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FOOD SYSTEMS PROFILE – LIBERIA

Catalysing the sustainable and inclusive transformation of food systems

Liberia

FOOD SYSTEMS PROFILE – LIBERIA

Catalysing the sustainable and inclusive transformation of food systems

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FOOD SYSTEMS PROFILE

LIBERIA

Key messages

Liberia is a West African country, whose capital is Monrovia. It has a total surface area of 111 370 km^2, of which 96 320 km^2 is land and 15 049 km^2 is water. Stretching along a 580-km coastline, the country is bounded by the Atlantic Ocean to its south and west, and by Sierra Leone, Guinea and Côte d'Ivoire to its north and east.

The country has long, sandy coastal plains and extensive beaches that are scattered with lagoons, mangrove forests and bluffs. Beyond the coastal plains are rolling hills that support crop cultivation and agroforestry, while the deeper interior is largely a plateau traversed by rivers, hills and mountains. The climate is tropical and humid, with relatively small day-night and seasonal variations (Liberia, 2018a).

Liberia is one of the most biologically diverse countries in West Africa and the most forested in the region, covered by continuous, dense rainforests stretching from Guinea in the south to Ghana (World Bank, 2021a). It has more than 1.6 million ha (4 million acres) of arable land suitable for developing sustainable food systems that include food crops, tree crops, such as cocoa and palm oil, other horticultural crops, animal husbandry, fisheries and aquaculture (NIC, n.d.). Cassava and rice are the primary staple food crops, while the main cash crops and foreign exchange earners are rubber, palm oil, cocoa and timber (ITA, 2022).

Liberia has made significant economic and development progress since the end of a civil war in the country in 2003 and has also made some progress regarding nutrition. It is still, however, classified as one of the world's **least developed, low-income, food-deficit countries** and faces substantial hurdles in reducing **persistent high levels of poverty, improving food insecurity and increasing dietary diversity**. The country ranked 178 out of 191 countries in the 2021 Human Development Index.

The many challenges faced by Liberia range from rural-to-urban migration and high reliance on imported food to inflation and unemployment. These challenges greatly affect the country's urban poor.

The population of Liberia is very young, with a median age of just over 18 years. Nearly one-third of its **5.4 million people** (2023) live in and around Monrovia. **More than half of the population lives below the poverty line (in 2020)** and are unable to access sufficient food on a daily basis. Its serious food insecurity is borne out by a ranking of 113th out of 121 countries in the 2022 Global Hunger Index.

While Liberia has made some progress towards achieving the global nutrition targets for stunting, 29.8 percent of children under five years old are still affected, compared to an average of 30.7 percent for the African region (World Bank, 2022). In addition, limited progress in curbing diet-related non-communicable diseases (NCDs) makes Liberia vulnerable to the triple burden of malnutrition (see KSQ 1). A lack of

dietary diversity is likely linked to poverty, poor incomes impeding access to diverse foods, inadequate coping mechanisms and limited knowledge about the importance of a diverse diet.

The national vision of social and economic transformation, wealth creation, and food and nutrition security are hinged on expanding the agricultural sector. The government has committed to bring back economic growth by increasing productivity through agrifood value chains, as the agricultural sector is a major source of foreign exchange and livelihoods for Liberians. It aims to achieve this by using improved and appropriate practices and technologies, emphasizing processing and marketing of crops, such as rice, cassava and vegetables.

Despite the Government's commitments to social and economic transformation, there are substantial impediments to a transition to sustainable agrifood systems, which are explored in the four Key Sustainability Questions (KSQs) in this food systems assessment.

These include the following:

Farming systems in Liberia are characterized by low productivity of land and labour, high dependence on rainfall, shifting cultivation (see KSQ 4) and low livestock production levels.

Because of the high levels of rural out-migration, many urban residents try to practice urban agriculture. Despite the opportunities, however, urban and peri-urban farming systems remain inefficient and underdeveloped, and do not cover the demand for quality vegetables in Liberian cities. This results in a **persistently high dependence on food imports, especially fruits and vegetables.**

Continued degradation of the land, forests and biodiversity threatens Liberian livelihoods and the transformation of sustainable agrifood systems. Moreover, Liberia is highly vulnerable to the impact of climate change, ranking 177th out of 185 countries in the 2021 ND-GAIN Index. This poses an additional burden.

To address the complex challenges facing Liberia, the following key systemic levers have been proposed under the four KSQs:

In the area of food security, dietary diversity and improved nutrition:

- support a strategic, policy focus, strengthening institutions and multisectoral cooperation (including their budgets) for effective policy development.
- increase investment in diversified and sustainable production practices and technologies to support rural communities (including women and young people) to improve food security and dietary diversity, along with concerted multisectoral efforts to address issues related to access to resources, health and infrastructure.
- support raising nutritional awareness and nutritional education among the population, which could increase demand for healthier foods and translate into the development of new markets and employment opportunities.
- support capacity development of food systems actors and strengthen social protection programmes, bolstered by development and private sector partners, and civil society actors.

In the area of weak agrifood value chains:

- support farmers to increase production sustainably in volume and quality by exploring opportunities for good agricultural practices, diversification of produce, increasing access to agro-inputs, and climate-smart adaptation, while encouraging links and support between value-chain actors and investment in infrastructural development.

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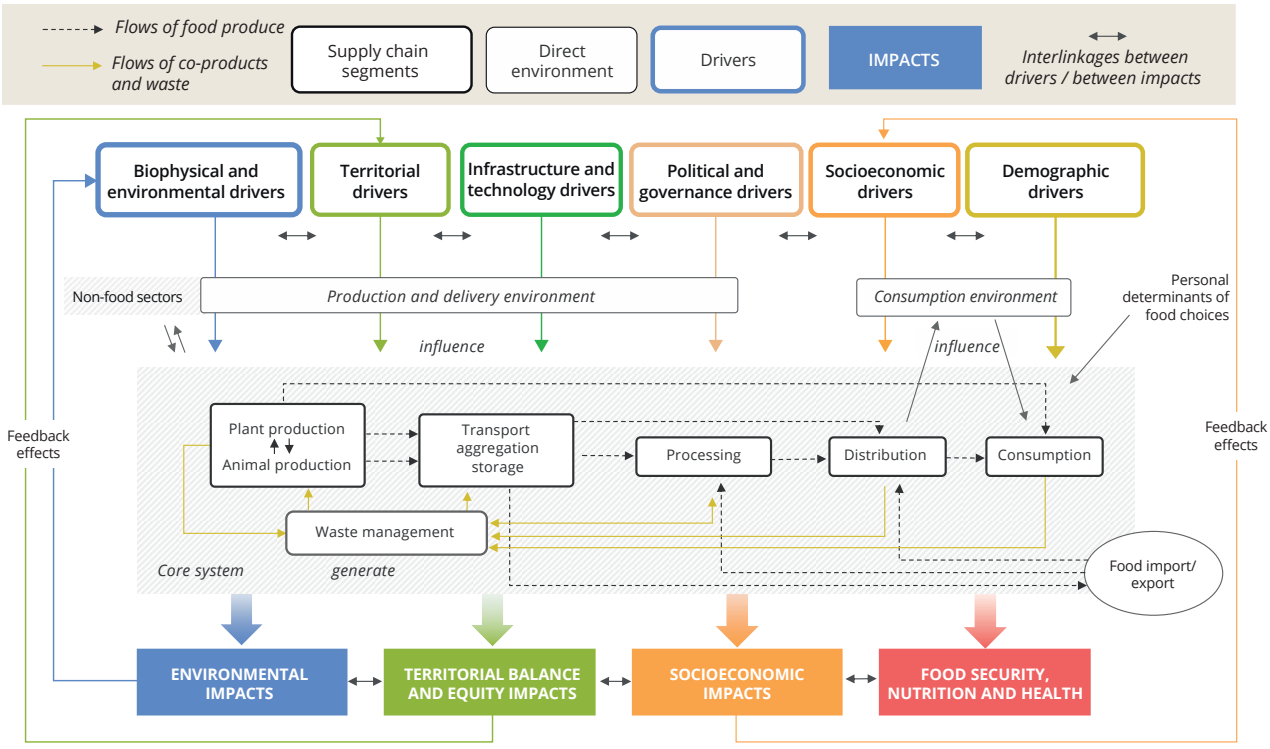
Methodology and process

This brief is the result of a collaboration involving the Ministry of Agriculture, the Government of Liberia, the Food and Agriculture Organization of the United Nations (FAO), the European Union and the French Agricultural Research Centre for International Development (CIRAD) in close collaboration with FAO experts. It was implemented in the Liberia from July to September 2021. The methodology used for preparing this brief is the result of a global initiative to **support the sustainable and inclusive transformation of food systems**. This assessment methodology is described in detail in the joint publication, *Catalysing the sustainable and inclusive transformation of food systems: conceptual framework and method for national and territorial assessment* (David-Benz *et al.*, 2022).

The assessment integrates qualitative and quantitative data analysis with participatory processes by mobilizing public, private and civil society stakeholders. The approach includes interviews with key stakeholders and a consultation workshop to refine systemic understanding of the food system and discuss potential levers to improve its sustainability. The assessment process thus initiates participatory analysis and stakeholder discussion on the strategic opportunities and constraints to sustainable transformation of food systems. The approach assesses the actors and their

Figure 1. Analytical representation of the food system



Source: David-Benz, H., Sirdey, N., Deshons, A., Orbell C. & Herlant, P. 2022. *Catalysing the sustainable and inclusive transformation of food systems: conceptual framework and method for national and territorial assessment*. Rome, Brussels and Montpellier, France. FAO, European Union and CIRAD.

activities at the core of the system, together with their interactions along the food chain, and the environments that directly influence their behaviour. Conditioned by long-term drivers, these actors generate impacts in different dimensions which, in turn, influence drivers via a number of feedback loops (see Figure 1).

The approach involves a detailed understanding of the main challenges along the four dimensions of sustainable and inclusive food systems: (i) food security, nutrition and health; (ii) inclusive economic growth, jobs and livelihoods; (iii) sustainable natural resource use and environment; and (iv) territorial balance and equity. Aimed at identifying critical issues affecting the sustainability and inclusivity of food systems, the assessment is qualitative and quantitative in nature. Critical challenges and key food systems dynamics are specified in the form of **key sustainability questions** (KSQs), whose answers (see schematic representations for all KSQs) help identify **systemic levers** and areas of action that are essential to bring about the desired transformation in food systems.

The final output was used as the major instrument for the stakeholder workshop held on 27 September 2021. The workshop gathered stakeholder inputs and secured the endorsement of the KSQs and levers. This approach is designed as a preliminary rapid assessment for food systems and can be implemented over a period of 8 to 12 weeks. The methodology has been applied in more than 50 countries as a first step to support the transition towards sustainable food systems.

This food systems brief begins with an overview of the national context, presenting some key indicators regarding population growth, economy and environment in the country. The second section gives an overview of the food production, consumption and trade patterns to reveal food sufficiency, availability of nutritious food, reliance on imports and the extent of exports. This is followed by a discussion of the main actors in the food systems. This background lays the ground for discussing the KSQs challenging the food systems in Liberia, along with a discussion on the systemic levers. The brief concludes with a discussion on transitioning to sustainable food systems.

National context: key figures

Liberia is classified as a least developed, low-income, food-deficit country. It ranked 178th out of 189 countries in the 2021 Human Development Index (UNDP, 2023). Following the 2003 Comprehensive Peace Agreement, it has been recovering from a 14-year civil war that destroyed national infrastructure and basic social services (WFP, 2022). The population was approximately 5.4 million in 2023, and had a fairly skewed distribution pattern. Almost one-third of the population resides in and around Monrovia. The population is also very young, with a median age of 18.3 years (Worldometer, 2022).

An outbreak of the Ebola virus disease in March 2014 claimed 4,800 lives in a little more than a year, highlighting the country's fragility. Although Liberia was declared Ebola-free in January 2016, the crisis had a severe impact on its economy. Poverty and food insecurity are generally high across the country and are particularly acute in rural areas where 51 percent of the population reside. In addition, some 83.8 percent of the population live on less than USD 1.25 a day (WFP, 2022).

Liberia faces a series of endogenous shocks, exacerbated by the impact of the COVID-19 pandemic, which are largely driven by declining external assistance and weak domestic revenue generation. Overall, 63 percent of the population faces multidimensional poverty (women being more affected), 30 percent of children aged 6–59 months are stunted, and 3 percent are acutely malnourished. The Government's National Development Plan, the Pro-Poor Agenda for Prosperity and Development (PADP 2018–2023), aims to make Liberia a middle-income country by 2030, in line with the Sustainable Development Goals (WFP, 2022).

Table 1. Country level data – Liberia

Indicators	Year 1	Year 2	Year 3	Comments
Poverty: national poverty rate (%)[i]	76.2 (2002)	50.9 (2014)	59 (2016)	Country-specific poverty rate trended below 2002 figures, but it has increased since 2014
Population growth rate (%)[iii]	2.4 (2002)	4.1 (2008)	2.05 (2020)	Steady increase over 2010
Rural population (%)[iii]	52.2 (2010)	50.2 (2015)	46.9 (2022)	Declining trend of rural population, mainly owing to out-migration to urban areas
Urban population (% of total population)[iii]	45.0 (2002)	47.8 (2010)	53.1 (2022)	Urban population growth rate is high due to employment seekers (young people) migrating to cities, among other reasons
Gini index [v]	36.5 (2007)	33.2 (2014)	35.3 (2016)	Seasonal income/consumption distribution trend
Unemployment rate (%)[vi]	2.26 (2003)	2.27 (2010)	3.67 (2021)	Employment rate may have increased slowly as a result of stagnant economic growth and shocks
GDP/capita (USD)[ii]	478 (2008)	601.1 (2020)	673.1 (2021)	GDP trended upward due to the economic recovery, but later flattened due to the Ebola outbreak, COVID-19 and other diseases (large differences among data sources)
Share of agriculture to GDP (%)[ii]	46.7 (2012)	34.4 (2015)	36.9 (2021)	Slow but significant decline, partly due to climate change, unsustainable food systems.
Access to electricity (%)[iv]	5.2	15.2 (2015)	27.5 (2020)	Significant increase over the past 20 years, but still almost one in four households lack access to electricity.

Sources:

i Macrotrends. 2023. Liberia Poverty Rate 2007-2023. [Cited 23 September 2023]. https://www.macrotrends.net/countries/LBR/liberia/poverty-rate

ii World Bank Database. 2023. Agriculture, forestry, and fishing, value added (% of GDP) – Liberia. In: *World Bank*. Washington, DC. [Cited 23 September 2023]. https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=LR

iii World Bank Database. 2023. Rural population (% of total population) – Liberia. In: *World Bank*. Washington, DC. [Cited 24 September 2023]. https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=LR

iv World Bank Database. 2023. Access to electricity (% of total population) – Liberia. In: *World Bank*. Washington, DC. [Cited 4 December 2023]. https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=LRIndicator

v World Bank Database. 2023. Gini index – Liberia. In: *World Bank*. World Development Indicators. Washington, DC. [Cited 28 September 2023]. https://databank.worldbank.org/reports.aspx?source=2&series=SI.POV.GINI&country=LBR

vi Statista. 2023. Liberia unemployment rate. In: *Statista*. New York. [Cited 8 November 2023]. https://www.statista.com/statistics/808768/unemployment-rate-in-liberia/#:~:text=Unemployment%20rate%20in%20Liberia%202022&text=In%202022%2C%20the%20unemployment%20rate,decline%20of%20the%20unemployment%20rate

Key figures and trends in food production, trade and consumption

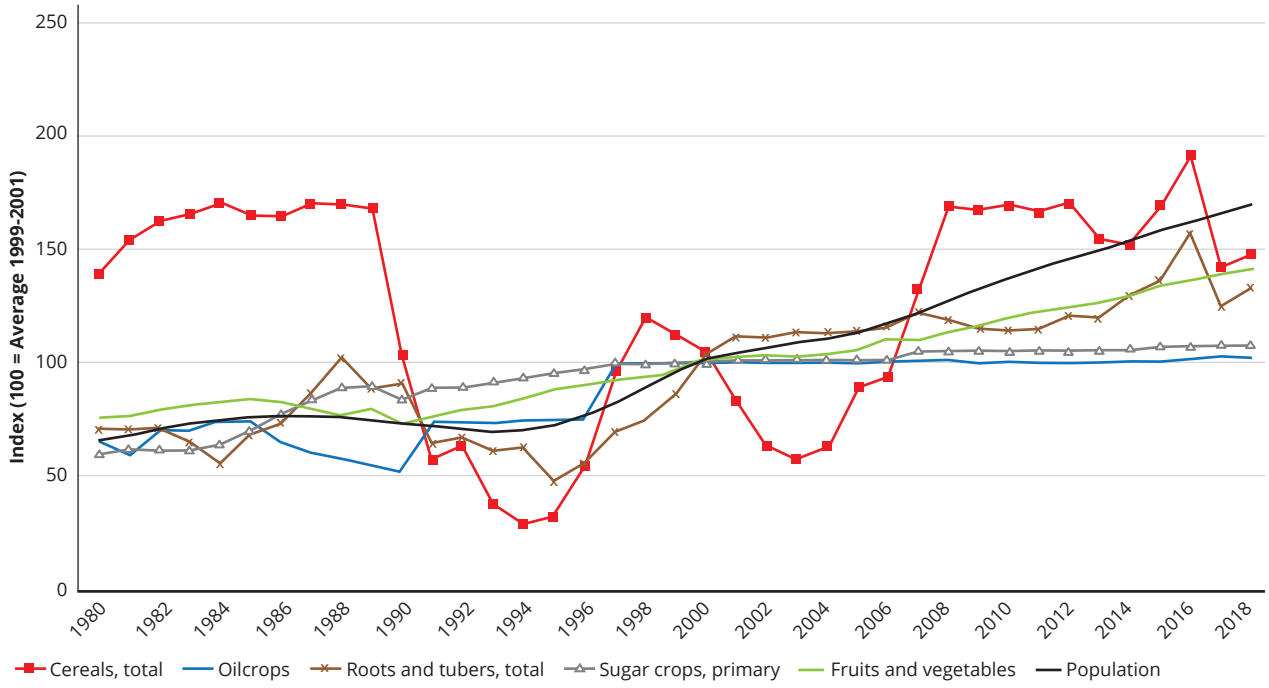
Production

Agriculture, including forestry and fisheries, provides the primary livelihood for more than 60 percent of the country's population; it accounted for 36.9 percent of the 2021 real gross domestic product (GDP), providing income for many households engaged in the production of cassava, rubber, rice, oil palm, cocoa and sugar cane. Rice and cassava are the primary staple food crops (ITA, 2022).

