



Assessing the Socioeconomic Impact of COVID-19 on Agriculture, Food Security, Livelihoods, and Food Systems in Liberia



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ABBREVIATIONS

ASI	Agricultural Stress Index
CDCS	Country Development Cooperation Strategy
CH	Cadre Harmonisé
CPI	Consumer price indices
DHS	Demographic and Health Survey
DPA	Data-Pop Alliance
ECOWAS	Economic Community of West African States
EULAP-PARTNERS	European Union-Liberia Agriculture Programme – Prosperous Agriculture Roadmap to Nutrition and Entrepreneurship, Reinforcing Sustainability
FCS	Food Consumption Score
FEWS NET	Famine Early Warning System Network
FSA	Food systems approach
FSNMS	Food Security and Nutrition Monitoring System
FSNS	Food Security and Nutrition Strategy
GDP	Gross domestic product
GIEWS	Global Information and Early Warning System on Food and Agriculture
GM	Genetically modified
HDDS	Household Dietary Diversity Score
HFPMS	High Frequency Phone Monitoring Survey
HIES	Household Income and Expenditure Survey
HLPE	High Level Panel of Experts on Food Security and Nutrition
KII	Key informant interviews
ICT	Information and communications technology
ILO	International Labour Organization
IMF	International Monetary Fund
IPC	Integrated Food Security Phase Classification
LISGIS	Liberia Institute of Statistics and Geo-Information Services
LPHFSA	Liberia Post-harvest and Food Security Assessment
MoA	Ministry of Agriculture
MoC	Ministry of Commerce, Industry, and Trade
MoL	Ministry of Labor
NGO	Non-governmental organization
OHCP	One Health Coordination Platform
PPP	Purchasing power parity
rCSI	Reduced Coping Strategy Index
RAF	Regional Office for Africa
REU	Regional Office for Europe and Central Asia
SME	Small and medium-sized enterprise
USD	United States dollar
WFP	World Food Programme
Y/y	Year-over-year

EXECUTIVE SUMMARY

This report communicates the findings of a study examining the impacts of the COVID-19 pandemic on Liberia's food system in relation to demand, supply, and governance. Research was conducted by consultants at Data-Pop Alliance with guidance from the Food and Agriculture Organization in Liberia and with support from the European Union (EU), the International Fund for Agricultural Development (IFAD) and the Government of Liberia. The methodology adopted for this study combines quantitative and qualitative data, ranging from primary and secondary sources. **Primary data** analyzed belong to the **Liberia Post-harvest and Food Security Assessment 2021 (LPHFSA) survey**, whose data have been collected by FAO Liberia and the Ministry of Agriculture between January and March 2021, as well as key informant interviews (KII). Additional interviews with key informants were conducted by Data-Pop Alliance in October 2021. Data gathered by LPHFSA survey, combined with data provided by the Household Income and Expenditure Survey (HIES) 2016 allowed the authors to investigate the impacts of COVID-19 on the demand side of the food system approach, whilst KII have been utilized to analyze the impacts on supply and governance sides. **Secondary data** has been collected and analyzed mainly from the following sources: 1) Household Income and Expenditure Survey (HIES 2016) — which informed on **Liberia's income, consumption and poverty rates**, in order to define a picture of the socioeconomic situation of the country prior to the onset of COVID-19; and 2) World Bank (WB) 2020; International Monetary Fund (IMF) 2021; FAO-GIEWS (2021) and Global Report on Food Crisis (2021) — which informed on **Liberia's macro-economic characteristics before and after the onset of COVID-19**. Additionally, the COVID-19 Stringency Measures Index elaborated by Oxford University, the response and preparedness indicators elaborated by Liberia's Ministry of Health allowed the authors to identify **the stringency of lockdown measures** implemented by the government throughout the country. Other studies conducted at the microeconomic level by FAO and other sources, such as FAO (2021b) and Aggrawal et al. (2020) have been considered to benchmark the results identified by the authors.

The screening of information has been made through a data mapping exercise. Data gathered from primary and secondary sources was analyzed in order to depict aspects

related to Liberia's agriculture, poverty rates and food security, as well as to inform on other factors embedded in the food system framework. Through this approach, the expected output was to create an understanding of the impacts in the food system that can be related to the COVID-19 pandemic and the measures taken to mitigate these impacts.

The main data gaps identified from a first screening of the LPHFSA 2021 survey with respect to the literature concern the temporal dimension. Information was collected for one point in time: 2021. Data sets available before 2021 shared with the authors did not consider the same sample of people as did LPHFSA 2021. In order to fill this gap regarding the temporal dimension, the authors took a microsimulation approach. Further, since the LPHFSA 2021 survey is at the farmer level, it does not cover socio economic or political drivers of the food system, such as market, policies, and food environment.¹ KII with main actors of the supply chain and multiple regression analysis were conducted to address this gap.

Main Findings: Impacts on the Demand Side — COVID-19

Exacerbated extreme poverty in Liberia. The analysis shows that poverty—living on less than USD \$1.90 per day at 2011 purchasing power parity (PPP)—rose an additional three percentage points beyond the expected level from 2016 to 2021. In the non-covid scenario, poverty was expected to rise from 46% in 2016 to 52% in 2021, based on the 2016 Household Income and Expenditure Survey (HIES) projections with the microsimulation.² However, the poverty rate rose to 55% with COVID-19, based on LPHFSA 2021 data.³

Households' capacity to afford basic expenses was constrained by increases in consumer prices, which the International Monetary Fund (IMF) forecasted to increase by 20.5% and 17% for 2020 and 2021 respectively.⁴ Household income was not expected to increase due to decreases in labor productivity, which Liberia witnessed between 2016 and 2019—a trend that continued in 2021. The pandemic amplified the repercussions of these changes, with consumer prices (CPI general indices) rising by 35% between 2019 and 2020, and by 6.6% between 2020 and 2021.

1 The sequence of the questions presented in the LPHFSA 2021 survey, and its respective list of available answers, are difficult to interpret since the survey format is not very clear. This interferes with the interpretation of possible data gaps inferred from the survey.

2 LISGIS, 2018

3 FAO Liberia & MoA, 2021

4 Year-on-year changes, according to IMF estimates from the country staff report 2019 (IMF, 2019)

Increased food insecurity in Liberia. The results suggest that food insecurity increased for Liberian nationals between 2016 and 2021, particularly for households below the poverty line. According to the Household Income and Expenditure Survey (HIES), the average rate of the reduced Coping Strategy Index (rCSI) was 3.2 in 2016, while it increased to 9.08 during the pandemic.⁵ Food insecurity was aggravated for poor households between these 2 years. While in 2016, the RCSI for households above the poverty line was 2.91, in 2021 they had an rCSI of 3.54.⁶ It was particularly high in the first quarter of 2021; for households above the line the rCSI rose to 6.71 and to 9.23 for households below the poverty line. The gap between the two time frames—2016 and the first quarter of 2021—increased by a factor of four, from 0.63 to 2.53. This means that not only is poverty positively correlated with increased food insecurity, but the persistence of poverty over time worsens food insecurity for those already in a state of vulnerability.

These estimates demonstrate the limited coping capacity of poor households in Liberia to deal with external shocks such as the pandemic. Their worsening situation in terms of food insecurity underscores the urgent need to improve households' resilience to cope with and recover from the impacts of COVID-19.

Main Findings: Impacts on the Supply Side — COVID-19

Agricultural production. The results did not show an induced contraction in agricultural production, and agricultural production mitigated containment measures' negative impacts on food security, especially in counties where the government applied more stringent containment measures. Further, the measures adopted to preserve the agricultural economy were considered to be ineffective by 63% of the stakeholders surveyed via key informant interviews (KIs). In particular, informants revealed how forms of support to the food supply chain actors—such as grants and subsidies programs for small and medium-sized enterprises (SMEs) or the seeds and nets distribution programs—were not always associated with fair and transparent support and management from public offices.

Worsening of the economic condition. The results indicated an overall deterioration of economic conditions of the supply chain actors, particularly for food business actors (input suppliers, processors, transporters, retailers) and farmers. Findings from the KIs revealed that the COVID-19 pandemic exacerbated already existing issues in the country—such as limited access to financial resources—and created new emergencies, including a hike in food prices and transportation costs.

Main Findings: Governance-related Impacts — COVID-19

5 Differences are significant based on a Welch's two-sample t-test for unequal variances (T value -34.49)

6 FAO Liberia & MoA, 2021

Negative impacts by contingency measures. The stringency of the containment measures negatively impacted households' food security, worsening the fragile situation of areas that were already facing socio economic issues. However, the KIs revealed that the vast majority of informants appreciated the effectiveness of the containment measures.

Social assistance measures such as subsidies, cash transfers, food distribution, and support to water and electricity expenses could not be clearly classified as effective or ineffective since informants who were consulted via KIs had divergent opinions. However, lessons learned from Liberia's COVID-19 Stimulus Package Program, such as the unfair distribution of the benefits or the logistical issues, should help improve future social assistance programs. In particular, insights gained from the KIs show that while the Stimulus Package Program effectively identified appropriate aid recipients, its operationalization faced critical barriers. Informants noted that field officers implementing the program were not able to carry out tasks related to the fair distribution of the program's benefits, resulting in an ineffective social assistance program unable to reach the population in need.

Introduction

The impacts of new SARS-CoV-2 (COVID-19) in Africa have been varied. However, most countries on the continent have undergone several shared experiences, most notably an increase in chronic poverty and extreme human vulnerability, exacerbated by the lack of access to proper health care, hand washing, and sanitation. Such pandemic-induced adversity has raised serious concern among experts. Still in the process of recovering from other catastrophes, Liberia has been particularly exposed to impacts of the COVID-19 pandemic. The West African nation has experienced two devastating civil wars in recent history, and was one of the countries hit hardest by the Ebola epidemic in 2014.

The first case of COVID-19 in Liberia was recorded on March 16, 2020.⁷ On April 8, 2020 President George Weah announced a state of emergency and imposed lockdown measures. According to the High Frequency Phone Monitoring Survey Report (HFPMS) launched in August 2020, two thirds of households had already experienced income losses and dire food insecurity. If unchecked, Liberia's current economic crisis, exacerbated by the pandemic, is likely to give way to a serious food crisis, with potential implications for livelihoods, peace, and security.⁸

In light of the issues raised above, this report seeks to assess **the socio economic impact of COVID-19 on agriculture, food security, livelihoods, and food systems in Liberia**. To do so, it provides a **methodological framework** to assess the aforementioned impacts step by step, and to generate **targeted policy recommendations** to alleviate the pandemic's negative effects on agriculture, food security, and nutrition.

The **desk review** presented in this report builds on the best current work to distill optimal practices, embedded knowledge, and key indicators already in use for other studies identified in the literature. The authors combine macro and micro perspectives in assessing the impacts of COVID-19; specifically, the macro insights from FAO's RAF methodology⁹ are combined with the micro perspectives from FAO's REU assessments in Bangladesh, Pakistan, the Philippines, and other countries.¹⁰ The authors also made a systematic review of relevant lessons learned beyond FAO's

previous assessments, driving attention to the actual impact of the COVID-19 pandemic on food systems.

The evidence reviewed for this report comes from **Béné et al.**,¹¹ the **United Nations**,¹² the **Organisation for Economic Co-operation and Development** (OECD),¹³ the **High Level Panel of Experts on Food Security and Nutrition** (HLPE),¹⁴ the **International Monetary Fund** (IMF),¹⁵ the **World Bank**,¹⁶ the **International Labour Organization** (ILO),¹⁷ the **Food Security Information Network** (FSIN) and the **Global Network Against Food Crises** (GNAFC),¹⁸ **Aggarwal et al.**,¹⁹ and other relevant sources. The desk review analyzing key literature on COVID-19's impacts on food systems was used as a guiding instrument to design a specific **methodological framework**, presented in the following section. Moreover, the empirical information and evidence collected and synthesized through the review allowed the authors to identify main **indicators** for measuring such impacts, as well as the **data gaps**.

By combining the insights emerging from the literature with the analysis of secondary and primary data sources, including FAO's and the Ministry of Agriculture's **Liberia Post-harvest and Food Security Assessment 2021 (LPHFSA)**²⁰ and key informant interviews (KIIs), the authors provided further evidence on the extent of COVID-19's impact. The scope of this study focuses on the pandemic's effects on the **demand side** (i.e., income losses reducing economic access to food); **supply side** (i.e., disruptions of supply chains hampering physical access to and availability of food); and with regard to **governance** (i.e., disruptions generated by stringent containment measures and efficacy of social assistance policies).

I. Methodological Framework

I.I. Food Systems Approach

The desk review starts with an evaluation of the most comprehensive food systems approach as it applies to the topic of this assessment. The authors employed and adapted the holistic food systems approach described by van Berkum et al.²¹ considering the similarities that this framework shares with FAO's sustainable food systems

7 FAO, 2021b

8 UN, 2020a

9 FAO, 2019b

10 FAO, 2020b; 2020c; 2021a; 2021b; 2021c; WFP & FAO, 2020; WFP, 2020a; WFP, 2020b; Global Report on Food Crises, 2021

11 Béné et al., 2021

12 UN, 2020b

13 OECD, 2020a; 2020b

14 HLPE, 2017; 2020

15 IMF, 2021, 2020a

16 World Bank, 2020a

17 ILO, 2020a

18 FSIN & GNAFC, 2020; 2021

19 Aggarwal et al., 2020

20 FAO Liberia & MoA, 2021

21 van Berkum et al., 2018

Table 1. Limitations of Traditional Food Security Frameworks

<p>Approach 1. Traditional food security systems tend to be production-focused, where increasing the supply of food is understood as the main way to increase food security. While in sub-Saharan Africa, insufficient food production is one of the main causes behind food insecurity, plenty of other factors hinder households' ability to acquire and consume food in a healthy manner, including regulations—or lack thereof—, cultural norms, food prices, and income, among others. As such, the supply focus neglects important factors that shape food security for individuals.</p>	<p>Approaches 1, 2 and 3 attempt to improve the efficiency of a single element to enhance the capacity of the food system, seeking to reduce hunger and malnutrition. However, by focusing on one single element these approaches fail to consider the other factors that often interact with each other and influence food security and nutrition. The challenges presented in these approaches require more holistic and inclusive approaches to identify the impact of activities and actors, the points of intervention, and the complexity and interdependence of a food system.</p>
<p>Approach 2. Value Chain (VC) development approaches put emphasis on all the steps and actors involved in the chain. Here, interventions aim to improve the performance of specific value chains. However, the approach does not consider the interdependencies that exist between other value chains in the whole ecosystem. In these cases, interventions may improve the performance of one specific chain, but the challenges of farmers who rely on different crops—and consumers who rely on several chains of products—may be neglected.</p>	
<p>Approach 3. Market system approaches examine the complexity of a market and address constraints mainly linked to market access. However, this approach is still limited to a single market and neglects the intertwined complexities of the food ecosystem as a whole.</p>	

Source: Elaborated by the authors

approach,²² as well as with the clear design of the High Level Panel of Experts on Food Security and Nutrition's (HLPE) food system dynamics.²³ This approach is applied due, in part, to its capacity to situate key considerations of this assessment—that is, to analyze livelihoods, food security, and agriculture—within a wider and interconnected ecosystem, where feedback loops and the pandemic's disruptive effects can be easily identified.

I.II. Why Adopt the Food Systems Approach (FSA)?

The utilization of system-thinking approaches has increased considerably in the context of food security. These approaches provide the necessary tools to understand the role of all actors involved in food value chains and the complexity of their interactions, especially in the presence of covariate shocks, such as the COVID-19 pandemic. Food systems approaches build on other frameworks to ensure a comprehensive analysis of the supply, demand, regulatory, and sociocultural aspects of food security. The resulting holistic analysis facilitates the identification of catalyzing actions, which may help to improve the system's performance. Some of the advantages of the food systems approach, compared to traditional food security systems or value chain approaches, are explained in **Table 1**.

22 FAO, 2018a; FAO, IFAD & WFP, 2014

23 HLPE, 2017; 2020

24 FAO, 2018a; FAO, IFAD & WFP, 2014

25 FAO, 2018a

26 van Berkum, et al., 2018

27 Socioeconomic and political factors affect or influence the food system through, for example, trade relations and economic growth (markets), land rights and food security legislation (policies), technological innovations (science and technology), households and social movements (social organizations), and lifestyles (individual factors). Environmental factors indicate the biophysical context in which the food system operates. Food production, for example, exerts pressure on the environment and is particularly influenced by the biophysical context. In accordance with the terms of reference of the present study, environmental factors were not considered in the analysis, but they can be embedded in the analysis in a later stage.

I.III. Characteristics of van Berkum's FSA (2018)

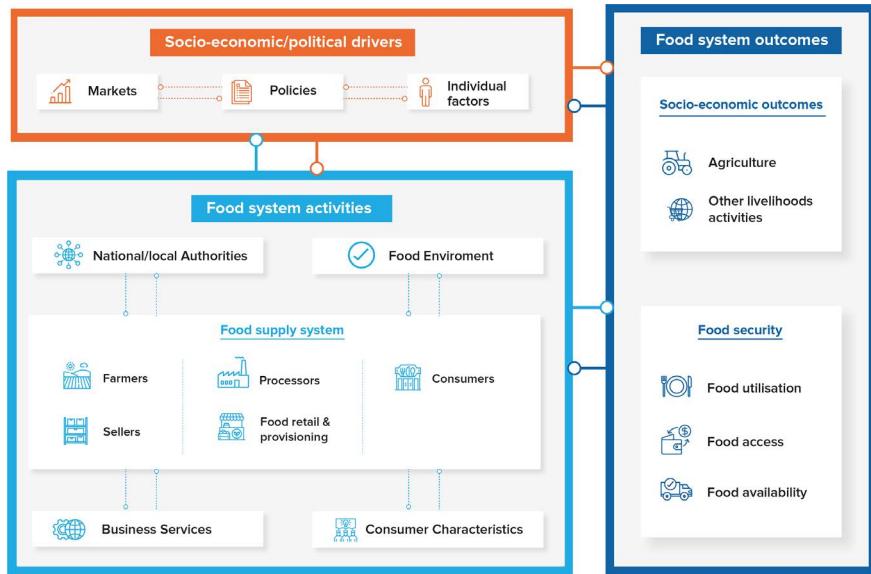
FAO's definition of a sustainable food system is based on FAO, IFAD and WFP's food system vision in which the sustainability of the system depends on its capacity to deliver food security, and ensure economic, social, and environmental sustainability.²⁴ The main desired outcomes in FAO's food system are **poverty reduction**, and **increasing food security and nutrition**, which are rooted in the broader economic, social and environmental dimensions of sustainability.²⁵ In van Berkum's food systems approach there are two main outcomes of interest: first, **increasing food security**; and second, **reaching socio economic outcomes, such as income and livelihood**.²⁶ All outcomes should be achieved taking into consideration the sustainability and full respect of the natural environment.²⁷

In each of these two frameworks, the overall performance of the food system is evaluated by observing the behavior of several actors. This behavior is examined within the structure of the core system, as well as societal and natural elements. When further broken down, the core system encompasses activities through which food products flow, such as production and aggregation. In turn, these activities are embedded into society (i.e., policies, laws, and regulations) and the environment (i.e., water, soil, and ecosystems).

In particular, van Berkum et al. consider two main **drivers** in the food systems approach: socio economic/political; and environmental drivers.²⁸ These drivers correspond to the three dimensions—social, economic and environmental—identified by FAO²⁹ and to the socio cultural, political, demographic, and environmental drivers discussed by the HLPE.³⁰ These drivers are in relation to the **food system**

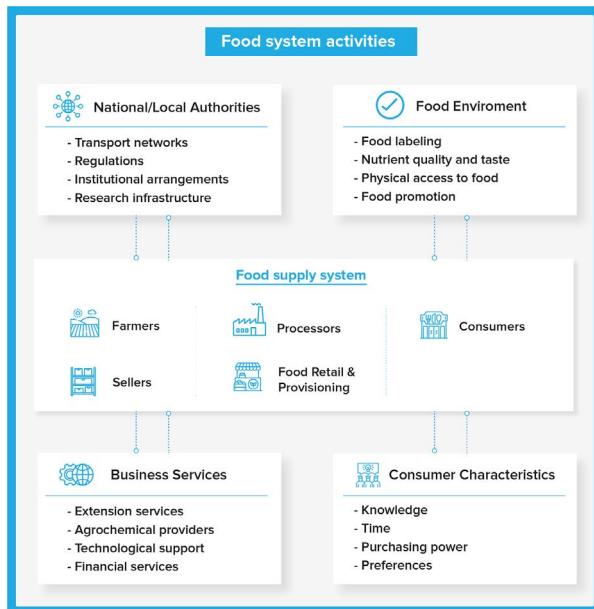
activities. The food system activities are represented by the interaction between all supply chain actors and the government. **Figures 2 and 3** clearly identify these activities, outcomes, drivers, and the relationship between each other. For further exploration of the similarities between van Berkum's food systems approach and FAO's approach, please refer to the appendix.

Figure 1. Food Systems Approach (FSA), Adapted from van Berkum et al. (2018)



Source: Elaborated by the authors with information from van Berkum et al., 2018

Figure 2. Food System Activities Adapted from van Berkum et al. (2018)



Source: Elaborated by the authors with information from van Berkum et al., 2018

28 van Berkum et al., 2018

29 FAO, 2014

30 HLPE, 2017

The COVID-19 pandemic and the government's restrictive measures to contain the spread of the virus have affected all aspects of the food system, including actors such as the government, consumers, primary producers, and midstream actors, such as sellers and processors. In Chapter 1, an analysis of the overall effects generated by the COVID-19 pandemic on the various dimensions of the food system and its actors will be presented.

II. Measurement Framework

All the elements —outcomes, activities, and drivers— of the food systems approach correspond to a specific set of indicators that have been affected by the pandemic. All such indicators are described in this section.

II.I. Indicators³¹

In line with the food systems approach introduced above, the authors evaluated the effects of COVID-19 on the following indicators: i) outcomes; ii) socio-economic and political drivers; and iii) food system activities. When possible, the authors also categorized the effects and the indicators by supply, demand, and governance.

II.I.I. Food System Outcome Indicators

Table 2 summarizes the effects of COVID-19 on the **outcomes** of the food systems approach: food security, agriculture, and other livelihood activities. This classification was adapted and integrated in accordance with the most recent literature described in the sections above.

As previously mentioned, on the **supply side**, food security and nutrition of households and individuals were undermined by mainly the reduced quantity of food consumed, due to the curtailment of market supply, movement restrictions, and price increases. At the same time, **demand** was diminished because of the reduction of purchasing power linked to income losses. The twin forces of reduced access to and demand for staple foods or highly nutritious foods led to deteriorated nutritional quality of meals, especially among vulnerable groups.

II.I.II. Socio economic and Political Drivers Indicators

Based on the drivers presented in van Berkum et al.'s approach and primary and secondary data sources, the authors analyzed three different levels of drivers. The first level encompasses **socioeconomic and political drivers**. At this level, closer attention was paid to the relationship between macroeconomic and individual factors (see **Table 3**).

Table 2. Effects of COVID-19 on Outcomes

Effects of COVID-19 on outcomes	Indicators	
	On the supply side	On the demand side
Food security	—	Household/individual level food security and nutrition e.g., hunger experience, reduced quantity of food consumed, and deteriorated nutritional quality of meals, particularly among vulnerable groups (youth and women).
		Access to staple foods or other high-nutrient foods (e.g., meat and fish), including prices and physical access due to movement restrictions.
Agriculture	Deaths and illness caused among farmers from COVID-19 that result in a reduction of food production capacity.	Household incomes and purchasing power decrease, due for example to loss of income or employment, reduced remittances, or wage cuts. Reference for analysis page
	Disruption of common labor arrangements due to the imposed physical distancing (loss of employment).	—
Other livelihood activities	—	Other livelihood activities such as fisheries, aquaculture, livestock, forestry activities and other business activities, remittances (loss of employment and income).
	—	Labor migration, access to credit and finance, borrowing and investment.

Source: Elaborated by the authors

³¹ The following tables present how the indicators proposed by FAO Liberia are embedded in van Berkum's framework. In the first column, the categories suggested by van Berkum's framework are presented, whilst columns 2 and 3 show the indicators proposed by FAO. The impact of COVID-19 in each of these indicators (whenever information was available) is presented in the following chapters. Specifically, Chapter 1 reports information on the impact documented by the literature. Chapter 2 informs on the impact of COVID-19 through the analysis conducted by the authors.

Table 3. Socioeconomic and Political Drivers

Effects of COVID-19 on food system activities	Indicators		
	On the supply side	On the demand side	Governance
Market	<ul style="list-style-type: none"> GDP Food world prices Employment rates Trade relations and prices Forecasted trade changes (import/export goods and food) Trade balance, capital balance and balance of payment Exchange rate Deficit 		
Policies	The availability of and access to social protection services (safety nets, social insurance, paid sick leaves, unemployment benefits)		<ul style="list-style-type: none"> Government's technical and financial assistance and government's interventions (e.g. social protection measures) Food import/export restrictions Revision of trade agreement Support to domestic market and production Price stability Social assistance
Individual factors		<ul style="list-style-type: none"> Consumer behavior, e.g., the pattern of retail behavior regarding shops and markets and food choices Gender sensitive and vulnerable analysis (youth, women, casual laborers or informal dietary patterns) 	

Source: Elaborated by the authors

II.I.III. Food System Activities Indicators

The second set of indicators is derived from the **food system activities**, involving the analysis of all actors and how their

roles have been impacted by the COVID-19 pandemic, including an overall analysis of how agricultural production has been affected (see **Table 4**).

Table 4. Food System Activities

Effects of COVID-19 on food system activities	Indicators		
	On the supply side	On the demand side	Governance
Farmers	Access to input and output markets	The availability of and access to social protection services (safety nets, social insurance, paid sick leaves, unemployment benefits)	Key government institutions handling COVID-19 and major response measures taken for containment (i.e., tariff and non-tariff measures on key commodities).
	Farmers' ability to produce – farm size and preferred crops;	—	—
	Supply of high-value nutritious foods to rural and urban markets, assessed in terms of (a) reduced supply (b) nutrition, and (c) food loss and waste;	—	—

Processors	Domestic food prices and inputs (for both domestically produced, imported food products, and imported items for storing, packaging, or preserving food);	—	—
Retail and provisioning	Other operators along food supply chains, especially exporters, importers, input suppliers, processors, wholesalers, and retailers;	—	—
Consumers	—	Household expenditure, for example increased spending on medical items/support, stockpiling of food and transportation	—

Source: Elaborated by the authors

III. Assessment Methodology

III.I. Data Sources

This assessment follows a mixed-methods methodology, in which each of the items of the framework outlined above has been analyzed combining information coming from secondary data sources (i.e., literature review based information, Chapter 1) with quantitative and qualitative information derived from primary data, Chapter 2. The primary data analyzed belong to the 2021 **Liberia Post-harvest and Food Security Assessment 2021**,³² whose data were collected by FAO Liberia Country Office and the Ministry of Agriculture in 2021; and **key informant interviews (KIs)** conducted by the authors in October 2021.³³ The LPHFSA data, in combination with information from the HIES 2016 and a microsimulation model, allowed the authors to analyze the impact of the COVID-19 pandemic on the **demand side** of the food systems approach (income losses reducing economic access to food). KIs and multiple regression models were used to analyze impacts on the **supply side** (disruptions of supply chains hampering physical access to and availability of food); and **governance** (disruptions generated by the stringency of the containment measures and efficacy of the social assistance policies).

