1}^{I_h} (\hat{Y}_{hi} - \frac{1}{m_h} \sum_{i=1}^{I_h} \hat{Y}_{hi})$$

where $\hat{Y}_{hi}$ and $\hat{Y}_h$ are the estimates of the total amount of *Y* at EA and stratum levels, respectively.

An approximate estimator of the variance of the mean is:

$$\tilde{V}\left(\hat{\bar{Y}}\right) = \frac{1}{M^2} \tilde{V}(\hat{Y})$$

Coefficient of variation of the total

$$\widetilde{CV}(\hat{Y}) = \frac{\sqrt{\tilde{V}(\hat{Y})}}{\hat{Y}}$$

Coefficient of variation of the mean

$$\widetilde{CV}\left(\hat{\bar{Y}}\right) = \frac{\sqrt{\tilde{V}\left(\hat{\bar{Y}}\right)}}{\hat{\bar{Y}}}$$