Agriculture is mainly small-scale, and overall production and productivity are low, owing to poor agricultural practices, limited technology usage and lack of quality agricultural inputs, among other factors. Consequently, Liberia imports more than 80 percent of its staple food, rice, making it vulnerable to global food price volatility. The production index (see Figure 2) shows that agricultural output has been volatile for decades, with steadily increasing fruit production and fluctuating cereal output lagging population growth, as of 2015.

The main cash crops and foreign exchange earners are rubber (see Figure 6a), palm oil, cocoa and timber, of which rubber is the dominant revenue driver, accounting for 12.5 percent of total export receipts in 2021. An estimated 20 000 people are employed by commercial rubber farms, and 35 000 smallholder households are involved in growing rubber trees. The Firestone Natural Rubber concession, covering almost 518 km^2, is one of the world's largest, contiguous natural rubber operations, and the largest private sector employer in Liberia.[1]

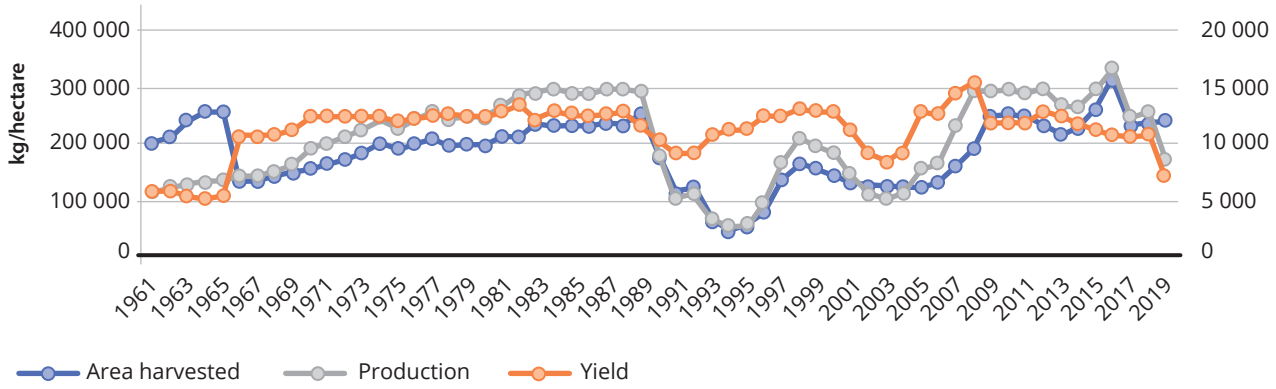
Figure 2: Index of agricultural production since 1980



Source: FAO. 2023. Production database. In: *FAOSTAT*. Rome. [Cited 20 March 2023]. www.fao.org/faostat/en/#data/QCL

[1] For more details about the Firestone Natural Rubber concession, see www.firestonenaturalrubber.com/.

Figure 3: Trends in rice production



Source: FAO. 2023. Production database. In: *FAOSTAT*. Rome. [Cited 20 March 2023]. www.fao.org/faostat/en/#data/QCL

Palm oil is another significant cash crop. Traditionally, it has been consumed domestically, but there has been some export development with smallholders and large investors have expressed interest in expanding cash crop production. The Central Bank of Liberia reported a 12.4 percent increase in palm oil output to 25 041 tonnes in 2021, from 22 286 tonnes a year earlier, due to greater harvests from smallholder farms and the relaxation of COVID-19 restrictions (Central Bank of Liberia, 2022).

Liberia only produces 40 percent of its rice needs. So, it imports 300 000 tonnes per year to cover the shortfall, at a cost of USD 200 million. Paddy rice harvests have been trending lower across the country, most likely due to localized dryness during the planting of upland rice and flooding of lowlands in some areas, combined with increasing pest infestations (see Figure 3) (FAO, 2021a).

Although **cassava is the second most consumed crop** in the country and is produced by 60 percent of the farmers, only a few of them generate any income from it. Supply chain hurdles result in substantial farm crop losses.

The livestock subsector comprises approximately 14 percent of agricultural GDP (IFAD, 2019). Most animals are owned by traditional farmers, who use local, less productive animal breeds and techniques, which could be improved. As of 2016, nearly a quarter of agricultural households (21.7 percent) owned livestock, including cattle, sheep, goats, pigs and chickens (LISGIS, 2017). Demand for livestock products is higher than domestic supply, therefore, substantial imports make up the shortfall in livestock products and animals, such as cattle, sheep and goats (Murphy, Erickson and Tubman, 2016; Liberia, Ministry of Agriculture, 2014).

Most livestock, including poultry, are raised by smallholder farmers and households for domestic consumption. These include goats, sheep, pigs and rabbits, while poultry includes chicken and ducks. Available data suggest that while beef and buffalo meat production has diminished due to different reasons, including, among them, declining feed production and the civil war, poultry meat production (including in urban areas) has trended higher, reaching almost 250 tonnes in 2018 (FAO, 2023a). Since 2000, milk production has also been trending higher, albeit at a very small scale (Figure 4). Overall, the **rising demand for meat products has been mainly covered by supplementary imports**.

The **fishery subsector** consists of industrial and artisanal fishing activities, inland fishing and aquaculture, which are practised in rural areas

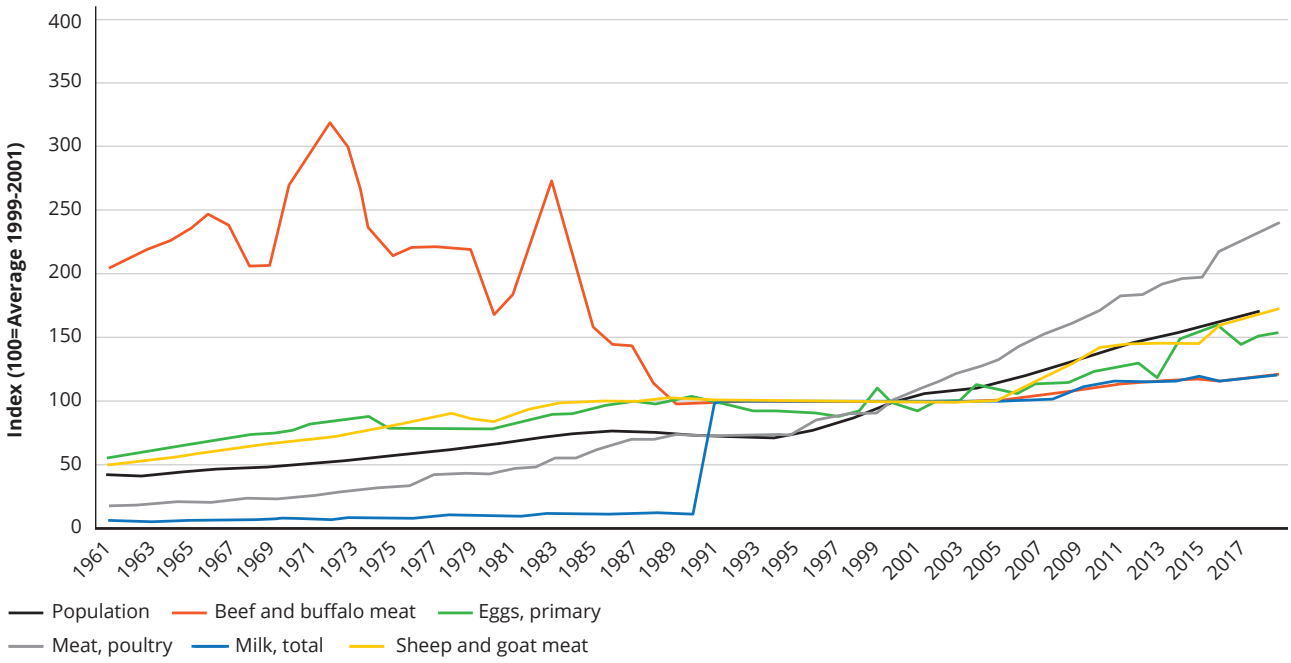
through a fishpond culture. Liberia has a coastline of approximately 580 km and a continental shelf averaging 34 km in width (INTERPOL Environmental Security Sub-Directorate, 2014).

Fisheries generate approximately 3.0 percent of the national GDP, and more than 80 percent of the population depends directly on fish for animal protein, as it is a cheaper source than red meat or poultry (FAO, 2021b). The sector provides fulltime livelihoods for thousands of Liberians and for perhaps tens of thousands more on a part-time basis. The last available estimate of employment data, which is from 2017, indicated that 35 054 people were engaged in fisheries and aquaculture: 1 460 in inland fishing, 33 222 in marine fisheries and the remainder in aquaculture.

There are significant concerns over illegal, unreported and unregulated fishing in Liberia. The figures for industrial fisheries, in particular, should be viewed with caution, given this context (Wuor and Mabon, 2022). Finally, marine resources are increasingly challenged by rising sea levels and water temperatures, and coastal flooding resulting from climate change (see KSQ 4).

Aquaculture in Liberia is predominantly subsistence farming of tilapia and catfish in earthen ponds. In 2017, the annual production in the sector was estimated to be 45 tonnes (FAO, 2023b). The sector has **significant untapped potential** because of the country's large irrigation potential (600 000 ha), which could be used to develop integrated and sustainable irrigation–aquaculture practices and a rice–fish culture, which has been tested at the demonstration scale in recent years (FAO, 2023b).

Figure 4. Evolution of animal production in tonnes (index)

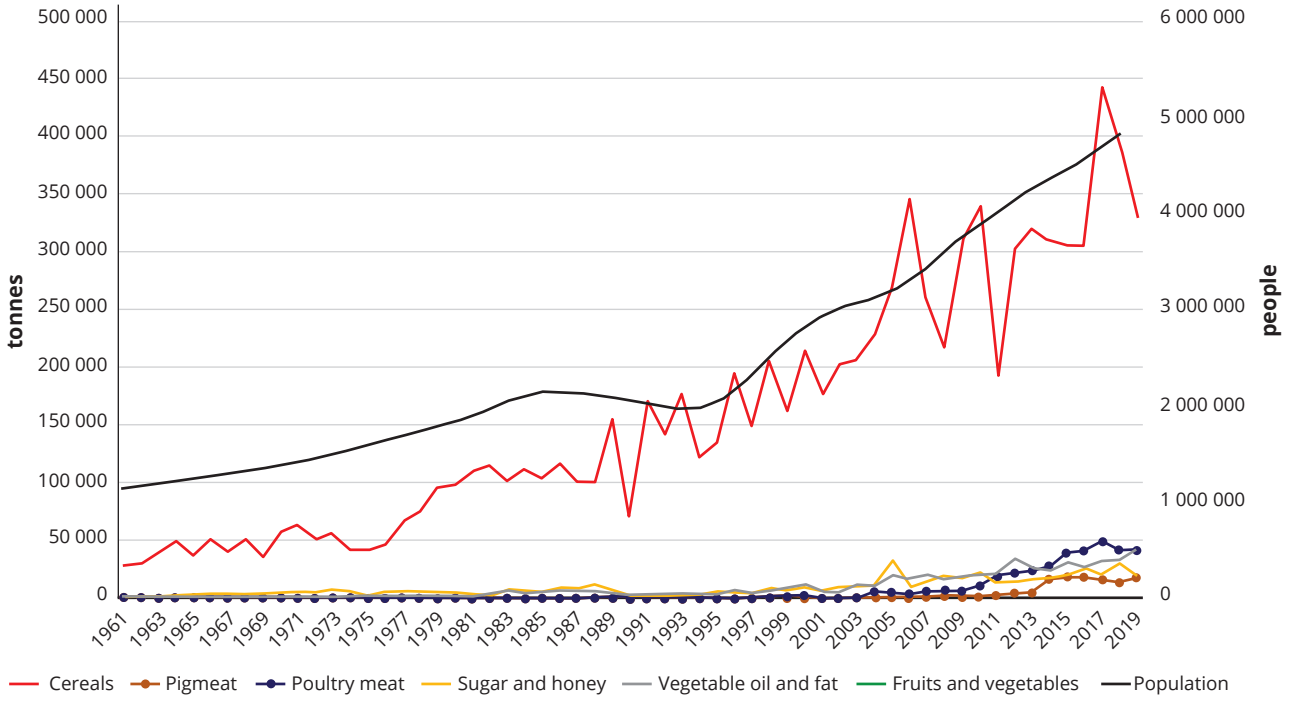


Source: FAO. 2023. Production database. In: *FAOSTAT*. Rome. [Cited 20 March 2023]. www.fao.org/faostat/en/#data/QCL

Trade trends

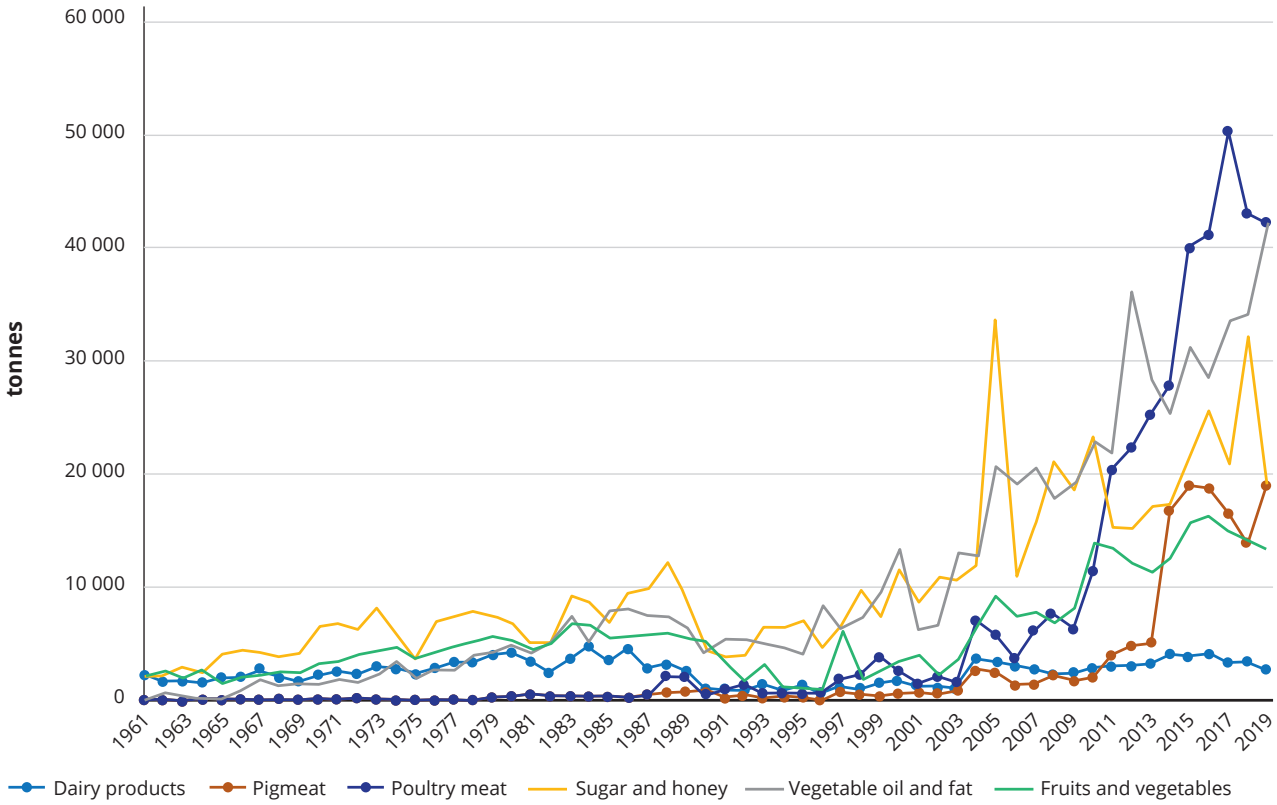
Rice production is substantially less than national requirements and imports account for more than half of the country's **total cereal demand**. Rice for human consumption makes up more than 80 percent of such imports, while wheat and maize account for approximately 13 percent and 6 percent, respectively (FAO, 2021a) (see Figure 5a and Figure 5b). The country spends approximately USD 200 million annually on rice imports, which was 37.8 percent of the total food imports into the country in 2018 (FAO, 2019). Liberia is still largely food insecure as a result of its reliance on imports, which exposes it to global food shocks.

Figure 5a: Main product import volumes (including cereals) vs population



Source: FAO. 2023. Production database. In: *FAOSTAT*. Rome. [Cited 20 March 2023]. www.fao.org/faostat/en/#data/TCL

Figure 5b. Main product import volumes (excluding cereals)



Source: FAO. 2023. Trade database. In: *FAOSTAT*. Rome. [Cited 20 March 2023]. https://www.fao.org/faostat/en/#data/TCL

As noted, the main agricultural export of Liberia is **natural rubber, which accounted for 12.5 percent of total export receipts in 2021 and more than 13.5 percent in 2020, followed by vegetable oil and fruits, whose growth is less significant, although fruit exports have been rising steadily** (see Figure 6a and Figure 6b). The rubber industry also creates employment and supports the livelihoods of many smallholder farmers. In 2019, Liberia was the ninth largest natural rubber-exporting country by value, highlighting the opportunity this commodity offers for enhancing agricultural system sustainability (African Development Bank, 2021).

The **availability of fish protein declined considerably after the civil war broke out in 1989**. Per capita fish consumption decreased from 15 kg annually before the war to an estimated 6.0 kg in 2016, while just 4.8 kg were available for consumption per capita in 2020 (FAO, 2023b; GLOBEFISH, 2023). In 2020, the estimated exports of fish and fishery products were valued at USD 3.5 million, while imports were pegged at USD 12.9 million (GLOBEFISH, 2023).