Secondary data sources mainly concern:

- **Household Income and Expenditure Survey (HIES 2016).** This survey, carried out by the Liberia Institute for Statistics and Geo-Information Services, provides information on income, consumption, and poverty rates and was used to

draft a picture of the socio-economic situation of Liberia before the pandemic began.

- **The World Bank (WB),³⁴ the International Monetary Fund (IMF) 2021,³⁵ FAO's Global Information and Early Warning System on Food and Agriculture (GIEWS)³⁶ and the Global Report on Food Crises³⁷.** Information provided by these organizations was used to define the macroeconomic characteristics of Liberia before and during the COVID-19 pandemic.
- **COVID-19-related sources of information**, such as Oxford University's COVID-19 Stringency Measures Index³⁸ and the response and preparedness indicators elaborated by the Liberian Ministry of Health at county level,³⁹ provided a detailed mapping of the lockdown measures in Liberia and how stringent they were.
- **The 2019 Demographic and Health Survey⁴⁰** provides a snapshot of the welfare situation in Liberia before the pandemic, including indicators on population demographics, health, and nutrition.
- Other studies conducted at the microeconomic level undertaken by FAO and other organizations and independent consultants, such as Aggrawal et al., were considered to benchmark the authors' results and enrich the literature review.

The screening of information was carried out through a data mapping exercise. Data was compiled from LPHFSA 2021, and other secondary data sources to inform aspects related to agriculture, poverty, and food security, as well as other factors of the food systems approach (see **Figure 2**). Through this approach, the expected output was to create

32 FAO Liberia & MoA, 2021

33 Two types of key informant interviews were conducted during this study: the first one by FAO and Liberia's Ministry of Agriculture between January and March 2021, and a second one by Data-Pop Alliance in October 2021. The KIs data provided by FAO Liberia and the Ministry of Agriculture at the beginning of this consultancy could not be analyzed since Data-Pop Alliance did not have access to the questionnaire-related questions.

34 World Bank, 2020d

35 IMF, 2021

36 FAO, 2021c

37 FSIN & GNAFC, 2021

38 Hale et al., 2021

39 National Public Health Institute of Liberia, 2020-21

40 LISGIS, 2021

an understanding of the changes in the food system that can be attributed to the COVID-19 pandemic and the measures adopted to contain it.⁴¹

III.II. Methodology

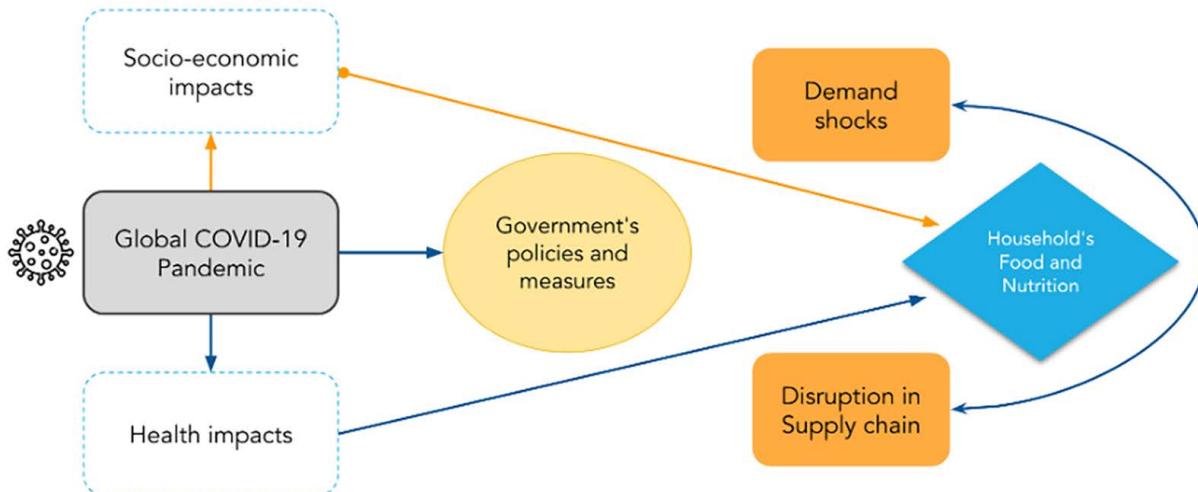
Demand side. The LPHFSA 2021 survey covered Liberia's 15 counties and collected responses from 4,157 households between January and March 2021. Since the reference year is 2021, all the data belong to the post-COVID scenario. Strongly unbalanced responses between these months did not allow the authors to run a comparison across months. Since a before-and-after analysis in quantitative terms was not possible due to the absence of data before the onset of the COVID-19 pandemic for the same group of people, and comparison across months was limited by attrition issues, the authors opted for a **micro simulation approach**.

A microsimulation was modeled using both the LPHFSA 2021 and HIES 2016 data. Behavioral models were predicted for occupational choice, wages, and household income using econometric methods. Macro-level projections taken from international and national sources were then fed into the micro-model to calibrate the development of income and food security at the household level over time.

Two scenarios were modeled: the first scenario corresponds to the COVID-19 shock; the second corresponds to the counterfactual scenario with macro-level projections taken from pre-COVID-19 estimates. These two scenarios allowed the authors to estimate the impact of COVID-19 on the demand side—notably, income losses and consequent poverty rates and their relation to food security.

Supply and governance sides. The LPHFSA 2021 survey provided data at the farmer level, and it does not cover socio economic and political drivers of the food system, such as market, policies, and food environment.⁴² **Key informant interviews (KII)** with main actors of the supply chain were carried out by the authors in October 2021 to fill this gap.⁴³ The analysis of KIIs offers insights into the impact of COVID-19 on the supply side, such as the disruptions of supply chains hampering physical access to and availability of food; and on governance with the evaluation of the efficiency of containment and the social assistance measures. On the governance side, the authors also adopted multiple regression models in order to assess the disruptive effect of the stringency of the containment measures on the food security and production. All effects analyzed through the various econometric techniques are summarized in **Figure 3**.

Figure 3. Impact Pathways of COVID-19 on Households' Food and Nutrition Security



Source: Elaborated by the authors with information from Chiwona-Karltun et al. (2021, Fig. 1)

41 This study does not aim to establish causal links between COVID-19, measures taken to contain it, and the components of the food system. First, because system-thinking approaches focus more on the interplay between actors and their feedback loops, rather than the linear causal links. Second, since the pandemic was a covariate shock (i.e., it affected the global population), identifying a treatment and control group to establish causal impacts would prove impractical.

42 The sequence of the questions presented in the LPHFSA 2021 survey and its respective list of available answers are difficult to interpret, as the survey format is not very clear. This interferes with the interpretation of possible data gaps inferred from the LPHFSA 2021 survey.

⁴³ Other information gaps emerging from both the analysis of the literature and LPHFSA (2021) are described in Chapter 2.

Chapter 1

COUNTRY CONTEXT AND THE COVID-19
PANDEMIC

1.1. Socio economic Characteristics of Liberia

Liberia's population was estimated at approximately 5 million in 2020.⁴⁴ Based on estimates of the Multidimensional Poverty Index, about 3 million Liberians (70.1%) were multidimensionally poor and deprived of development in 2016.⁴⁵ Another 924,000 were on the verge of multidimensional poverty. Groups with the highest levels of poverty (66%) are those in which the head of household had no formal schooling. With primary education the proportion falls to 58.7%; with secondary to 43.8%; and to 15.9% when the head of household has some post-secondary education.⁴⁶ Approximately 70% of the country's total labor force is employed in the agriculture sector; women represent 75% of the agricultural workforce. In rural areas, although women usually own the crops they cultivate, they rarely have a land title or deed of ownership.⁴⁷

In 2016, more than 2.2 million Liberians—68% of whom resided in rural areas—were unable to meet their basic food needs.⁴⁸ The COVID-19 crisis hit Liberia when the country was recovering from the 2014–2016 Ebola epidemic, compounding its impact on the Liberian population. Liberia's health system is among the weakest in the world, with severe shortages of human and financial resources, limited institutional capacity, and insufficient infrastructure.⁴⁹

1.2. The Impact of COVID-19: Review of the Crisis to Date

This report chiefly aims to assess the impact of COVID-19 on food systems, income reduction, and loss of purchasing power and employment in the agriculture sector and other livelihood activities (fisheries, aquaculture, livestock, forestry activities, etc.), with a secondary focus on food insecurity. As indicated by Béné et al., “the current threat to the food security of millions of people in the world is not the direct effect of the virus itself, but the results of the disruptions in food supply and in income revenues.”⁵⁰

1.2.1. Economic and Food Supply Impacts

The COVID-19 pandemic and the consequent governance measures to curb the spread of the virus impacted the country's entire food system with adverse effects on **consumers, primary producers, and midstream actors.**⁵¹ In the following section, an analysis of the effects of COVID-19 on food system activities will be presented, focusing on three dimensions: supply, demand, and governance.

A. Impacts on the Economy and Trade (Market)

National economy. The COVID-19 outbreak triggered a global economic recession which resulted in a dramatic loss of livelihoods and income on a global scale.⁵² The International Labour Organization (ILO) estimates indicate a significant increase in unemployment and underemployment globally.⁵³ Furthermore, ILO suggested in 2020 that global gross domestic product (GDP) growth would drop by 2-8%, leading to the loss of 5.3-24.7 million jobs worldwide.⁵⁴ This, in turn, implies large income losses for workers, estimated at US\$ 860 million to US\$ 3.44 billion. According to World Bank estimates, an additional 71 to 100 million people are likely to fall into extreme poverty as a direct result of the pandemic.⁵⁵ The World Food Programme (WFP) estimates that an additional 130 million people will face acute hunger as a result of the crisis.⁵⁶ Finally, according to UN reports, approximately 45 million people —mainly in Asia and sub-Saharan Africa— became acutely food insecure between February and June 2020.⁵⁷

In Liberia, the economy contracted by 2.5% in 2019. Inflation was estimated at 24%, eroding purchasing power and consequently well-being (see **Table 5**). The real GDP was projected to contract by 2.6% in 2020 due to COVID-19.⁵⁸ Despite some improvements in the trade balance, the current account deficit is expected to widen from 22.5% of the GDP in 2019 to 22.8% in 2020 before narrowing to 19.4% of the GDP by 2022.

44 World Bank Macro Poverty Outlook for Sub-Saharan Africa, 2020.

45 The Multidimensional Poverty Index (MPI) uses 10 indicators of development deprivation in three categories: education, health, and standard of living. MPI calculations cited here are based largely on data from the Liberia Institute of Statistics and Geo-Information Services' (LISGIS) 2013 Liberia Demographic and Health Survey (DHS).

46 LISGIS, 2021

47 Ibid.

48 World Bank, 2020b

49 World Bank, 2020a

50 Béné, 2020, p. 815

51 Termeer et al., 2020; Rosen, 2020; Tounkara, 2020

52 World Bank, 2020a

53 ILO, 2020

54 Ibid.

55 World Bank, 2020a

56 WFP, 2020b

57 UN, 2020b

58 World Bank, 2020b

Table 5. Macroeconomic Indicators (2018-2022f)

	2018	2019e	2020f	2021f	2022f
Real GDP Growth (constant prices) % change	1.2	-2.5	-2.5	4	4.4
of which mining & pinning	24.2	13.2	8.6	6.8	6
of which non-mining	-1.2	-4.5	-3.5	3.5	4.1
Inflation (CPI annual average)	21.2	24.4	17.6	23.5	11
Total revenue and grants (% of GDP)	25.9%	28.4%	27.6%	27.7%	28.9%
Total expenditure (% of GDP)	30.8%	34.7%	33.6%	33%	31.8%
Overall fiscal balance (% of GDP)	-4.8%	-6.3%	-6.1%	-3.7%	-5.6%
Debt (% of GDP)	37.2%	51.1%	59.5%	65.6%	66.6%
Current account balance (incl. grants) (% of GDP)	-22.4%	-22.5%	-22.8%	-20.2%	-19.4%

Source: Elaborated by the authors with information from the World Bank's Liberia Economic Update (2020d)

Agriculture and fisheries account for 27.3% of Liberia's economic output, **service** for 45.3%, **commercial and artisanal mining** for 22.1%, **forestry** for 9.7%, and **manufacturing** for 6.5%. Regarding the impacts of the pandemic on these sectors, the World Bank revealed the following information:

[Liberia's] 2019 contraction was driven by declining output in forestry, manufacturing, and services sectors, coupled with sluggish agricultural growth and a slowing expansion in the mining sector (see Figure 5). Meanwhile, high inflation rates eroded real household income, which adversely affected private consumption. Agriculture and fishery output grew by just 2.3 percent in 2019, well below the annual average of 3.8 percent for 2016-18, as increases in rubber and crude palm oil output were offset by significant declines in cocoa and coffee. Following a slowdown in the previous year, mining output expanded by 13.2% in 2019. The forestry, manufacturing, and services sectors, which together account for over 60% of Liberia's GDP, contracted in 2019. Forestry output fell by 5.2 percent (y/y), marking the third consecutive annual decline since 2017, due to falling demand for round logs and timber. Manufacturing

output contracted by 10.1 percent, its second consecutive annual decline, as domestic demand remained soft. On the supply side, the manufacturing sector continues to face enormous structural constraints, including the high cost of energy. The Liberian economy's largest sector, services, contracted by 2.2 percent in 2018 and by an estimated 7.6 percent in 2019, as weakening aggregate demand impacted both market and nonmarket services. Output in the trade and hospitality, transportation and communications, and utilities subsectors all declined modestly during the year, while nonmarket services plunged by 27.0 percent.⁵⁹

Loss of working hours after the onset of COVID-19 pandemic. Due to the public health crisis, labor markets were disrupted to unprecedented levels in 2020. According to the ILO, on a global scale the agricultural sector was among the most resilient in terms of the estimated decline in working hours. In 19 out of 54 African countries, working hours lost (by percentage) was higher than the global average.⁶⁰ Figure 4 shows in color gradient the decline in the **total number of hours worked in 2020** compared to a baseline⁶¹— the fourth quarter of 2019. These working hour losses have pushed almost five million workers and their

59 World Bank, 2020d, pp. 8-9

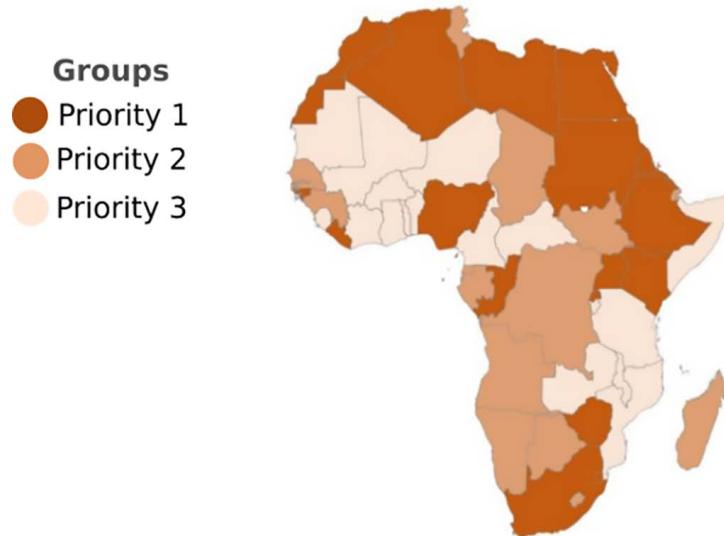
60 ILO, 2020

61 This color gradient represents three equal sized groups, with 18 countries in each). Priority 1, priority 2, and priority 3 groups are in the darkest shade, medium shade and lightest shade, respectively. The countries in priority group 1 include: Liberia, Eritrea, Morocco, South Africa, Cape Verde, Uganda, Algeria, Eswatini, Egypt, Ethiopia, Kenya, Rwanda, Republic of Congo, Libya, Zimbabwe, Guinea-Bissau, and Nigeria. The working hours data was estimated using both economic activity and evolution of the labor market to predict aggregate hours worked.

families into extreme poverty in sub-Saharan Africa (ILO, 2022). Lockdowns and border closures affected heavily informal workers. It was projected that if working hours recovered to pre-crisis levels, employment growth in Africa, specifically decent work, would remain low. This is due to

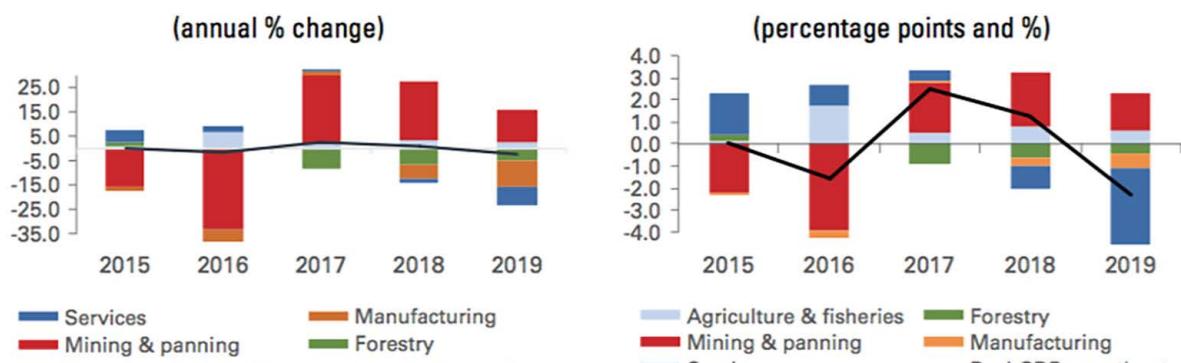
the fact that the informal sector represents most of the region's economy, mainly in subsistence agriculture and self-employment (ILO, 2022).

Figure 4. Working Hours Lost Due to the COVID-19 Crisis



Source: Elaborated by the authors based on ILO (2020)

Figure 5. Real GDP and Output Growth by Sector (left) and Contribution to Real GDP Growth by Sector (right)



Source: World Bank (2020d)

International food prices and trade. Several studies have described how food prices increased due to the COVID-19 outbreak,⁶² while others show rapid price fluctuations for crops and food items.⁶³ Béné et al. explored the levels of inflation in different countries of the world,⁶⁴ showing how the 2020 inflation rate (around 3.2%) is expected to be one of the lowest figures of the last 3 decades (IMF estimates).

This result runs counter to the prevailing view that expects a global food price increase. It is not yet clear whether these latter predictions will eventually prove accurate. Further micro and macro research is needed on this matter; the FAO has set up the Daily Food Price Monitor in a first endeavor to this end.⁶⁵

62 Erokhin & Gao, 2020

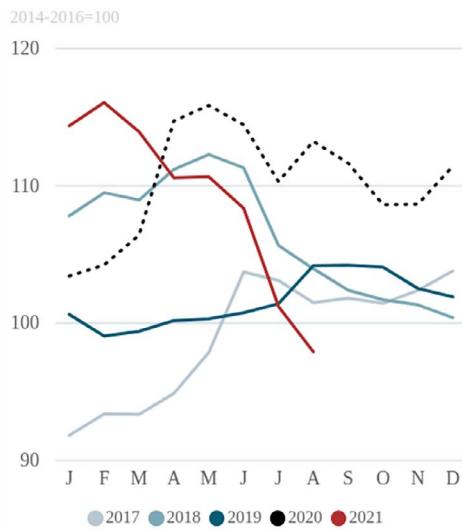
63 Aggarwal et al., 2020; Hirvonen et al., 2020b

64 Béné et al., 2021

65 FAO Data Lab, 2021

Staple crops. Rice and cassava are the main food crops in Liberia. **Rice** for human consumption accounts for over 80% of imports in the country.⁶⁶ The international price of rice is showing high oscillation in the market. According to FAO's All Rice Price Index, the price for rice averaged 97.9 points in August 2021, reaching its lowest level since May 2017 (see **Figure 6**).⁶⁷ However, Figure 6 also shows that at the beginning of 2021, the price index of rice was at its highest point (116) for the last 4 years. This means that it has dropped 18.1 points in the last 8 months. During the last 4 years, the price index started below 100 points in January, with 2017 being the lowest, at 91.8. Thereafter, the index value started to increase until it reached its peak between the months of May and July. Toward the end of each year, the index value started a downward trend, although it remained above 100 points until 2021, when it is expected to fall below 90.

Figure 6. FAO's All Rice Price Index

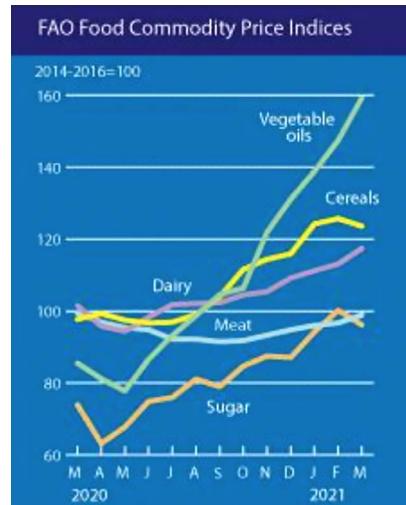


Source: FAO Rice Price Update (2021d)

Other crops. FAO's Food Commodity Price Index averaged 132.5 points in September 2021 (see **Figure 7**), up 2.6 points (2.0%) from August 2021 and 28.5 points (27.3%) above its September 2020 level.⁶⁸ Among the major cereals, world **wheat** prices increased the most in September, up almost 4% month-on-month and as much as 41% year-on-year. Tightening export availability amid strong world demand continued pushing up international wheat prices.

By contrast, maize's world prices remained overall stable (with a difference of only 0.3% increase from August), although they were nearly 38% above September 2020 levels. The overall stability of maize's world prices is due to the improved global crop prospects and the start of the harvests in the United States and Ukraine.

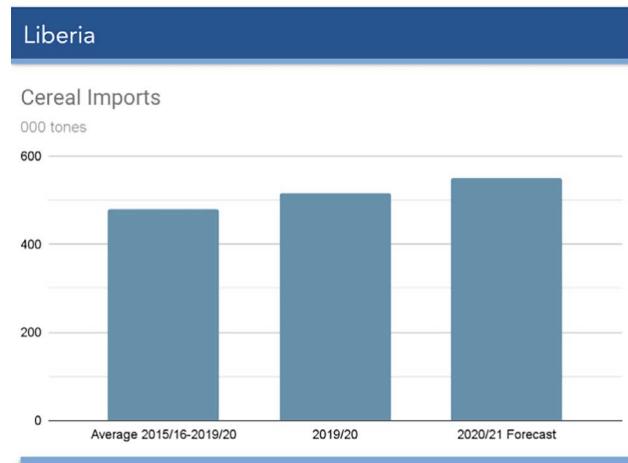
Figure 7. FAO's Food Commodity Price Indices



Source: FAO Food Commodity Price Index (2021c)

Although oscillations have been registered in the price of cereals (especially rice), according to FAO/GIEWS's cereal supply and demand balance sheet,⁶⁹ the import forecast for the 2020/21 marketing year (November–October) shows an above-average level of 540,000 tonnes of cereal imports to Liberia as local traders aimed to replenish their stocks (see **Figure 8**).

Figure 8. Liberia Cereal Imports 2021



Note: Includes rice in milled terms. Split year refers to individual crop marketing years (for rice, calendar year of 2nd year shown).

Source: Elaborated by the authors based on FAO/GIEWS's Cereal supply and demand balances for sub-Saharan African countries (FAO, 2021c)

66 FAO, 2021c

67 FAO, 2021d

68 Ibid.

69 FAO, 2021c

Cash crops and export commodities. According to the World Bank, risks to food-price forecasts are large in both directions and depend on the speed with which the pandemic is contained and mitigation measures are lifted.⁷⁰ **Palm oil**, rubber, and cocoa are the main cash crops in Liberia. The price of palm oil is projected to rise at an accelerated rate in 2020 before moderating in 2021 (see **Figure 9**).⁷¹ During the first 5 months of 2020, prices for **iron ore** and **rubber** fell by 2.2% and 20%, respectively. **Gold** prices rose by 9.9% during the same period, and they are projected to increase by 12.3% in 2020 and 15.4% in 2021. The price of rubber shows a slight increase in 2021. Although cocoa prices fluctuated in 2020 after the onset of the COVID-19 pandemic, on average, prices did not differ much from other years. The Liberia National Cocoa and Coffee Exporter Association (LINACEA) announced in October 2020 that cocoa's farm gate price was US\$1.50 per kilogram. Yet, the exporters association noted that delivery to any warehouse in Monrovia (at the expense of the farmer) was US\$1.65 per kilogram (Yates, 2020).

Agri food import and export. According to the World Bank, the value of Liberia's exports increased by 18.2 percent (y/y), driven by rising prices for gold, iron ore, and rubber.⁷² Exports of other products, including cocoa, crude palm oil, diamonds, and round logs, increased marginally.