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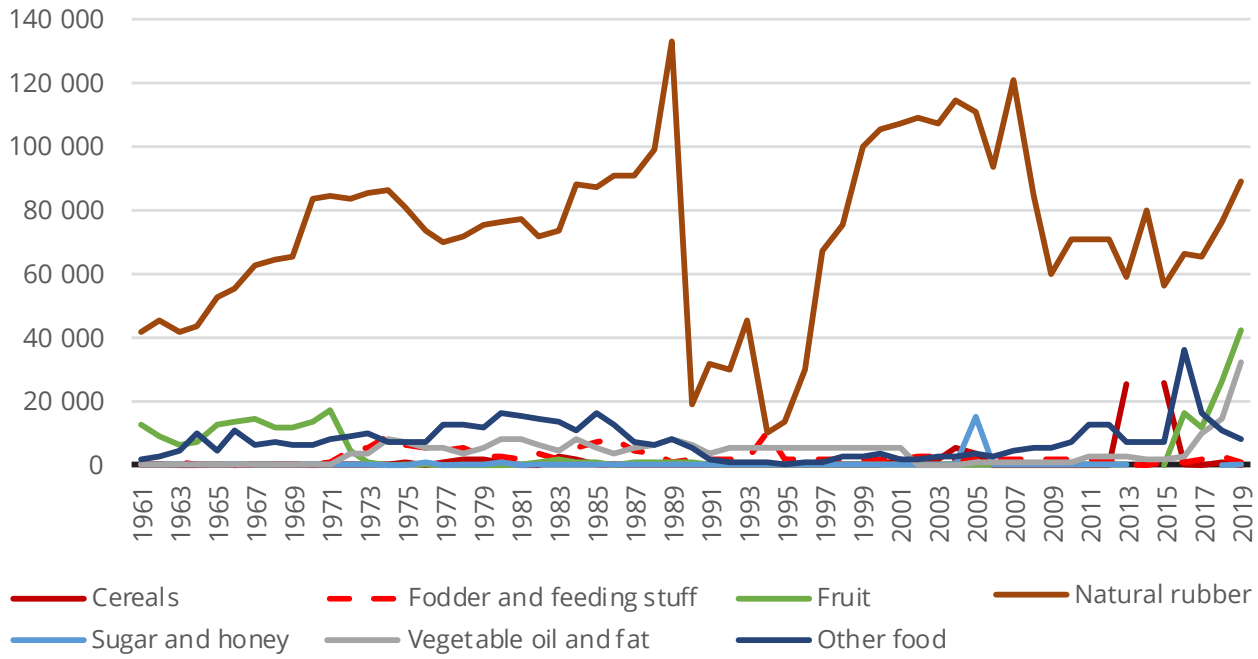
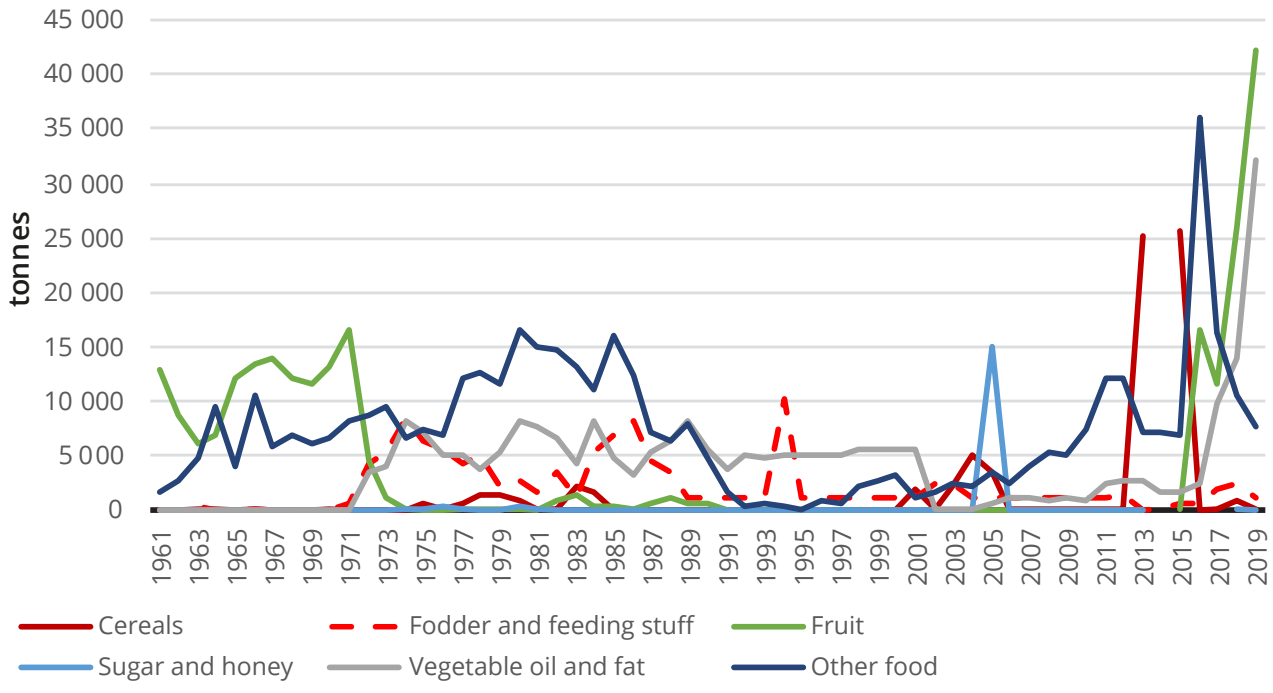
Figure 6a. Main product export volumes (including natural rubber)



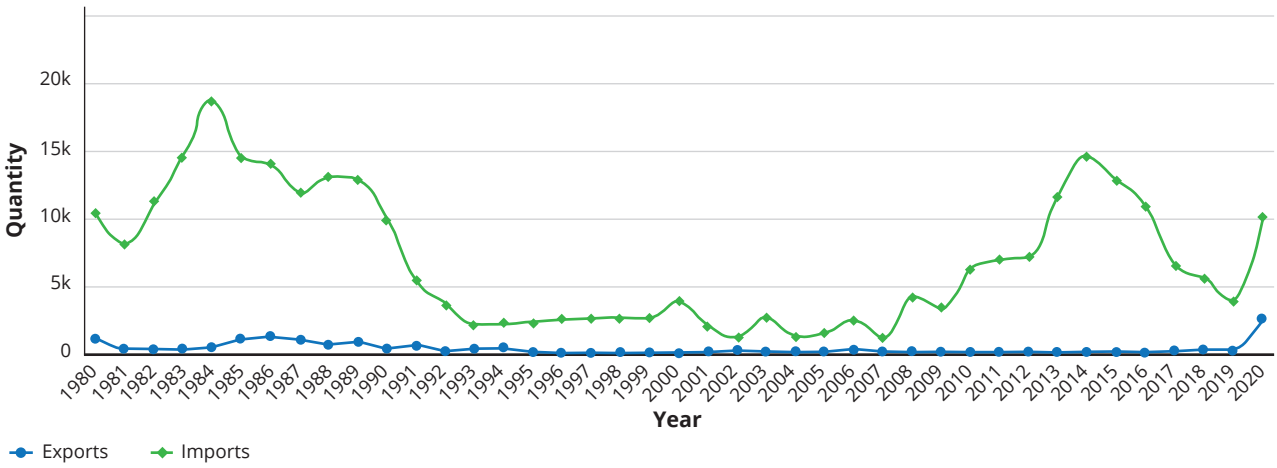
Source: FAO. 2023. Trade database. In: *FAOSTAT*. Rome. [Cited 20 March 2023]. https://www.fao.org/faostat/en/#data/TCL

Figure 6b. Main product export volumes (excluding natural rubber)



Source: FAO. 2023. Trade database. In: *FAOSTAT*. Rome. [Cited 20 March 2023]. https://www.fao.org/faostat/en/#data/TCL

Figure 7: Total imports and exports of fish and fishery products (tonnes)



Source: FAO. 2023. Liberia. In: *Fishery and Aquaculture Country Profiles*. Rome, FAO.[Cited 20 March 2023]. https://www.fao.org/fishery/en/facp/lbr?lang=en

Food Consumption

Rice and cassava are the main staple foods in Liberia. Rice, commonly served in rich sauces, contributes half of all food energy in the local population's diets, with average consumption of approximately 133 kg a year – among the highest in Africa. Cassava, popular as a starchy mashed dish known as *fufu*, is the second most consumed crop in Liberia (GAFSP, 2021).

Liberia conducted the Rapid Food Security, Livelihoods, Nutrition and Market Assessment (RFSLNMA) in collaboration with leading international agencies (Liberia, 2022). The overall objective of this assessment was to review the impact of economic and food price shocks on agricultural production, livelihoods, food security and the nutritional status of households and communities. Surveys were conducted in 4 160 households across 15 counties, including 112 districts and Monrovia (urban Montserrado County). The key findings related to food consumption patterns and food insecurity are highlighted here.

The national prevalence of food insecurity is at 47 percent using the Consolidated Approach for Reporting Indicators of Food Security (CARI) consumption, coping and food expenditure share. One in two of the interviewed households suffered from inadequate current food consumption at the time of the survey. Nearly half (47 percent) of the households were food insecure, and 8 percent were severely food insecure, meaning they faced extreme food consumption gaps or extreme loss of livelihood assets. A total of 39 percent of households that were moderately food insecure might have been experiencing some food consumption gaps and lacked the ability to meet food needs.

One in two households (53 percent) experience inadequate food consumption. Of these, 27 percent have poor food consumption, meaning they consume an extremely unbalanced diet that most likely lacks deficient food energy and consists mainly of a daily staple (generally rice) flavoured with a fish condiment. Twenty-six percent of households with borderline consumption supplement their daily staple with vegetables and oils about six days a week. They eat smaller amounts of fish and meat regularly, but as condiments, rather than as a source of protein.

Approximately 28 percent of Liberian households have low dietary diversity, consuming less than four of the seven recommended food groups. The figures show a wide gap between households in urban and rural areas (5.5 percent vs 37.8 percent). At the county level, households with low dietary diversity were highest in Sinoe (61 percent) followed by Maryland (52 percent), River Gee and Grand Kru (41 percent). A worrying 7 percent of households in Grand Bassa, 5 percent in River Gee and 4.1 percent in Sinoe consume a diet comprised of only staples and fats.

Rural households are more likely to have unacceptable food consumption than urban household (61 percent vs 44 percent). It is important to note that food insecurity at 45 percent among urban populations (Monrovia), marks a deteriorating trend.

The assessment also has found that 60 percent of households spend nearly two-thirds of their income (65 percent) on food. The data indicate that 62 percent of those in the moderately and severely food insecure categories spend more than 75 percent of their income on food and 47 percent of food insecure households spend 65–75 percent of their income on food. Households that spend high proportions of income on food have no buffer to protect them when prices rise, and are vulnerable to food insecurity.

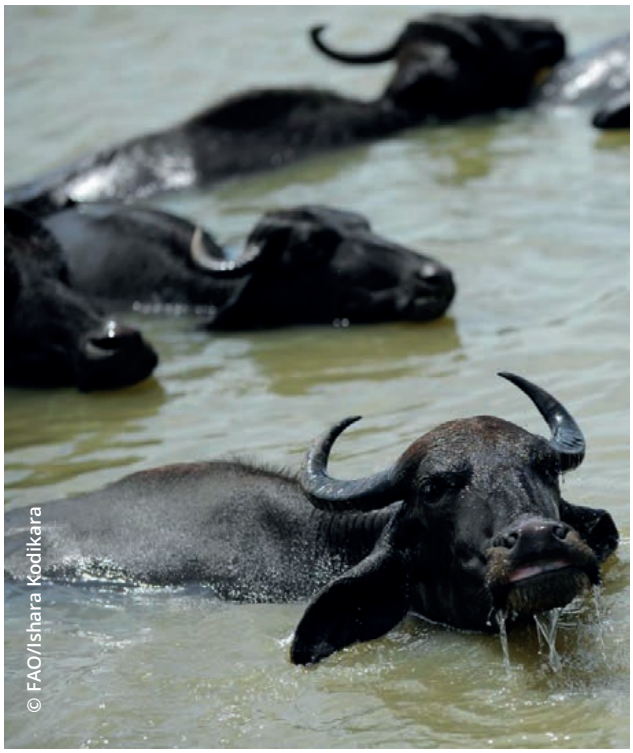
Characterization of the dominant actors of the food systems

Liberian food systems actors consist of farmers, farmers' organizations, input suppliers, processors, transporters, marketers, wholesales, retail supermarkets, restaurants, importers, financial institutions and banks, governmental agencies, research and academic institutions, international development partners, non-governmental organizations (NGOs) and consumers.

Nearly 70 percent of the population is dependent on agriculture for livelihoods and women make up an estimated 75 percent of the total agricultural workforce. The average household farm size is 1.6 ha, with regional variations. Approximately 74 percent of farming households grow a mix of food crops, with rice and cassava being dominant. Approximately one-third of farming households keep some share of land under permanent/cash crops (IMF, 2021).

Rubber commercial farms are estimated to employ approximately 20 000 people and approximately 35 000 households are engaged in growing rubber trees. Palm oil is another important cash crop and the production of it is likely to expand significantly. Important stakeholders in the palm oil sector are cooperatives of smallholder farmers, individual farmers, large multinational-owned corporations and concessionaires, such as Golden Veroleum Limited (ITA, 2022).

There are three categories of farmers in the country – traditional, commercial and concessional. Traditional smallholder farmers produce staple foods (primarily rice and cassava) and limited export crops, such as coffee, cocoa, rubber and oil palm. Commercial farms are mainly owned and operated by Liberians and produce fruits, coffee, oil palm, cocoa, and poultry and livestock products. Foreign-owned concession plantations mostly produce rubber and palm oil (LNBCC, 2017). Recent data on households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engaged in poultry and livestock production are lacking, but estimates place this at approximately 43 percent and 24 percent of total livestock production, respectively. Overall, production in the livestock sector has grown over the past few years (see Figure 4).

Women play a vital role in agricultural production, marketing and household food preparation. In rural areas, women are traditionally given ownership of the crops they cultivate, but not the title to the land. Assumptions based on traditional gendered roles perpetuate female subordination and prevent access to rights of asset ownership and economic resources (IMF, 2021; World Bank, 2010). Female-headed households account for 20 percent of the country's farming households; they cultivate approximately 79 percent of the average national land area that is cultivated per household (LISGIS, 2017).

Table 2. Rice value chain – Liberia

Rice value chain actors	Rice value chain constraints and risks
1. Farmers – smallholder farmers	Lack of high-quality and high-yielding rice seeds
2. Processors – farm gate level: parboiling, drying, de-stoning	Lack of farmer capacity (human and technical)
3. Traders/aggregators	Lack of farmers – farming is considered an unattractive job
4. Millers – parboiling, drying, de-stoning, de-husking and polishing	Absence of technical farming capability
5. Transporters – trucks and boats	Lack of reasonably priced paddy due to NGO overpayments
6. Importers –various rice varieties on a large scale	Poor transport networks connecting rice fields with markets
7. Wholesalers	Non-competitive against imports due to the following: i. Overly expensive cost of production ii. Poor quality rice iii. Low or non-existent import tariffs
8. Feeding programmes funded by donors that buy imported and domestic rice varieties	Minimal and rudimentary rice processing capability (de-stoning, drying, polishing, parboiling)
9. Retailers – market women, supermarkets and restaurants	Market pricing challenges for both paddy rice and processed rice
10. Consumers	Minimal packaging and marketing efforts Minimal access to finance Agroclimatic risks No ready market for what farmers produce at current prices

Source: Kazadi, M. and Ryan B. 2016. *Value Chain Analysis Assessment Report. The selection of the most promising agricultural value chains in Liberia.* 2016. Value Chain Analysis Assessment Report: the selection of the most promising agricultural value chains in Liberia. Washington, DC, USAID. https://pdf.usaid.gov/pdf_docs/PA00T225.pdf

Only a few rice processing facilities are functional across the country and farmers themselves are most often involved in processing (see Table 2) and marketing rice. Moreover, small- and medium-sized enterprises, such as rice importers and agroprocessors, often operate in an uncoordinated matter and rely on informal networks and relationships that they set up to navigate legal processes (FAO, 2021b). **More than 90 percent of agro-input dealers** are in Monrovia; they generally supply inputs to donor agencies or projects and the government (see KSQ 2 and KSQ 3).

The high interest from foreign companies to invest in Liberia presents unions with the opportunity to cement fair labour practices from the outset. One of the major agricultural unions in Liberia is the Farmers Union Network (FUN), an umbrella organization for farm-based organizations and farmers, which advocates improving the socioeconomic status of farmers.

Cooperatives and unions are stronger in the traditional rice belt counties of Lofa, Bong and Nimba, but they have also been expanding in the coastal cassava belt (FAO, 2021b).

Institutional buyers in Liberia include supermarkets of substantial size in Monrovia and dozens of restaurants, hotels and catering companies. Traders who buy and sell vegetables may be members of the Liberia Marketing Association (LMA), which provides physical infrastructure and charges membership fees for access to the trading space. Most traders in these markets are women, and an informal contingent of LMA members known as Gobachop women work together to set prices and collude for their own gains when purchasing from producers and selling to consumers (GROW, 2016).

Other important actors are commercial banks and **microfinance institutions (18 registered)**.

These entities play a significant role in providing credit for agricultural production and facilitating trade to enhance food availability. The sector, however, is undercapitalized and operates predominantly in the Montserrado county area – close to Monrovia. One international institution, BRAC International, established BRAC Liberia Microfinance, which has extended outreach across several counties (Central Bank of Liberia, 2023).

Various NGOs and development partners are active in the country, including the World Bank, FAO, the World Food Programme (WFP) and the International Fund for Agricultural Development (IFAD). These organizations provide support to agriculture and food systems and coordinate responses through the country's Agriculture Donor Working Group (FAO, 2021b).

The most important actor shaping the food systems, however, is the public sector. The Ministry of Agriculture designs and implements agricultural policies and programmes and is responsible for the governance, management and promotion of the agriculture sector, including the provision of extension services. Other important actors are the Ministry of Education, the Ministry of Health, the Ministry of Commerce and Industry, the Ministry of Finance and Development Planning, the Ministry of Gender, Children and Social Protection, and the Ministry of Youth and Sports (FAO, 2021b).

The national standardization body – the Liberia Standards Authority (LISA) – formerly known as the National Standard Laboratory, operates as an extension of the Ministry of Commerce and Industry and includes food safety standards in its ambit. It hosts the Codex Contact Point, linking Liberia to the Codex Alimentarius global food standards, which are intended to ensure that food is safe and can be traded. Adoption of Codex standards by Liberia has led to the development of food laws on safety and quality standards for food and animal feed (Food Business Africa, 2022).

Among the other leading food systems agencies and organizations are CARI, which researches and promotes innovations and practices, such as those relating to improved seed varieties, such as rice seed (NERICA), cassava and animal husbandry and the Environmental Protection Agency, which is responsible for environment-related policies and regulations.

Key challenges to the achievement of core sustainable food systems goals

The food systems analysis of Liberia has identified four priority challenges framed as KSQs that were analysed to facilitate the transition towards sustainable transformation of the country's food systems. To address these KSQs, specific leverage points were identified for transforming the food systems in a multisectoral manner, enhancing the integration of rural and urban economies, and wealthy and poor communities, while promoting spatial justice and environmental integrity.

Key Sustainability Question 1: What are the main reasons behind food insecurity and inadequate dietary diversity in Liberia?

Food insecurity in Liberia is serious, as the country ranks 113th out of 121 in the 2022 Global Hunger Index. In 2020, more than 50 percent of the population lived below the poverty line (USD 1.90/ day) and were unable to access sufficient food on a daily basis (World Bank, 2021b). The lack of dietary diversity among the population (for whom diets comprise mainly cassava, rice and some vegetables) is also likely linked to poverty, poor incomes constraining access to diverse foods, inadequate coping mechanisms and limited knowledge about the importance of having a diverse diet. Finally, the country's farming systems are characterized by low productivity of land and labour, high dependence on rainfall, shifting cultivation (see KSQ 4) and low livestock production levels. Even before the war in Ukraine affected global commodity prices, food security conditions in Liberia were worsening as a result of the COVID-19 pandemic, climate change impacts and high post-harvest losses (see key drivers in this section and Figure 8).

The results of the 2022 RFSLNMA rapid assessment indicate that nearly 47 percent of households were food insecure – comprising 8 percent in the severely food insecure category, and 39 percent were experiencing some forms of moderate food insecurity and consumption gaps (Liberia, 2022).

Counties in the southeastern and northern parts of Liberia are estimated to have the highest levels of food insecurity, with three in every five households being food insecure. Sinoe and Lofa counties are the worst affected. Rural Montserrado and Margibi counties have the highest levels of marginally food secure households, at 56 percent and 50 percent, respectively. These households are highly vulnerable to becoming food insecure if there is a change in current conditions, or if food prices rise.

Malnutrition in children under five years old is reflected in a global acute malnutrition (GAM) prevalence of 7.1 percent, of which moderate acute malnutrition (MAM) is 4.6 percent and severe acute malnutrition (SAM) makes up 2.5 percent. The concerning GAM figures were attributed to food insecurity that has existed over a period of time.

The GAM average puts Liberia at the "alert/stress" level, indicating that the country is vulnerable to further shocks. However, the levels of acute malnutrition in three counties – Bomi (22.4 percent), Grand Cape Mount (22.2 percent) and Urban Montserrado (26.6 percent) – are well above the national average and are categorized as "critical/extreme".

The results of the RFSLNMA assessment also show that the urban population is becoming increasingly vulnerable to acute malnutrition (Liberia, 2022).

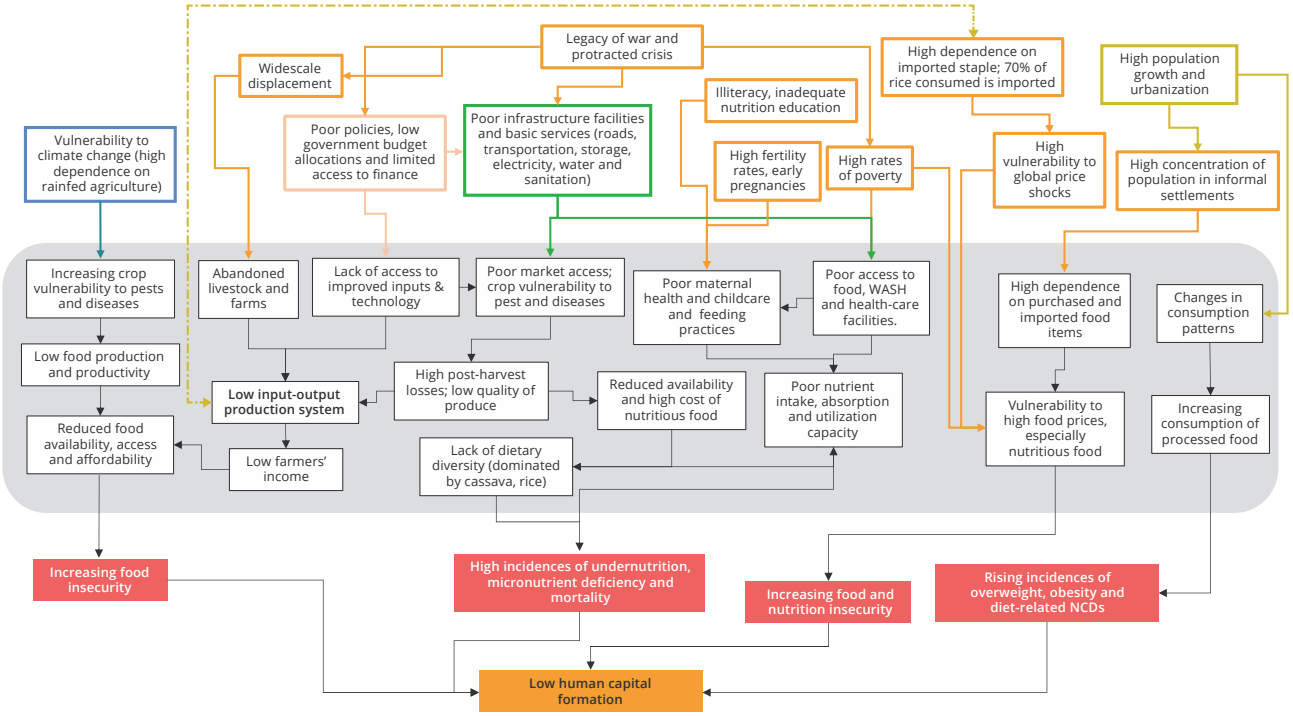
The United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) define minimum dietary diversity as the percentage of children aged 6–23 months consuming foods and beverages from at least five out of eight defined food groups during the previous day. The report shows that only 4 percent of children aged 6–23 months consume five or more food groups and thus meet the recommendations for minimum dietary diversity (Liberia, 2022).

The RFSLNMA assessment also has collected data on dietary diversity among Liberian women for the first time. The data indicate that just 15 percent of women consume four or more food groups, and thus meet the recommended minimum dietary diversity. It should be noted that the proportion of women and children meeting the minimum dietary diversity levels could be doubled by adding one food group to their daily diet, such as animal-source foods, or legumes/ nuts or other fruits and vegetables.

In addition to the above figures, an estimated 16.5 percent of adult women and 6.7 percent of adult men in Liberia are obese, though the prevalence is lower than the regional average of 20.8 percent for women and 9.2 percent for men (Global Nutrition Report, 2023). An important dynamic stimulating obesity is the higher intake of processed foods, refined grains and sugary beverages, along with lower intake of minimally processed foods, such as fish, fruits and vegetables, which may be associated with weight gain and obesity in adult populations. This is especially true in the Monrovia area, where there is potentially increasing risks of NCDs, such as diabetes and strokes (WorldObesity.org, 2023). Meanwhile, diabetes is estimated to affect 9.3 percent of adult women and 9.2 percent of adult men in the country (Global Nutrition Report, 2023).

Finally, communicable diseases, such as tuberculosis, diarrhoea, malaria, HIV and dengue fever, are also widespread in Liberia, driven by poor water, sanitation and hygiene (WASH) facilities (CDC, 2023), as discussed in the following section.

Figure 8: Schematic representation of food security, nutrition and diets in Liberia



Sources: Authors, 2022.

Key drivers

The civil war in Liberia and related crises has left a legacy of massive population displacement, along with major disruptions to agrifood value chains and broader food systems. The economy, infrastructure, institutions and human capacity were devastated during two periods of war between 1989 and 2003, before a comprehensive peace agreement was concluded. **Out of a pre-war population of 3 million, an estimated 250 000 people were killed and as many as 1.5 million were displaced** (Truth and Reconciliation Commission, 2009, p.282).

The conflict devastated the fundamental societal, economic, cultural and political structures. It uprooted and displaced agricultural communities, who abandoned their farmlands and livestock, resulting in a major disruption to food systems. Structures, including health-care facilities, educational institutions and power infrastructure, were pillaged, set ablaze and demolished. Water and sanitation systems deteriorated significantly and became non-functional. Roadways and bridges were in ruins, rendering them impassable (Liberia, 2018b).

Many young people from rural areas never had the opportunity to work in agricultural value chains and broader food systems, and subsequently faced difficulty in entering the sector after the end of the fighting.

Poverty: High levels of poverty limit the population's capacity to afford adequate food that is diverse and nutritious to access suitable WASH facilities, which has a direct impact on the food security, nutrition and health of the Liberian population (Global Nutrition Report, 2023; Liberia,

2018b).[2] This ultimately leads to a reduction in human capital. Furthermore, the high fertility rate, closely spaced births and early pregnancies are important factors behind the country's poor child health outcomes and childhood poverty, as well as preventing women from participating in the workforce and improving their well-being and food security situation (Murphy, Erickson and Tubman, 2016).

Urbanization and population growth: The poverty situation has been exacerbated by high population growth and urbanization (rural–urban migration) over the past decade. The population increased from 4.0 million to 5.2 million between 2010 and 2021 (World Bank, 2023), while the urban population expanded to 53 percent of the total population by the same year (see Table 1). Rural to urban migration has been increasing, in the search for employment and livelihoods (Integral Human Development, 2022). In short, there has been a disproportionate rate of urbanization and urban primacy. In 2017, Monrovia, the capital and economic hub, was home to 40 percent of the population. In addition, 66 percent of the urban population lived in informal settlements (UN-Habitat and Cities Alliance, 2017). Significant challenges result from unplanned urbanization and threaten to impede national development. Rapid urbanization has also led to changes in consumption patterns, with people increasingly eating convenient processed foods high in sodium, sugars and fats, causing higher incidences of NCDs; this has been especially noted among resident in the Monrovia area.

Unpredictable weather events and climate change: globally, unpredictable rainfall patterns and increasing temperatures have affected soil moisture and water availability for food production, leading to a decline in production and productivity (FAO, 2015). Primary agricultural production plays a critical role in the country's food security and nutrition situation. A total of 80 percent of the agriculture sector consists of subsistence farming, which is dependent on rainfed agriculture (Liberia, 2018b). Yields of subsistence crops, such as rice and maize, may be further threatened by climate change (see also KSQ 2, KSQ 3 and KSQ 4). For example, rice is highly sensitive to increased humidity, intense rainfall and higher temperatures (and pests that thrive under such conditions). Such changes may thus affect rice yields, threating food security (World Bank, 2021a).

High food prices: Liberia is highly dependent on imported staples, especially rice, as 70 percent of rice consumed in the country is imported, making the economy vulnerable to global market price shocks. In recent years, the price of a 25-kg bag of rice cost USD 25 in Monrovia and its suburban areas, a sharp rise from approximately USD 13.50 previously. And the retail price of a cup of rice was between LRD 60 and LRD 80 (USD 0.39 and USD 0.52), compared to a LRD 35 (USD 0.23) previously (Doddoo, 2022).[3]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[2] Approximately 68 percent of the country's poor live in rural areas, where the poverty incidence is 71.6 percent, more than twice as high as in cities (31.5 percent) (World Bank, 2021b).

[3] USD 1.00 was approximately LRD 154 at the time of publication of these prices, in September 2022.


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In both rural and urban communities, buying imported food is the main food access mechanism for many households. Many of them, however, lack the resources to purchase imported foods and remain dependent on their own subsistence production. Hence, **high staple food prices** constrain the purchasing power and food access of Liberian households.

Inadequate infrastructure: The two main deficits in infrastructure in Liberia relate to feeder roads and storage facilities. The lack of roads increases the vulnerability of farmers in the wet season by cutting off food supplies and access to trading networks and provoking increased local food prices and greater food insecurity in years with short harvests. The lack of storage facilities prevents local farmers from trading and accessing central markets. This hampers the sale of their surplus production, resulting in lower local food prices, reduced farm incomes (see also KSQ 4) and higher **post-harvest losses**. Rice serves as an example here, as smallholder farmers have only very basic rice storage facilities and losses are a significant factor. Studies conducted by the Ministry of Agriculture in southeastern and western Liberia, sponsored by the African Development Bank and the International Fund for Agricultural Development (IFAD), found that most farmers store rice in bush tents or tanks known as "rice kitchens" that were not protected from birds, rodents or insects (Liberia, 2010, cited in Tarway-Twalla, 2013). In addition, due to the lack of processing/milling machines for cassava products (e.g. gari and fufu flour) in most parts of Liberia, the tubers may rot or remain on the farm unharvested; the tubers tend to spoil rapidly after harvest, before they can reach distant processing sites (see also KSQ 4).

Limited policy impact: The government, along with its regional and developmental partners, has developed various policies and implemented several strategic interventions to improve the food and nutrition security in Liberia and improve farmers' welfare. These include the 2008 National Food Security and Nutrition Strategy, the Comprehensive Food Security and Nutrition Survey (CFSNS) 2018, the 2008 Poverty Reduction Strategy, Liberia Rising 2030, the 2009 National Gender Policy, the 2012 Agenda for Transformation, and the second generation of the Liberia Agriculture Investment Plan (2018–2022). **Despite these policies, strategies, and programmatic interventions, however, food insecurity remains an urgent and persistent issue**, suggesting that these policies and interventions have had only a little impact towards improving food security and reducing poverty and hunger in the country. Participants attending the stakeholder consultation workshop held as part of this Food

Systems Assessment process underscored the importance of designing and implementing multisectoral policies. This was suggested as a way to improve coordination. Existing dynamics indicated a situation under which several agencies and public institutions assume different responsibilities, may have different objectives and priorities for action or pursue multiple areas of overlap. This situation suggests insufficient **multisectoral coordination**, leading to ineffective implementation of interventions to improve food security and nutrition.

Illiteracy and inadequate nutrition knowledge: According to the CFSNS 2018 (Liberia, 2018b), 28 percent of heads of households have had no formal education. Of these households, nearly one-quarter were notably food insecure (21 percent moderately food insecure and 3 percent severely food insecure) (Liberia, 2018b). Research among Liberian mothers and health workers found child malnutrition to be a **consequence of abject poverty, illiteracy, lack of nutrition education** and lack of robust social protection programmes (Kumeh *et al.*, 2020). Illiteracy and lack of knowledge about good nutritional practices and the need for varied, nutritious diets also extend to adult food consumption. Some nutrition education and awareness programmes exist in Liberia, such as the Power of Nutrition, which aims to improve the quality of relevant nutrition education and counselling, including a gender-sensitive behaviour change communications strategy, revision of existing nutrition messages and prioritizing high-level nutrition advocacy across the country. Such activities would benefit from being scaled up.

Potential impacts

Food security is an important factor that directly influences the state of fragility in Liberia. Growing demand for staple foods remains unmatched by domestic supply, as agricultural productivity lags substantially, and a high reliance on imports entails large costs and leaves the country vulnerable to exogenous price shocks (Liberia, 2019a). Sustained poor rates of food and nutrition security may also reduce human capital and impose an increasing burden on the health-care system.

Over and above the incalculable human impact, there may be substantial impacts on the national economy as well, which could have repercussions for socioeconomic, political and environmental stability and future sustainability of food systems as a whole.

Proposed systemic levers

From a national policy perspective, encouraging improvements in multisectoral cooperation among various governmental institutions (and regional and development partners) would help to strengthen the food security and nutrition situation. Such a process should be accompanied by effective policymaking, implementation and enforcement to ensure effective delivery. This challenging task could be achieved through mobilizing or advancing cooperation of all stakeholders, including the ministries tasked with agriculture, health, commerce, internal affairs and education, as well as other relevant agencies, such as CARI, the Cooperative Development Agency (CDA), the National Fisheries and Aquaculture Authority (NaFAA), the Forestry Development Authority (FDA) and the Environmental Protection Agency, along with the private sector, development partners and farmers' organizations.

Improved extension services and training could have a substantial impact, given that many households have inadequate knowledge of agricultural practices adapted to climate change. Training professionals, community health workers, farmers' groups, women and heads of households could help in sharing nutritional knowledge among local communities.

A further step could include promoting the production and consumption of indigenous foods, protein-rich fish and livestock products. This could also be combined with efforts to demonstrate and implement appropriate technologies for the preparation of diversified, nutritious food that

the rural population can also afford. Expanding specific nutrition-sensitive programmes and interventions could help to educate consumers. An entry point could be the formulation of national dietary guidelines to increase the ability of practitioners to provide context-specific advice on healthy diets and lifestyles, combined with social and behavioural campaigns and programmes on nutrition and health.

Several main levers could improve the food security, dietary diversity and nutrition of the Liberian population:

1. Support a strategic policy focus and strengthen institutions (including their budgets) for **investments in diversified and sustainable agricultural production practices and technologies to help rural communities improve their food security, dietary diversity and, hence, nutrition. Of particular relevance is the support for family farming (including female-headed households) and local food value chains** through the promotion of nutrition-sensitive and climate-smart agricultural approaches, including encouraging investment in local, village-based agroprocessing. Furthermore, strengthened social protection programmes to improve food security along with concerted multisectoral efforts and investments are needed to address such issues as access to resources, health and infrastructure (improved road network and market access).

2. Support **nutrition awareness** (and reduce illiteracy) and scale up **nutritional education campaigns** on the importance of nutritious, healthy diets. This could increase demand for healthier foods and possibly translate into the development of new local markets and employment opportunities. It could also be combined with **dietary guidelines and efforts to raise health and nutrition awareness among consumers**, including discouraging high consumption of sugar and salt through, for example, appropriate regulatory measures such as taxes and labelling.