National food prices. Around two thirds of the households surveyed by the Liberia Institute of Statistics and Geo-

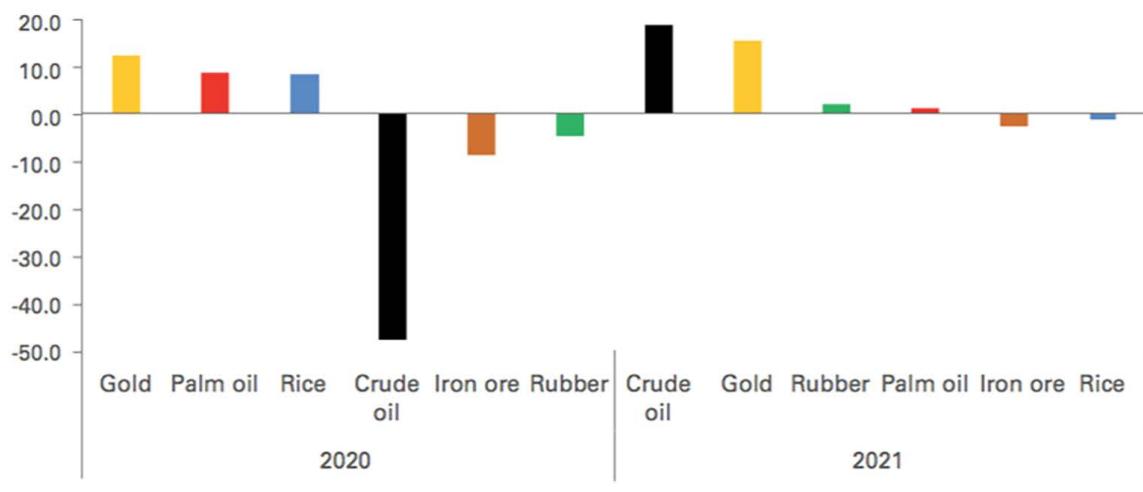
Information Services (LISGIS) reported price increases, which are fuelling food insecurity fears.⁷³ Prices of traditional crops increased between 3 and 9% during the COVID-19 period compared to the month before.⁷⁴ FAO's Global Information and Early Warning System on Food and Agriculture (GIEWS) also reported that:

[P]rices of staple food have been on the rise in most domestic markets since early 2021. Prices of rice reported major increases, between 5 and 40 percent in early 2021 above the level recorded during the same period in 2020. Rural markets in Maryland and River Gee counties continue to report the highest food prices than other counties due to poor internal trade flows. The increased prices in the country are attributed to the poor conditions of roads, high food inflation and the weakening of the local currency.⁷⁵

According to the World Bank (see **Figure 11**):

[D]omestic food-price inflation reached 31.2 percent in 2019, largely due to the poor performance of the agricultural sector, and total food-price inflation approached 30 percent. While the recent collapse of global fuel prices appears to be easing nonfood inflationary pressure, food prices continue to rise in 2020 in a context of supply-side constraints, including weak farm-to-market road infrastructure and inadequate storage and processing facilities.⁷⁶

Figure 9. Projected Price Changes for Liberia's Cash Crops and Exports



Source: World Bank (2020d)

70 World Bank, 2020d

71 Ibid.

72 Ibid.

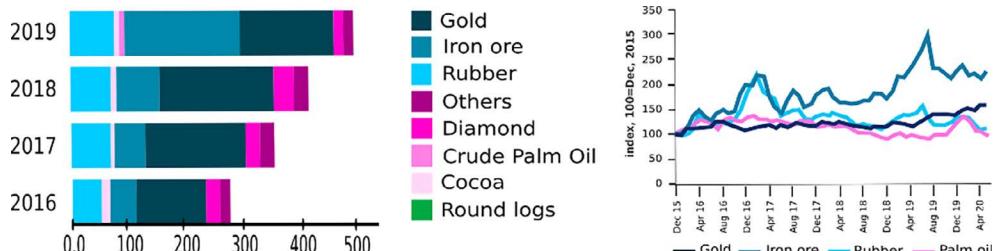
73 Letouzé et al., 2020

74 Aggarwal et al., 2020

75 FAO, 2021c, p. 2

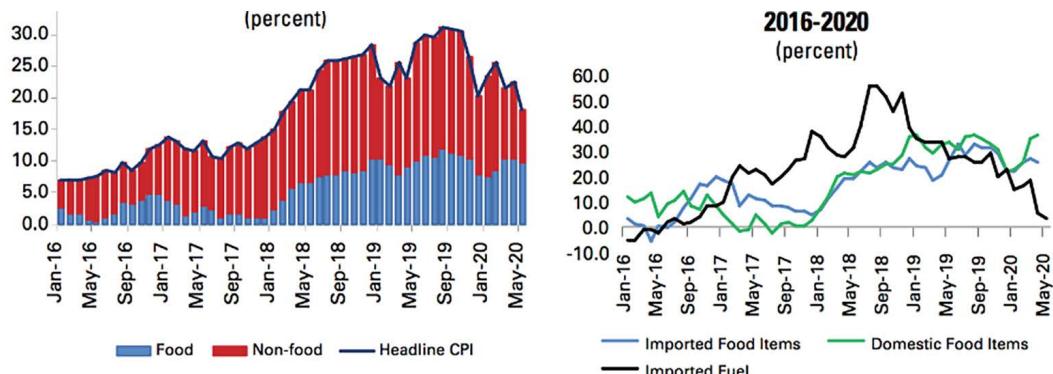
76 World Bank, 2020d, p. 10

Figure 10. Export Composition in US\$ millions (left) and Price Fluctuations (right)



Source: Elaborated by the authors based on World Bank (2020d) and World Bank Commodity Price Database (2020)

Figure 11. Source of Inflation (left) and Changes in Food and Fuel Prices (right)



Source: Central Bank of Liberia (2019) as in World Bank (2020d)

B. Impacts on Food Supply (Farmers and midstream actors)

Lockdown measures have disrupted the overall supply chain—from primary producers to midstream actors, including sellers and processors.⁷⁷ COVID-19 was confirmed in Liberia at a time when the country had just experienced (February–March 2020) a series of fuel/gasoline shortages, which adversely affected people’s movement and regular food transport.

Several authors have described COVID-19 disruption of local market activities, throughout the world and especially in Africa.⁷⁸ In the case of Liberia, “market activity was severely disrupted,” and there were considerable declines in market vendors’ income.⁷⁹ On the supply side, disruption is mainly caused by low levels of production due to producers getting ill, reduced access to inputs in the market (e.g., fertilizer), and subsequent increase in input prices and labor/worker availability.⁸⁰

For **primary producers**, the following disruptions were reported:⁸¹ interruption in the upstream input supply chains—fertilizers, seed supply, spare machinery parts, etc.;⁸² and decline in business profitability and associated revenues.⁸³ In Liberia, the spillover effects of the pandemic are seen in the large profit reduction among farmers, declining to almost no profit by May 2020.⁸⁴ One-fifth of surveyed Liberian households reported “a reduction of the agricultural area planted (compared to last year) and, as such, a lower production this year.”⁸⁵ Overall, 67.5% of households surveyed by LISGIS reported income losses, and around 75.3% of households reported job losses, while businesses reported temporary and permanent layoffs of around 40% of their workforce.⁸⁶

For **midstream actors** (e.g. retailers, sellers, etc.), the main issues documented were reduction in worker availability due to mobility restrictions; increase in public transport costs; fear of exposure to virus;⁸⁷ reduction in demand for

77 WorldAware, 2020

78 Dugué et al., 2021; Anon, 2020

79 Aggarwal et al., 2020, p. 1

80 HLPE, 2020

81 Béné et al., 2021

82 Claudino, 2020; Termeer et al., 2020; Robins et al., 2020; MSSRF, 2020

83 Macías-Chóez et al., 2020; Harris et al., 2020; Quiroga Mendiola et al., 2020; Niang & Faye, 2020

84 Aggarwal et al., 2020

85 FAO, 2021b

86 LISGIS, 2021

87 IFAD et al., 2020; Macías-Chóez et al., 2020; DNPGCA, 2020

their products;⁸⁸ and loss of or reduced connectivity with their established business partners or consumers.⁸⁹

Concerning midstream actors, in Liberia impressively 98% of street vendors reported that they were closed or had reduced business hours⁹⁰ they declared an increase of 35% in stocking costs. Interviews with key informants were undertaken in order to complement this information. The results of the interviews will be explained in the next chapter.

Impacts on agriculture. There is a large consensus in the literature suggesting that the major direct effects of COVID-19 on socio economic outcomes are its impact on employment, income and associated purchasing power of all those individuals whose jobs and livelihoods were affected by the lockdown and by other mobility restriction measures established by local and national authorities.⁹¹ On the supply side, disruptions are mainly caused by low levels of production due to producers that get ill, reduced access to inputs in the market or the sharp increase in their prices, and workforce shortage due to mobility restrictions.⁹² On the demand side, disruptions are provoked by the reduction of consumers' purchasing power, reduced quantity of food consumed, and mobility restrictions.⁹³ The IMF forecasts that the COVID-19 pandemic will cause the worst global recession since the Great Depression and, to a greater degree of intensity, the 2008 financial crisis.⁹⁴

Concerning farmers' production, 2020 national rice production is estimated at 270,000 tonnes, similar to the five-year average and slightly below the previous year.⁹⁵

Figure 12. Liberia's Rice Production

Liberia				
Cereal Production				
	2015-19 average	2019	2020 estimate	change 2020/2019
			000 tonnes	percent
Rice (paddy)	269	276	270	-2.4
Total	269	276	270	-2.4

Note: Percentage change calculated from unrounded data.

Source: Elaborated by the authors based on FAO/GIEWS Country Cereal Balance Sheet (FAO, 2021c)

88 Varshney et al. 2020; Harris et al. 2020; FAO, 2020b

89 Ebata et al., 2020; Nedumaran et al., 2020

90 Aggarwal et al., 2020

91 FSIN & GNAFC, 2020; Robins et al., 2020; FAO, 2020e

92 Aggarwal et al., 2020

93 Béné et al., 2021

94 IMF, 2020a

95 FAO, 2021c

96 FAO/GIEWS, 2021

97 FAO, 2021b

98 Letouzé et al., 2020

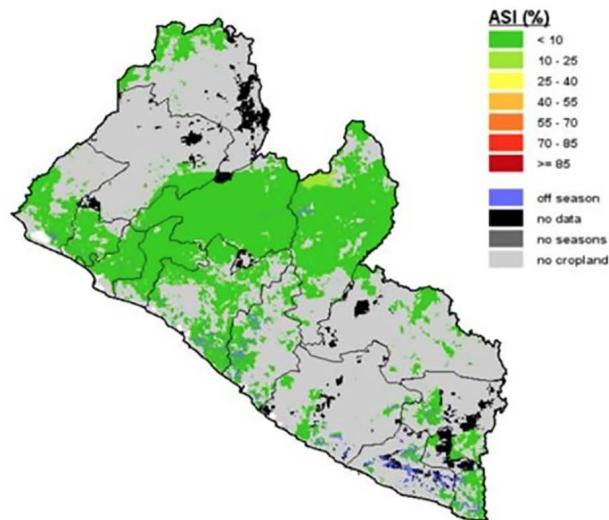
99 FAO, 2020d; Termeer et al., 2020

Further, the Agricultural Stress Index (ASI) as of April 2021 did not show any particular risk for cultivation, such as drought risk.⁹⁶ The percentage of crop area affected by severe drought was less than 10%, and in a few areas between 10-25%.

Figure 13. Liberia's Agricultural Stress Index

Liberia - Agricultural Stress Index (ASI)

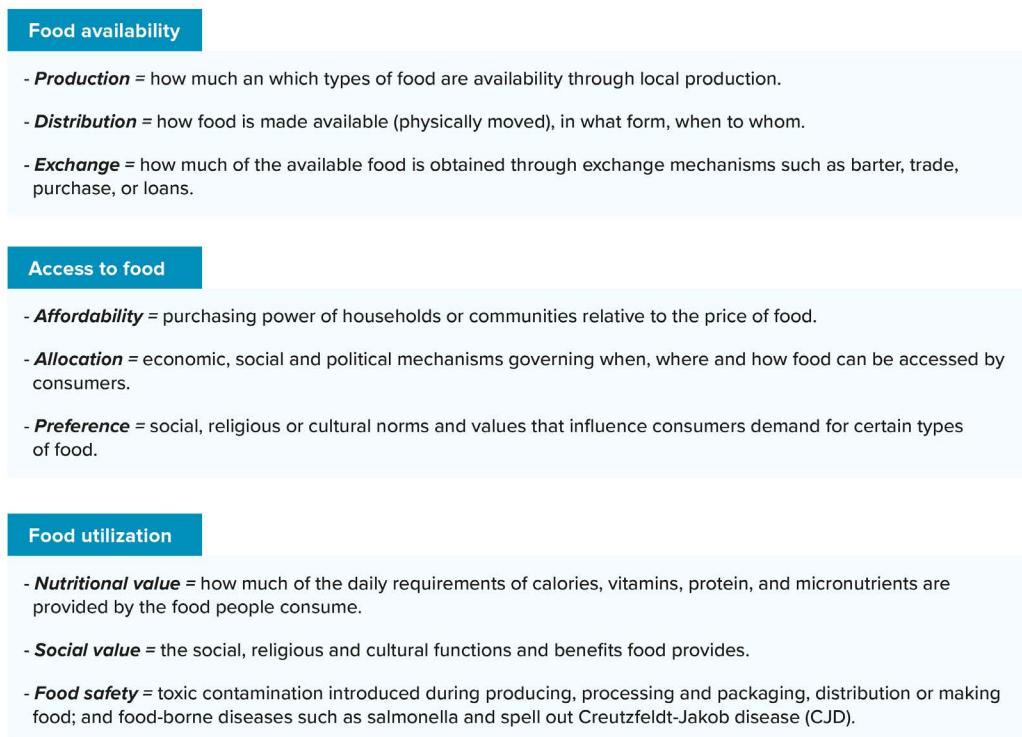
from start of season 1 to dekad 2, April 2021



Source: FAO/GIEWS Country Brief Liberia (2021)

Further, farmers in Liberia found "unusual difficulties in accessing finance or credit as a result of their insufficient income and because they faced higher prices than usual."⁹⁷ A rapid assessment of COVID-19 impact in Liberia conducted in 2020 by Analysis for Economic Decisions (ADE) and Data-Pop Alliance (DPA) highlights how lockdown measures and mobility restrictions reduced access to financing facilities and how the creditor risk aversion to lending may be further exacerbated by the fact that many debts will be unpaid.⁹⁸ The literature stressed the importance of ensuring access to loan/credits for food system actors who have been severely hit by COVID-19.⁹⁹ In absence of financial support, the long-term implications will lead to a further disruption in the value chain of business and investments.

Figure 14. Three Traditional Dimensions of Food Security



Source: Elaborated by the authors with information from FAO (1996)

Impacts on livestock and fisheries. Concerning the impact of COVID-19 on livestock and fisheries in Liberia, the main source of information is an FAO report.¹⁰⁰ Survey findings show that for animal breeders, access to feed and veterinary inputs and services were the main difficulties that households faced in raising their animals, followed by input price increase, decreased income, and limited access to credit. In addition, 45% of surveyed animal breeders reported a decrease in the number of animals they owned. Concerning fisherfolk households, the analysis shows difficulties such as decreased demand, market access, and lack of inputs and equipment.

1.2.2. Impacts on Food Demand (consumers, access to food, vulnerables)

On the demand side, mobility restriction and lockdown measures imposed by the government generated losses of income and purchasing power and access to traded food.¹⁰¹ Particularly, the COVID-19 pandemic impacted consumers' food security through its effects on the income and associated purchasing power. The **loss of consumers' purchasing power** is associated not only with the increase in prices of food items, but also with the decrease in consumers'

income due to temporary job losses or reduction in salaries. Thus, COVID-19 has caused a shift in behavior that has generated negative impacts on consumers' food security, such as **reduced food expenditures and deteriorated nutritional quality of meals**; e.g., reduced access to staple foods or highly nutritious food, especially among vulnerable groups.¹⁰² Furthermore, COVID-19 increased consumers' sense of uncertainty and triggered negative strategies such as hoarding and **panic buying**—as was globally observed in the first few weeks following the onset of COVID-19—with a subsequent disruption in local food supply chains.¹⁰³

Thus, COVID-19 effects reduced the demand for certain food items, which in turn led to reduced income for vendors, retailers, and producers. The contraction in demand also generated excess supply and a decline in prices of certain products. The possible implications of this decline in purchasing power and production are well established in the literature: fall back into poverty, with negative mid- to long-term effects on (child) nutrition, as well as deterioration of well-being and physical and mental health.¹⁰⁴

Impacts on Liberia's food and nutrition security and humanitarian situation. Food security encompasses the

100 FAO, 2021b

101 HLPE, 2020 & Béné et al., 2021

102 FAO & CELAC, 2020; FAO, 2020f

103 Lewis, 2020; Norberg & Rucker, 2020

104 Devereux et al., 2020

three traditional dimensions of food security specified by FAO¹⁰⁵ and HLPE¹⁰⁶, which are extensively described in **Figure 14**. These are:

- **Food availability.** An adequate supply of food at the national or international levels.
- **Food accessibility** (affordability). The relative cost of food compared with a household's income and purchasing power.¹⁰⁷
- **Food utilization** (quality and safety). Food quality describes the attributes that influence food's value and that make it acceptable or desirable for the consumer.¹⁰⁸ Food safety describes the impact of food on human health and refers to "all those hazards, whether chronic or acute, that may make food injurious to the health of the consumer."¹⁰⁹

COVID-19 impacts on food supply and demand will directly and indirectly affect all three pillars of food security and nutrition: **availability, access, and utilization**¹¹⁰ and **all the related literature**.¹¹¹

On the supply side, food security and nutrition of households and individuals are undermined by reduced market supply, movement restrictions, and price increases, which result in reduced quantity of food consumed. On the demand side, inadequate nutrition results from the reduction of purchasing power linked to income losses. This leads to a deteriorated nutritional quality of meals (reduced access to staple foods or highly nutritious food), especially among vulnerable groups.

Several studies assessing the impacts of COVID-19 in Africa find large declines in food security in Uganda¹¹² and Nigeria.¹¹³ Prior to COVID-19, Liberia had structural food security; according to the World Food Programme, approximately one in five households suffered from food insecurity in March 2020, just before the COVID-19 crisis began in the country.¹¹⁴

According to the 2019 report on State of Food Security and Nutrition in the World, Liberia's levels of undernourishment and severe food insecurity were among the highest in sub-

Saharan Africa (SSA), affecting an average of 37.2% and 62.2% of the population in 2016 and 2018, respectively.¹¹⁵

According to the 2021 Global Report on Food Crises¹¹⁶ and the IPC/CH acute food insecurity phase description and response, in June–August 2019, only 1% of the population was in acute food insecurity (Phase 3–crisis; Phase 4–emergency; Phase 5–catastrophe), and 19% was in Phase 2–stressed.¹¹⁷ After the onset of COVID-19 in March 2020, there was an increase in the percentage of population both in Phase 2 and in Phase 3 with 24% (Phase 2) and 10% (Phase 3) in October–December 2020; and then 32% (Phase 2) and 20% (Phase 3) in June–August 2021. According to the latest Cadre Harmonisé (CH) analysis, about 940,000 people were estimated to be in CH Phase 3–crisis and above between June and August 2021 due to high food inflation rates and the negative effects of the COVID-19 pandemic on the economy. The country also hosts approximately 8,200 refugees who require assistance.

The number of wasted children under 5 years old was particularly high in the Sahel countries in 2020. In Liberia, the Global Report on Food Crises shows a national wasting prevalence of 4.3% and stunting prevalence of 30.1% in 2020.¹¹⁸ According to UNICEF et al., the number of stunted children was around 35.5% in 2012 and decreased to 28% in 2020; the wasting prevalence in 2019 was around 3.4%.¹¹⁹ Comparing the results of both studies, it can be deduced that between 2019 and 2020 there was an increase in wasting prevalence from 3.4% to 4.3% and a reduction in stunting prevalence from 35.6% (2012) to 30.1% (2020). The Global Hunger Index shows an increase in the proportion of undernourished in the population from 35% in 2012 to almost 40% in 2020.¹²⁰

A report from FAO reveals that, in Liberia, during the lean season in 2020, 28.3% of households were estimated to be affected by severe food insecurity.¹²¹ Particularly, "people have faced serious constraints in the quantity of food they are able to purchase, have experienced hunger and, in the most extreme of situations, have been forced to go without eating for 1 day or more". However, Aggarwal et al.

105 FAO, 1996; 2008

106 HLPE, 2017

107 Powell et al., 2013

108 FAO, 2003

109 FAO, 2003

110 HLPE, 2020

111 WFP 2020a; Chris Béné et al. 2021; UN, 2020; OECD, 2020a; 2020b; Termeer et al., 2020; FAO, 2020b; 2020c; 2021a; 2021b

112 Mahmud & Riley, 2020

113 Amare et al., 2020

114 WFP, 2020c

115 FAO et al., 2019

116 FSIN & GNAFC, 2021

117 Ibid

118 FSIN & GNAFC, 2021

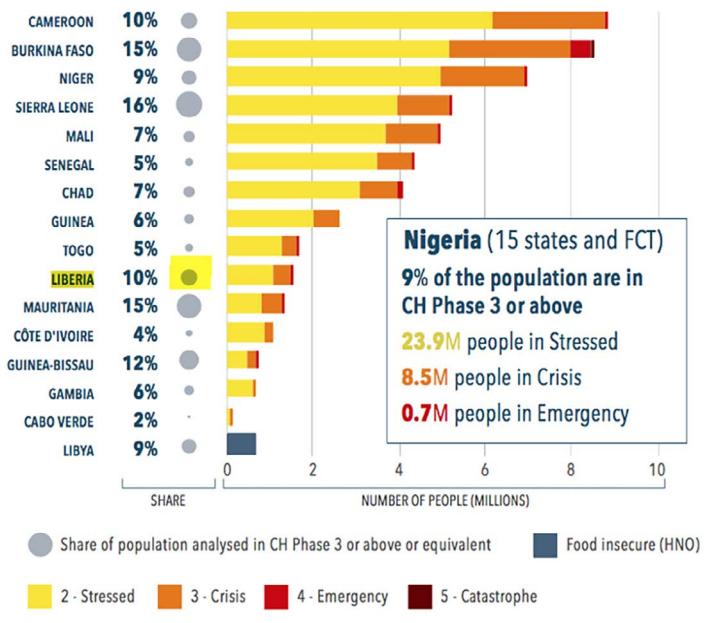
119 UNICEF et al., 2021

120 Global Hunger Index, 2020

121 FAO, 2021b

Figure 15. Numbers of People in CH Phase 2 or Above

Numbers of people in CH Phase 2 or above and share of population analysed in CH Phase 3 or above (or equivalent)

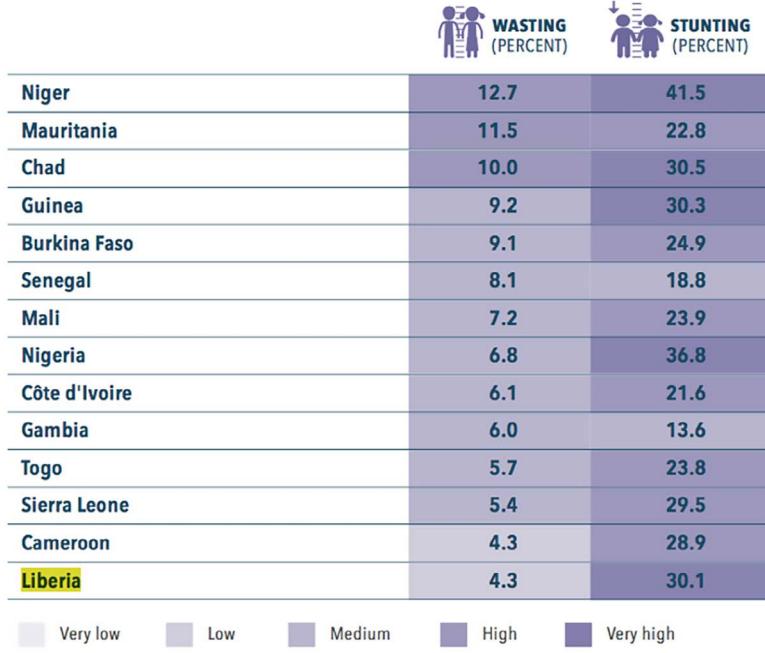


Source: FSIN, using CILSS-Cadre Harmonisé and HNO data.

Source: Food Security Information Network, 2021

Figure 16. Wasting and Stunting in Children Under 5

Wasting and stunting in children under 5 years



Note: No recent data available for Guinea-Bissau and Libya. Date range used for data, 2015–2020.
Source: FSIN, using National Nutrition Surveys data.

Source: Food Security Information Network (2021)

analyzed the impact of COVID-19 on food security between April and August 2020, and found that the level of food insecurity has not been exacerbated during the market disruptions generated by lockdown measures associated with the pandemic.¹²² These findings are confirmed by a recent study conducted by Innovations for Poverty Action, which suggested that food security has not significantly deteriorated for the lowest-income rural populations.¹²³

Impacts on vulnerable populations. The COVID-19 crisis hit Liberia at a time when the country was recovering from an Ebola outbreak, further exacerbating the impact on vulnerable groups such as youth, women, migrant workers, households depending on remittances, and indigenous groups. Many of these people work in the informal economy, which accounts for 50–75% of all non-agricultural employment in developing countries.¹²⁴ According to the World Bank, 90% of the population in Liberia works in the informal sector, mostly in the form of self-employment or unregistered non-farm enterprises.¹²⁵ Youth (15–24 years old) and women are more likely to be in the informal sector compared to non-youth (25–64 years old) and men; in 2016, 95 % of female workers and 97% of youth workers worked in the informal sector.¹²⁶ Informality is lower in urban than in rural areas; however, it still accounts for 84% of total employment.

According to FAO, the agricultural activities of rural women have been affected by COVID-19 more than those of men.¹²⁷ In particular, women have been likely to be at greater risk of exposure to COVID-19 due to their caregiving role inside the family. This has generated implications for food production, processing, and trade.¹²⁸ Women are also at risk of experiencing domestic violence due to confinement at home with their aggressors when lockdown measures are in place.¹²⁹ FAO observed that in Liberia, at the time of COVID-19, the surveyed households with the highest estimated prevalence of food insecurity were female-headed households, with 85.3% of them in a state of moderate or severe food insecurity.¹³⁰

DPA also explored the literature on the effects of COVID-19 on outcomes in the sphere of labor migration (human capital). Concerning migrant workers, the literature studies the effects of COVID-19 on the reduction of remittances,

predicting that the countries highly dependent on remittances, including Liberia, will be hit harder by the crisis.¹³¹ In Liberia, remittances accounted for over 31% of the GDP in 2019.¹³²

At the beginning of 2020 there were just over 8,000 refugees residing in five counties in Liberia, with some in settlements that tend to be crowded,¹³³ but a subsequent new influx had significantly increased the refugee population in Liberia by October 2021. Furthermore, in comparison to non-migrant workers, migrant workers tend to face higher vulnerability to poverty and food insecurity, with little access to health care and social protection measures.¹³⁴ A study carried out by Klassen and Murphy shows that migrant workers experienced higher incidences of COVID-19 infections compared to other populations.¹³⁵

1.2.3 Governance Impacts (Policies)

A. COVID-19 Cases and Deaths

The COVID-19 confirmed cases curve shows a minimum stationary trend between October 7, 2021, and November 7, 2021, with 16 cases reported throughout the country (**Figure 17**, upper panel). This coincides with a significant increase (although still minimal for collective protection) in the number of vaccines administered. From October 7, 2021, to November 2, 2021, the vaccinated population went from 1.7% to 7.8% (partial doses). Figure 17 shows important peaks in cases. The first is observed in June–July 2020, when there were reports of up to 84 daily cases. The second peak of infections is observed in June–July 2021. This rebound had higher figures, with reports of up to 398 daily cases. As of November 7, 2021, 5,815 confirmed cases of COVID-19 had been registered in the country.

On the other hand, the lower panel of Figure 17 shows the death reporting curve. As of November 7, 2021, a total of 287 deaths had been reported over the course of the pandemic. Just as two important curves of COVID cases are observed, there are two clusters of deaths that temporarily coincide with the cases.