Key Sustainability Question 2: What are the reasons behind the limited development of the agrifood value chain and job opportunities, especially among young Liberians?

Value chain development and the commercialization of smallholder agriculture are important elements of the pro-poor development strategy of the Government of Liberia to increase economic growth, and improve income generation and food security in the country. However, Liberian agrifood value chains remain inefficient and underdeveloped, affected by low production and productivity, very limited diversification (see KSQ 1, KSQ 3 and KSQ 4), rudimentary levels of agrifood processing, high levels of post-harvest losses and food safety issues (Figure 9). These value chains are unable to compete with imports, which, in turn, has systemic implications for the country's food systems. Important aspects are low returns to food systems actors – especially smallholder farmers – limited availability of diverse and nutritious food, food safety challenges, lost employment opportunities, especially for the young people, and persistent high dependency on food imports. Food systems dynamics suggest that developing agrifood value chains remains a great challenge.

The Pro-Poor Agenda for Prosperity and Development (PADP 2018–2023), the second in the series of the 5-year National Development Plan (NDP) recognized the importance of investing in the agriculture sector to support the structural transformation of the economy, including a **move from subsistence to commercial farming through targeted value chains for crops, such as rice, cassava, horticulture, cocoa and oil palm** (Liberia, Ministry of Finance and Development Planning. 2018).

The challenges are significant. Liberian value chains are undeveloped, and markets are often inaccessible; rural infrastructure, including roads, is deplorable; storage, drying and processing facilities are rare; and food safety and quality control systems remain inadequate (Liberia, 2010; Seward, 2021).

More than 90 percent of agro-input dealers are in Monrovia and they generally supply donor agencies and their projects, and the government. Linkages between producers and markets are poor, and farmers lack the appropriate information to make prudent marketing decisions (FAO, 2016).

In a study conducted under the USAID-funded Liberia Agribusiness Development Activity (LADA) project, high-, medium- and low-priority value chains for the country were identified based on a scoring methodology encompassing sixteen criteria. These criteria included assessments of market growth at both international and national levels, market competition in comparison to both international and national products, potential for job creation, self-sustainability, proof of concept, import substitution, consumption trends, food security considerations, likelihood of intervention success, priority as perceived by the Government of Liberia, suitability of farmer skills, impact per intervention dollar, and the influence on transportation and the Local Agriculture Development Agency (LADA). **High-priority chains included rice, cassava, fisheries and cocoa; medium-priority chains included vegetables, maize, poultry and oil palm;** while chains for **rubber, livestock and coffee were identified as being low priority** (Kazadi and Ryan, 2018).

Value chain development and diversifying agricultural production have the potential to increase the availability, affordability and accessibility of diverse and nutritious foods – a major contribution that agrifood value chains and food systems can make to improve food security and nutrition, employment and income generation. This is also a **prime rationale behind the Government's strategy to increase economic growth in an equitable manner** and diversify

smallholder agriculture, thereby increasing incomes and resilience (Liberia, 2018b).

The population of Liberia is largely young, urban and poor, and have low access to health facilities and education opportunities. These factors are linked to the way the food systems are structured: Traditional subsistence farming, especially of rice and cassava, is dominant, with limited investments in value addition and processing. Some smallholder farmers also cultivate cash crops, including coffee and cocoa, though typically on a very modest scale. Since the end of the civil war, the government and its national and international partners have **made great efforts to generate interest in agrifood value chains and food systems among the country's young people. Unfortunately, food and cash crop production have not attracted many of them and their participation in agrifood systems remains low**.

As a result, Liberia still faces the dual challenge of a large youth population that lacks employment opportunities. **More than 70 percent of the population is under 35 years and children aged 14 and under make up more than 40 percent of the population** (Table 3). Moreover, most young Liberians work in the informal sector, including as farm and manual labourers; they are either unpaid family workers or self-employed (World Bank, 2020b). In 2020, nearly nine out of ten young workers in Liberia were involved in informal work and nearly half of those aged 15–24 were poor, despite having a job, leading to **high levels of vulnerability among the young people**.

While **youth unemployment and underemployment are a growing concern for the Government of Liberia**, the farming workforce is ageing and the need for young people in agriculture may become more important to secure the future of farming and sustainable food systems. **It is, however, not surprising that young people leave rural areas in search of urban employment**, given the drudgery of agricultural work in Liberia, the low returns from subsistence farming and the poor living conditions in rural areas (Liberia, 2008; FAO, 2014). The urban jobs that young people find are also mainly in the informal sector – as much as 78 percent in 2010 (Van Soelen and Van Hoolwerff, 2018). Such jobs are characterized by low wages and high insecurity, but despite their vulnerable circumstances, the young people from the rural areas are unlikely to return to their villages.

Table 3. Age distribution over percentage population

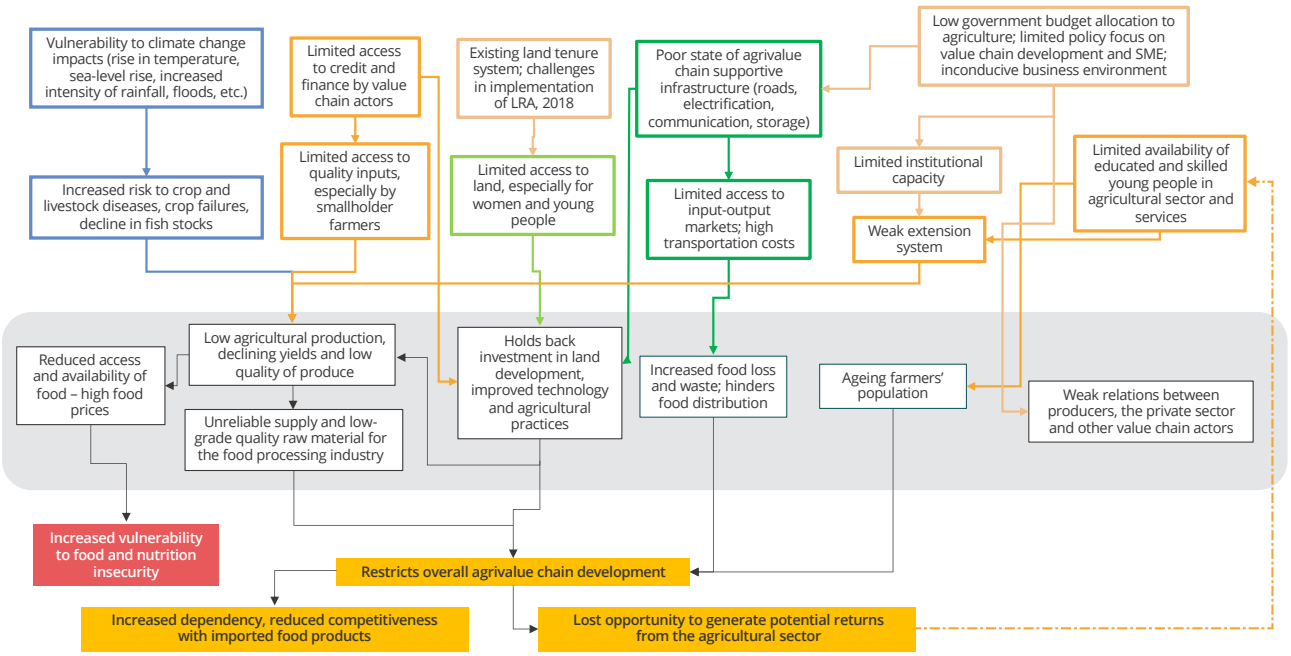
Age	Number (million)	% of total population
0–14	2.0	40.0
15–34	1.8	34.3
over 35	1.3	25.7
Total	5.2	100

Source: Countryeconomy.com. n.d. Liberia – Population pyramid 2021. [Cited 7 September 2023]. https://countryeconomy.com/demography/population-structure/liberia

In conclusion, weak value chains make local produce uncompetitive against imports, increasing reliance on imported foods, especially rice, and limiting opportunities for young people to engage in the sector to make a living through employment in agrifood production or value addition activities.

Young Liberians face many organizational, structural, social, economic and environmental challenges on a path to a productive agrifood-related career. Analysing these challenges is necessary to understand how they could be drawn into gainful employment opportunities in transforming food systems.

Figure 9. Drivers and impacts of limited agrifood value chains and youth participation in Liberia



Source: Authors, 2022.

Key drivers

Climate change/environmental issues: Climate change is expected to lead to increasing temperatures and affect water availability across Liberia. Some areas of the country may also experience flooding from increased rainfall, coastal erosion and sea-level rise (World Bank, 2021a). The changes in weather patterns may have an adverse effect on the country's vulnerable agrifood systems. Higher temperatures reduce yields of desirable crops and spur weed and pest proliferation, while changes in precipitation patterns increase the likelihood of **short-run crop failures and long-run production declines** (FAO, 2015). Such pressures add to the difficulties posed by the ongoing focus on cassava and rice, which are vulnerable to flow production and the deteriorating quality of crops also are counter to efforts to develop value chains, given that these limit the scale of operations that could add value and improve the quality of the end-products, due to the low-grade raw materials (FAO, 2015).

If not properly managed, the impacts of environmental threats and climate change on agricultural production can lead to an increase in food prices, reduced access to and availability of food and an increase in nutritional deficiencies among vulnerable populations and families. Changes in climate also influence livestock grazing and survival, increasing the prevalence of animal diseases, and pest and weed resistance. In addition, warmer temperatures can result in a decline in fish stocks, potentially exacerbating non-climate stressors threatening fisheries, such as overfishing, increased demand for fish, lack of surveillance and control over industrial and artisanal fishing, and pollution (Wuor and Mabon, 2022).

Insufficient access to finance and input markets: Severe constraints are impeding the availability of commercial inputs, such as seeds, fertilizers and farming tools, and affecting crop productivity and a possible transformation from subsistence to commercial farming. These impediments are strongly related to poor road

infrastructure and limited access to credit due to the perceived high risk for credit providers. These conditions hold back output, which is far below its potential (Sigman and Davis, 2017) (see also KSQ 1). The World Bank ranked Liberia 175th overall in its Doing Business Report 2020. Key indicators for agricultural businesses included a ranking of 75th place for starting a business, 180th place for registering property, and 104th place for getting credit – which is especially challenging for agricultural undertakings. Most micro, small and medium enterprises (MSMEs) in agriculture face serious challenges in accessing financial support to expand their production, with commercial banks and microfinance institutions providing loans at high interest rates and requiring collateral.

Access to finance is a challenge for smallholder farmers in general, and for women and young people in particular. It also holds back other value chain actors, such as small traders and processors, in developing viable agribusinesses that can benefit fully from value chains. This lack of financial support hinders investment in technology, irrigation and machinery by the various actors along the value chains. Financial services, moreover, are particularly limited in rural communities.

Land access and tenure: In 2018, Liberia passed the Land Rights Law, which established legally guaranteed land rights for all Liberians. The legislation includes legal protections for women's land rights, including guarantees for the rights of spouses to own land in their marital community. The law has immense potential for economic development and for promoting land-based livelihoods for all Liberians. However, there are obstacles to its implementation, particularly for young people. Among them are the following:

- **Unemployment and poverty:** For those with access to resources, the quickest ways to get land for cultivation are to buy or rent it, or to inherit it. However, high poverty levels among young people force them to lease land by agreement with a community or a landowner. These leases are often short term and owners restrict output to annual crops, discouraging investment in the land and development of long-term plans or strategies to improve profitability and incomes among subsistence farmers (Mercy Corps, 2017).
- **Land governance, traditional power hierarchies and intergenerational tensions:** Traditional notions of land are central to governance in the country. Land is often managed collectively by village elders and chiefs, who closely monitor access to it and often exploit youth labour (Liberia, 2008). According to a study conducted by Mercy Corps (2017), the primary path for both male and female young people to access land is by leasing it from a community or landowner. Lease agreement may be straightforward, but they are often short and restricted to production of annual crops. Such arrangements limit the producers' potential to increase revenue and their scope for producing tree crops, which require longer-term planning. Furthermore, assessments conducted by the youth-based agricultural organization Agro Tech Liberia indicate that 55 percent of the country's young people have no access or very limited access to a physical financial institution (Blum *et al.*), and are not involved in decision-making at community, district and national levels (Karmo, 2021).
- **Gender and inheritance:** Discriminatory social norms and practices further hinder young women, who are less likely than young men to have access to land. Women are at a distinct disadvantage regarding long-term land ownership and tenure, given that local inheritance customs favour men. They also do not make the decisions about land use in their families, which limits their ability to diversify crops and protect themselves from shocks (Bøås and Dunn, 2013, pp. 47–50).

Inadequate infrastructure: The country has approximately 10 600 km of primary, secondary, and feeder road networks, of which approximately 25.8 percent is in good condition and nearly 50 percent is in poor condition

(Sigman and Davis, 2017). **Liberia has poorly developed rural infrastructure, including roads, storage facilities, communication and electricity networks** (see KSQ 1 and KSQ 4). This limits inputs, increases transport costs, isolates farmers and severely hampers food distribution from major production areas to consumer markets and connections between small producers and local markets or urban centres (Liberia, 2018b). This also increases waste and losses, reducing producers' incomes and raising consumer prices. Moreover, such poor linkages hamper already limited extension services.

Rural electrification is an important factor that could support value chains and improve farm incomes, but **Liberia has one of the lowest national electrification rates in Africa**. Approximately 46.7 percent of the urban population and only 7.6 percent of the rural population have access to electricity (USAID, 2020). Inadequate power production and limited power distribution to rural areas worsen food losses and waste in instances in which stable refrigeration and cold storage could reduce spoilage and maintain food quality. This discourages the establishment of rural processing plants, which could offer prospects for farmers to improve the value of their products and raise incomes.

Inadequate government budget allocation and enabling environment: The Government of Liberia recognizes that the development of food systems, including value addition and diversification, are important for economic growth and employment creation by supporting MSMEs. However, the annual national budget allocated to agriculture represented only approximately 3 percent of the total budget in 2022, far below the 10 percent set under the Malabo Declaration. In addition to committing to allocate 10 percent of public spending to agriculture, which seemed pertinent (Fontan Sers and Mughal, 2019), the Declaration had also committed to investments in developing infrastructure and services.

Inadequate education and skills: Young people in Liberia have limited access to education. Results from the International Labour Organization (ILO) School to Work Transition Survey (SWTS) conducted in 2014 highlighted that most of the young people surveyed had attended school or a training programme at some point in their lives (88.5 percent in 2014). **However, the results of the survey showed that still too many young people were excluded from the education system**. In 2014, a total of 14.2 percent of young women and 8.2 percent of young men had not attended school or received any training. **Moreover, according to Word Bank data on education statistics, between 2010 and 2020, only 13 percent of young people had enrolled in upper secondary education**. Education is free only at the primary level, which makes it difficult for young people to continue their studies at higher levels in the education system.

This explains the **relatively low-skill levels among the young people in Liberia**, which limits their access to decent employment. In addition, the lack of schools offering further education opportunities in rural areas often forces young people to leave their villages, which may also affect the availability of labour and continuation of farming in general (Mercy Corps, 2017). **Many agricultural professionals have left the country, resulting in significant gaps in knowledge and skills transfer** capacity in the sector. There is a critical shortage in the quality and range of specialization of human resources, while general **extension workers have limited skills and capacity to advise food systems actors on issues, such as sustainable agricultural production and value chain development** (Liberia, 2018b).

In addition, the **lack of coordination between agrifood systems and the education sector** affects the appropriate use of education to improve young people's involvement in agrifood value chain and food systems activities. More than half of the Liberian workforce has not completed primary education and the literacy rates are among the lowest in the world (IFAD,

2020). This situation limits investment in the modernization and development of agrifood value chains. Going forward, young people will also find it difficult to keep up with new, more efficient technologies and farming systems that require a certain level of knowledge and skills. This will result in a severe shortage of young people with an adequate education and job skills, hampering productivity and growth.

Potential impacts

In the absence of any significant intervention, underdeveloped and inefficient agrifood value chains will continue to generate negative systemic impacts on the overall food systems in Liberia. Underdeveloped domestic value chains, lack of job opportunities for young people and poor rural livelihoods, among other factors, contribute to the out-migration of young people in search of better prospects. This scenario also indicates continued reliance on imports for food security, while limiting employment opportunities and undermining investment in national food systems. Future impacts could include increased social and political tensions, along with rising food insecurity and poverty.

Proposed systemic levers

Key levers include developing and promoting inclusive and sustainable value chains to increase producers' access to markets, improving livelihoods and creating jobs through opportunities for value addition, especially for young people. This entails investing in value chain development and creating an enabling environment through availability of infrastructure and services, such as the following:

1. **Developing appropriate public and private services, and infrastructure to support inclusive value chains to establish agribusinesses in rural areas**, and emphasizing additional or alternative employment for young people. The focus should be on **easing constraints on production, processing and marketing** to help farmers deliver the necessary quantities of goods of sufficient quality without jeopardizing household food security. At the farm level, this involves **supporting farmers to increase production in volume and quality** by exploring opportunities for good agricultural practices, production diversification, increasing access to agro-inputs and climate-smart adaptation, while encouraging links and support among value chain actors. This also entails improving access to rural finance and appropriate financial products, upgrading infrastructure and improving services. Developing information and communications technology (ICT) infrastructure and services offering a wide range of products for accessing financial services, such as e-banking, e-business and e-trade, through mobile banking could be supported too. The engagement of young people in policy dialogue should be another important consideration.

2. **Supporting the development and implementation of a national agribusiness strategy that also addresses challenges of youth participation in agrifood value chains and broader food systems**, land access and management, access to finance, training and perception of employment by young people in agrivalue chains. Fostering entrepreneurial capabilities and capacities, business support and private sector partnerships are crucial. To achieve this, institutional issues must be addressed, human capacities must be improved, multisectoral approaches must be taken and the development and implementation of adequate policies are needed. **More concretely, linking young people to MSMEs, cooperatives, producer and supplier organizations, local businesses and financial institutions for increasing productive investment and innovation in agrivalue chains and food systems** strengthens local agribusiness and improves supply chain efficiency. This includes, for example, building on local structures involving young people, such as the Liberian kuu system of communal labour (USAID, 2017; Mercy Corps, 2017) and sensitization to portray the importance of engaging in agricultural value chains.

Key Sustainability Question 3: What are the main reasons why urban agriculture is underdeveloped in Monrovia and other Liberian cities, given its high potential and the increasing urban demand for vegetables?

The urban population of Liberia reached 53 percent in 2020 (see Table 1). Because of the high levels of rural out-migration, inflation and unemployment, many urban residents try to practice urban agriculture. However, urban farming systems remain inefficient and underdeveloped, despite the opportunities, given the demand for quality vegetables in Liberian cities. Some of this demand is being met by imports. While vegetables are seen as a potential "cash crop", this sector has not received much government investment (GROW, 2021).

Urban and peri-urban farming is the growing of crops and raising of livestock within and around cities, where there is high demand for fresh produce. It involves the production of inputs (manure, seeds), processing, marketing, and the provision of services to agricultural producers and agro-entrepreneurs (FAO, 2022). Approximately 60 percent of Liberian farming households are engaged in vegetable cultivation, of largely traditional varieties. While rural households mostly consume the vegetables they grow and find limited wider demand, supermarkets in Monrovia have substantial demand for a variety of vegetables, including exotic varieties (GROW, 2021).[4] Apart from expatriate communities and affluent Liberian households, hotels and restaurants are major consumers of exotic vegetables. Tomatoes, onions, potatoes, zucchini, carrots and bell peppers are imported almost all year round, mainly by local traders from neighbouring countries.

According to FAO, in 2018, Liberia produced approximately 3 500 tonnes of tomatoes and imported approximately 41 000 tonnes. **Vegetable imports** typically increase during April and May (at the start of the wet season and local planting season) and during November and December (the local dry season, when production is low). It is estimated that the **market size for fruits and vegetables in greater Monrovia alone is approximately USD 320 million per year** (GROW, 2016). The country has a suitable climate for growing horticultural crops, which are in high demand all year round (IMF, 2021). Furthermore, the increasing urban population is an important driver of this potential demand, along with rising incomes of the working class, the returning Liberian diaspora, who often have acquired new consumption tastes and patterns, and an increasing number of expatriate workers.

Supermarkets and hotels have reported an **increase in the number of Liberian consumers buying vegetables** (indigenous and exotic) or eating out; an estimated 10-20 percent of urban residents **buy produce from formal supermarkets** (GROW, 2016). Combined with an expanding services sector, especially the hospitality industry, and an increasing number of Liberians are working longer hours, clearly demand for vegetables is growing in Liberian cities. This could represent an **opportunity for increased local production of vegetables and for greater participation of smallholders from urban and peri-urban areas** (GROW, 2016).

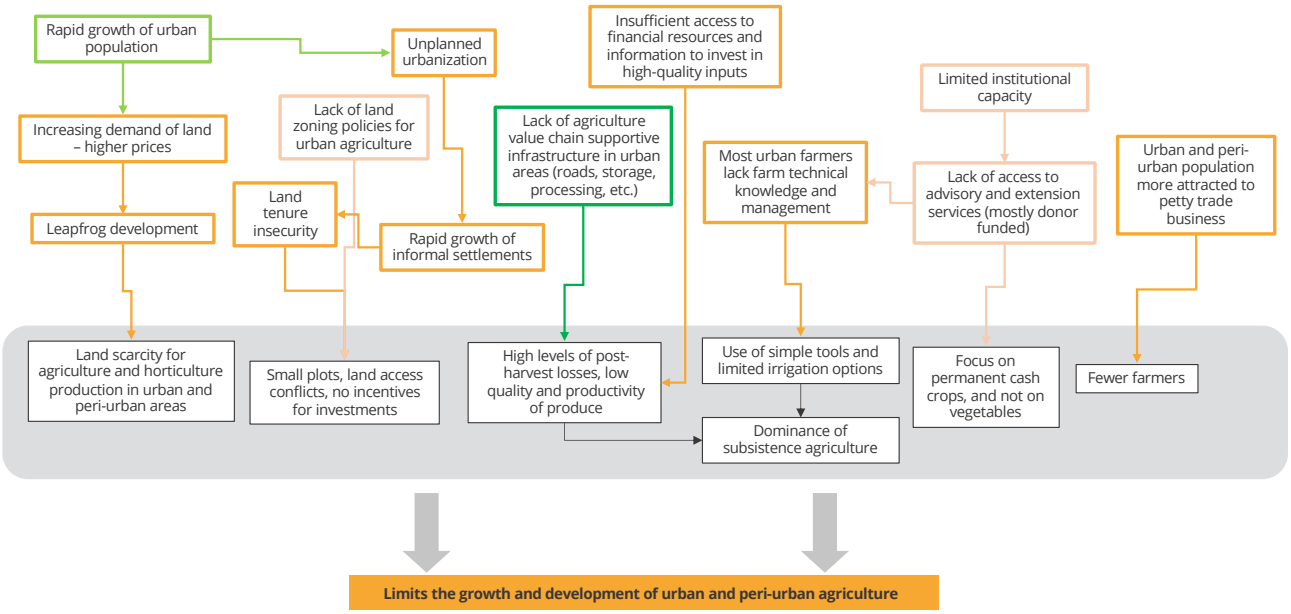
Urban agriculture is not new in Liberia. It was practised for decades in Monrovia and other Liberian cities before the civil war broke out in 1989, but it has increased in importance during and after the conflict. Although both

[4] GROW Liberia is a business and investment advisory agency that collaborates with businesses, investors, associations and government agencies. It aims to help increase income and employment opportunities through MSME development in the priority agrifood value chains of Liberia (see https://grow2liberia.com).

men and women engage in urban agriculture, **approximately 75 percent of those practising it are women**. Women farmers are mainly vegetable gardeners (90 percent of urban farmers produce vegetables and some fruits), while the livestock keepers are mostly (elderly) men. Women are also responsible for marketing the produce. The most commonly grown urban crops are bitter balls, okra, cabbages, corn, sweet potatoes, tomatoes, lettuce, cucumbers, peppers and collard greens. Rice and cassava are also grown, but more in peri-urban areas (RUAF, 2012; GROW, 2016).

Analysing the barriers to growing vegetable value chains in particular and urban agriculture in general can provide insight into why Liberian food systems have not developed this sector, despite its potential (Figure 10).

Figure 10: Drivers and impacts of underdeveloped urban agriculture in Liberia



Source: Authors, 2022.

Key drivers

Inadequate access to land: The rapid increase in the urban population of Liberia has not only led to rising demand for food in the cities, but it also has had implications for rising demand for urban land, resulting in higher land values (Ayambire *et al.*, 2019; Pribadi and Pauleit, 2015). This has fuelled the phenomenon of **leapfrog development**,[5] making land for urban agriculture and horticulture scarcer and more expensive (Cobbinah and Aboagye, 2017; Ayambire *et al.*, 2019). Moreover, **insecurity of land tenure is a key impediment to the development of smallholder farms in urban and peri-urban areas**, as incentives for investments in such areas are low (IMF, 2021). Most farmland is held by local communities, tribal trusts or families.

[5] Leapfrog development occurs when urban development skips over vacant land closer to developed areas in favour of areas further away from cities, in rural or semi-rural areas where land costs are lower.

Land used for urban farming tend to belong to governmental institutions, individuals, families or traditional authorities.

Urban farmers either claim traditional land rights, have squatter agreements, or rent or lease the land. Although the use of urban and peri-urban land is often free, many urban farmers pay high land rent for each cropping season in Greater Monrovia. **A sizeable group of urban farmers have faced uncertainty over how long they can continue to farm their plots** (Kollie, 2019). **Disputes about land use, access and tenure are also endemic in the country** and remain a major source of conflict. In many cases, this is a consequence of ambiguities between customary and formal property rights. Finally, there are no proper land-use zoning policies to allow for sustained urban agriculture (GROW, 2021).

Unplanned urbanization: Approximately two-thirds of the population of Liberia live in Montserrado county (which includes Monrovia) and the northern region of the country. Lack of land-use planning has resulted in **unplanned urbanization** in this region at an unprecedented pace. The residents of informal settlements generally have little or no security of title to the land they occupy, contributing to their income insecurity.

Lack of input and output markets, and structure: The absence of infrastructure for processing, preserving and storing perishable produce, especially vegetables and fruits, impedes the development of urban agriculture. The limited number of **storage facilities in urban areas and poor roads** leads to **post-harvest losses** and constrain farmers' ability to price their produce appropriately (see also KSQ 2). Few agrifood value chain actors are incentivized or interested in investing in storage and packaging and other means to reduce losses, as they lack access to relevant information and networks (GROW, 2021).

Urban areas offer very limited **agro-inputs (seeds, fertilizers and farming tools), finance and extension services**, which reduces productivity. Most urban farmers grow local vegetable varieties using self-retained seeds that have likely lost their genetic purity, which adversely affects the quality of their produce (GROW, 2021). Farmers have limited financial capacity to buy quality seeds or other inputs, such as fertilizers. Suppliers, for example, sell fertilizer in small packets to match farmers' buying capacity. Additionally, farmers rely on pre-financing from traders, who often exploit them (GROW, 2021). **In sum, farmers have insufficient access to financial resources and information to invest in higher-value vegetables**.

Insufficient technical knowledge and capacity of most urban farmers: Most urban farmers face challenges in management capacity, leading to low harvests, a subsistence-oriented approach and abandoned projects. This can be attributed to inadequate agricultural knowledge and skills, limited access to inputs and water resources, reliance on chemical fertilizers, the risk of pollution, losses during cultivation due to pests and diseases, contamination of crops with pathogens linked to irrigation with polluted water, and the absence of appropriate and coordinated agricultural extension services. The resulting lack of year-round consistency in vegetable supply is a major constraint on local output. Irrigation is a major enabling factor for year-round production, which may help overcome the current barriers to local sourcing and to meeting demand for locally produced vegetables. This could also be an important factor in reducing vegetable imports during the dry season (RUAF, 2012).

Limited advisory, educational and support services: The main actors involved in vegetable research and development are the Ministry of Agriculture, through CARI, and more recently, the World Vegetable Center. The recent establishment of the Center in Liberia could potentially usher in new opportunities for transforming the agrifoods sector through the development of appropriate seed varieties, as CARI has limited capacity in the field of vegetable research and in leveraging this opportunity. **The government extension officer to farmer ratio in**

Liberia is 1:33 000; most officers are deployed under different donor-funded programmes that focus on permanent cash crops rather than vegetable production (GROW, 2021).

None of the country's various agricultural colleges are **specialized in vegetable production, nor in urban agriculture in general**. The Liberian International Christian College in Ganta has offered a three-year general agriculture course since 2009, and graduates have become input dealers in their communities or commercial farmers, though the government extension service does not offer alumni sufficient employment opportunities (GROW, 2021).

Potential impacts

Because of the underdevelopment of the urban and peri-urban farming system, significant income generation potential is lost, and value addition is limited. Furthermore, the high levels of post-harvest losses, along with low food productivity and output, leads to food supply deficits and higher dependency on imports. The result is poor food and nutrition outcomes and negative implications for the country's trade balance. Improving vegetable production and availability have the potential to improve dietary diversity and nutrition. Engagement of urban women in growing vegetables also has the potential to improve their livelihoods. The lack of action in this area marks a potential lost opportunity for local economic development, the provision of jobs and income, social inclusion, and improving food security and healthy diets, while emphasizing planned urban development to enable access for the urban poor to necessary services.

Proposed systemic levers

Sustaining urban and peri-urban agriculture can complement the food supply from rural agriculture by generating positive nutritional, economic, environmental and social impacts in Liberia. Levers to address the complex socioeconomic, technical, spatial and land access issues in urban and peri-urban agriculture should be accompanied by efforts to improve functionalities at the governance and policy level. These include the following:

1. **Support for improving and designing multisectoral policies and regulations for urban and peri-urban agriculture at national, county and district levels (e.g. access to land)**. More specifically, **the purchase of development rights**, along with expropriation and zoning of peri-urban land for agricultural purposes, are **important strategies** for **promoting access to land for peri-urban agriculture**. Such strategies call for revisions of city legislation and land-use planning to legitimize and promote agriculture in cities and on their peripheries. The passage of the Land Rights Law in 2018 provides the framework to address these development constraints.

2. **Support for overall livelihood opportunities for smallholder farmers, women and young people in urban and peri-urban areas**. Urban agriculture is overwhelmingly conducted by smallholder farmers, especially women, while young people represent approximately 90 percent of this population. **An increase in demand for vegetables** and opportunities to substitute local produce for imports may provide a clear pathway to income growth for the urban poor, if they can offer the required quality, quantity and consistency. More specifically, identifying a promising value chain and improving access for women and young people to basic support and resources are important factors. These efforts would include access to arable land through titled ownership, **financial services and business development services, as well as targeted, tailored training and extension services. Finally, promoting urban farmers' organizations could boost these activities through collective action**.

Key Sustainability Question 4: What are the main reasons behind natural resource degradation in Liberia, specifically high levels of deforestation, which is threatening livelihoods and the sustainable agrifood system transformation?

The agrifood systems of Liberia are characterized by continued degradation of natural resources, which have significant impacts across the four sustainability dimensions listed earlier: (i) food security, nutrition and health; (ii) inclusive economic growth, jobs and livelihoods; (iii) sustainable natural resource use and environment; and (iv) territorial balance and equity. This discussion reflects on the indicators, major drivers and impacts associated with the degradation of the natural resource base, and loss of habitat and biodiversity, which are fundamental to the development of a sustainable agrifood system in Liberia. Moreover, climate change impacts may worsen natural resource degradation, as Liberia is highly vulnerable to such impacts and is ranked 177 out of 185 countries in the 2021 ND-GAIN Index.

Approximately 47 percent of the population of Liberia lived in rural areas in 2020. In addition to food purchased from markets, the urban population depends **on the ecosystem for food, forest and aquatic products, and derives livelihoods from other extractive activities**. Forests provide a safety net, offering resources to recover from most shocks. Informal and largely unmeasured, forest activities provide an important source of jobs, income and food security for the rural population (Nthara and Srivastava, 2020). Local traditions and culture are built around the use of resources found in the immediate environment.

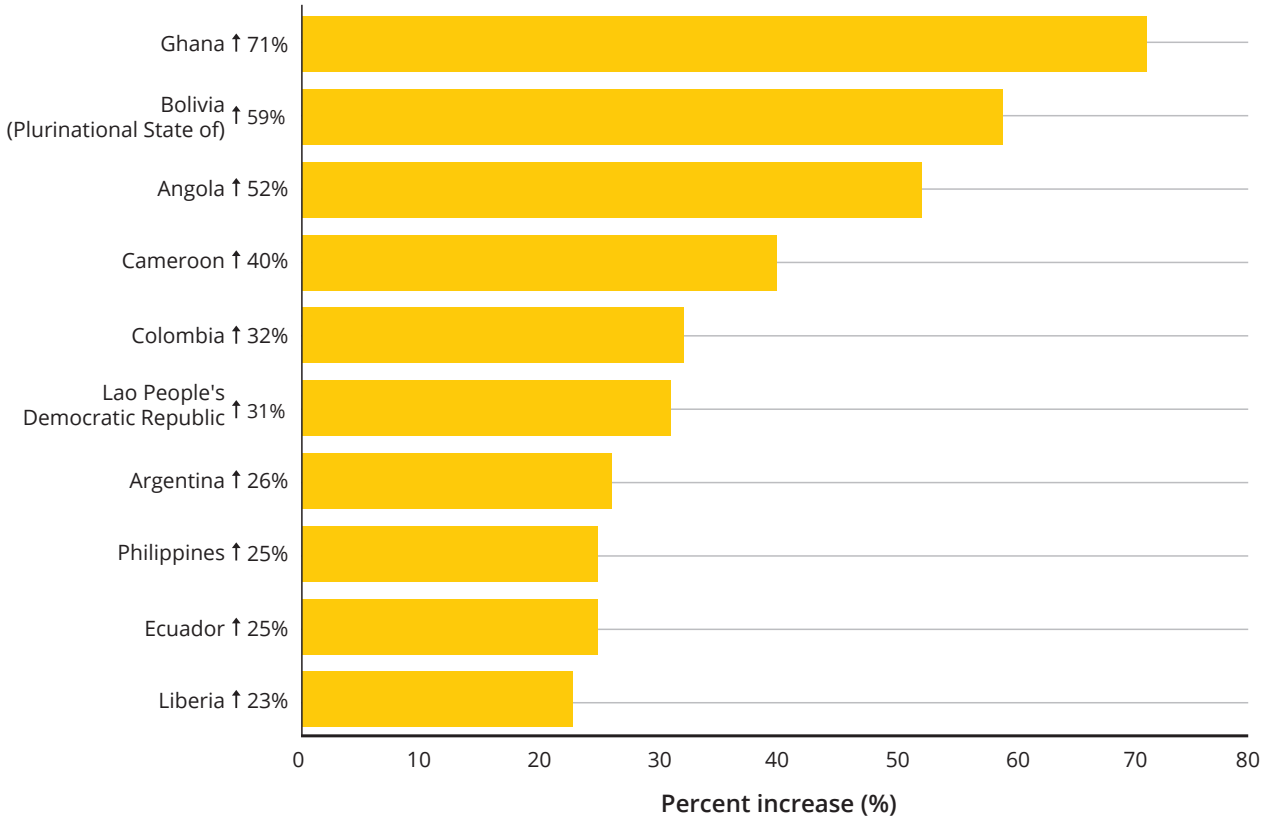
The forests of Liberia provide a wide range of benefits to communities, the economy and the international community. As part of the Upper Guinea Forest – one of the "three lungs of the world" (Rodrique, 2023) – the forests in Liberia cover more than 60 percent of the country's land surface. Forests are the fourth-largest contributor to the domestic economy (Nthara and Srivastava, 2020) and an important source of income for one-third of its people (NICFI, 2020). Half of the population live within 2.5 km of a forest. Each day, these households spend more than three hours collecting forest products for subsistence and sale, earning 35 percent of their income (Nthara and Srivastava, 2020).

The commercialization and utilization of food plant species, medicinal plants and other non-timber forest products are also a source of income relevant to both rural and urban communities and the wider economy. Forests have a rich biodiversity – 881 known fauna species, of which 0.8 percent are endemic and 4.2 percent are threatened; and at least 2 200 species of vascular plants, of which 4.7 percent are endemic (Nthara and Srivastava, 2020).