B. Lockdown and Containment Measures

Several waves of COVID-19 and periods of lockdowns occurred at different times around the world. Liberia's

122 Aggarwal et al., 2020

123 IPA, 2020

124 White & Aylward, 2016

125 World Bank, 2020c

126 World Bank, 2021

127 FAO, 2020g

128 Moseley, 2020

129 FAO, 2020g; WHO, 2020a

130 FAO, 2021b

131 Gagnon, 2020; The Economist, 2020

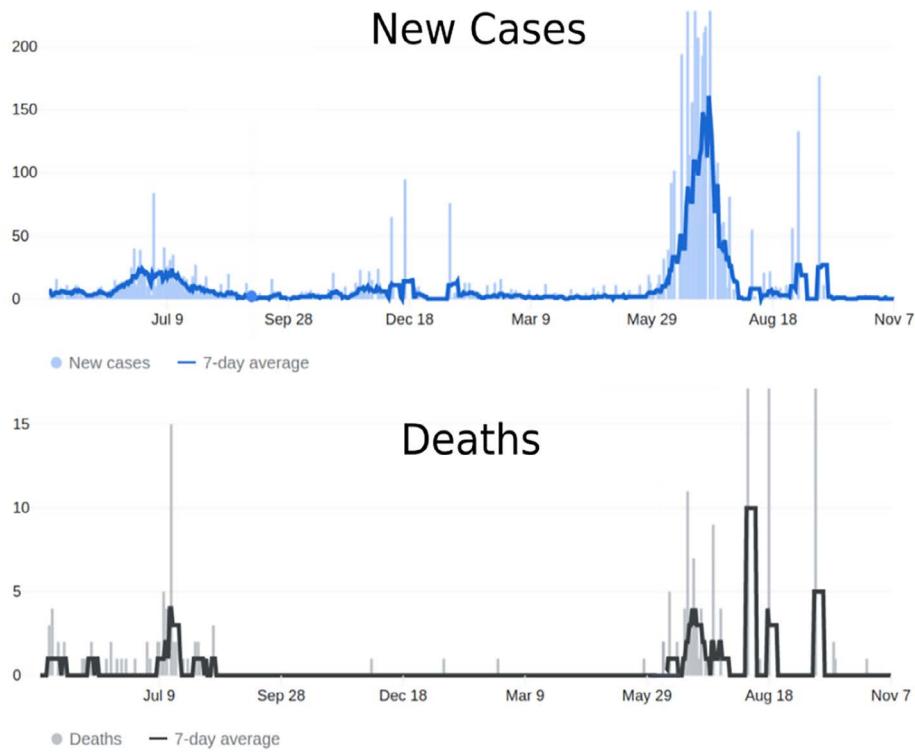
132 Front Page Africa, 2019

133 Letouzé et al., 2020

134 HLPE, 2020

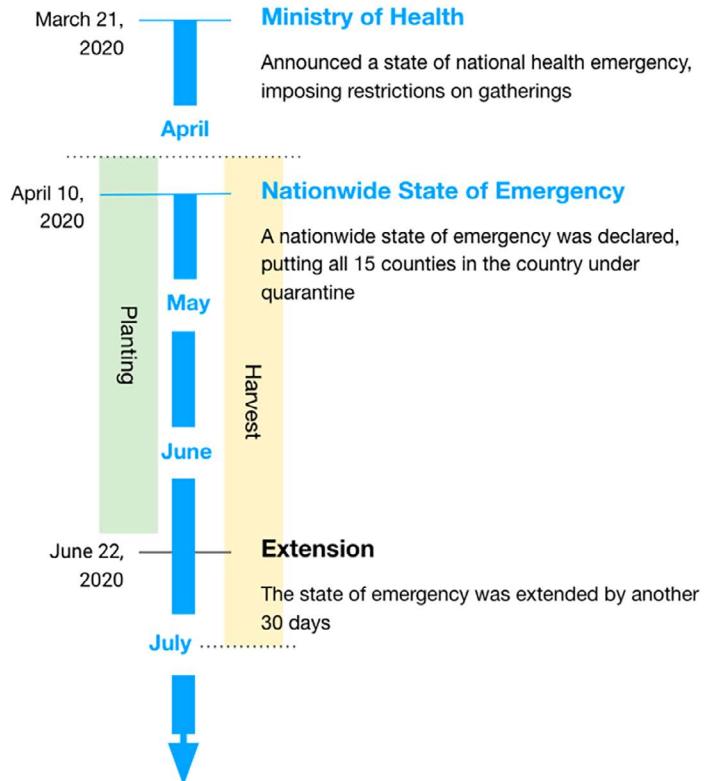
135 Klassen & Murphy, 2020

Figure 17. Liberia's COVID-19 New Cases and Deaths (2020-21)



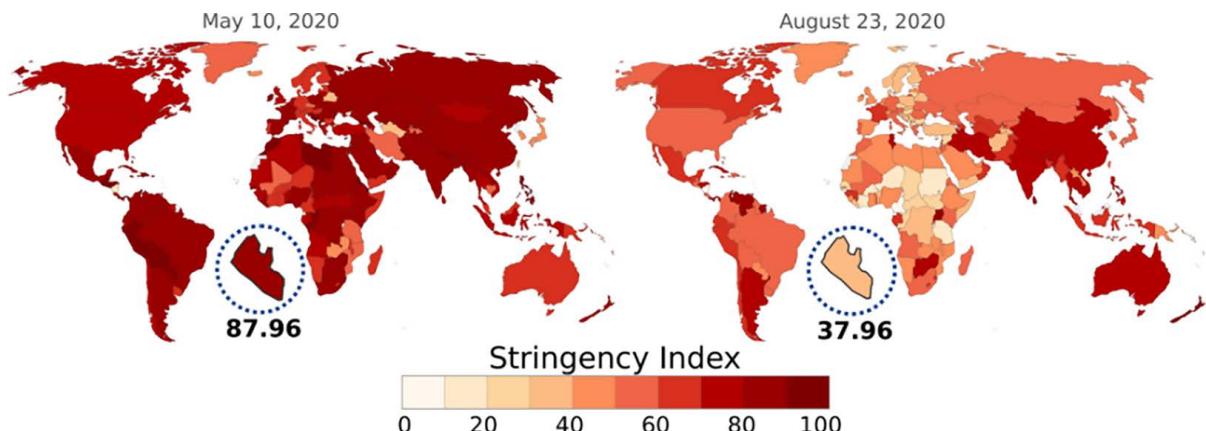
Source: Johns Hopkins University's COVID-19 Dashboard (Dong et al., 2021)

Figure 18. Liberia's Government Response to COVID-19



Source: Elaborated by the authors with information from Aggarwal et al., 2020

Figure 19. COVID-19 Stringency Index



Source: Oxford's COVID-19 Stringency Index (Hale et al., 2020)

pandemic response, which is widely believed to be effective, was characterized by strict lockdowns and restrictive measures, and drew upon lessons the country learned during the 2014 Ebola crisis.

The first case of COVID-19 in Liberia was confirmed on March 16, 2020. On March 22, the Liberian government announced a Declaration of National Health Emergency, which was followed by a Ministry of Health-sponsored policy that proclaimed a 60-day state of emergency throughout the country along with a 21-day lockdown in four counties¹³⁶ After declaring the health emergency, the government immediately banned entry from countries with more than 200 confirmed cases, closed schools, and restricted the circulation of public transportation. On March 24, Montserrado and Margibi counties—including the capital Monrovia and Roberts International Airport—were ordered to shelter in place; this order was followed by the closure of overland borders.

On April 8, the Executive Committee on Coronavirus was created as the operational arm of the Special Presidential Advisory Committee on Coronavirus (SPACOC), operating under 18 pillars focused on the necessary outreach and initiatives to address the population’s needs.¹³⁷ By this date, the counties of Montserrado, Margibi, Nimba, and Grand Kru were also under shelter-in-place orders. This was extended to the entire country on April 24.

The Declaration of National Health Emergency officially expired on July 21 and Roberts International Airport reopened to international flights a week later. Measures were relaxed in the second half of 2021, as reported by the

comparison of the COVID-19 Stringency Measures Index in 2020 (87.96) and 2021 (37.96) (see **Figure 19**).

In June 2021, there was a sharp increase in the number of positive cases in the country, which was controlled through the enactment of new health protocols (mandatory masks, enforcement of social distancing, etc.) and remote work for government employees.¹³⁸ As of August 24, 2021, Liberia had confirmed 5,527 cases of COVID-19, with 245 deaths.¹³⁹ As of August 25, 2021, a total of 113,680 vaccine doses had been administered. Although vaccination rollout has increased, according to Oxford's COVID-19 Stringency Index, only 0.6% of the population has been fully vaccinated.¹⁴⁰

C. Key COVID-19 Policy Responses and Measures for the Food Sector

Price monitoring and stabilization. The business community and consumers had complained that the lack of price regulation in Liberia was “making things hard for the people” even prior to COVID-19.¹⁴¹ When COVID-19 hit the country, the Ministry of Agriculture (MoA) started to monitor the market prices of basic agricultural products with support from FAO through the FIRST program and the European Union-Liberia Agriculture Programme – Prosperous Agriculture Roadmap to Nutrition and Entrepreneurship, Reinforcing Sustainability (EULAP-PARTNERS).

Food availability. As explained above, rice is the most important food commodity and staple food in Liberia. According to the National Investment Commission, the average Liberian consumes 120 kg of rice per year.¹⁴² A rice

136 Goiton, 2020

137 UN Liberia, 2020

138 IMF, 2021

139 WHO, 2021

140 Hale et al., 2020

141 Menkor, 2020

142 National Investment Commission, 2020

seed voucher scheme was launched in June 2020 under the USAID-funded Feed the Future Liberia Agribusiness Development Activity (LADA).¹⁴³ The project aimed to distribute quality rice seeds to 1,500 rice farmers in the counties of Bong, Nimba, and Lofa.¹⁴⁴

Agriculture transport permit system. Beginning in May 2020, all supply chain actors could use a mobile phone platform to obtain cross-county passes for transporting their food products during the lockdown.¹⁴⁵ The Department of Customs introduced procedures to facilitate trade with neighboring countries, which included: (a) measures to facilitate cross-border movement to trade food and other essential goods, (b) measures to support the economy and sustain supply chain continuity through economic stimulus, (c) measures to protect customs staff from COVID-19, and (d) measures to stop the import of counterfeit drugs and other uncertified medical supplies.¹⁴⁶

Distribution of seeds and equipment. The Ministry of Agriculture, with the support of development partners, introduced measures to support the agricultural sectors, such as providing seed and other inputs, capacity-building activities, and purchases of products fabricated by farmers.

Food distribution and home delivery. The Ministry of Agriculture, civil society organizations, and private service providers supported local food distribution and home delivery. Producers from northern and central Liberia, as well as local farmers (those producing for and supplying to their own villages), would take phone orders and provide home deliveries.¹⁴⁷

Social assistance. Across the world, social protection measures, such as social assistance and labor market and social insurance programs, have been the most widely used types of responses deployed by governments as a way to mitigate the effects of the socioeconomic disruptions caused by COVID-19. Social assistance measures represented 90% of the measures implemented in low-income countries and are more prevalent in sub-Saharan Africa, South Asia, and Latin America as compared to other regions. In contrast, labor market and social insurance programs were more prevalent in high-income countries.¹⁴⁸

In Liberia, the legislature approved the president's USD 25 million stimulus package, which included food distribution to households and support for electricity and water expenses.¹⁴⁹ Although the original —and communicated—

intention of the stimulus package was to provide such assistance, Aggarwal et al. reported that none of the surveyed households received any assistance from the government during the national health emergency.¹⁵⁰ In fact, the distribution of the stimulus package (mainly rice) started months later. FAO found that “only 7% of agricultural input traders surveyed reported that they have benefited from COVID-19-related assistance from the government or aid agencies, which has mainly been in the form of labor and/or social assistance.”¹⁵¹ Furthermore, 9% of surveyed households requested livelihood support —tools and machinery, seeds, fertilizers, advisory and extension services—and cash and in-kind food assistance. Although these preliminary studies refer to a limited number of households in Liberia, the government may have had limited financial and logistical capacity to identify beneficiaries and provide income assistance.

Credit measures. The Minister of Finance and Development Planning and the Minister of Agriculture signed a cash collateral guarantee agreement with the Afriland Bank on March 26, 2020. This agreement provided agricultural loans to enable rice processing companies to purchase paddy from smallholder rice farmers to process for the domestic market.

Pro-vulnerable measures. The Market Women and Small Informal Petty Traders Bank Loan Programme was approved by the Senate and House of Representatives to support businesses existing before January 1, 2020. Furthermore, an agreement was reached on a modified version of the program, adding credit unions and related entities that are registered and doing business.¹⁵² The main aim of the program was to help market women and small informal petty traders in all sectors to repay debt to commercial banks and other creditors. While the loan program was created before the onset of the COVID-19 pandemic, the payback conditions were relaxed to alleviate the impact of the pandemic on the daily earnings of vulnerable groups.

143 FAO, 2020h

144 New Dawn, 2020

145 MoA, 2020a

146 FAO, 2020h; MoA, 2020b

147 Ibid.

148 Béné et al., 2021

149 IMF, 2020

150 Aggarwal et al., 2020

151 FAO, 2021b

152 Browne, 2020

Chapter 2

**ASSESSED IMPACT OF COVID-19 ON
FOOD SYSTEM IN LIBERIA**

2.1. General Characteristics of the LPHFSA 2021 Survey

The LPHFSA 2021 survey covers Liberia's 15 counties and collected responses from 4,157 respondents from January to March 2021, although with an irregular distribution of responses among these months. Of the surveyed households, geo-referenced information was obtained for 70% of them, with the greater number of respondents from rural areas. On average, the number of people living in households is 5.9 (+/- 3.5). Regarding educational level, almost 70% of household heads either had no schooling or completed primary school. Household members working or looking for work outside the community is 6.66% (see Table 6). The rest of the survey is made up of variables from

the following modules: labor migration, food consumption, agriculture, livestock, income/livelihood sources and access to credit, shocks, risks, and coping.

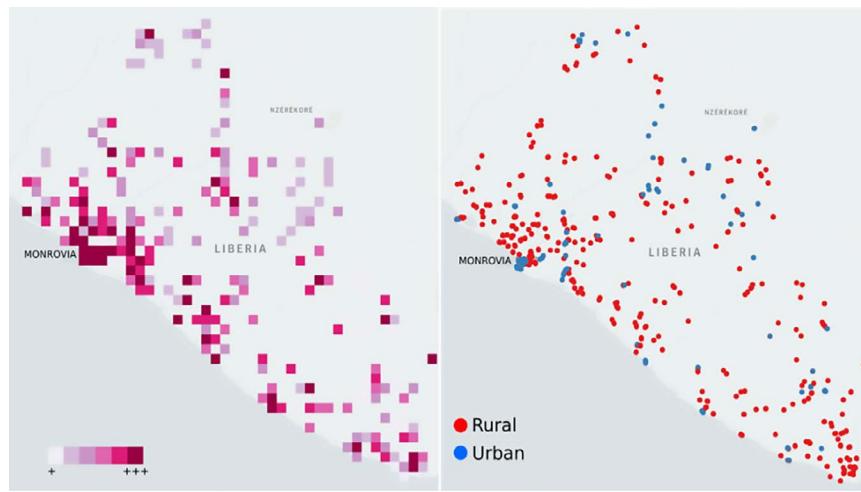
Based on the geo-referenced information from the survey, maps were constructed to visualize the concentration of the surveyed households (see **Figure 20**). It can be observed that the area of the capital, Monrovia, comprises a significant part of the information collected by the survey. The map on the right shows the rural vs. urban distribution of households surveyed.

Table 6. LPHFSA 2021 Survey Characteristics

Number of Respondents	
Temporality: January to March 2021	
January	40 respondents
February	931 respondents
March	3,186 respondents
Total	4,157 respondents
Coordinates	
Rural household with coordinates	2,244 (53.9 %)
Urban household with coordinates	721 (17.3 %)
Socioeconomic Characteristics	
Age (years)	41.03 +/- 13.68
Female	1,989 (47.8 %)
Male	2,166 (52.2 %)
Urban	976 (23.5 %)
Rural	3,181 (76.5 %)
Persons living in the household	5.9 +/- 3.5
Household-head Highest Level of Education	
No schooling	1,886 (45.4 %)
Completed primary	1,347 (32.4 %)
Completed secondary	666 (16.0 %)
Vocational/Technical	131 (3.15 %)
Completed College/University	125 (3.01 %)
Employment	
Household members working or looking for work outside the community	277 (6.66 %)

Source: Elaborated by the authors

Figure 20. Visualization of the Concentration and Distribution of Surveyed Households



Source: Elaborated by the authors

Note: The squares or tiles shown in the map on the left have a dimension of 10 km per side. The darker the color of the tile, the higher the concentration of respondents.

2.2. LPHFSA 2021 and Data Gaps

The main data gaps identified from a first screening of the LPHFSA 2021 survey with respect to the literature concern the temporal dimension. Information was collected for one point in time: 2021. Data sets available before 2021 shared with the authors did not consider the same sample of people as did LPHFSA 2021. In order to fill this gap regarding the temporal dimension, the authors took a microsimulation approach. Further, since the LPHFSA 2021 survey is at the farmer level, it does not cover socio economic or political drivers of the food system, such as market, policies, and food environment.¹⁵³ KIs with main actors of the supply chain and multiple regression analysis were conducted to address this gap.

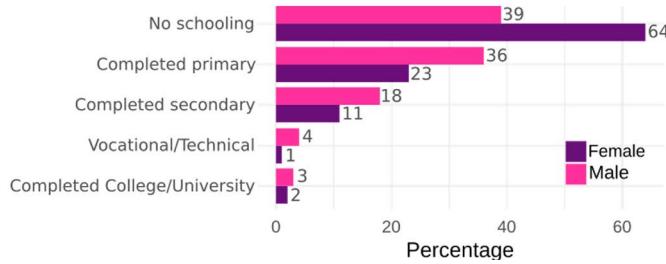
In the following sections, the authors first provide a series of descriptive statistics related to the LPHFSA 2021 survey and then analyze the results of the micro simulations, regression analysis, and the KIs.

2.2.1. Sociodemographic Characteristics

The LPHFSA survey captures the educational attainment of the head of the household, and it presents an accurate overview of safety nets and social assistance measures coming from both the formal and the informal sectors. The survey allows for a disaggregation of the main variables at the level of women and youth (e.g., age categories). It also contains a set of variables giving useful insights on women's empowerment, such as engagement in productive activities, participation in groups, and ownership of productive assets. Information concerning the role of migrant workers (internal migration) is limited to a set of variables measuring whether any household member migrated to find a job. Concerning external migration, the survey contains measures of change in remittances' volume.

Education. The sample's average level of education is low, as the respondents have either not attended school or completed only primary education. There are notable differences between male- and female-headed households, with 64% of the women not having any level of education, compared to 39% of the men (see **Figure 21**).

Figure 21. Percentage Distribution of the Highest Level of Education Attained by Household Head



Source: Elaborated by the authors

¹⁵³ The sequence of the questions presented in the LPHFSA 2021 survey, and its respective list of available answers, are difficult to interpret since the survey format is not very clear. This interferes with the interpretation of possible data gaps inferred from the survey.

Safety nets. In LPHFSA 2021, along with reducing/limiting the number and quality of food, **borrowing food or money** was one of the options to the question, “How are you covering for your basic needs after the job loss?” (see **Figure 22**).

Women's empowerment. From the Liberia Demographic and Health Survey (DHS) 2019-20,¹⁵⁴ data for married women aged 15-49 were used to construct the following bar plot (see Figure 23). The left panel shows the percentage distribution of women (x-axis) who participate in different numbers of decisions (y-axis), which mainly concern decisions about healthcare, large household purchases, and visits to family or relatives. The right panel shows, on the x-axis, the percentage distribution of women who disagree with all the reasons used to justify wife beating—that is: i) arguing with husband; neglecting the children;

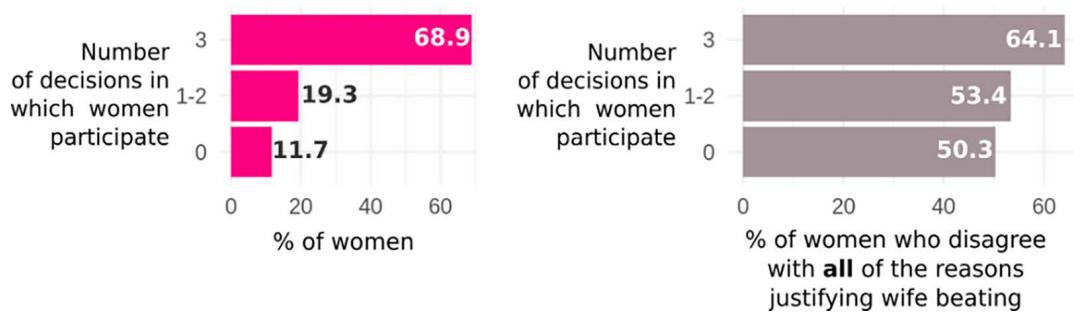
ii) going out without informing husband; iii) refusing to have sex with husband; and iv) burning the food— in relation to the number of decisions in which women participate (y-axis).

There is a significant proportion of women participating in only one or two decisions (19.3%) regarding healthcare, household purchases or visits to family members, and even more concerning, a proportion not participating at all (11.7%) in the aforementioned decisions (see left panel). In the right panel, there is an evident correlation: the higher the number of decisions in which women participate, the higher the percentage of women who disagree with all the reasons justifying wife beating. Particularly concerning is the widespread acceptance of violence by an intimate partner; over one third (39.5%) of women surveyed do not disagree with any of the reasons used to justify wife beating.

Figure 22. Safety Nets Word CloudSource: Elaborated by the authors



Figure 23. Indicators of Women's Empowerment



Source: Elaborated by the authors with data from the Liberia DHS 2019-20

2.2.2. Food Supply

A. Agriculture and Other Livelihood Activities

For the main crops (food and cash crops), information is available about hectares of cultivated land and percentage of crops produced and sold to the market. Furthermore, the survey reports the monetary value of production for each crop and the relative expenses (i.e., purchasing value) financed through cash, credit, or assistance. In order to build statistics related to agricultural production, assumptions were made about crop prices.¹⁵⁵ The survey also contains information about workers engaged in farming activities in the last year, although the number of workers, the time spent working, and payment-related information are missing.

Of the population that has access to farmland to cultivate, the distribution of farmland area was calculated; it was found that almost 50% of households have access to less than one hectare to cultivate.

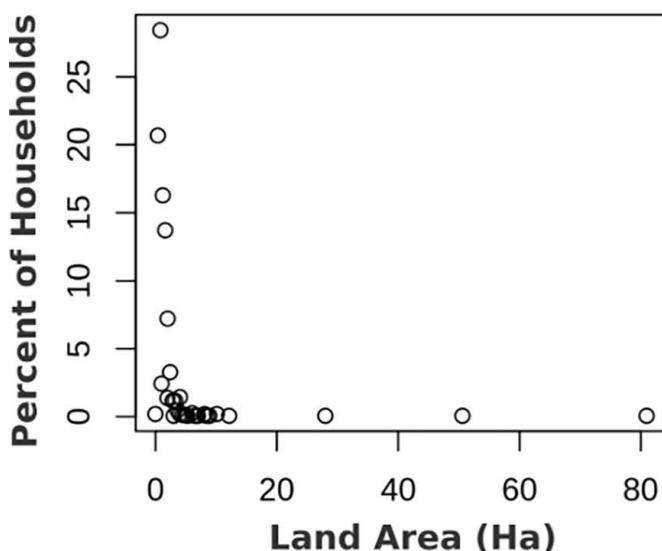
Note: The right-hand panel shows the distribution of households in relation to the area of the farmland to which they have access. It is important to clarify that the area values used to calculate this distribution were obtained from answers that indicated the units of hectares (ha) or acres. Answers that were unclear about the area units were not included.

Concerning other livelihood activities (fisheries/aquaculture, livestock, forestry, and private business activities), although it is possible to identify the number of animals owned by livestock type, and the percentage of livestock by product (milk, eggs, meat, etc) sold in the market, information on its net production is missing. The same observation holds for fisheries. Concerning individual and household wealth, there is a lack of information about productive and non-productive assets and household utilities. These variables are useful to build the Wealth Index.

B. Agricultural Production

The percentage of households that reported having produced crops in 2020 is shown in the left panel of Figure 25a. This percentage is in relation to the total number of households (4,157) captured in the LPHFSA survey. The absolute values of the number of households are shown in the right panel. Half of the households (49.43%) reported not growing any crops. Figure 25b shows the mean value per household of the crops harvested (in kilograms) in 2020. Cassava and rice stand out for reaching harvest values of 783 and 609 kg, respectively.

Figure 24. Land Area Distribution Across Households



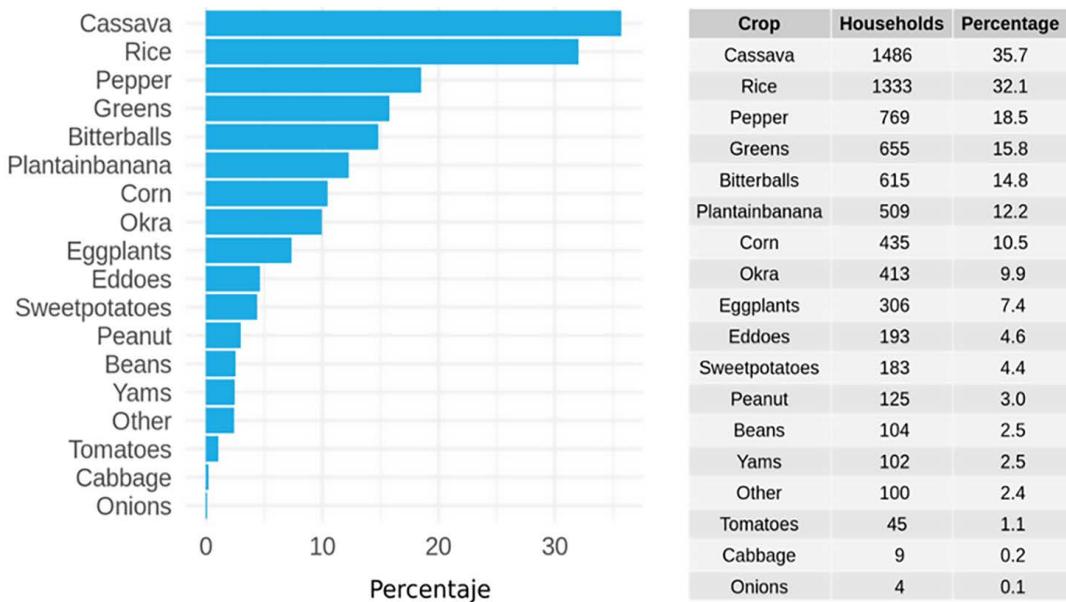
Land Area (Ha)	Households (%)	Land Area (Ha)	Households (%)
0.81	28.43	10.12	0.2
0.4	20.68	4.45	0.13
1.21	16.28	4.86	0.13
1.62	13.72	5	0.13
2.02	7.22	8	0.13
2.43	3.28	3	0.07
1	2.43	5.26	0.07
4.05	1.44	6.47	0.07
2	1.38	6.88	0.07
2.83	1.18	7	0.07
3.24	1.18	8.5	0.07
3.64	0.46	8.9	0.07
6.07	0.26	12.14	0.07
0	0.2	28	0.07
4	0.2	50.59	0.07
8.09	0.2	80.94	0.07

...continues →

Source: Elaborated by the authors

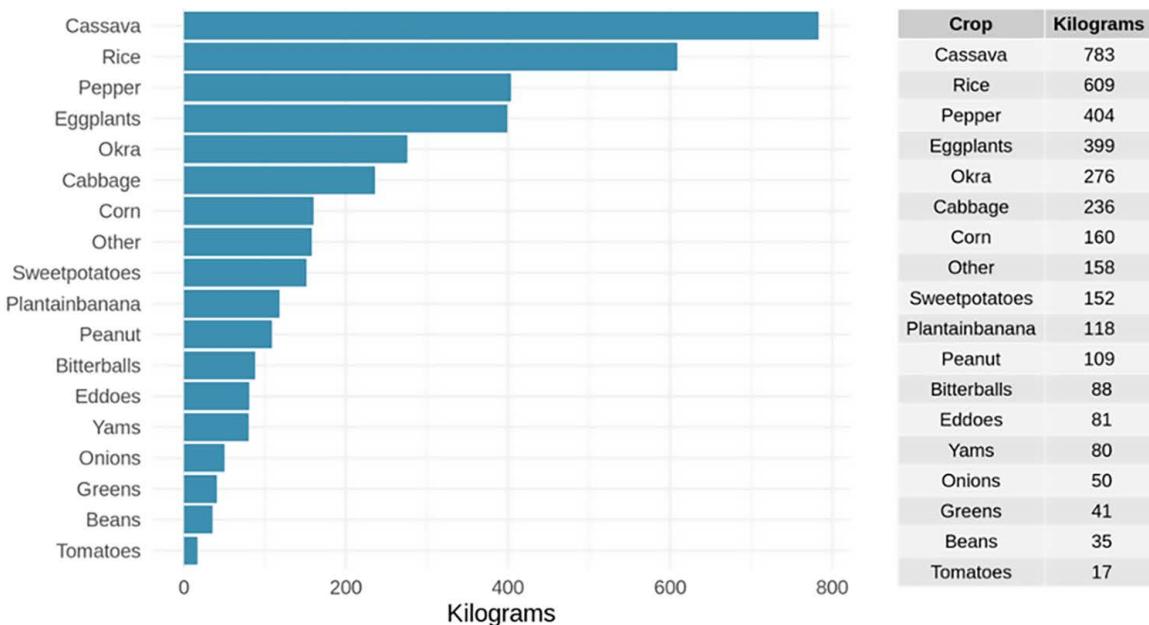
¹⁵⁵ In order for these data to be useful, clarification should have been provided about the sources of credit and assistance, and the time framing of the question.