While the country's civil wars slowed development and land-use change, during the post-conflict years, there has been a surge in land-cover transformation due to agricultural expansion. This has included shifting cultivation and commercial irrigated agriculture, along with plantations and mining – all of which have expanded since 2003 (Tappan *et al.*, 2016). The overall rate of change in land use and land cover has accelerated from 0.5 percent/year between 1975 and 2000 – slightly below the regional average – to 1.3 percent/year between 2000 and 2013, which was above the regional average for this period (Tappan *et al.*, 2016).

Recent data suggest that the average primary forest loss in Liberia during the period 2020−2022 has increased by 23 percent, as compared to the average during the period of 2015−2017, which is recorded as the tenth-largest increase in forest loss among countries around the world. Between 2002 and 2022, Liberia lost 315 kha of humid primary forest (see Figure 11) (Weisse, Goldman and Carter, 2023).

Figure 11: Top 10 countries in terms for increase in primary forest loss, as of 2022



Top 10 countries were determined by comparing the average primary forest loss from 2015-17 to the average from 2020-22. Includes countries with a least 1 Mha of tropical primary forest in 2001

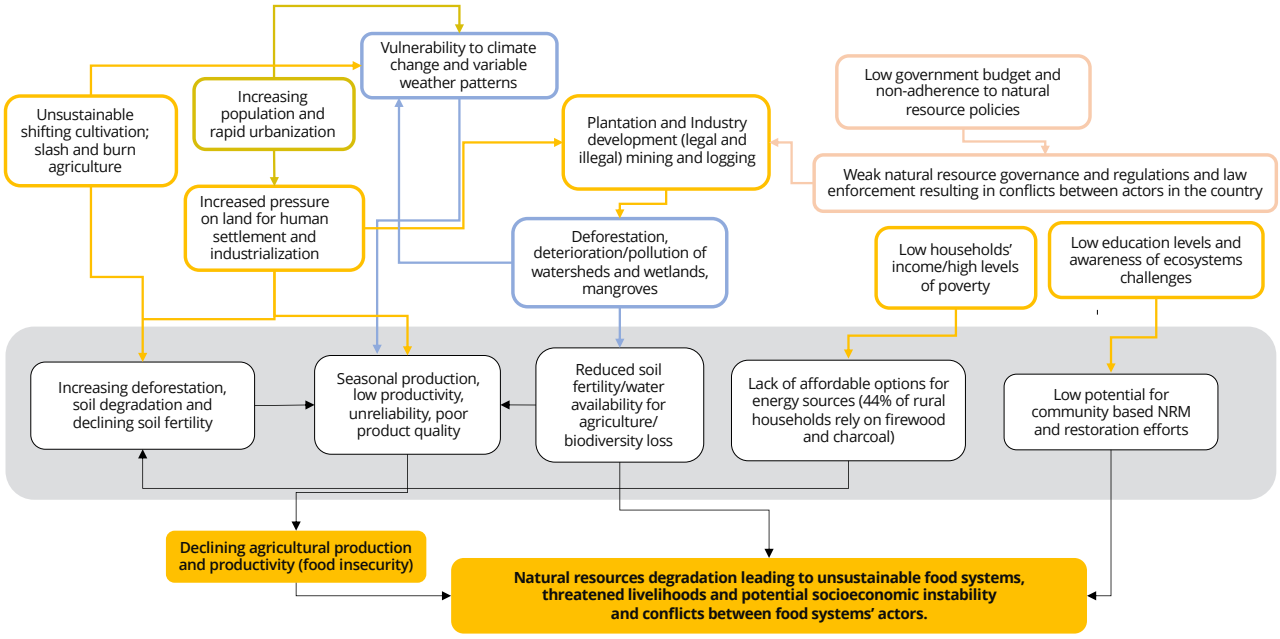
Source: World Resources Institute. 2023. Forest pulse: the latest on the world's forests. global forest review. 27 June 2023. Washington, DC, World Resources Institute [Cited 13 September 2023]. https://research.wri.org/gfr/latest-analysis-deforestation-trends

The formal commercial forestry sector generated approximately 8-11 percent of real GDP from 2012 to 2017 and remains a major source of income, employment and livelihoods (Nthara and Srivastava, 2020). An estimated 24 000 workers are employed by forest-related industries and annual revenue generated by **chainsaw milling** alone is estimated at USD 31 million-41 million, or approximately 3-4 percent of GDP. Additionally, the **demand for charcoal continues** to grow at approximately 4 percent per year, with a potential annual market value of USD 25 million, going largely to small producers. Commercial timber processing accounts for approximately 10 percent of GDP; its estimated annual value was USD 88 million in 2016 (Nthara and Srivastava, 2020).

These activities and practices contribute to the economy and livelihoods. However, without sustainable forest and environmental management, and combined with traditional agricultural practices, the **result is deforestation, and land and soil degradation, which can increase biodiversity losses and desertification, undermine food systems and increase poverty** (Liberia, 2019b).

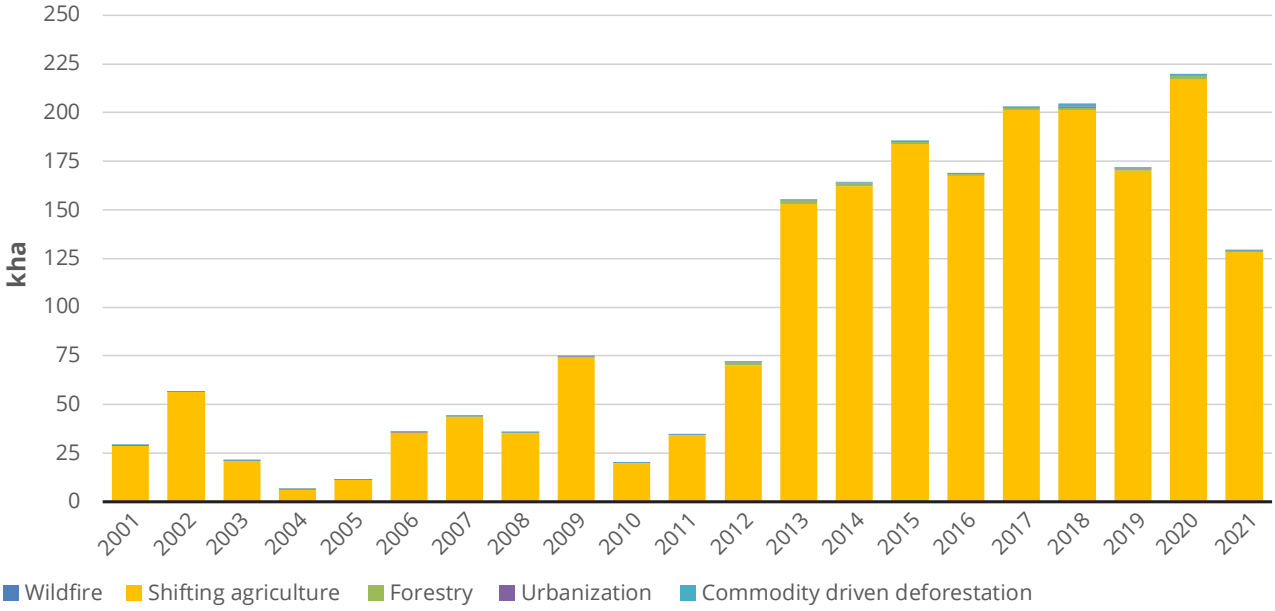
Understanding the many reasons behind natural resource degradation would help in fathoming why Liberia is unable to stem deforestation and soil degradation, which threatens livelihoods and food security and drives increased poverty and migration.

Figure 12. Drivers and impacts of natural resource degradation in Liberia



Source: Authors, 2022.

Figure 13. Annual tree cover loss by dominant driver – shifting cultivation



Source: Global Forest Watch. 2022. Forest change in Liberia. In: *Global Forest Watch*. [Cited 20 April 2023] https://www.globalforestwatch.org/dashboards/country/LBR/

Key drivers

Slash-and-burn agriculture: A very traditional and widely used farming system, **slash-and-burn agriculture, or shifting cultivation**, is a major cause of land degradation and deforestation in Liberia, especially in the highlands (see Figure 12) (NICFI, 2020). Research suggests that **approximately 70 percent of deforestation in the country is caused by clearing land for agriculture – nearly all of it by slash-and-burn** (Sibanda and Nyenka, 2011). Figure 13 shows that the **annual tree cover loss is predominantly** caused by shifting agriculture.

Earlier, when population pressure was low and **land was abundantly available**, the slash-and-burn agriculture had very long fallow periods, which enabled the soil to regenerate and, hence, the system was sustainable. However, under the present conditions of **high population densities**, population growth and increases in land pressure, **fallow periods have become shorter. The reduced soil regeneration periods have resulted in lower soil fertility and crop yields**, ultimately making shifting cultivation unsustainable, particularly given changes in climate. (Mildenhall, 2017).

From 2001 to 2021, only 0.56 percent of tree cover loss occurred in areas where the dominant drivers of loss resulted in deforestation (Global Forest Watch, 2022). Other recognized drivers of deforestation, discussed in detail later in this section, include the establishment of commercial plantations (specifically rubber, palm oil and cocoa), **timber cutting for charcoal, fuelwood near urban settlements and tree felling for construction** near urban centres. These have all taken a toll on the country's forests, including mangroves and wetlands.

Clearance of primary rainforest for settlements and commercial plantations: Clearance of primary rainforest and human settlements is associated with the establishment of commercial plantations. Deforestation in Liberia has also occurred in **mining areas for the construction** of low-cost housing and fuelwood for these settlements. Wild fires that were often started by settlers (for clearing land, and in gathering honey), which indiscriminately destroyed all tree types, shrubs and undergrowth, have led to increased deforestation (Sibanda and Nyenka, 2011).

Plantation agriculture: Commercial plantations have been converting tracts of primary forest land into cocoa, coffee, rubber and oil palm plantations. Mainly owned and operated by foreign multinational corporations, these operations generally use heavy, earth-moving equipment to regularize the soil surface and clear the natural vegetation of mixed species in favour of monoculture, by felling large trees and setting them ablaze. Monoculture, such as that of rubber, reduces biological diversity and such areas can serve as habitats for insect pests and disease transmission to native trees. In addition, the high investment in commercial plantations spurs **the increased use of chemical inputs and pesticides**, whose secondary effects include the selection of resistant pests and crop epidemics.

Illegal logging: Illegal and quasi-legal logging that is taking place through poorly regulated practices, unrestrained by law enforcement and domestic timber supply policy, also is contributing to forest degradation. Destructive logging carried out with heavy machinery leaves the land treeless and scarred, a recipe for erosion of topsoil. This logging process is unmonitored, unmanaged and, sometimes, accompanied by only superficial replanting from the nurseries of private companies. Such deforestation also destroys important habitats for wildlife species threatened by extinction, such as the forest elephant, pygmy hippopotamus, short-horned buffalo and several primate species.

Civil society groups in Liberia have said the lack of monitoring and weak enforcement of the country's forestry laws have allowed the illegal harvesting of substantial volumes of timber in the country. An audit report in 2019 found that

as much as 14 000 m^3 of timber in Grand Bassa county had been harvested illegally, with no action taken against the perpetrators, despite the publication of information about the situation. The civil society groups have demanded tough action and increased penalties for companies involved in illegal harvesting, arguing that loggers are content to pay modest fines when they can make substantial returns from illegal logging. They also have noted that the situation in Grand Bassa was only one example of a widespread problem and that investigations in community forests in other areas would come up with similar findings. (Giahyue, 2021).

Commercial mining and conflicts over resources: There is a high degree of geographic overlap between mineral deposits, exploration permits and the protected area/forest reserve network. Mining activities in these areas significantly affect biodiversity and forest cover. Although deforestation and land degradation have resulted from various activities, they have often been downplayed because of their localized impact. Mining activities serve as an example of this. However, **iron ore mining** on the slopes of four mountain ranges in the country has reduced the vegetation cover significantly. Due to the steep slopes, **heavy soil erosion** has resulted, even after mining operations have ended.

During the civil war, gold and diamond panning and dredging along river banks resulted in substantial **siltation of rivers**. Additionally, heavy metals and other toxic substances associated with effluent from gold mining, such as mercury and cyanide, have resulted in the **poisoning of the downstream waters in these rivers** (Sibanda and Nyenka, 2011). More recently, a **new gold boom has resulted in unregulated mining, harming rivers in the country despite a ban on the use of dredges and mercury** (Kamara, 2022).

The establishment of camps for refugees and internally displaced persons (IDPs) during the civil war also has resulted in extensive deforestation due to the need for fuelwood. This led to soil erosion in areas, such as Grand Cape Mount, Lofa, Bomi and Gbarpolu counties.

Rural areas have faced a range of conflicting issues regarding land use: agro-industrial plantations, mining concessions, absence of information on deeded lands, tribal lands and any other pre-existing land encumbrances, locations of mineral deposits, and the relevance

of boundaries for parks, national forests and concessions. To address some of these issues, the Liberia Land Authority (LLA) was established in 2016 as an autonomous government agency with operational independence (LLA, n.d.). The Land Rights Law, which was passed two years later, marked a critical point on the country's long and tortuous path to legislative reforms regarding land and natural resources. However, beyond the text of the legislation, realities on the ground and legal loopholes pose real challenges to realizing the promise of the Land Rights Law. Inequality in access to information and in power relations between customary communities and urban elites, gaps in the Land Rights Law, and weak technical and institutional capacity together threaten and potentially derail the hard-fought gains in land reform (Kaba *et al*., 2019).

Weak governance and law enforcement: The Government of Liberia has developed various policies and laws for enforcing environmental norms, such as the Community Rights Law of 2009, the National Forestry Reform Laws of 2006, the National Wildlife and the Conservation Protected Area Management Law of 2012, as well as wetland and climate change policies, and water quality guidelines (IMF, 2021). However, according to the International Monetary Fund (IMF), **a key challenge facing environmental protection and management is inadequate enforcement of these laws, given the sociopolitical and economic interests and concerns**. The problem of weak law enforcement is also exacerbated by the fact that many communities and resource users are unaware of environmental policies and legislation. Enforcement is also constrained by inadequate data collection infrastructure, which hampers efforts to use quantitative indicators to identify emerging problems, assess policy options and gauge the effectiveness of environmental programmes (IMF, 2021).

Inadequate knowledge and awareness: The low level of awareness among the general population about environmental protection and climate change issues, coupled with the competition between human economic activities and the environment, also undermine efforts to improve environmental management. Environmental degradation, climate change, lack of infrastructure, poor water quality and basic sanitation, and the loss of biodiversity and ecosystem services, constitute serious obstacles to development and poverty reduction efforts, undermining resilience and increasing vulnerability to risks and hazards (Drakenberg, Andersson and Wingqvist, 2014). The country's revised nationally determined contributions commitment to the Paris Agreement on global warming enshrines awareness-building as a key aspect of the adaptation and mitigation measures (Liberia, Environment Protection Agency, 2021).

Climate change and natural hazards: Liberia faces significant climate change-associated risks due to its high level of dependence on climate-sensitive activities, such as rainfed agriculture, which make it vulnerable to climate variability and change. Some of the key climate hazards are changes in rainfall patterns, flooding, and rising sea levels and sea temperatures (Liberia, Environment Protection Agency, 2021). The population, as a result, is affected by the impacts of climate change through loss of livelihoods, income and settlements, and face increased risks of adverse health impacts.

Among the climate-related impacts is high potential for extreme coastal flooding, especially where vegetation is scant, or has been removed, such as mangrove forests. Another possible impact on the land is high daytime temperatures, which affects the ability of the soil to absorb water, encouraging runoff and resulting in erosion (World Bank, 2021a).

Potential impacts

The forests of Liberia are being depleted by human settlements, industrial development, exploitative mining, charcoal production and logging, among other activities, causing habitat and biodiversity loss, and jeopardizing

the future sustainability of the country's food systems. Degraded lands may further increase the country's vulnerability to climate change events and eventually challenge socioeconomic stability, increasing the likelihood of poverty, food insecurity, conflict and migration. Continued deforestation will undermine economic opportunities linked to sustainable logging, wood processing and timber exports. Likewise, damaging natural resilience against flooding and erosion will also affect the costs of infrastructure maintenance.

Proposed systemic levers

The main leverage points to deal **with the overexploitation of the ecosystems should be aligned with the need to establish natural resource management and governance systems**. This must be based on intersectoral policies and strategies supported by **strong compliance and enforcement legislation**. The development of commercial plantations, for instance, should be preceded by environmental impact assessments (EIAs). Generating evidence-based information could be used to better engage the various actors in natural resource management. It would be pertinent to review and update forestry, agrifood value chains and wider food systems policies to stress multisectoral approaches and sustainability. The key levers for achieving this are discussed below:

1. **Clearly design and implement land tenure policies** to allow profitable and sustainable use of land. Providing support to sustainable and climate-friendly practices, such as **agroecology, climate-smart agriculture, conservation agriculture, agroforestry and integrated pest management**, would, therefore, be relevant. In addition, devoting a larger share of the available lowlands to sustainable annual crop production, including swamp rice promotion, may be an alternative to slash-and-burn agriculture. The Land Rights Law is a step in the right direction, though strong implementation is necessary for the legislation and policies to achieve the desired impact.

2. Review of **institutional mechanisms and multisector coordination among relevant ministries and agencies**, including agriculture, environment, forestry, mining, local government and commercial plantations, to ensure coherent policies and effective implementation. This also includes exploring institutional innovations for empowering local communities in natural resource planning, use and restoration to promote sustainable use of natural resources. For example, NGOs, academics, and relevant ministries could leverage **partnerships between the public and private sectors, engaging authorities at decentralized levels and relevant local communities** as a step towards improving the management of natural resources. These organizations could also assist in educating farmers in production and conservation technologies.

3. Support investment in **data collection systems, research and extension services** to enhance the capacity and delivery of information on key indicators of sustainable food systems, with particular reference to ecosystems degradation and climate change, and the implementation of adaptation options.

Finally, investment needs to be made in Liberia to support structural adaptation changes in its water management infrastructure, planning for urban expansion and the energy sector, as well as WASH quality improvements, which is a common thread through all the key sustainability questions discussed here.