Figure 25a. Households Producing Crops in 2020



Source: Elaborated by the authors

Figure 25b. Household Mean Crop Production (kg) in 2020



Source: Elaborated by the authors

C. Wealth

The Wealth Index was computed using the 2019-2020 Demographic and Health Survey (DHS).¹⁵⁶ Data was collected from October 2019 to February 2020. **Figure 26** reports the percentage distribution by county of the *de jure* population (i.e., resident population) in relation to Wealth Index quintiles.¹⁵⁷ The 1st quintile corresponds to the lowest wealth score, while the 5th quintile corresponds to the highest wealth score. The upper and lower panels in this graph show the percentage distribution of the male and female populations, respectively. This percentage distribution was calculated by dividing the number of the *de jure* population (weighted and disaggregated by sex of the household head) in each wealth quintile by the total number of the *de jure* population for all the wealth quintiles (in each county). The number obtained was multiplied by 100, as suggested in the DHS guide methods.¹⁵⁸

When comparing the two panels, important differences are observed. In Montserrado, for example, the blue bar (5th quintile) of the male panel is greater than the blue bar for females. This result suggests that in Montserrado a higher percentage of men (54.7%) are in quintile 5 of the Wealth Index, compared to the proportion of women (39.1%) in this quintile. In Grand Kru, the contrary is reported: the pink bar (quintile 1) of the male panel is smaller (40.6%) than the pink bar (59%) of the female panel.

The only county with a higher proportion of the population with better wealth conditions (quintile 5) is Montserrado. However, in Montserrado there is a lower number of

households headed by women than by men (54.7 vs. 39.1%) that belong to this quintile 5. The other counties have a very low proportion of their population that fall into this quintile 5.

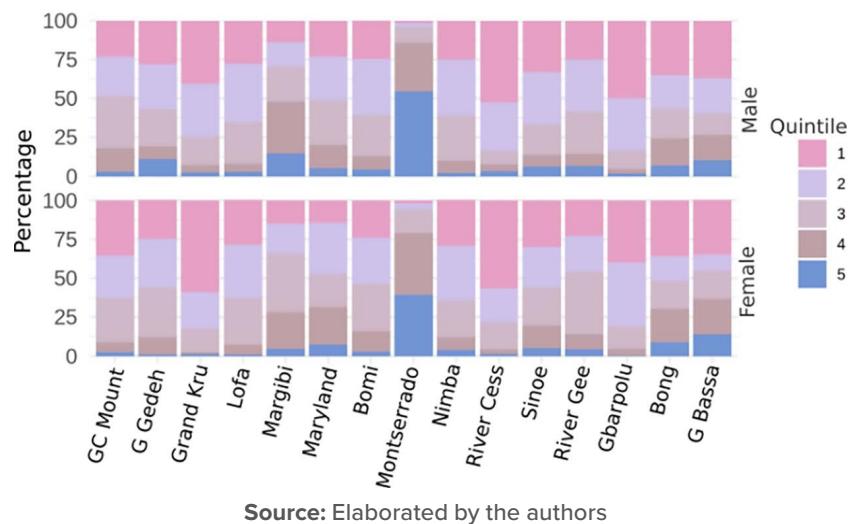
On the other hand, most counties show important proportions of their population that fall into vulnerable conditions of wealth (quintiles 1 and 2). Out of the 15 counties, in 9 of them, the proportion of households headed by women that falls in the lowest level of wealth (quintile 1), is greater than that of men.

D. Farmers

LPHFSA 2021 provides an extensive set of information about farmers' access to inputs and land cultivated. Diversification of livelihood can be measured as well, through a rich set of information about off-farm income earning opportunities.

Land accessibility. Regarding access to arable farmland, 49% of the population answered that they do not have access to any farmland to cultivate. The population with access (51%) is composed of 22% women and 78% men. For this population, **Figure 27** shows the percentage distribution of people for each type of farmland rights. Note that the largest percentage of the population —56% of men and 48% of women— has only one plot without a deed. The population that does have deeds is around 19% for men and 24% for women. Around 20% of men and 23% of women have no rights, as they are in a squatter agreement. Only 2% of men and 2% of women rent land. Survey responses did not address access to community land.

Figure 26. Percentage Distribution by County of the *de Jure* Population According to Wealth Quintiles and Sex of the Household Head



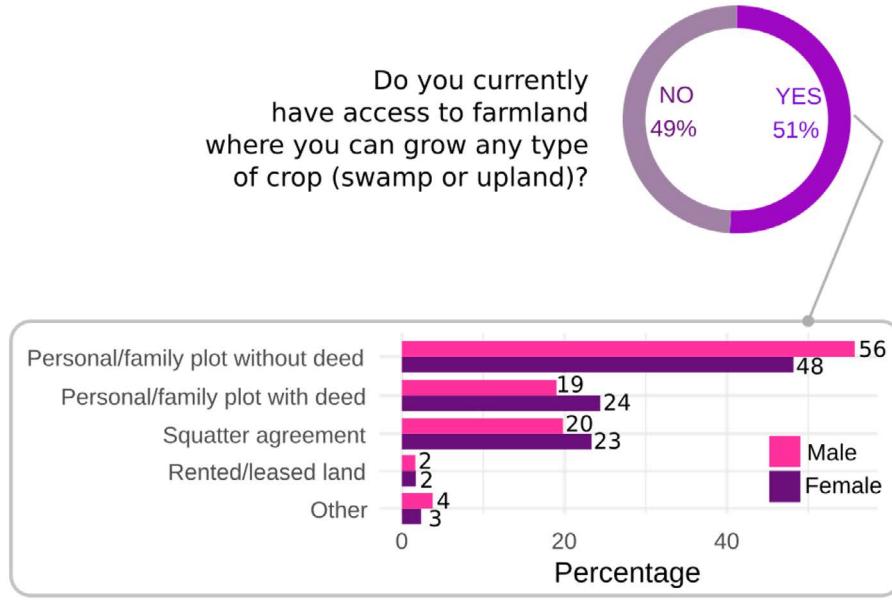
Source: Elaborated by the authors

156 LISGIS, 2021

157 The Wealth Index is calculated using easy-to-collect data on a household's ownership of selected assets, such as televisions and bicycles, materials used for housing construction, and types of water access and sanitation facilities. Generated with a statistical procedure known as principal components analysis, the Wealth Index places individual households on a continuous scale of relative wealth. DHS separates all interviewed households into five wealth quintiles to compare the influence of wealth on various population, health, and nutrition indicators.

158 Croft et al., 2018

Figure 27. Access to and Rights over Farmland



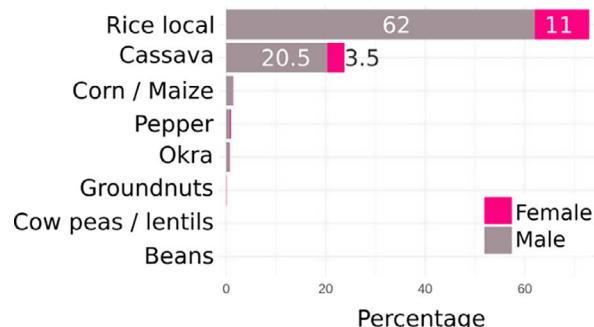
Source: Elaborated by the authors

Rice is the predominant food crop, covering 73% of the total farmland area—2,117 ha in total, see **Figure 28**. In second place, cassava accounts for most of the remaining farmland, as it represents 24% of the cultivated area. Disaggregating by sex, female-headed households reported an area of rice and cassava of 11% and 3.5%, respectively, of farmland area, compared with 62% and 20.5% accounted for by male-headed households. This translates to 231 ha of rice cultivated by women and 1,314 ha by men. The area for cassava corresponds to 72 and 432 ha for women and men, respectively.

The authors collected the answers only to the variables under “Select name of Crop #1” and “What is the area planted for this crop?”.¹⁵⁹ The responses considered were those given in acres or hectares (which add up to 79.65% of the total responses).

Access to inputs. Most heads of household use neither organic fertilizers (92.8%) nor pesticides (98.5%). The bar plot below (see **Figure 29**) shows the percentages of men and women who use them. Only a small portion of the population does use them: 7.1% for fertilizers and 1.5% for pesticides.

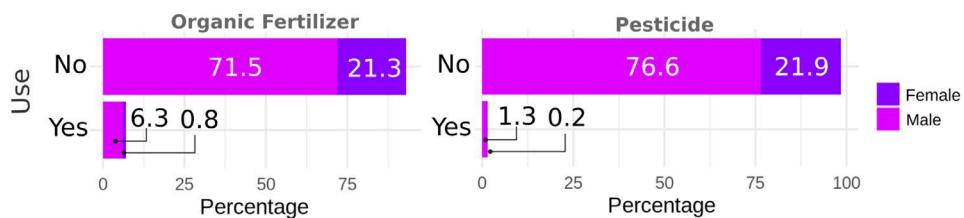
Figure 28. Proportion of Area Planted for Crops according to the house heads interviewed (LPHFSA 2021)



Source: Elaborated by the authors

¹⁵⁹ The remaining 20.35% of answers were not incorporated, corresponding to answers provided in lot and number of footpaths, which are not universal units of area. The survey also probes variables on Crop #2 and Crop #3 but these have around 40% and 60% of answers given in lot and foot path.

Figure 29. Use of Inputs



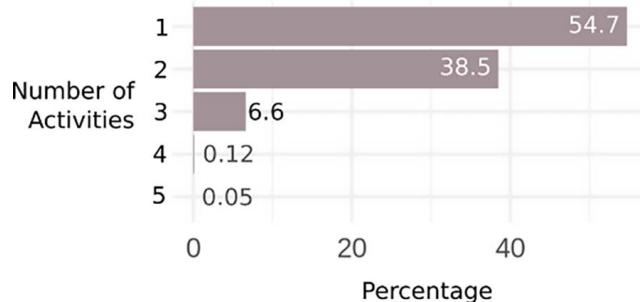
Source: Elaborated by the authors

Diversification of livelihood. Regarding the question “How many livelihood activities does your household have?”, **Figure 30** shows the percentage distribution of the population according to the number of activities. More than half of the population (54.7%) only has one livelihood activity, while 38.5% and 6.6% perform two and three activities, respectively.

Figure 31 shows the percentage distribution of households in relation to their main livelihood activity as well as which members of the household are involved in that specific activity. “**Own production and sale of food crops**” is the most important activity, accounting for more than 30% of the sample. Further, it is an activity in which both male and female household members participate (26%). The second predominant livelihood activity is the petty trading and commercial activities, where female members of the household represent an important fraction (11%). Skilled

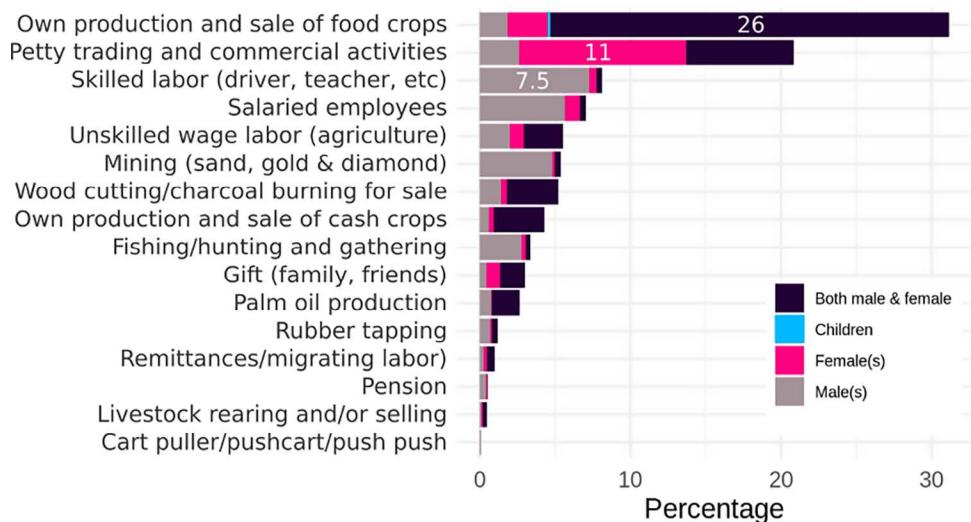
labor, in third place, is one of the activities that is mainly performed by male household members (7.5%), as the participation of other members is minimal.

Figure 30. Diversification of Livelihoods



Source: Elaborated by the authors

Figure 31. Frequency of Households per Main Livelihood Activity and Participants



Source: Elaborated by the authors

E. Processors, Retailers, and Providers

The survey does not provide any information concerning midstream actors of the supply chain.

2.2.3. Food Demand

An extensive set of survey questions is included to measure food access, preference, utilization, and food supply (i.e., food availability). Data about the **distribution** and **exchange of food** are limited. Although the survey contains information about the quantity of crops sold in the market and the quantity retained for private consumption, there is a lack of information related to production resulting from contractual agreements with supply chain intermediaries.

Reduced Livelihood Coping Strategy Index. The reduced Coping Strategy Index (rCSI) is a proxy for food insecurity. It measures the frequency and severity of five pre-defined coping strategies that households engage in when faced with a lack of food or the financial resources to acquire it.¹⁶⁰ The frequency is measured according to the number of days in which the household used the coping strategy during a 7-day recall period. The severity is based on predefined weights that allow for comparability across different countries and contexts. When a household uses all coping strategies for 7 days in a row, the rCSI is 56. The greater the number, the more deprived the household.¹⁶¹

Between January and March 2021, the average RCSI of all households was 9.08 (this includes households that

did not deploy any coping strategy). The average RCSI of households that deployed at least one coping strategy increases to 13.35. Although this score is low in comparison to the maximum level of stress possible, households' use of coping strategies was widespread, with 68% of the population having engaged in at least one coping strategy. This means that **more than two thirds of the population faced a lack of food** in the preceding 7 days. Females were more affected than males (10.1 and 8.09, respectively),¹⁶² while no significant difference was found between rural and urban areas.¹⁶³

FAO's Livelihood Coping Strategy Index,¹⁶⁴ which refers to food-based coping strategies, shows that most surveyed households (94%) reported having reduced the quantity of some food items consumed over the past 3 months compared to usual times. Among the food items most commonly reduced were cereals (46%), fruits (28%), milk-based products (24%), vegetables (23%), and roots and tubers (22%).

The worsening situation is underscored when comparing this indicator with the measurement in 2018,¹⁶⁵ when only 7% of households reported employing coping strategies (compared to 68% mentioned above). The 2018 WFP report indicates the average number of days in which the main coping strategies are mentioned.¹⁶⁶ Table 6 shows the increase from 2018 to 2021 in the average number of days that coping strategies were used, attesting to the reduced food security of households.

Table 7. RCSI: Average number of days in which a coping strategy was used when a household did not have enough food or resources to buy food

Coping Strategy	WFP 2018	LPHFSA 2021	Severity (weight)
Less preferred or less expensive food	2.5	2.94	1
Borrow food or rely on help from a relative or friend	-	2.18	2
Limit meal size	1.8	2.74	1
Restrict consumption by adults for small children to eat	-	2.45	3
Reduce the number of meals eaten per day	1.5	3.04	1

Source: Elaborated by the authors with data from WFP 2018 and LPHFSA 2021

¹⁶⁰Each coping strategy in the RCSI has a standard weight, which allows for comparability of the index across different subnational and international contexts. The full coping strategy index requires tailored weights to the coping strategies that are context specific, and therefore less comparable.

¹⁶¹ People in Need, 2021

¹⁶² The difference between female and male respondents was statistically significant (t-test, p<.05).

¹⁶³ In rural areas, the score was 9.2, compared to 8.6 in urban areas.

¹⁶⁴ FAO, 2021b

¹⁶⁵ WFP, 2018

¹⁶⁶ For the individuals who engaged in the coping strategy, meaning that those who did not use it do not count in the average.

The Household Dietary Diversity Score (HDDS) measures food access by counting the number of food groups that households consumed during the past 24 hours. The indicator is based on 12 dietary groups.¹⁶⁷ The more groups consumed, the more diverse the diet of households. This metric is indicative of food access and tends to have a positive correlation with households' socioeconomic status and food security.¹⁶⁸

Between January and February 2021, households consumed four dietary groups on average (HDDS=4). No significant difference was found between rural and urban areas and a significant but not meaningful difference was found between male and female respondents.¹⁶⁹ This measurement was made at the peak of the dry season, between January and February, when most of the agricultural land is being prepared for rice production and before the lean season, which starts in April or June depending on location (see **Figure 32**). Access to food tends to decrease in months following the dry season, worsening the living conditions of Liberians.

In 2018, the HDDS measurement indicated that 44% of households had either low or medium diversity in their diets (four or fewer food groups).¹⁷⁰ In 2021, LPHFSA data show that this proportion increased to 67%, meaning a 23-percentage

point decrease in access to food. Furthermore, the HDDS in 2018 was measured between March and May, meaning that the lean season had already begun in some locations. This difference in dates between the dry season in 2021 and the start of the lean season in 2018 suggests that the difference in negative impacts could be larger if they had been analyzed in the same time periods.

Food Consumption Score. The Food Consumption Score (FCS) —a food consumption and security indicator introduced by the World Food Programme in 1996— aggregates information on the diversity and frequency of food groups that were consumed in the 7 days preceding the survey. This score is weighted according to the relative nutrient density of the food groups.¹⁷¹ Foods with higher nutrient density (e.g., meat, fish, pulses) are assigned a higher weight. This score classifies a household's food consumption—a proxy for caloric intake—into one of three categories: poor, borderline, or acceptable.¹⁷²

Figure 33 shows the percentage distribution of households according to the food consumption score, disaggregated by sex. The distribution is quite similar between male- and female-headed households, with 87% and 85%, respectively, having an acceptable level of household food consumption.

Figure 32. Liberia's Seasonal Cropping Calendar

LIBERIA NATIONAL SEASONAL CALENDAR BY COUNTY												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Peak Dry Season		Dry Season ends	Rains begin	Cassava Harvest			Peak Rainy Season			Rains end	Dry Season begins
	Land Preparation Cowpea & Vegetable		Planting Vegetable		Lean Season			Vegetable Harvest		Land Preparation Vegetable		
	Land Preparation Rice		Planting Rice				Minor Rice Harvest	Main Rice Harvest				
	Peak Dry Season		Dry Season ends	Rains begin	Cassava Harvest			Peak Rainy Season			Rains end	Dry Season begins
	Land Preparation Cowpea & Vegetable		Planting Cowpea & Vegetable		Lean Season			Cowpea Harvest	Vegetable Harvest		Land Preparation Vegetable	
	Land Preparation Rice		Planting Rice				Minor Rice Harvest		Main Rice Harvest			
	Land Preparation Cowpea & Vegetable		Planting Cowpea & Vegetable		Lean Season			Cowpea Harvest	Vegetable Harvest		Land Preparation Vegetable	

Source: WFP, 2018

¹⁶⁷ The food groups analyzed: cereals; white tubers and roots; vegetables; fruits; meat; eggs; fish and other seafood; legumes; nuts and seeds; milk and milk products; oils and fats; sweets; and spices, condiments, and beverages.

¹⁶⁸ FAO, 2010

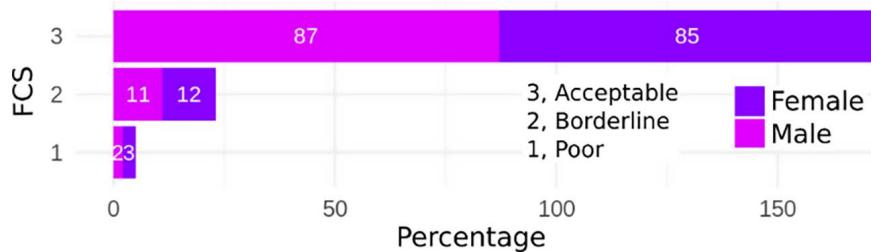
¹⁶⁹ When analyzing the indicator by the gender of the respondent, female respondents had an average of 3.9 vs 4.11 for males. This difference is statistically significant (Poisson regression, coeff = -0.05, p<0.05), but the difference is not meaningful. The mean for rural households was 4.02 and for urban households was 3.98. The difference is not significant.

¹⁷⁰ Government of Liberia, 2018

¹⁷¹ The World Food Programme's technical guidance sheet on the FCS acknowledges that “[a]lthough subjective, this weighting attempts to give greater importance to foods such as meat and fish, usually considered to have greater ‘nutrient density’ and lesser importance to foods such as sugar. It is not yet known if these weights are appropriate universally. However, at this time it is recommended that the weights remain constant to provide a more standardized methodology. As research continues, further support may be lent to these weights, or it may be found best to modify them in either a universal or context specific manner.” (WFP Vulnerability Analysis and Mapping, 2008, p. 19)

¹⁷² INDDEX Project, 2018

Figure 33. Percentage Distribution of Households According to Food Consumption Score (FCS), Disaggregated by Sex of the Household Head



Source: Elaborated by the authors

C. Consumers

Information about consumer preferences can only be deduced from farmers' food crop expenses. The potential switch in food preferences can be derived from the reduced coping strategy index. Data regarding episodes of panic buying or changes in food prices that could have affected consumer preferences were not identified or shared with the authors.

2.3. Data Gaps Identified from the Desk Review

The data mapping exercise identified important gaps in the literature with respect to the selected food systems approach. The main issues concerning these gaps are outlined below.

Presence of reliable data on agriculture and other livelihood activities before and during the COVID-19 pandemic. Agricultural sample surveys and censuses have not been periodically conducted (e.g., every 5 or 10 years), and the last population census refers to 2008. Other observed gaps mainly concern information about midstream supply chain actors and final consumers who are not producers (retailers, providers, processors, farmer organizations, and community members). Specifically, the authors were **not able to identify and quantify the main issues faced by the midstream actors** before and after the onset of the COVID-19: laborer/worker availability due to mobility restrictions; public transport costs; fear of exposure to the virus;¹⁷³ demand for midstream actor products;¹⁷⁴ connectivity with their established business partners or consumers.¹⁷⁵

Limited data on consumers. Regarding the impacts of the COVID-19 pandemic, episodes of food losses, waste (due,

for example, to excess supply), and panic buying are not extensively documented in the literature nor in the LPHFSA survey. Key informant interviews with community members and leaders could elucidate the most significant changes and fill those gaps. Additional information should be collected from farmers concerning access to credit, employment, and salaries both in agriculture and in off-farm activities.

Limited data on governance indicators. An extensive set of qualitative information is available about social assistance and protection measures. However, the literature lacks clarity in identifying the final beneficiaries of those measures and their socio demographic characteristics.

2.4. Assessing the Impact and Filling Data Gaps: Results from Microsimulations, Key Informant Interviews, and Multiple Regression Analysis

Microsimulations. The impacts of COVID-19 on the demand side focus on income losses due to the pandemic, their effects on poverty, and their relation to food security. Two scenarios are analyzed to assess the impact of the pandemic on these outcomes. The first scenario is the **real observed COVID-19 scenario**. Indicators for income (proxied through consumption), poverty, and food insecurity are constructed using LPHFSA 2021 data. The second scenario is a **counterfactual non-COVID scenario**. This analysis is based on a microsimulation that predicts the outcomes of interest in 2021, using HIES 2016 data, macroeconomic factors between 2016 and 2019, and forecasts for these factors for 2020 and 2021 made prior to COVID-19.¹⁷⁶ The evolution of the indicators of interest between 2016 and 2021 for the pandemic and non-pandemic scenarios are compared.

173 IFAD et al., 2020; Macías-Chóez et al., 2020; DNPGCA, 2020

174 Varshney et al., 2020; Harris et al., 2020; FAO, 2020b

175 Ebata et al., 2020; Nedumaran et al., 2020

176 The microsimulation is based on the Partnership for Economic Policy's behavioral top-down microsimulation model for distributive analysis (Tiberti et al., 2018). The macroeconomic indicators between 2016 and 2019 are obtained from the World Bank and IMF statistical reports.

The macroeconomic forecasts for Liberia in 2020 and 2021 are based on the IMF's World Economic Outlook report from October 2019 (available here) and the IMF staff country report from 2019 (available here).

Key informant interviews. Interviews with main actors of the supply chain were conducted to assess the **impact on the supply side**, such as disruptions of supply chains — which reduced physical access to and availability of food—and with regard to **governance**, with the evaluation of the efficiency of measures to contain the pandemic and provide social assistance.

Multiple regression models. With regard to government measures, multiple regression models were applied to investigate the disruptive effect of the stringency of the containment measures on food demand and supply.

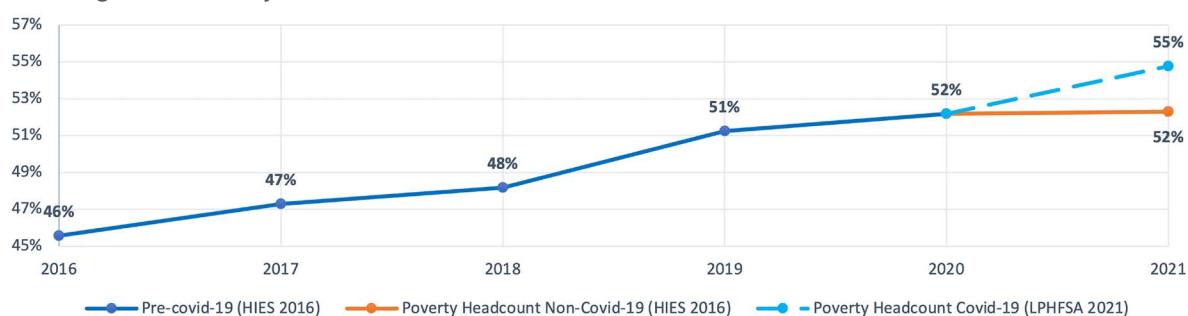
2.4.1. Microsimulations: The Impact of COVID-19 on the Demand Side – Poverty and Food Insecurity

Poverty. Extreme poverty in Liberia has risen each of the past 5 years—climbing from 46% in 2016 to 55% in 2021.¹⁷⁷ This study's results suggest that the COVID-19 pandemic has played a role in exacerbating it. When tracking the evolution of poverty in Liberia from 2016 to 2021, there is

a difference of three percentage points in the number of people living on less than USD \$1.90 per day (PPP from 2011) between the COVID-19 scenario (based on LPHFSA 2021) and the simulated non-COVID-19 scenario (based on the microsimulations). In the hypothetical absence of COVID-19, the extreme poverty headcount was expected to rise from 46% to 52% of the country's population.

The authors' estimates suggest that this exacerbation of extreme poverty is mainly due to increased prices for consumers, coupled with decreasing wages. Households' capacity to afford basic expenses was constrained by increases in consumer prices, which the IMF forecasted at 20.5% and 17% for 2020 and 2021 respectively.¹⁷⁸ Household income was not expected to increase due to decreases in labor productivity, which Liberia witnessed between 2016 and 2019 — a trend that would continue in 2021 (see Table 8). The pandemic amplified the effect of these changes, with consumer prices (CPI general indices) rising by 35% between 2019 and 2020 and by 6.6% between 2020 and 2021.

Figure 34. Poverty Headcount Between 2016 and 2021: COVID-19 and Non-COVID-19 Scenarios



Source: Elaborated by the authors based on HIES 2016 for poverty between 2016 and 2021 (non-COVID-19 scenario) and based on LPHFSA 2021 for the COVID-19 scenario

Table 8. Changes in GDP, Employment, and Labor Productivity, (2016-2021), for non-COVID-19 Scenarios

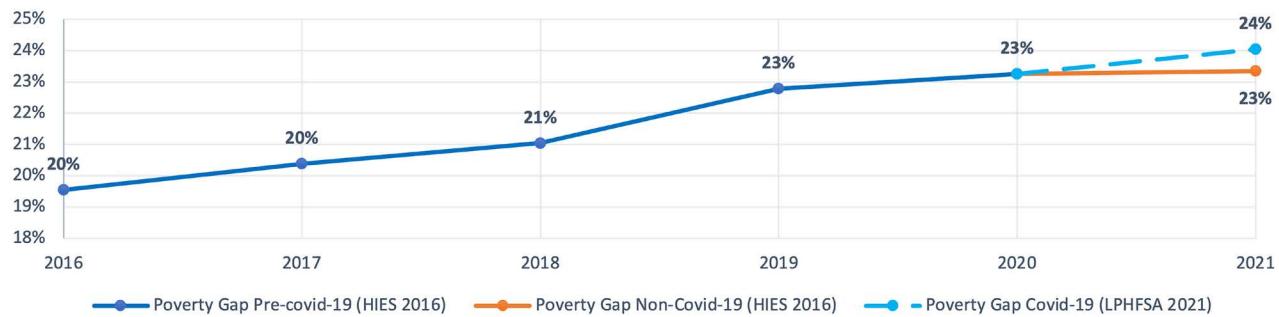
	Year	GDP constant USD (in billions)	Employed (in millions)	Labor productivity (thousands)	Labor Productivity growth % (2016=100)
Pre-COVID	2016	2.51	1.99	1.27	0.00%
	2017	2.58	2.04	1.26	-0.41%
	2018	2.61	2.1	1.24	-2.01%
	2019	2.55	2.17	1.17	-7.23%
Non-COVID forecast	2020	2.56	2.17	1.18	-6.86%
	2021	2.6	2.17	1.2	-5.38%

Sources: WB's World Development Indicators, ILO, IMF's World Economic Outlook 2019

¹⁷⁷ The analysis is based on LPHFSA 2021 survey data. The consumption module of the questionnaire was not made available to the authors, and the analysis was carried out assuming that consumption data was in Liberian dollars. The analysis would be distorted if a substantial number of survey respondents provided their consumption in US dollars. However, the log distribution of consumption approximates normality rather than a bimodal distribution, suggesting that the values of consumption are close to each other and not severely affected by differences in currencies.

¹⁷⁸ Year-on-year changes, according to IMF estimates from the country staff report 2019 (IMF, 2019).

Figure 35. Poverty Gap Between 2016 and 2021: COVID-19 and Non-COVID-19 Scenarios

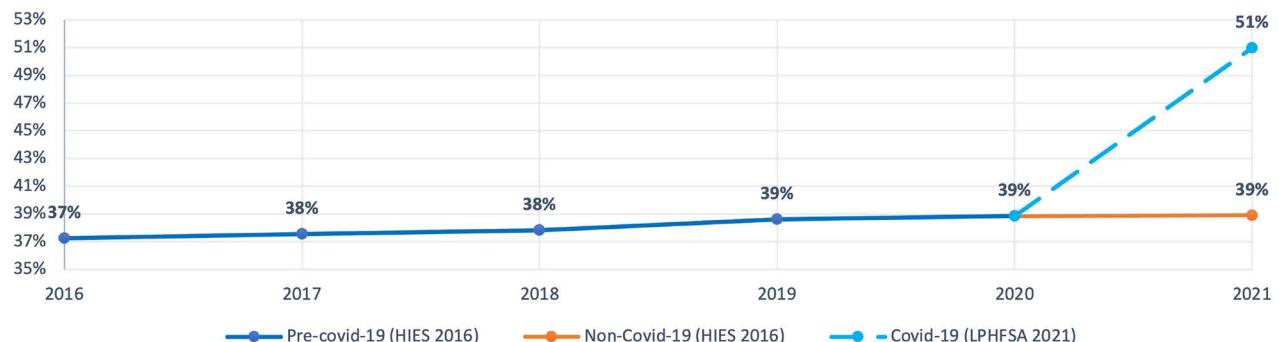


Source: Elaborated by the authors based on HIES 2016 for poverty between 2016 and 2021 (non-COVID-19 scenario) and based on LPHFSA 2021 for the COVID-19 scenario

The poverty gap measures the intensity of poverty by averaging the income of individuals under the poverty line and presenting it as a percentage of the poverty line. In the non-COVID-19 scenario, this figure was supposed to rise from 20% in 2016 to 23% in 2021 (a three-percentage point increase). It is worth noting that an increase in the poverty gap was expected in this scenario, despite the growth in GDP forecasted in 2019 for 2020 and 2021 (0.4% and 1.6%, respectively).¹⁷⁹ This implies that the economic growth of the country was not expected to reach the poorest in Liberia. The analysis shows that these inequalities have been aggravated for the poor due to the pandemic. The results show that, with COVID-19, the poverty gap increased by four percentage points between 2016 and 2021. As the poverty gap increases, so does the stress in the government's budget, since more resources are needed to alleviate poverty.

The negative impact of the pandemic on the standard of living and inequalities between Liberians is further supported by important increases in the Gini coefficient (see **Figure 36**). As a result of the pandemic, the Gini coefficient of Liberia increased by 12 percentage points between the COVID-19 and non-COVID-19 scenarios and by 14 percentage points between 2016 and 2021. Increases in income inequality can perpetuate the cycle of poverty by preventing households from recovering and attaining greater well-being, even in a post-pandemic recovery context.

Figure 36. Gini Coefficient Between 2016 and 2021: COVID-19 and Non-COVID-19 Scenarios



Source: Elaborated by the authors based on HIES 2016 for poverty between 2016 and 2021 (non-COVID scenario) and based on LPHFSA 2021 for the COVID-19 scenario

¹⁷⁹ According to IMF estimates from the 2019 country staff report (IMF, 2019).

Poverty and food security. These inequalities are also reflected in a widening gap of food insecurity between households below and above the poverty line. Food insecurity increased for Liberians between 2016 and 2021. According to HIES 2016 data, the average rCSI was 3.2 and it increased to 9.08 during the pandemic.¹⁸⁰

The difference in food insecurity became more intense for poor households between these 2 years.¹⁸¹ While in 2016, the rCSI for households above the poverty line was 2.91, households below the poverty line had an rCSI of 3.54.¹⁸² During the first quarter of 2021, the rCSI increased for households above the line to 6.71 and reached 9.23 for households below the poverty line.¹⁸³ The gap between the two time frames increased by a factor of four, from 0.63 to 2.52. This means that, not only is poverty related to increased food insecurity, but the persistence of poverty over time worsens food insecurity for those who are already vulnerable.

These estimates provide evidence on the limited coping capacity of poor households in Liberia to external shocks such as pandemics. The worsening situation in terms of food insecurity highlights the urgent need to improve households' resilience to cope with and recover from the impacts of COVID-19.

2.4.2. Regression Analysis: The Impact of Stringency Measures on Food Demand and Production

The results of the microsimulations analysis were complemented with multiple regression analysis. A simple regression technique was used to measure the effect of the stringency of lockdown measures on food supply and demand.

The COVID-19 outbreak generated two types of hazards: on one side, the population faced the health hazard (i.e., risk of infection), and on the other side the policy hazard (i.e., containment measures).¹⁸⁴ The authors investigated how the interplay between the stringency of government containment measures and other sociodemographic factors reveals insights into the impact of the pandemic across the different counties throughout Liberia. Health hazards were not measured, although they could have been measured through the number of COVID-19 cases reported by the Ministry of Health. They were excluded due to the high collinearity between the health hazard and the policy hazard.

180 FAO Liberia & MoA, 2021

181 Differences are significant based on a Welch two sample t-test for unequal variances (T value -34.49).

182 Estimates based on HIES 2016 data, comparing the RCSI for households above and below the poverty line. Linear regression with statistical significance ($p<.05$). These results are also significant after controlling for differences between rural and urban areas and gender of the respondent.

183 Estimates based on LPHFSA 2021 data, comparing the RCSI for households above and below the poverty line. Linear regression with statistical significance ($p<.05$). The results remain significant after controlling for differences between rural and urban areas as well as gender of the respondent.

184 WFP, 2020d

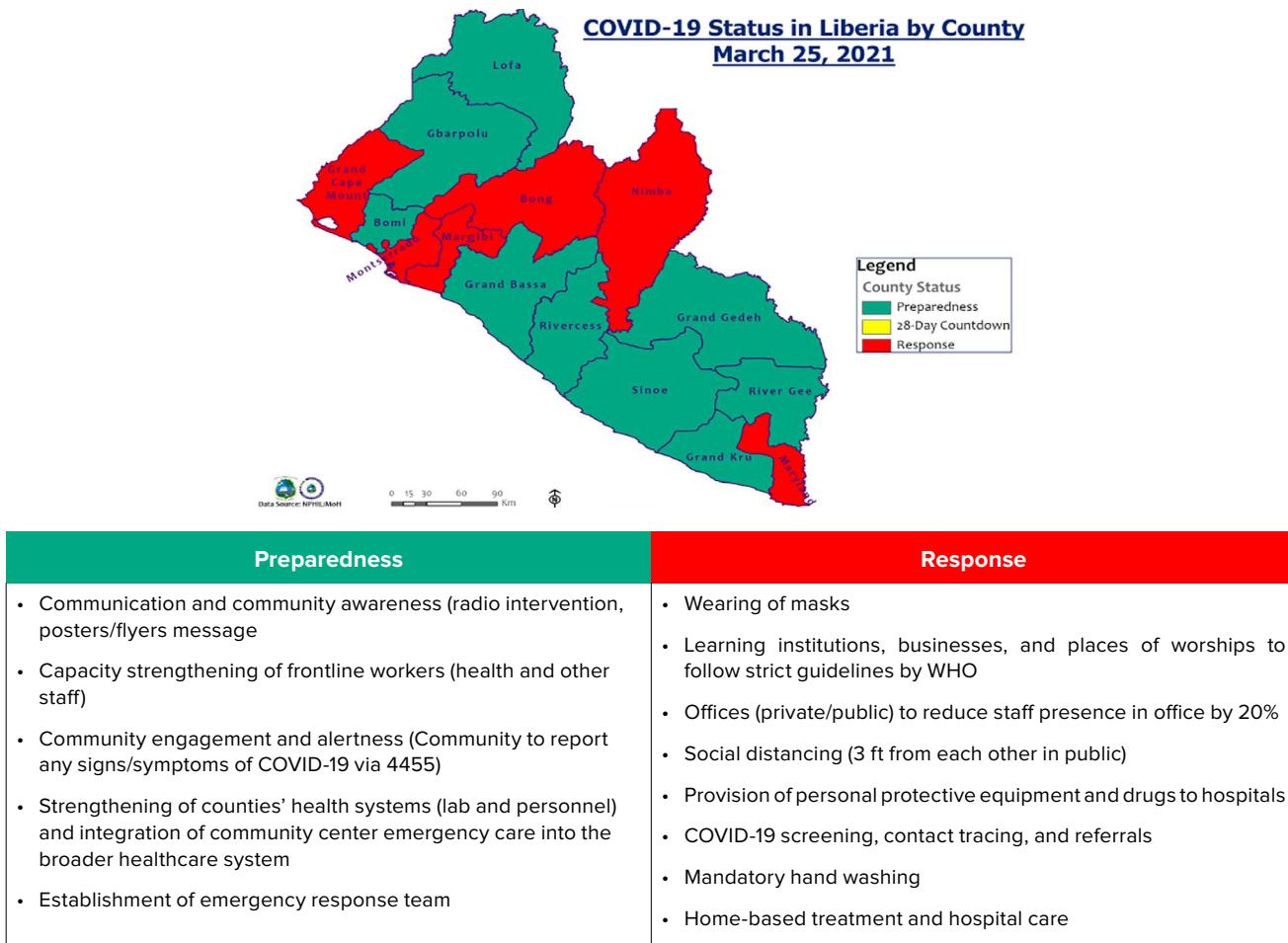
185 UNICEF Liberia Country Office, 2020

The policy hazard was measured using response and preparedness county data, which were used to quantify the rigidity of the government's response to the coronavirus pandemic. Certain databases measuring stringency, such as the Oxford Stringency Index, were not used since they provide information at the national level only, without county-level granularity. In practice, the term **response measures** refers to stronger containment measures such as compulsory mask wearing, home working, social distancing (3 ft from each other in public), whereas **preparedness measures** refer to softer preventive actions, such as the establishment of an emergency response team or community surveillance/case detection reporting system. The list of measures was retrieved from the Ministry of Health database, which provides monthly information about the stringency of containment measures, by county (see **Figure 37**).¹⁸⁵ The response/preparedness variable is named "stringency" (stringency=1 for counties in response and stringency=0 for counties in preparedness).

In line with the methodological framework presented in the introduction, the rCSI is used as an outcome variable to analyze food security. Household income is the second outcome variable of interest and is proxied with the amount of crops produced and reported in the LPHFSA 2021 (in kilograms). While the rCSI is estimated for all households in the sample, the production analysis focuses on households that grow crops, particularly rice. Almost half of Liberian households reported growing crops (50.7%). Of those growing crops, 70.6% grew rice. Stringency is the predictor variable. The results are controlled for geography (urban and rural) and sociodemographic characteristics (age, sex, and highest education level attained by the head of household). All variables were obtained from the LPHFSA 2021 survey with the exception of the stringency measure, which was obtained from the Ministry of Health webpage.

A least squares regression was fitted for each possible combination of the predictor variables. In practice, the regression fitted all models that contained exactly one predictor, then two predictors, and so forth. The regressions measure the effect (e.g., correlation effect) of containment policies and other control variables on food security and production across the different Liberian counties. The final regression models were then chosen using a combination of cross-validated prediction error and adjusted R^2 . The results from the analysis suggest that:

Figure 37. Preparedness and Response Strategies



Source: UNICEF Liberia Country Office, 2020.

- Exposure to food insecurity is significantly higher for the counties in which the government applied more stringent containment measures.** The rCSI was 1.297 points higher for households in the "response" status, as compared to those under "preparedness" ($p\text{-value}<.05$) (see Table 9). These results confirm recent findings of WFP about the food security costs of a domestic COVID-19 outbreak and the ensuing restrictions.¹⁸⁶ Moreover, the analysis shows that female-headed households face more food insecurity than male-headed households, as already observed by FAO.¹⁸⁷
- Rice production was not significantly affected by the stringency of the containment measures** (see Table 10). The restrictive measures did not affect households' rice production; this result is in line with the literature, and in particular with FAO's GIEWS data for which 2020 national rice production is estimated at 270,000 tonnes, similar to the five-year average and slightly below the previous year.¹⁸⁸
- To further develop the analysis and study the combined effect of the stringency measures on food security and production, the authors interacted the stringency of containment measures with the amount of rice production, maintaining food security as the outcome of interest. The analysis focuses on rice production since rice is the most cultivated crop in Liberia; yet, it can be easily replicated for other types of crops. The analysis highlights how rice production becomes a strong explanatory variable when interacted with the stringency of the containment measures.
- The results of the combined model (Table 11) show that **greater production of rice corresponds to a lower effect of the stringency measures on the household's food security**. In particular, a marginal effects analysis examines production between 25 and 1,025 kg, in increments of 50 kgs. The results show a reduction of the effect of stringency on food security for each rice production increase (see Table 12).

¹⁸⁶ Ibid.

¹⁸⁷ FAO, 2021b

¹⁸⁸ FAO, 2021c

Overall, these findings indicate that restrictive measures affected households with greater vulnerability. As previously observed, greater rice production reduced the effect of the restrictive measures and created more food security for these households; households producing more

rice enjoyed greater food security. This suggests that the increase in production mitigated the negative effect of the stringency measures on food security, while lower production rendered households even more vulnerable to greater food insecurity.

Table 9. Regression Results with Food Security (rCSI) as Outcome of Interest

VARIABLES	(1) Model 1	(2) Model 2
Stringency of containment measures	1.297*** (0.322)	1.513*** (0.331)
Female		1.768*** (0.324)
Rural		-0.559 (0.386)
Highest education level of household head = 1, Completed Primary		-1.010*** (0.366)
Highest education level of household head = 2, Completed Secondary		-1.546*** (0.471)
Highest education level of household head = 3, Vocational/Technical		-1.494 (1.057)
Highest education level of household head = 4, Completed College/University		-4.247*** (0.927)
Constant	8.513*** (0.206)	9.016*** (0.505)
Observations	4,157	4,155

Source: Elaborated by the authors

Table 10. Regression Results with the Amount of Rice Production as Outcome of Interest

VARIABLES	(1) Model 1	(2) Model 2
Stringency of containment measures	-365.2 (234.3)	-334.8 (218.6)
Female		-495.0 (329.8)
Rural		100.4 (376.7)
Highest education level of household head = 1, Completed Primary		-169.6 (356.2)
Highest education level of household head = 2, Completed Secondary		-323.4 (391.9)
Highest education level of household head = 3, Vocational/Technical		-546.4* (298.4)
Highest education level of household head = 4, Completed College/University		-827.3** (370.7)
Constant	1,045*** (216.5)	1,243** (620.6)
Observations	852	852
R-squared	0.001	0.004

Source: Elaborated by the authors

Table 11. Regression Results with the rCSI as Outcome of Interest and the Amount of Rice Production as Control and Interaction Term

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 2
Stringency of containment measures	1.857** (0.863)	2.810*** (0.951)	2.782*** (0.953)
Total rice production (kg)	-0.000114** (4.60e-05)	-8.70e-05** (3.92e-05) (0)	-7.37e-05* (4.04e-05) (0)
1.Stringency* total rice production		-0.00139*** (0.000462)	-0.00130*** (0.000485)
Female			3.036*** (0.727)
Rural			0.177 (1.009)
Highest education level of household head = 1, Completed Primary			-0.0368 (0.744)
Highest education level of household head = 2, Completed Secondary			0.756 (1.296)
Highest education level of household head = 3, Vocational/Technical			-1.234 (2.951)
Highest education level of household head = 4, Completed College/University			1.598 (7.219)
Constant	9.364*** (0.401)	9.336*** (0.401)	7.802*** (1.212)
Observations	852	852	852
R-squared	0.009	0.017	0.039

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Elaborated by the authors

Table 12. Marginal Effect of the Stringency Measures at Different Levels of Rice Production

Stringency		
Amount (kg) of rice production	Coefficient (Effect of the stringency on rCSI)	p-value
25	2.74	<.05
275	2.42	<.05
525	2.09	<.05
775	1.77	<.05
1,025	1.44	0.08 (not significant)
Observations	852	

Source: Elaborated by the authors

2.4.3. Key Informant Interviews

The KIIs aimed to gather inputs from key community stakeholders in Liberia about overall issues and concerns faced by **farmers, food business sector** (private and industry level-processors, transporters, retailers, vendors, consumers), **government, civil society**, and the **third sector**, particularly during the COVID-19 pandemic. The KIIs were designed to give an overall sense of community sustainability and rural development in order to identify strategies to address emerging issues, such as the coronavirus pandemic. In addition, the KIIs aimed to identify the perceived value regarding the government's interventions and services provided at community level.

The KII assessment delved into a wide range of issues, which can be grouped into five main categories:

1. Demographic characteristics of the informant;
2. Economic context (all economic aspects fall into this category);
3. Programs and policies (an evaluation of the programs/policies hosted in the community at the time of COVID-19);
4. Governance (issues that relate to COVID-19, consultations, and support processes);
5. Vulnerable groups (every aspect that relates to youth, women, and migrant workers and their needs at the time of COVID-19).¹⁸⁹

A. Research Methodology and Sample

The interviews with key informants were anticipated by the identification of relevant informants, specifically government authorities (local, regional, and national) and other stakeholders in Liberia (key local organizations, agriculture representatives, influential local suppliers and supply chain actors, civil society and third sector representatives, etc.). These subjects were invited to participate in the interviews via three main channels: face-to-face, Zoom, and telephone. Each interview lasted approximately 1 hour.

To select optimal informants, the authors narrowed a pool of 203 stakeholders to identify 80 individuals who are influential and knowledgeable about the specific issues relevant to this study (e.g., youth, employment, rural development). Furthermore, to ensure a balanced diversity of opinions, the sample included:

- i. Women;
- ii. Youth (under 18) or those that work with these groups;
- iii. Representatives of certain ethnic or disadvantaged communities;
- iv. A range of socioeconomic statuses (not just the rich or the poor);
- v. Social sector (non-governmental organizations,

religious leaders, civil society groups, etc.);

- vi. Private firms working in the food sector, with different roles (transporters, processors, vendors, etc.), especially local entrepreneurs and any influential firms that employ in the area;
- vii. Educators and academics;
- viii. Government (local or regional representatives, as appropriate).

The collection of data was carried out by two local consultants and specialized facilitators, each one working alone with the support of tablets and smartphones. The training of the facilitators was directly administered by Data-Pop Alliance. During the training process, survey questions were extensively described and discussed in order to ensure that the facilitators fully understood the questionnaire.

As explained above, 80 informants were randomly selected from a list of 203 stakeholders belonging to different categories. The selection process was conducted to ensure a balanced diversity of opinions. It is important to note that this sample does not aim to be representative at national or county level.

B. Demographic Characteristics of the Stakeholders

The interviews were conducted with informants belonging to different branches of the agricultural supply chain. Informants at the government levels (specifically, the Ministry of Agriculture, Ministry of Commerce and Industry, Ministry of Finance and Development Planning, and Ministry of Transport) constituted 25% of the total sample. About 15% of the respondents worked as retailers, exporters, or wholesalers; another 15% were employed in fishery, agriculture, and livestock cooperatives or unions. About 12.5% of the total sample were processors and 12.5% were input providers. Transporters constitute about 8.5% of the informants interviewed. About 7.5% of respondents were consumers (who are not farmers); 7.5% worked with NGOs and/or international organizations; while only 2.5% of respondents were employed in financial institutions.

Table 13 presents the sex distribution of the respondents. Approximately 58.7% of the respondents identified as males and 41.3% identified as females. This is unsurprising given that some categories considered in the analysis are male-dominated. Most stakeholders (41.3%) were aged between 35–44 years; 26.3% were aged between 45–54 years; and 23.8% were aged between 25–34. Only 6.3% and 2.5% of the stakeholders were aged between 55-60 and 65-74, respectively. All respondents had formal education—mostly tertiary or college education (53.8%)—and only 3.8% had completed primary school and another 3.8% had vocational training. The average number of years of experience was

¹⁸⁹ Refugees are also included in the category of 'vulnerable groups'; however, due to logistical issues and barriers imposed by the COVID-19 pandemic, interviews with these groups were not included.

about 12 years. By category, about 36.3% of the actors had 6–10 years of experience; 20.8% had 11–15 years, 17.5% had 1–5 years; 13.8% had 16–10 years and 12.5% had over

20 years of experience. There was no significant difference between the mean years of experience for males (13.1%) and females (11.0%).

Table 13. Frequency Distribution of Informants, Disaggregated by Sex

Subcategory of key actors by sex	Frequency			Percentage
	Male	Female	N	
Government	12	3	15	18.8
Processors	5	5	10	12.5
Transporters (large or medium)	7	0	7	8.5
Retailers/exporters/wholesalers	6	6	12	15.0
Consumers (who are not farmers)	3	3	6	7.5
Fisheries, agriculture, livestock cooperatives/unions	6	6	12	15.0
Input providers	1	9	10	12.5
NGOs/international organizations	5	1	6	7.5
Financial institutions	2	0	2	2.5
Total	47	33	80	100.0

Source: Elaborated by the authors

Table 14. Distribution of the Demographic Characteristics of Stakeholders

Variables	Description of categories	Frequency	Percentage
Sex	Male	47	58.7
	Female	33	41.3
Age of the respondents	25-34	19	23.8
	35-44	33	41.3
	45-54	21	26.3
	55-64	5	6.3
	65-74	2	2.5
	Primary education	3	3.8
Education levels of the respondents	Middle education / junior high school	7	8.8
	Secondary education / senior high school	24	30.0
	Vocational education	3	3.8
	Tertiary education / college	43	53.8
	Mean years of experience	-	12.2
Years of experience	1 – 5	14	17.5
	6 – 10	28	36.3
	11 – 15	16	20.8
	16 – 20	11	13.8
	Over 20	10	12.5

General classification of stakeholder	Governmental level		15	18.8
	Private sector and industry level [food business actors]		45	56.3
	Civil society and third sector		18	22.5
	Other		2	2.5
Main sector of work by stakeholders	Crop production		55	60.8
	Fishery		5	6.3
	Livestock		2	2.5
	Others		18	22.5

Source: Elaborated by the authors

C. Economic Context

During the interviews, a six-point Likert scale (much worse, worse, about the same, slightly better, much better, and don't know) was used to elicit informants' perceived economic condition about food business actors (processors, transporters, retailers / wholesalers, vendors and input suppliers), farmers, livestock breeder and fishery households, compared to 2 years before the onset of the COVID-19 pandemic. The results show that more than half of the stakeholders (66%) perceived that the economic conditions of food business actors have gotten worse or much worse since the pandemic began. In contrast, only 9% said it was slightly better or much better.

Regarding the economic condition of farmers compared to 2 years prior to the outbreak of the pandemic, about 63% of the stakeholders believed that it was worse or much worse. Concerning the actual economic condition of people conducting other livelihood activities (livestock raising activities, fisheries, and aquaculture), more than half of the

respondents (55%) perceived them as worse or much worse compared to 2 years before the onset of the pandemic, while 36% perceived them to be about the same.

D. Main Issues Emerging from COVID-19

The interviewees were also asked to share their perspectives about the main issues that emerged during the COVID-19 pandemic for food business actors, farmers, and people involved in other livelihood activities, such as livestock and fisheries. The results (see Table 16) show that the lack of financial resources and the increase in transportation costs were two of the three main issues identified by each of the three categories. The lack of government support was also indicated as the main issue for farmers and people involved in other livestock activities, while food price increase was perceived as one of the major problems affecting food business actors.

Table 15. Respondents' Perception of Economic Condition of Key Actors Compared to 2 Years Ago, Before the Onset of the COVID-19 Pandemic

Key indicators of economic conditions	Level of economic condition				
	Much worse	Worse	About the same	Slightly better	Much better
What is the current economic condition of food business actors (processors, transporters, retailers/wholesalers, vendors, input suppliers) compared to 2 years ago, before the onset of the COVID-19 pandemic?	8%	58%	25%	6%	3%
What is the actual economic condition of farmers compared to 2 years ago, before the onset of the COVID-19 pandemic?	12.1%	51.5%	24.2%	5.9%	5.9%
What is the actual economic condition of people conducting other livelihood activities (livestock raising activities, fisheries, and aquaculture) compared to 2 years ago, before the onset of the COVID-19 pandemic?	12.1%	42.4%	36.4%	6.1%	3%

Source: Elaborated by the authors

Table 16. Main Issues Stemming from COVID-19

Issues stemming from COVID-19	Food business actors	Farmers	Other livelihood activities
Labor supply (general, mostly unskilled)	38%	51%	48%
Labor supply (skilled)	5%	2%	12%
Input supply (shortage and costs)	42%	60%	39%
Transportation costs	70%	70%	72%
Food waste	28%	36%	39%
Food prices increase	80%	55%	60%
Panic buying	4%	33%	0%
Financial resources (i.e., decrease in income, remittances, credit and investment capital)	80%	78%	78%
Government support, investments, and incentives	57%	66%	70%
Lack of innovation and technology needed for community development	43%	60%	60%
Environmental conditions (constraints or advantages)	20%	18%	18%
Decrease in demand for certain food products and increase in demand for other products	4%	0%	0%
Other	7%	0%	0%

Source: Elaborated by the authors

The qualitative findings regarding actors' perspectives on the main issues that emerged during the COVID-19 pandemic for food business actors, farmers, and people

involved in other livelihood activities are documented in the table below.

Table 17. Perceptions of the Main Issues During the COVID-19 Pandemic for Food Business Actors, Farmers, and People Involved in Other Livelihood Activities

Issue	Actor	Findings
1. Lack of financial resources	1.1. Input providers and processors	In the interviews, input providers and processors suggested that the government should implement programs targeting increased access to credit for agro-dealers, wholesalers, retailers and other actors. In practice, the government should work with financial institutions to develop services providing credit opportunities to agro-dealers. Furthermore, they suggested a more transparent management from the government regarding processes to access these new programs and interventions that are already taking place, such as grants, loan, input-subsidies, among others.
	1.2. Government	Governmental informants called for: 1) the establishment of credit opportunities or facilities, especially in the agricultural sector, such as the establishment of a bank for agricultural loans in Liberia; and 2) the establishment of long-term loans for agriculture. In order to achieve these goals, the government should set a guarantee fund for commercial banks in order to incentivize the provision of loans to agribusinesses.
	1.3. Farmers (members of cooperatives or unions)	Farmers who are part of cooperative or union members working with fishery, agriculture and livestock production registered lack of financial resources in terms of decrease in income and credit as a major setback. For instance, cocoa cooperative members revealed that they had not generated the expected revenue per the volume of production due to poor pricing paid to farmers by buyers. They stressed the need for the government to ensure a robust regulation for farmers to receive fair prices. Other farmers also emphasized that the government should provide subsidies to farmers.
2. Transportation costs increase	2.1. Transporters	The poor road conditions and connectivity from farms to the market were documented as major constraints. Transporters stressed that the government and related partners should also focus on reconditioning farm to market roads to ease the difficulties they faced (e.g., cost for vehicle maintenance) when transporting farm products. Transporters and their respective unions also criticized the lack of permanent stations for arrival and departure.
	2.2. Farmers and consumers	Poor road conditions also affect consumers and farmers through the increase in food prices and food waste (post-harvest losses).
	2.3. Processors	Processors revealed that high transport costs due to bad road conditions are one of the major burdens for farmers.
	2.4. Non-governmental and international organizations	NGOs and international organizations involved in food distribution and assistance to poor and food insecure populations, as well as vulnerable groups stressed that high transportation costs resulting from bad roads were responsible for farmers selling at farm-gates, thus realizing lower revenue compared to what they could generate if they transported and sold their products at the main markets.
3. Lack of Government support	3.1. Non-governmental and international organizations	NGOs and international organizations underlined the lack of or poor governmental investments in climate-resilient practices and infrastructure. The informants stressed that the government should create policies providing incentives for climate-smart agriculture investments.
	3.2. Cooperative and union members	Cooperatives and unions called on the government of Liberia and development partners to tailor their investment to the needs of farmers through training and input supply programs. They further mentioned that the government should complement farmers' access to markets by directly investing in improving farm to market roads, early warning systems, and processing equipment.
	3.3. Processors	Processors criticized the lack of incentives in this sector and encouraged the government to provide those incentives to generate skilled labor supply. They also argued that there is a need to increase farmers' access to affordable inputs by reducing tariffs on agricultural inputs. Processors also attributed job losses to the lack of government support and investment.

4. Increase in food prices	3.4. Retailers	Retailers suggested that the government subsidize farmers to reduce the burden they face in getting feed for their livestock. They added that such intervention would have a positive trickle-down effect on retailers and consumers.
	3.5. Consumers	Consumers suggested that the government should create policies targeting relieving the burden on consumers' pocket by reducing the price of inputs. In practice, the government should intervene by reducing tariffs on key inputs such as fertilizers, chemicals, and packaging materials that are imported into the country, and provide subsidies or credit facilities to farmers and other business actors.
	3.6. Transporters	Transporters stressed that the government should prioritize empowering programs focused on youth. Programs such as technical and vocational training in carpentry and driving heavy duty machinery would meet the labor demand of the market.
	3.7. Government	Government representatives recognized the lack of government support for basic social services or infrastructure such as roads, irrigation, and climate information. They also acknowledged that it is a burden to call on the government to work with other development partners to construct new roads or rehabilitate existing ones, invest in irrigation and storage, or incentivize private sector investment. They agreed that those solutions would ease the burden of high transport costs for those in food businesses and facilitate year-round production of food in the country.
	4.1. Wholesalers and retailers	The increase in food prices due to the high input and transportation costs for locally produced commodities, along with inflation and the unfavorable exchange rate have deeply affected the income of wholesalers and retailers of imported commodities. These informants stressed that the government should intervene by reducing input duties and tariffs.
	4.2. Cooperative and union members	Cooperatives and unions underlined that most farmers could not properly cultivate their crops due to the lockdown measures, resulting in poor harvests and leading to higher demand for imported food. They suggested that the government should address the road problems and provide other programs like training in farm management and input use. They also encouraged the government to prioritize foreign direct investment to help stabilize the economy by providing incentives to attract investment; provide subsidies and incentives for farmers to produce more food to meet high demand; and increase actors' access to finance and credit in the sector to address the financial gap affecting processors, farmers, and other actors along the food chain. Another alternative could be the provision of soft loans or grants to farmers, cooperatives, and traders.
	4.3. Consumers and processors	Both consumers and processors argued that the government should support farmers to grow more staple crops and reduce dependency on imported food. Input subsidies could be a form of support.
	4.4. Transporters	Transporters stressed that the government should address the steep increases in the prices of major commodities such as petroleum products. In practice, transporters would like the government to implement a price regulation that would curtail the artificial hike in food prices, particularly in the context of health crises such as the COVID-19 pandemic.
	4.5. Government	Governmental informants emphasized the high cost of food in the country, and suggested that the government provide subsidies to farmers.
	4.6. Non-governmental and international organizations	NGOs recognized that the high food prices are caused by high tariffs and high transport costs, as a result of bad roads. They stressed that the government should reduce tariffs on agricultural inputs.

Source: Elaborated by the authors

E. Five-year Outlook for Liberia's Agricultural Economic Recovery

The stakeholders interviewed seemed to be cautiously optimistic in their expectations for Liberia's agricultural economic recovery for the next 5 years. Most of them had either high (31.3%) or moderate (40%) expectations for the country in this regard.

F. Policies and Programs

Stakeholders' perceptions of the effectiveness of policies or programs implemented to confront COVID-19 in Liberia

Since the onset of the COVID-19 pandemic, the government of Liberia has adopted several measures to curb the spread of the virus and attenuate its adverse societal impact, including lockdowns, social assistance, and interventions

Table 18. Respondents' Specified Level of Effectiveness of Policies/Programs Implemented Since the Outbreak of COVID-19 in Liberia

Activities / measures adopted by government	Level of agreement with effectiveness of measures adopted during COVID-19 pandemic (%)				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Government adopted effective lockdown and restrictive measures	-	8.8%	3.8%	56.3%	31.3%
Government adopted effective social assistance measures (e.g., subsidies, cash transfers, food distribution, support for water and electricity expenses)	22.5%	32.5%	10.0%	31.3%	3.8%
Government adopted effective measures to preserve agricultural economy (e.g., agricultural, fisheries, and livestock)	23.8%	38.8%	18.8%	17.5%	1.3%

Source: Elaborated by the authors

to preserve the agricultural economy. During semi-structured interviews, informants were asked about their level of agreement regarding the effectiveness of the government's measures and actions. Their perceived level of effectiveness was measured on a five-point Likert scale ranging from *strongly disagree* to *strongly agree* regarding a series of statements recorded in **Table 18**. The analysis reveals that 88% of the stakeholders agreed or strongly agreed that the government adopted **effective lockdown and restrictive measures**. Some issues highlighted by interviewees concerned the measures adopted to **preserve the agricultural economy**; 63% declared that the measures were either ineffective or strongly ineffective. **With regard to social assistance measures**, such as subsidies, cash transfers, food distribution, and support to cover water and electricity expenses, 55% of the stakeholders disagreed or strongly disagreed that the measures were effective; 10% took a neutral stance on the effectiveness of the measures.

COVID-19 Stimulus Package Program

During the interviews, the informants were asked to express their views on specific social assistance and economic programs implemented by the government. The informants mainly referred to the **COVID-19 Stimulus Package Program**, implemented by the Ministry of Commerce, Industry and Trade (MoC). This program aims to provide food distribution and cash transfers to vulnerable households. Concerning the program's effectiveness, government representatives considered it effective due to the absence of public outcry or demonstrations within a particular community; however, they pointed out some logistical constraints and poor planning on the part of

the government. Other stakeholders (specifically, input providers, consumers, retailers, transporters, processors, and people working in financial institutions) felt that the program was ineffective because most communities did not receive food or cash. Consumers indicated that the use of cell phones to reach out to vulnerable or poor populations was not a valid approach since most of those people have inactive contact numbers. Furthermore, transporters attributed their perceived ineffectiveness of the program to an unfair distribution process. Finally, for NGOs and international organizations, the program was necessary and timely especially given the COVID-19 crisis; however, it was implemented only once the lockdown had been lifted, and inadequate logistical planning prevented the COVID-19 Stimulus Package distribution from being as effective as it might have been otherwise.

Grants and subsidies for agriculture

SME grants targeting small agricultural businesses and enterprises across the country were considered to be an effective program by governmental informants; however, they noted that some SMEs did not pay the loan back. Processors lamented the fact that some of these SMEs were ghost entities. Other stakeholders (specifically, input dealers) considered the program to be effective, yet lamented the lack of awareness about the process to access the grants and subsidies, noting, too, that the selection process was perceived to be competitive, as it was done via a digital platform. This last aspect was also emphasized by NGOs and international organizations.

Stakeholders' knowledge of and satisfaction with government consultation processes used to identify problems and priorities related to COVID-19 in their communities

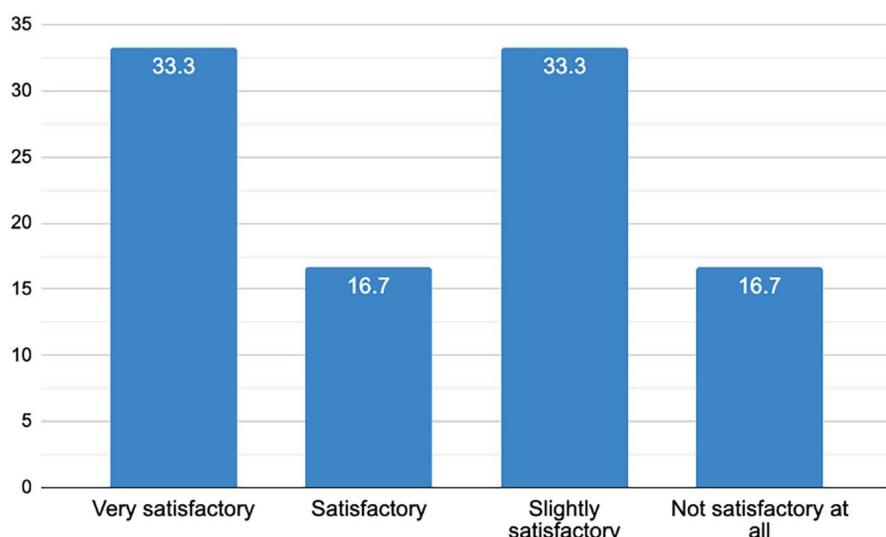
During interviews, the authors sought to understand the degree and nature of the government's consultation with various stakeholders to identify community problems and priorities associated with the COVID-19 pandemic. The results show that about 65% of the informants were not consulted nor was there a platform bringing together government entities and the community to identify problems and priorities stemming from COVID-19. Furthermore, 28% said they were not aware whether consultations were carried out by the government; only 7% indicated

that beneficiaries were consulted. As shown in Figure 38, among the stakeholders who had been consulted by government entities, half expressed being satisfied or highly satisfied and the other half expressed disappointment and dissatisfaction.

G. Vulnerable Groups

The last part of the interviews focused on assessing the impacts of COVID-19 on women and youth as vulnerable groups. The analysis shows how stakeholders perceived the economic situation of these groups both before and during the COVID-19 pandemic.

Figure 38. Stakeholders' Satisfaction with the Level of Engagement Between Government and Communities



Source: Elaborated by the authors

Table 19. Respondents' Perception of Vulnerable Groups' Economic Condition Compared to 2 Years Ago, Before the Onset of the COVID-19 Pandemic

Categories of key actors	Economic condition compared to 2 years ago (%)				
	Much worse	Worse	About the same	Slightly better	Much better
How do you perceive the overall economic situation of women today in comparison to other groups of people?	13.8	51.3	27.5	3.8	3.8
How do you perceive the overall economic situation of young generations today in comparison to other groups of people?	45	33.8	16.3	3.8	1.3

Source: Elaborated by the authors

As shown in **Table 19**, when comparing the actual situation to the situation 2 years before the COVID-19 pandemic, about 65% of the stakeholders perceived the overall economic situation of women to be worse or much worse. From the perspective of young generations, 78% perceived the economic situation of youth to be worse or much worse.

During the interviews, informants were asked if any specific issues emerged for **women** and **youth** during the COVID-19 pandemic. Only 61% of the stakeholders indicated that there had been issues specific to **women** and **youth**. Overall, stakeholders agreed that the social issues identified at the time of COVID-19 predated the pandemic, signaling how COVID-19 exacerbated existing structural problems of the country. In particular, **Table 20** shows that 93.6%, 76.6%, and 65.9% of the informants attributed the issues emerging for women to lack of credit access, job loss, and lack of career opportunities, respectively; 59.6% said it was caused by lack of favorable social and ethical conditions.

Most informants stated that issues emerging for young people during the COVID-19 pandemic included lack of

career opportunities (84.6%), lack of access to quality education and schooling (82.1%), job loss (82.1%), job insecurity (74.4%), and lack of favorable social and ethical conditions (53.9%) (see **Table 21**).

Perceived Levels of COVID-19 Impacts on the Implementation of the One Health System in Liberia

During the interviews, special attention was paid to the impacts of the COVID-19 pandemic on the One Health System in Liberia, specifically to respondents at the **government level**, including seven stakeholders belonging to ministries. The majority declared that the outbreak had a moderate impact (66.7%); citing the most impacted features to be zoonotic disease management (46%) and propagation of zoonotic disease through health and food systems (34%). In practice, the One Health System Platform has great potential to limit the spread of the virus; however, at the moment of the outbreak the platform was not able to promptly detect and respond to COVID-19.

Table 20. Main Issues for Women During the COVID-19 Pandemic

Issues emerging for women during the COVID-19 pandemic	Percentage
Job loss (basic employment)	76.6%
Lack of career opportunities (aspirational employment)	65.9%
Job insecurity (longer term vs. seasonality or short term)	29.8%
Lack of entrepreneurship training or support	23.4%
Lack of credit access	93.6%
Lack of favorable social and ethical conditions	59.6%
Lack of access to quality education and schooling	36.2%
Others	8.5%

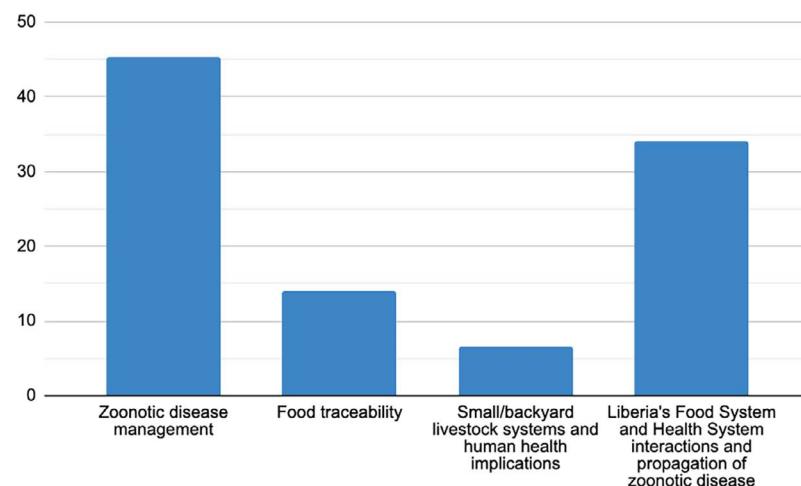
Source: Elaborated by the authors

Table 21. Main Issues for Youth During the COVID-19 Pandemic

Issues for young people during the COVID-19 pandemic	Percentage
Job loss (basic employment)	82.1
Lack of career opportunities (aspirational employment)	84.6
Job insecurity (longer term vs. seasonality or short term)	74.4
Lack of entrepreneurship training or support	48.7
Lack of credit access	66.7
Lack of favorable social and ethical conditions	53.9
Lack of access to quality education and schooling	82.1
Others	2.6

Source: Elaborated by the authors

Figure 39. Most Impacted Aspects of the One Health System



Source: Elaborated by the authors

Chapter 3

**LONG-TERM POLICY IMPLICATIONS
OF COVID-19 ON AGRICULTURE,
FOOD SECURITY, AND NUTRITION**



Chapter 1 discussed the impacts of COVID-19 on food supply, demand, and governance, based on the information available in the literature. Chapter 2 (specifically, section 2.4) complemented the information documented in the literature with microsimulations, key informant interviews, and multiple regression analysis, to fill data gaps identified during the first phase of the study. This final chapter provides policy-targeted recommendations based on the results of the analysis described in the preceding chapters.

3.1. Demand Side

Immediate and Long-term Policy Measures to Mitigate Impact of COVID-19 on Livelihoods, Food, and Nutrition Security

The pandemic influenced food demand in Liberia, from income losses due to the pandemic, their effects on poverty, and their relation to food security. The Liberian government took immediate and long-term policy measures to mitigate the negative impacts of COVID-19 on livelihoods, food, and nutrition security. The review of the literature, in combination with the results of the KIIs, microsimulations, and multiple regression analysis, have revealed the following trends:

- **Decrease in food security.** An increase in people experiencing acute food insecurity or food stress was identified. According to the latest Global Report on Food Crises,¹⁹⁰ after the onset of COVID-19 in March 2020, there was an increase in the percentage of the population in Phase 2 or Phase 3 of food insecurity. In October and December 2020, 24% were in Phase 2 (food stress) and 10% in Phase 3 or above (food crisis, emergency, and catastrophe). These numbers increased to 32% (Phase 2) and 20% (Phase 3 or above) in July–August 2021. The author's analysis of LPHFSA 2021 data confirms this tendency. Specifically, the results of the micro simulations and the LPHFSA 2021 show how food insecurity increased for Liberians between 2016 and 2021. The Reduced Coping Strategy Index nearly tripled, from 3.2 pre-COVID-19¹⁹¹ to 9.08 during the pandemic outbreak.¹⁹² Furthermore, food insecurity became more intense for Liberians between 2016 and 2021, especially for the poor. For those above the poverty line, the rCSI moved from 2.91 in 2016 to 6.71 in the first quarter of 2021. For those below the poverty line, the rCSI rose from 3.54 in 2016 to 9.23 in 2021. The “food insecurity gap” increased by a factor of four (0.63 to 2.53). The findings of the present study are confirmed by FAO's analysis showing that during the lean season in 2021

around 28.3% of households were affected by severe food insecurity.¹⁹³

- **Nutrition alarm.** The Global Report on Food Crises shows a national wasting prevalence of 4.3% and stunting prevalence of 30.1% in Liberia.¹⁹⁴ Comparing the results of this study with those of UNICEF et al.,¹⁹⁵ It can be observed that between 2019 and 2020 the wasting prevalence increased from 3.4% (2019) to 4.3% (2020) while between 2012 and 2020, there was a reduction in stunting prevalence, from 35.6% (2012) to 30.1% (2020).
- **Increase in consumer prices.** Prior to the pandemic, households' capacity to afford basic expenses was constrained by yearly increases in consumer prices and decreases in labor productivity. In 2020, the IMF forecasted increases in the CPI of 20.5% and 17% for 2020 and 2021 respectively.¹⁹⁶ However, during the pandemic consumer prices (CPI general indices) increased even more, rising by 35% between 2019 and 2020 and by 6.6% between 2020 and 2021.
- **Decrease in purchasing power.** The microsimulation analysis suggests that all poverty levels increased in Liberia due to COVID-19. The comparison of non-COVID with COVID-19 scenarios reveals that (a) the poverty headcount increased from 52% to 55%, and (b) the poverty gap increased from 23% to 24%. Furthermore, the pandemic negatively affected the standard of living and exacerbated inequalities between Liberians, as evidenced by significant increases in the Gini coefficient, which rose by 14 percentage points between 2016 and 2021. As a result of the pandemic, the Gini coefficient in Liberia increased by one percentage point between the COVID and non-COVID-19 scenarios. These increases in income inequality can perpetuate the cycle of poverty by preventing households from recovering and attaining greater well-being, even in a post-pandemic recovery context. These inequalities are also reflected in a widening gap of food insecurity between households below and above the poverty line.

As a consequence of the impact of COVID-19 on food demand, the government of Liberia implemented forms of social assistance and economic stimulus, including the Stimulus Package Program and the grants and subsidies programs for agriculture and SMEs. These and other measures were extensively described in the previous chapters, and were evaluated by the informants interviewed.

In light of the issues documented above, the authors recommend that the following actions be taken by the

190 FSIN & GNAFC, 2021

191 HIES, 2016

192 FAO Liberia & MoA, 2021

193 FAO, 2021b

194 FSIN & GNAFC, 2021

195 UNICEF et al., 2021

196 IMF, 2019

government of Liberia and development actors working on agriculture and food security in Liberia:

1. **Investments in cash transfers and in-kind food distribution (short-term).** Food assistance in the form of in-kind food or cash to vulnerable households would alleviate immediate food insecurity, but lessons learned from the **COVID-19 Stimulus Package Program** suggest that fairer distribution and better logistic strategies be prioritized to improve the future of social assistance programs. Specifically, evidence from the KIIs shows that, while appropriate beneficiaries were effectively identified, operationalization was lacking. Specifically, stakeholders noted that field officers implementing the program were not up to the task, resulting in an ineffective social assistance program unable to reach the population in need of food.
2. **Investments in social safety net programs (long-term).** Social protection programs help mitigate micro- and macro-level economic losses generated by COVID-19, protecting household consumption and welfare through the injection of cash into local economies.¹⁹⁷ However, the Liberian government, like many others in Africa, faces budgetary constraints. It is therefore vital to reinforce international dialogue and receive the support of the international aid community to expand existing social safety net programs, especially those that improve household access to healthy and nutritious food. Prior to the COVID-19 outbreak, the government of Liberia, with support from its development partners, started building a national social safety net system including cash and school feeding programs. Forms of assistance such as income assistance, vouchers for household food purchases, renter eviction protections, housing assistance, and school lunch programs would offer adequate access to healthy and nutritious food and would help resolve the emerging food crisis.
3. **Develop a Food Security and Nutrition Monitoring System (FSNMS).** The development of a FSNMS could play a vital role in confronting future shocks and identifying people at highest risk of food insecurity and malnutrition. According to the World Bank,
[T]his system would better target appropriate policies and monitor their effectiveness. The current MoA food security reports are a good step in this direction. However, the system should be systematized and based on frequent, robust data collection systems to improve efficiency. Such a system could also aid farmers by providing seasonal trends analyses to better link supply and demand in order to reduce wastage, improve efficiency and ultimately improve livelihoods.¹⁹⁸

3.2. Supply Side

The Impact of COVID-19 on Key Food Value Chains, with Focus on Groups Most Vulnerable to COVID-19 Measures

The COVID-19 pandemic affected food systems in Liberia on the supply side as well—notably key food value chains—and exacerbated some existing issues, particularly for vulnerable groups.

Agriculture. The review of the literature, in combination with the results emerging from KIIs, microsimulations, and multiple regression analysis has demonstrated the following:

- **COVID-19 did not directly impact rice production.** In this regard, as shown by FAO/GIEWS analysis,¹⁹⁹ rice production decreased by only 2.4% between 2020 and 2021. Further analysis of the impact of stringency measures on rice production **did not show an induced contraction in agricultural production related to the stringency of the containment measures.** However, agricultural production mitigated the negative impact of the stringency of the containment measures on food security, especially in the counties in which the government applied more stringent containment measures.
- **Measures adopted to preserve the agricultural economy were considered to be ineffective by 63% of the informants interviewed.** In particular, stakeholders pointed out how forms of support to supply chain actors, such as SME grants and subsidies programs, or the seeds and nets distribution programs, have not always been associated with fair and transparent support and management from the government.
- **Smallholder farmers are held back by lack of government support, high transportation costs, and inadequate access to credit.** During the peak of the COVID-19 pandemic, Liberia's banking system experienced long-standing liquidity challenges, affecting both the USD and the Liberian dollar. This made access to finance extremely difficult for agribusinesses during the harvest season. However, the problem became particularly pronounced beginning early 2020. Cocoa cooperatives in Lofa and Nimba were unable to fulfill their buying potential due to difficulties in accessing cash from banks. Rural enterprises were also impacted. Fofie Nyeh, the business manager of Sebehill Cooperative, which purchases coffee and cocoa from farmers in Lofa County and sells it to an exporter, described how it became necessary to travel to Monrovia to pick up cash from the buyer, or meet halfway along the road. Other issues documented in the literature include the lack of input supplies, such as fertilizer and irrigation; poor seeds and breeding stock; and inadequate machinery and infrastructure for transport, storage, and marketing.

¹⁹⁷ World Bank, 2020d

¹⁹⁸ World Bank, 2020d, p. 47

¹⁹⁹ FAO, 2021c

- Around **63% of informants** noted that the **economic conditions of farmers are worse** or much worse compared to 2 years prior to the outbreak of COVID-19. For further details, please refer to **Table 17**.

Other livelihood activities (livestock raising activities, fisheries, and aquaculture). The review of the literature, in combination with the insights gleaned from KIIs, microsimulations, and multiple regression analysis showed that:

- More than half (55%) of informants interviewed perceived the **economic conditions of people conducting other livelihood activities as worse** or much worse compared to 2 years before the onset of the COVID-19 pandemic. For further details, please refer to **Table 17**.
- The main **issues** faced by this group of people were **access to financial resources, insufficient government support, and high transportation costs**. Other survey findings from FAO show that for animal breeders, limited access to feed and veterinary inputs and services were the main difficulties that households faced in raising their animals, followed by input price increases, low income, and limited access to credit.²⁰⁰ In addition, 45% of surveyed animal breeders faced a decrease in the number of animals owned. Concerning fisherfolk households, FAO's analysis shows difficulties such as decreased demand, market access, and lack of inputs and equipment.²⁰¹

Vulnerable groups. In Liberia, around 70% of the total labor force work in agriculture, and women represent 75% of that workforce. In rural areas, women tend to own the crops they cultivate but lack land titles. The review of the literature, in combination with the insights gleaned from KIIs, microsimulations, and multiple regression analysis showed that:

- Only 61% of the informants interviewed observed issues specific to **women** and **youth**. Overall, respondents agreed that the issues identified at the time of COVID-19 predated the pandemic, emphasizing that COVID-19 exacerbated existing societal issues. In particular, KIIs show that 93.6%, 76.6% and 65.9% of informants attributed the issues specific to women to **lack of credit access, job loss, and lack of career opportunities**, respectively; 59.6% said they were caused by lack of **favorable social and ethical conditions**. The same issues were identified for youth.
- According to FAO, the agricultural activities of rural women were affected by COVID-19 more than those of men.²⁰² Specifically, women were at greater risk of exposure to COVID-19 due to their family caregiving roles. This

200 FAO, 2021b

201 Ibid.

202 Moseley, 2020

203 FSIN & GNAFC, 2021

204 FSIN & GNAFC, 2021

generated implications for food production, processing, and trade.²⁰³

In light of the issues documented above, the following recommendations to the government of Liberia and development actors working on agriculture and food security in Liberia are listed below.

1. **Support domestic agricultural production, reducing dependency on imported food.** Input subsidies, for example, could be a form of support together with loans or grants supporting SMEs already developed as a response to COVID-19.
2. **Support nutrition-sensitive agricultural production programs** such as home gardens and homestead production, as part of a demand-expansion strategy toward increasing fruit and vegetable consumption and diet diversity. This is a vital strategy to fight the high malnutrition rates among children, as proposed by the 2021 Global Food Crises report.²⁰⁴
3. **Support sustainable and climate-resilient production practices.** Agriculture support measures should include sustainable and climate-resilient production practices like conservation agriculture, water management, and integrated pest management. KIIs shed light on the lack of investments or inadequate government investments in climate-resilient practices and infrastructure.
4. **Collaborate with financial institutions to develop services providing credit opportunities to all supply chain actors**, especially farmers working in agriculture, in other livelihood activities and agro-dealers. It is unfortunate that, as of yet, there is no bank for agricultural loans in Liberia, as reported by some of the stakeholders interviewed. The SME grants and subsidies program and the seeds and nets distribution programs were intended to address these issues by providing inputs (seeds and fertilizers), and soft production loans. However, as observed by some informants, these forms of support should be associated with more transparent government management.
5. **Reinforce the Market Women and Small Informal Petty Traders Bank Loan Program** approved by the Senate and House of Representatives to support businesses existing before January 1, 2020 (before COVID-19).
6. **Create a mechanism by which employees—especially youth and women—can make a report when their rights are being violated.** This mechanism could follow a community logic structure in which a group of organized agricultural workers meet regularly (by month or trimester) to discuss the main issues that affect them, and then formally present their concerns and requests to the

Ministry of Labor (MoL), along with its labor inspectors, who could investigate the situation. The MoL would then deliberate, guided by the provisions of the Review on Complaint of Labor Violation, to provide a decision on the consequences of any employer who infringes the law. This would allow for an individual's personal needs and concerns to be heard. Moreover, individuals would be able to access community support when experiencing injustices.

3.3. Governance

3.3.1. The Impact of COVID-19 on Governance Systems – Changes Needed to Counteract Negative Effects

The review of the literature, in combination with the results of KIIs, microsimulations, and multiple regression analysis, have shown that:

- **Exposure to food insecurity is significantly higher in the Liberian counties in which the government applied more stringent containment measures.** In the multiple regression analysis, the rCSI was 1.297 points higher for households in the “response” status, as compared to those under “preparedness.” These results confirm recent findings of WFP about the food security costs of a domestic COVID-19 outbreak and the ensuing restrictions.²⁰⁵ Moreover, the analysis shows that female-headed households face more food insecurity than male-headed households, as already observed by FAO.²⁰⁶
- **Rice production was not affected in a significant way by the stringency of the containment measures.** This result from the multiple regression analysis is similar to what the literature has documented, particularly FAO’s GIEWS data for which 2020 national rice production is estimated at 270,000 tonnes, similar to the five-year average and slightly below the previous year.²⁰⁷ The analysis shows that the food security of households with greater rice production (as a proxy for wealth), were less affected by the containment measures than households with a smaller production.
- **Greater production of rice corresponded to a lower effect of the stringency measures on households’ food security.** In particular, through a marginal effects analysis, production varies between 25 and 1,025 kg, with increments of 50 kgs; results show a reduced effect of the stringency of the containment on food security for each rice production increase.
- **Lack of financial resources and transparency in the government’s management of COVID-19 programs and policies.** **Input provider** and **processor informants** from the semi-structured interviews highlighted the lack of

financial resources in terms of income-targeted programs to agro-dealers, wholesalers, retailers, and other actors’ access to credit. Furthermore, they suggested a lack of transparency from the government in terms of management of new programs and interventions such as grants, loans, input-subsidies, etc. **Farmers** who are members of cooperatives or unions working in fishery, agriculture, and livestock production noted a lack of financial resources —such as decrease in income and credit—as a major setback.

- **Poor road conditions and transportation costs.** Transporter informants suggested that poor road conditions and connectivity from farms to the market are major constraints. The poor road conditions also affect **consumers** and **farmers** through the increase in food prices and food waste (post-harvest losses). **Processors** recognized high transport costs due to the bad road conditions as one of the burdens on farmers resulting from bad roads. **NGOs and international organizations** involved in food distribution and assistance to poor, food insecure populations and other vulnerable groups pointed out that the high transportation cost resulting from bad roads is responsible for farmers selling at farm-gates. They thus have lower revenue compared to what they could generate if they were able to sell their produce at the main markets.
- **Effectiveness of overall restrictive mobility and social assistance measures.** Analysis of the KIIs shows that 88% of the informants agree or strongly agree that the government adopted **effective lockdown and restrictive measures**. Some issues were pointed out concerning the measures adopted to **preserve the agricultural economy**. In this case, 63% of the informants declared that the measures were either not effective or strongly not effective. With regard to **social assistance measures**, such as subsidies, cash transfers, food distribution, and support for water and electricity expenses, 55% of stakeholders disagree or strongly disagree that the measures were effective.
- **COVID-19 stimulus package program.** The COVID-19 stimulus package program was implemented by the government of Liberia through the Ministry of Commerce, Industry and Trade, to provide food distribution and cash transfers to vulnerable households that are most affected by the pandemic. The KIIs revealed that although government representatives considered the program effective (since no public outcry or demonstrations within a particular community were documented), other informants (specifically, **input providers, consumers, retailers, transporters, processors, and people working in financial institutions**) agreed that the program was ineffective because most communities did not receive

²⁰⁵ WFP, 2020d

²⁰⁶ FAO, 2021b

²⁰⁷ FAO, 2021c

food or cash. Consumers also declared that the use of cell phones to reach out to people who were considered vulnerable or poor was not a valid approach since most of those people have inactive contact numbers.

- **Grants and subsidies for agriculture.** SME grants provided by the government targeted small agricultural enterprises across the country to support their businesses in face of pandemic-related hardships. Government representatives revealed in the KIIs that some SMEs did not pay the loan back, whereas processors suggested that some of these SMEs were ghost entities. Furthermore, input dealers considered this initiative to be effective, but also pointed out a lack of awareness about the grants and subsidies process, especially through digital platforms.
- **Lack of consultations with key stakeholders about problems and priorities stemming from COVID-19 in their communities.** The KII results revealed that 65% of informants were not consulted nor was there a platform for exchange between government entities and the community to identify their problems and priorities stemming from COVID-19; 28% said they did not know if consultation was carried out by the government; and only 7% affirmed that beneficiaries were consulted.

In light of the issues documented above, the authors recommend that the Liberian government and development actors working on agriculture and food security in Liberia take the following measures:

1. **Investments in inclusive and transparent governance.** The experience of the COVID-19 pandemic has provided insights on how to foster inclusive national dialogue and decision-making, stronger social contracts between states and communities, increased trust in institutions, and enhanced peacebuilding efforts. Furthermore, evidence from the other policy recommendations shows how the government could rigorously implement anti-corruption strategies and enhance transparency in the mobilization and utilization of development financing resources.
2. **Investments in data and technology.** Digitalization has already transformed Africa's economies in meaningful ways. Most African countries have actively employed digital technologies to shift to cashless transactions; the use of mobile money in East Africa, for instance, has helped reduce the risk of spreading the virus. In Liberia, the KIIs show how the use of digital platforms to send money via mobile did not yield the expected results since some of the recipients did not have access to the technology.

The need to invest in access to technologies has only become stronger during the pandemic. Urgent priorities include ensuring affordable access to mobile phones and internet connectivity to facilitate aid disbursements. The appropriate adoption of digitalization requires investing

in last-mile connectivity and setting up ICT infrastructure for the benefit of Liberians and the government. Although these priorities are established in Liberia's National ICT policy (2019-2024),²⁰⁸ they need to be expedited to alleviate the impacts of the pandemic. The benefits of implementing these priorities are manifold. For governments, the use of digital technologies can help increase aid effectiveness and create innovative ways for preparing for crises. When households enjoy greater use of digital technologies, this can increase access to education, health, and aid—through distance learning, telemedicine, and mobile-based cash transfers.

3.3.2. The Impact of COVID-19 on One Health System's Status and Implementation

The 2014-2016 Ebola outbreak weakened an already fragile health system undermined by years of civil conflicts. Liberia's One Health System was launched as a response to the Ebola outbreak. With support from the World Health Organization, FAO, USAID, and other partners, Liberia has made steady progress in institutionalizing the One Health System approach and establishing a permanent One Health Coordinating Structure and the One Health Coordination Platform (OHCP). In particular, the OHCP—which was endorsed by WHO, FAO, and the Global Health Security Agenda partnership—was created to reduce the risk of new emerging pandemics. This is achieved through strengthening capacities to prevent, prepare for, detect, and respond to known and emerging public health threats related to the interface of humans, animals, and the environment. The platform has been successful in raising awareness on emerging health issues in the country, such as rabies prevention, joint zoonotic disease investigations, and antimicrobial resistance.

During the KIIs, government respondents were asked about the impacts of the COVID-19 pandemic on the One Health System platform. Seven stakeholders belonging to different ministries expressed their opinion; the majority believed that the outbreak had a moderate impact (66.7%), with the most impacted features being zoonotic disease management (43%) and its propagation through health and food systems (57%). **Stakeholders participating in the KIIs recognized that the One Health System platform has great potential to limit the spread of zoonotic viral threats in the future; however, at the moment of the outbreak it was not able to promptly detect and respond to COVID-19.**

Although progress has been made to enhance the national health system, Liberia's health system is still among the weakest in the world, with severe shortages of human and financial resources, limited institutional capacity and infrastructure, weak information systems, and critical gaps in the availability of drugs, equipment, medical supplies,

and other essential inputs.²⁰⁹ The government and the international community should prioritize investments targeting health policies to reinforce the One Health System.

Food traceability.²¹⁰ In Liberia, there is no existing food traceability system in the agricultural sector, aside from cocoa (a local exporting company named Atlantic Cocoa and Export Company was recently awarded a certification to track the good or bad quality of cocoa within their supply chain). It is important to note that tracing the source of food contamination within the supply chain is central to guaranteeing food safety. However, apart from the cocoa system, Liberia has not been able to develop a traceability system to monitor food safety and quality control in the supply chain. Furthermore, it has become increasingly expensive for food market actors and farmers to afford hiring foreign certification companies to set up certification systems that include food traceability. On October 21, 2021, during the launch of the five-year cocoa strategy roadmap at the Ministerial Complex in Congo Town, the Minister of Agriculture stressed the need for government investment in capacity-building and coordination with the private sector to develop value addition, traceability, and transparency systems. Such investment could lead to improved certification systems for local enterprises.

3.3.3. Structural Factors Exacerbating Impacts of Crises and Longer-term Policy Implications

A. Weak Biosafety Control System, Food Quality Assurance Issues, and Absence of Strategic Food Reserve Systems

Liberia's food system has been affected by several structural constraints. Years before COVID-19, in 2015, the government's Food Agriculture and Policy Strategy planned to use resources to ensure the population has access—both physically and economically—to nutritious food, by rebuilding farm-to-market roads, enhancing income generation, and establishing strategic food reserves at community and national levels.

Strategic reserve of staple foods. In 2012, Liberia, like other countries in sub-Saharan Africa, signed the Economic Community of West African States (ECOWAS) Regional RESOGEST (Regional Networking of National Stock Management Companies and Offices in West Africa) Protocol Cooperation Framework, which calls for ECOWAS member states to contribute to the formulation and implementation of a regional strategy for food security and set up a national food security stock. Although technical assistance has been

offered, no actions have been taken to move forward on establishing a strategic food reserve in Liberia.

When COVID-19 hit the country, the MoA's COVID-19 Food Security, Nutrition and Livelihood Response Plan developed policies to facilitate opening "green channels" for moving food commodities and agricultural inputs across counties, aided by an effective platform for intercounty coordination.²¹¹ Jointly with the Ministry of Commerce, Industry and Trade, the MoA—with support from the EULAP-PARTNERS Programme—started to monitor the market prices of basic agricultural products in late April 2020. Further, the MoA started to review stock levels for major food commodities available in the private sector and in government food reserves, and to monitor supply chains to identify and address oligopolistic behavior.²¹² These efforts must be continued and accompanied by the development of constant price monitoring system strategies. According to FAO, prior to the COVID-19 outbreak, price monitoring was largely inadequate, limited to a few commodities and carried out only in Monrovia.²¹³ The business community complained that the lack of price regulation was "making things hard for the people."²¹⁴

Biosafety control system and quality assurance issues.

Over the years, Liberia has faced different challenges in ensuring a strong biosafety control system, as well as food quality assurance for food products and non-food products coming in and out of the country. After the onset of the COVID-19 pandemic, these issues were further exacerbated by mobility restrictions and with the Liberian government's efforts and attention redirected to limit the spread of the virus.

To ensure that the country meets and promotes good and professional practices in this regard, aimed at upholding the satisfaction and confidence of the customers while also complying with international standards and testing, particularly conforming with the applicable requirements stemmed from "**ISO/IEC 17025: 2005**" international standards, the government of Liberia set up the National Standard Laboratory. The Laboratory's major objectives are to provide testing and calibration services that will enable the country to avoid importing sub-standard products that may threaten public, plant, or animal health, while ensuring that food and agriculture exports from Liberia meet international standards.²¹⁵

In addition to the government's efforts in establishing the Laboratory, Liberia has drafted a Biosafety Law for

209 World Bank, 2020d

210 Data-Pop Alliance did not interact with the National Standards Laboratory. The information presented here is based on document and literature review.

211 Schmidhuber et al., 2020

212 World Bank, 2020d

213 FAO, 2020h

214 Menkor, 2020

215 FAO, 2019a; Ministry of Commerce and Industry, n.d.

regulating genetically modified (GM) organisms and foods. The Environmental Protection Agency is responsible for all matters concerning GM organisms. At the time of publication, the approval of the law is still pending and there is a need for the development of regulations on GM organisms and laboratories to examine GM foods. When enacted into law, the Biosafety Law will regulate GM organisms and foods to ensure that quality meets international standards. Furthermore, a GM foods online platform has been developed and is used to share information on safety assessment of foods derived from recombinant-DNA plants authorized, in accordance with the Codex Guideline for the conduct of food safety assessment of foods derived from recombinant-DNA plants (CAC/GL 45-2003, annex III adopted in 2008).²¹⁶ Hence, the platform also facilitates the effective utilization of food safety assessment in situations of low-level presence or r-DNA plant materials in food.²¹⁷ Yet, policies, protocols and guidelines need to be upgraded and funding should be raised both internally and externally with the support of the international community. At the moment, funding is limited to that provided by international research institution *l’Institut du Sahel*, through USAID.

B. Gaps in Legal and Regulatory Frameworks for Food and Nutrition Security

The Liberian government has established different strategies to ensure that enabling factors for sustainable food security and improved nutrition are in place through proper legal and regulatory frameworks. In 2008, the government developed the National Food Security and Nutrition Strategy (FSNS), which was revised in 2015 to bridge gaps in legal and regulatory frameworks for food and nutrition security. The FSNS platform was established to properly coordinate the efforts carried by the government through the Ministry of Agriculture, and joint actions of other governmental sectors and agencies, working with local and international partners in both the public and private sectors.²¹⁸

Furthermore, between 2013 and 2017, the United States government implemented a five-year development strategy, which was outlined in the **Country Development Cooperation Strategy (CDCS) 2013-2017** for Liberia. The strategy aimed to strengthen both public and private institutions to improve inclusive economic growth and reduce poverty through adequate legal and regulatory frameworks.²¹⁹

Despite these efforts, the legal and regulatory frameworks to address the gaps in food and nutrition security have not been improved to their full potential. To date, the FSNS

and CDCS strategies have not been fully implemented and require strong interventions to improve the sector. These gaps were further exacerbated when the COVID-19 pandemic hit the country. The institutional framework has been poorly implemented due to the poor coordination of collaboration between major stakeholders across the food and nutrition sectors.

The government of Liberia needs to undertake major steps through legal and regulatory frameworks to address the significant disparities in food security that can be found throughout the country, especially the prevalence of malnutrition. Specifically, more emphasis needs to be placed on counties located in rural areas, since Monrovians tend to be more food secure than populations living in rural areas.²²⁰ Data reveals that the most food insecure counties were Grand Kru (33%), River Gee (32%), Grand Cape Mount (30%), and Bomi (29%), where market activity was most affected by border closures and roadblocks during the Ebola epidemic. A similar situation has been observed during the COVID-19 pandemic.²²¹ The counties most affected by border closures such as Nimba and Lofa, as well as part of southeastern Liberia, experienced food shortages. Effective coordination and inclusive governance through public-private partnerships would improve policies and regulations on food security. Furthermore, the GoL should recognize the key contribution of the informal business community as a national asset, which also supports the country’s economic well-being. In order to support the informal sector, the GoL should develop a Code of Conduct, explicitly delineating rights and responsibilities for all parties. This will contribute to ensuring that information on the rules and regulations are publicly available.

C. Weak Integration of Food and Nutrition Early Warning Systems

The Integration of food and nutrition early warning systems—specifically Liberia’s Famine Early Warning System Network (FEWS NET)—has not been running at full capacity. The system was set up to provide early warnings alerting to the presence of food crises and related drivers to inform decision-makers such as the government and private sector actors on food shortages for the main food items on the market. However, as of June 2017, FEWS NET terminated its presence in Liberia and is no longer preparing regular food security reports. Currently, FEWS NET monitors the food security situation in Liberia and drafts special reports as needed to provide early warning or in-depth analysis of food insecurity drivers.²²²

216 Codex Alimentarius, 2003

217 FAO, 2019a

218 MoA Food Security and Nutrition Secretariat, 2015

219 USAID, 2016

220 WFP et al., 2018

221 Ibid.

222 USAID, n.d.

Furthermore, COVID-19 has exacerbated the fragility of warning systems due to limited resources. These systems have been considered particularly weak due to lack of proper coordination between government ministries (specifically, the MoA and the MoC). Strongly coordinated actions between public and private sectors are required to revitalize food and nutrition warning systems. Furthermore, technical training should be provided for staff working at the secretariats to effectively coordinate and manage those systems.²²³

D. Weak Integrated Food and Nutrition Security Information System

In 2008, the FSNS set up the Food and Nutrition Security Information System to evaluate price fluctuations and household food security status over time, including a market information system that collects data on the prices of main food and cash crops sold in markets across Liberia. Data is collected and analyzed along with the household surveillance data on access to utilization, informing the government about trade arrangements and food scarcity.

To date, the System has not been fully utilized to meet its objective due to lack of technical capacity; lack of logistics, lack of coordination between government ministries and agencies involved in the FSNS platform, and weak administration of the system.²²⁴ These issues have been further exacerbated —further weakening the system—following the outbreak of the COVID-19 pandemic. In this sense, the government of Liberia, through the Ministry of Agriculture, needs to drive efforts and investments to Liberia's Food and Nutrition Security Information System to reinforce technical capacity, logistics, and coordination to provide real-time information on food, nutrition, and market information.

3.3.4. Documenting Best Practices in Mitigating the Impact of COVID-19 in Liberia

Despite the many challenges and barriers imposed by the COVID-19 pandemic, the government of Liberia and other stakeholders have been adopting measures and practices to alleviate the negative effects of the pandemic not only on the health of its population, but more importantly on the socio economic hardships engendered by the crisis. Some of these best practices are detailed below.

A. Declaration of National Health Emergency

In March 2020, with rising COVID-19 cases in Liberia, the government announced the Declaration of National Health

Emergency, which was followed by a parliament-sponsored policy that proclaimed a 60-day state of emergency throughout the country along with a 21-day lockdown in four counties.²²⁵ Furthermore, the government instituted several measures to curb the spread of COVID-19, such as the **responses and the preparedness containment measures** discussed in Chapter 2. **Social assistance measures** were also adopted by the government. The KIIs and the multiple regression analysis help to understand the perceptions of various supply chain actors about the efficiency of these containment and social assistance measures.

Mortality surveillance strategy. According to the World Health Organization, Liberia's community-based enhanced surveillance system provided crucial real-time information starting June 2020 about the spread of COVID-19 in designated "hot-spot" counties.²²⁶ The community mortality surveillance strategy, which is supported by the WHO Regional Office for Africa, was initially designed for use by humanitarian agencies working in complex emergency settings.

B. COVID-19 Restrictions and Implications for Agribusinesses and Food Trade

There were several different measures that the Liberian government instituted to alleviate the negative impacts of COVID-19 in Liberia. Some of the containment measures instituted by the government of Liberia:

- Enforcement of using hand sanitizer, hand washing, mask wearing, and maintaining a distance of 1.5 meter between two persons;
- The closure of all public and private schools, including universities and primary schools;
- Closure of all bars, night clubs, casinos, cinemas, public and private beaches, and other entertainment venues;
- Closure of all churches;
- Limiting the number of persons who may enter a bank to five people at a time;
- Limiting the number of persons that may ride on public transportation vehicles at any given time;
- Ordering supermarkets and large stores to only allow 10 persons into their premises at any given time;
- Both government and private offices were restricted to essential staff only. All non-essential staff were asked to work from home;
- Ban on public gatherings;
- Travel restrictions and border closures;
- Restrictions on movement between high-risk COVID-19 counties in Liberia.

223 MoA Food Security and Nutrition Secretariat, 2015

224 Ibid.

225 Goitom, 2020

226 WHO, 2020b

Effectiveness of overall restrictive mobility and social assistance measures. As explained in the preceding section, the KIIs show that 88% of informants agreed or strongly agreed that the government adopted **effective lockdown and restrictive measures**. However, while the informants noted that lockdown measures succeeded in containing the spread of the virus in Liberia, they also disrupted supply chains and increased risks to food security and income. According to respondents, restrictions on transportation and movement challenged food trade and generated increases in food prices. Social assistance and economic measures, such as the **stimulus package program** and the **grants and subsidies programs** for agriculture and SMEs, were considered to be partially effective; informants underlined some logistical constraints and poor planning.

Community involvement. The KIIs also revealed the direct involvement or consultation with government representatives to identify community-related economic hardships and priorities stemming from the COVID-19 pandemic. The results of KIIs show that about 35% of the stakeholders interviewed had been consulted to identify community problems and priorities emerging from the pandemic. Furthermore, community involvement was instrumental in providing reliable screening information during the early stages of the pandemic, and reducing its transmission.²²⁷

²²⁷ Ibid.

Appendix

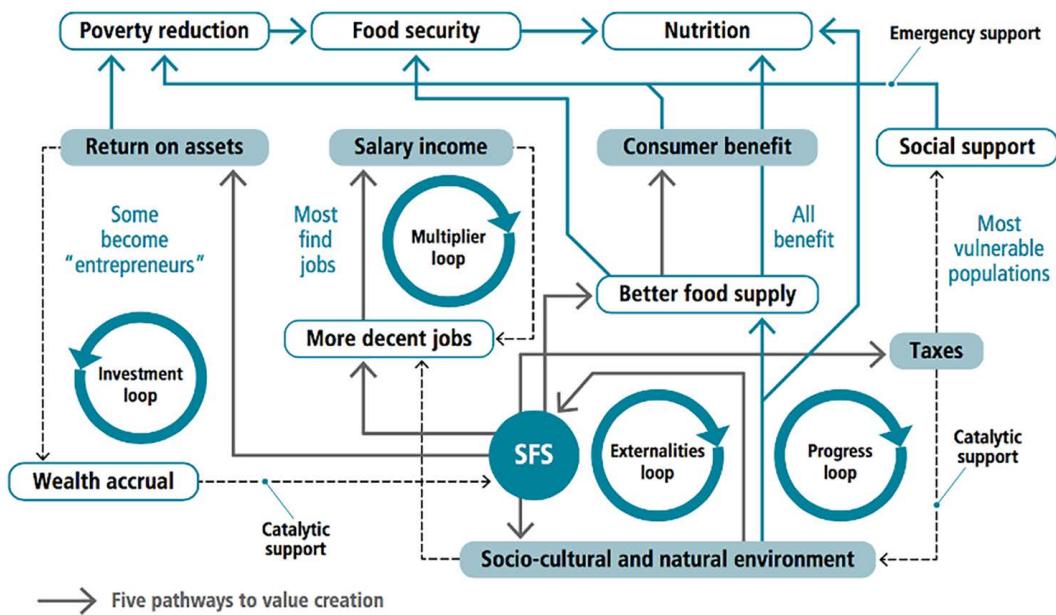
How FAO's Food System is Incorporated into van Berkum et al. (2018)

In FAO's conceptual framework, **food systems** are considered engines of growth that create value through five principal components: 1) workers' salaries, 2) profits made by entrepreneurs and asset owners; 3) government's tax revenues; 4) consumers' benefits; and 5) socio cultural and natural environment impacts within the broader food system and on other systems. Consequently, any added value in this regard will trigger feedback mechanisms that are linked to economic, social, and environmental sustainability. In return FAO's main goals of reducing poverty, hunger and malnutrition will be directly impacted (see the Figure below).

While FAO's framework explores the conduct of several actors in the food system and how they impact directly poverty, hunger and nutrition, van Berkum et al. (2018) split the food system elements into activities linked to **producing, processing and distributing food products, as well as outcomes linked to food security**, socioeconomic sphere, and the environment. Van Berkum's FSA (2018) embeds the food system's socio economic and environmental dimensions of FAO (2018a) in the outcomes and activities, and it provides the exact points of interactions and feedback within the ecosystem. It then allows for several valuable insights such as the mapping of opportunities and highlighting of better policy pathways.

A short comparison of the two approaches shows the following:

- Van Berkum's FSA incorporates the elements from the FAO's approach, but its focus is not so much on income (return on assets, salary income, consumer benefit, taxes), but **on the overall functioning of the system, including but not limited to their capacity to create monetary value**. The focus is not centered around income generation, because increases in income do not necessarily translate into increased food security.
- While both approaches are holistic, van Berkum's approach has the supply, demand and policy side clearly differentiated, which are guiding factors for the policy notes that will be produced afterwards. In both approaches, feedback loops are also present, but van Berkum's FSA focuses more on the interactions between the actors across the value chain, allowing to categorize and identify the impact chains of COVID-19 on the system. FAO's approach is more focused on value added (investment loop, multiplier loop, progress and externalities loop) and could lead to an analysis more centered on the interruption of value creation.



Source: Adapted from FAO, 2014.

Source: FAO's Food System Conceptual Framework (2018)

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