Transition to sustainable food systems

Liberia has detailed a long-term vision for social and economic transformation. Several overarching policies and plans have been developed to address issues relevant to food systems and an overall agriculture-led economic transformation. These policies have supported agricultural development and broader food security and nutrition objectives since 2006.

Two of these policies are the long-term development plan, Liberia Rising 2030 (Vision 2030), which seeks to make Liberia a middle-income country by 2030, and the Agenda for Transformation (2012–2017) (AfT) development strategy. Other important agricultural and multisectoral policy documents are the Statement of Policy Intent for the Agricultural Sector of 2006; the Food and Agriculture Policy and Strategy (FAPS) of 2009; the Fisheries and Aquaculture Policy and Strategy of 2013; the National Food Security and Nutrition Strategy of 2008, updated and revised in 2015; the Climate Change Policy and Response Strategy; the Liberia Agriculture Sector Investment Program II; the climate-change National Adaptation Plan 2020−2030, which adopted a sectoral approach for climate change adaptation and laid out revised nationally determined contributions; and the five-year Pro-Poor Agenda for Prosperity and Development (PAPD) of 2018.

Food insecurity continues to be a pressing and persistent issue, indicating that the existing policies, strategies, and programmatic interventions have had a limited impact in enhancing food security and nutrition, as well as in mitigating poverty and hunger in Liberia"

This Food Systems Assessment shows that Liberia faces various challenges to improve food security and nutrition, livelihoods and employment opportunities for people living **in**

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rural areas, as well as in urban and peri-urban areas, which have grown significantly over the past two decades. The legacy of war and other protracted crises, climate change and environmental degradation will continue to present significant and increasing demands on the country's food systems.

Progress in food systems sustainability requires improved access to land, investing in basic infrastructure (especially in rural areas), coordinating coherent policies and approaches, and taking steps to reconcile the interests of the various actors. Inclusive food systems transformation also requires **increased and sustained empowerment of women, and the engagement of young people**, along with wider access to technologies, finance and innovations, such as digitalization and updated information systems.

Investment in basic infrastructure, such as roads, safe water supplies, electricity and appropriate irrigation, is urgently needed, as are efforts to improve access to education, health and extension services. Similarly, **innovative financial mechanisms that invest in food value chains would also be an important lever**.

There is also a strong need to improve and diversify smallholder output and productivity **through sustainable practices (e.g. climate-smart agriculture, such as conservation farming and agroforestry)**, strengthening value chains and MSMEs, and enhancing policy processes, multisectoral cooperation and good governance.

Food systems involve multidimensional challenges, which demand an approach that is systemic, multilevel, multisectoral, multistakeholder and participatory to address these interrelated issues. In practical terms, transformation requires close coordination among rural and urban stakeholders in the fields of agriculture, health, education, the environment, forestry, mining and other related sectors. The desired impact also requires involvement at


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various levels – **from ministries and government line departments to rural communities, including women and young people, researchers, private-sector players and NGOs**, in addition to primary producers and consumers.

In summary, fostering the transition to sustainable food systems in Liberia requires integrated, multisectoral actions to address the underlying issues that undermine and compromise the performance and sustainability of food systems in the country.

The findings of this assessment serve as a first step in thinking about the transition necessary for sustainable food systems transformation. Further research would help to better detail the challenges and their impact on food systems sustainability and **refine the levers and necessary actions for the desired impact**. Institutional innovations could help to ensure that the voices of all stakeholders, especially of the most vulnerable, are reflected in the activities and plans.

References

African Development Bank. 2021. *African Economic Outlook 2021. From Debt Resolution to Growth: The Road Ahead for Africa*. Abidjan, Côte d'Ivoire, African Development Bank Group.

Ayambire, R.A., Amponsah, O., Peprah, C. & Takyi, S.A. 2019. A review of practices for sustaining urban and peri-urban agriculture: implications for land use planning in rapidly urbanising Ghanaian cities. In: *Land Use Policy*, 86 (3):260–277.

Bøås, M. & Dunn, K.C. 2013. *Politics of Origin in Africa: Autochthony, citizenship and conflict*. London, Zed Books.

Blum, R., N'Tow, S., Woolf, N. & Jesse, C. 2019. USAID/Liberia Youth Situational Analysis. www.youthpower.org/sites/default/files/YouthPower/files/resources/Liberia%20Youth%20Assessment%20Situational%20Analysis%20Report_0.pdf

CDC (Centers for Disease Control and Prevention). 2023. Global Health – CDC in Liberia. In: *CDC – Global Health*. Atlanta, Georgia, USA, CDC [Cited 5 September 2023]. www.cdc.gov/globalhealth/countries/liberia/default.htm

Central Bank of Liberia. 2022. *Annual Report 2021*. Monrovia, Central Bank of Liberia.

Central Bank of Liberia. 2023. Microfinance Institutions. In: *Central Bank of Liberia*. Monrovia. [Cited 5 September 2023]. www.cbl.org.lr/index.php/general/microfinance-institutions

Cobbinah, P.B. & Aboagye, H.N. 2012. A Ghanaian twist to urban sprawl. *Land Use Policy*, 61: 231–241.

David-Benz, H., Sirdey, N., Deshons, A., Orbell C. & Herlant, P. 2022. *Catalysing the sustainable and inclusive transformation of food systems: conceptual framework and method for national and territorial assessment*. Rome, Brussels and Montpellier. FAO, European Union and CIRAD.

Doddoo, L. 2022. Liberia: the global food crisis necessitating increment in rice on the Liberian market. *Front Page Africa*, 28 September 2022. [Cited 10 March 2023]. https://frontpageafricaonline.com/news/liberia-the-global-food-crisis-necessitating-increment-in-rice-on-the-liberian-market/

Drakenberg, O., Andersson, F. & Wingqvist, G.O. 2014. *Liberia environmental and climate change policy brief.* Sida's Helpdesk for Environment and Climate Change. https://sidaenvironmenthelpdesk.se/digitalAssets/1724/1724708_liberia_envcc-policybrief-2013-final-draft.pdf

FAO. 2014. *Youth and agriculture: key challenges and concrete solutions*. Rome, FAO; Ede, Netherlands, Technical Centre for Agricultural and Rural Cooperation; and Rome, IFAD.

FAO. 2015. *Climate change and food security: risks and responses.* Rome, FAO.

FAO. 2019. Government of Japan through FAO communication, to support integrated rice system development and port state measures in Liberia. In: *FAO in Liberia*, Rome, 11 April 2029. [Cited 3 March 2023]. www.fao.org/liberia/news/detail-events/fr/c/1190252/#:~:text=In%202018%2C%20rice%20represented%2037.8,increase%20in%20demand%20for%20rice%E2%80%9D

FAO. 2021a. GIEWS country brief Liberia. Rome, FAO. [Cited 20 March 2023]. www.fao.org/giews/countrybrief/country/LBR/pdf_archive/LBR_Archive.pdf

FAO. 2021b. *Strengthening the enabling environment for responsible investment in agriculture and food systems – Evidence from Liberia*. Rome, FAO.

FAO. 2022. Urban and peri-urban agriculture. In: *FAO*, Rome. [Cited 20 March 2023]. www.fao.org/urban-peri-urban-agriculture/en

FAO. 2023a. Production database. In: *FAOSTAT*. Rome. [Cited 20 March 2023]. www.fao.org/faostat/en/#data/QCL

FAO. 2023b. Liberia. In: *Fishery and Aquaculture Country Profiles*. Rome, FAO Fisheries and Aquaculture Division. [Cited 20 March 2023]. www.fao.org/fishery/en/facp/LBR

Fontan Sers, C. & Mughal, M. 2019. From Maputo to Malabo: public agricultural spending and food security in Africa. *Applied Economics*, 51:46, 5045−5062.

Food Business Africa. 2022. *Liberia passes bill to establish Liberia Standards Authority to deal with food safety issues.* 31 August 2022. [Cited 25 April 2023]. www.foodbusinessafrica.com/liberia-passes-bill-to-establish-liberia-standards-authority-to-deal-with-food-safety-issues/

GAFSP (Global Agriculture & Food Security Program). 2021. From cassava and rice to recovery: bolstering agriculture for a stronger Liberia. In: *Impact Stories*. 15 July 2021. Washington, DC, GAFSP. [Cited 5 September 2023]. www.gafspfund.org/news/cassava-and-rice-recovery-bolstering-agriculture-stronger-liberia

Giahyue, J. 2021. Liberia loggers felling trees outside concession as government stands by. *Mongabay Conservation News*, 23 November 2021. [Cited 20 March 2023]. https://news.mongabay.com/2021/11/liberia-loggers-felling-trees-outside-concession-as-government-stands-by/

Global Forest Watch. 2022. Liberia dashboard. In: *Global Forest Watch*. Washington, DC. [Cited 20 April 2023]. www.globalforestwatch.org/dashboards/country/LBR/

Global Hunger Index. 2023. Liberia. [Cited 5 May 2023]. www.globalhungerindex.org/pdf/en/2022/Liberia.pdf

Global Nutrition Report. 2023. Country Nutrition Profiles: Liberia. *Global Nutrition Report.* [Cited 1 November 2023]. https://globalnutritionreport.org/resources/nutrition-profiles/africa/western-africa/liberia/#:~:text=The%20country%20has%20shown%20no,women%20and%209.2%25%20for%20men

GLOBEFISH. 2023. Liberia: Globefish Market Profile – 2020. In: *GLOBEFISH*. Rome, FAO. [Cited 20 May 2023]. www.fao.org/3/cc5612en/cc5612en.pdf

GROW. 2016. Vegetable market systems analysis (Liberia). https://static1.squarespace.com/static/5afe8501aa49a1c2cb2fab10/t/6126a5464f16a63b7a3aee9e/1629922635380/Vegetable+Market+Systems+Analysis_FINAL_March+2016.pdf

GROW. 2021. Snapshot: Liberia's vegetables market. https://static1.squarespace.com/static/5afe8501aa49a1c2cb2fab10/t/6126a3646269fd327e7abe72/1629922154302/Snapshot+-+Liberia%27s+Vegetables+Market+Final.pdf

IFAD (International Fund for Agricultural Development). 2019. *Republic of Liberia Country Strategic Opportunities Programme 2020 – 2024*, 30 October 2019. https://webapps.ifad.org/members/eb/128/docs/EB-2019-128-R-17.pdf?attach=1

IMF (International Monetary Fund, African Department). 2021. *Poverty Reduction and Growth Strategy. IMF Staff Country Reports*, 21(10).

ITA (International Trade Administration). 2022. *Liberia – Country Commercial Guide: agricultural sectors.* Washington, DC, Department of Commerce, USA. [Cited 5 September 2023]. www.trade.gov/country-commercial-guides/liberia-agricultural-sectors

Integral Human Development. 2022. Migrant refugees: migration profile Liberia. Migrants & Refugees Section. Vatican City. [Cited 23 March 2023] https://migrants-refugees.va/country-profile/liberia/

INTERPOL Environmental Security Sub-Directorate. 2014. *Study on Fisheries Crime in the West African Coastal Region.* Lyon, France, INTERPOL. www.interpol.int/content/download/5144/file/INTERPOL%20Study%20on%20Fisheries%20Crime%20in%20the%20West%20African%20Coastal%20Region%20EN.pdf

Kaba, A.D., Leeway, N., Nyunkor, J. & Wehyee, D. 2019. Implementing the Land Rights Law of Liberia: A Critical Test for Stakeholders. In: *SDI Briefing*, February 2019. Duarzon Village, Liberia. Sustainable Development Institute (SDI). https://sdiliberia.org/sites/default/files/publications/SDI%20Briefing%20Paper%2008%20Implementing%20The%20Land%20Rights%20Law%20Of%20Liberia-A%20Critical%20Test%20For%20Stakeholders.pdf

Kamara, V. 2022. In Liberia, a gold boom leads to unregulated mining and ailing rivers. Mongabay Series: Land rights & extractives. *Mongabay Conservation News.* 22 December 2022. [Cited 8 May 2023] https://news.mongabay.com/2022/12/in-liberia-a-gold-boom-leads-to-unregulated-mining-and-ailing-rivers/

Karmo, H. 2021. Liberia: FAO Supports youth participation in responsible agriculture investment policy dialogue. In: *Front Page Africa*, 15 October 2021. All Africa [Cited 10 May 2023]. https://allafrica.com/stories/202110150467.html

Kazadi, M. & Ryan, B. 2016. Value Chain Analysis Assessment Report: the selection of the most promising agricultural value chains in Liberia. Washington, DC, USAID. https://pdf.usaid.gov/pdf_docs/PA00T225.pdf

Kumeh, O.W., Fallah, M.P., Desai, I.K., Gilbert, H.N., Silverstein, J.B., Beste, S., Beste, J., Mukherjee, J.S. & Richardson, E.T. 2020. Literacy is power: structural drivers of child malnutrition in rural Liberia. *BMJ Nutrition, Prevention & Health*, 3(2): 295–307.

LISGIS (Liberia Institute of Statistics & Geo-information Services). 2017. Liberia Poverty Assessment Statistical Abstract. Agriculture Recall Survey 2016. LISGIS Agriculture Team, Monrovia. https://lisgis.gov.lr/admin_area/data_pdf/2022060994179FinalAgricultureRecall2016.pdf

LLA (Liberia Land Authority). n.d. About Liberia Land Authority. *LLA*. Monrovia. [Cited 22 July 2023]. www.lla.gov.lr/

LNBCC (Liberia Netherlands Business and Culture Council). 2017. *Sector Scan – The Agricultural Sector in Liberia.* December 2017. The Hague, the Netherlands, Netherlands, Ministry of Foreign Affairs.

Liberia. 2008. *The impact of high prices on food security in Liberia*. Monrovia.

Liberia. 2010. *Liberia Agriculture Sector Investment Program (LASIP) Report.* 20 September 2010. Monrovia.

Liberia. 2018a. Liberia Agriculture Sector Investment Plan II. Monrovia. www.gafspfund.org/sites/default/files/inline-files/7.%20LIBERIA_Investment%20Plan.pdf

Liberia. 2018b. Comprehensive Food Security and Nutrition Survey. Liberia CFSNS Report, August 2018. Monrovia. https://docs.wfp.org/api/documents/WFP-0000108990/download/?iframe

Liberia. 2019a. Global Agriculture and Food Security Program (GAFSP) Proposal. Monrovia. www.gafspfund.org/sites/default/files/inline-files/5.%20LIBERIA_GAFSP%20Proposal.pdf

Liberia. 2019b. *National Report: Land Degradation Neutrality Target Setting Program.* Monrovia.

Liberia. 2022. Rapid Food Security, Livelihoods, Nutrition and Market Assessment (RFSLNMA) 2022. In Liberia, Ministry of Agriculture and Ministry of Health, Monrovia. [Cited 11 December 2023]. https://mptf.undp.org/project/00132395

Liberia, Environment Protection Agency. 2021. *Liberia's Revised Nationally Determined Contribution (NDC).* July 2021. Monrovia.

Liberia, Ministry of Agriculture. 2014. National Livestock Policy and Veterinary & Animal Law. Draft report, July 2014. National Livestock Bureau. Supported by BRAC Liberia. www.wto.org/english/thewto_e/acc_e/lbr_e/wtacclbr15_leg_8.pdf

Liberia, Ministry of Finance and Development Planning. 2018. Pro-Poor Agenda Prosperity and Development (PAPD). Briefing book. https://globalnaps.org/wp-content/uploads/2019/01/liberia-national-development-agenda-pro-poor-agenda.pdf

Mercy Corps. 2017. *Growing a Future: Liberian Youth Reflect on Agriculture Livelihoods*. Portland, Oregon, USA, Mercy Corps.

Mildenhall, T. 2017. In a country racked by climate change, farming must change, too. In: *Conservation International*. 23 November 2017. [Cited 5 September 2023]. www.conservation.org/blog/in-a-country-racked-by-climate-change-farming-must-change-too

Murphy, E., Erickson, K. & Tubman, M. 2016. *Food Security Desk Review for Liberia*, 2016-2020. USAID Office of Food for Peace. Washington, DC, USAID.

ND-GAIN (Notre Dame Global Adaptation Initiative). 2020. Country Index. In: *University of Notre Dame*, Notre Dame, Indiana, USA. [Cited 22 September 2023]. https://gain.nd.edu/our-work/country-index

NIC (National Investment Commission). n.d. Agriculture & agribusiness. *NIC*, Monrovia. [Cited 13 September 2023].www.investliberia.gov.lr/industries/agribusiness#:~:text=With%20over%204%20million%20acres,husbandry%2C%20and%20fisheries%20and%20aquaculture

NICFI (Norway's International Climate and Forest Initiative). 2020. Liberia Fact Sheet. In: *NICFI*, Oslo. [Cited 5 September 2023]. www.nicfi.no/partner-countries/liberia/

Nthara, K. & Srivastava, S. 2020. Liberia: understanding people's dependence on forests. *World Bank Blogs*. 11 November 2020. Washington, DC, World Bank. [Cited 20 March 2023]. https://blogs.worldbank.org/africacan/liberia-understanding-peoples-dependence-forests

Pribadi, D.O. & Pauleit, S. 2015. Peri-urban agriculture in Jabodetabek Metropolitan Area and its relationship with the urban socioeconomic system. *Land Use Policy*, 55:265–274.

Rodrique, S. 2023b. Liberia's biological diversity is its economic power horse. UNDP Liberia, 22 May 2023. [Cited: 13 September 2023]. www.undp.org/liberia/blog/liberias-biological-diversity-its-economic-power-horse

RUAF (Resource Centre on Urban Agriculture and Food Security). 2012. Urban agriculture in Liberia. Policy narrative. https://ruaf.org/assets/2019/11/Policy-Narrative-Liberia.pdf

Seward, D.M. 2021. Case study on value chain analysis of natural resource exports in Liberia. *Journal of Service Science and Management*, 14, 597-626.

Sibanda, H.M. & Nyenka, J. 2011. Liberia National Action Programme to Combat Desertification 2011−2018: strengthening capacities for sustainable agriculture to reverse the trend of land degradation. April 2011. Environmental Protection Agency. Monrovia. www.unccd.int/sites/default/files/naps/Liberia-eng-2013.pdf

Sigman, V. & Davis, K. 2017. Liberia: Desk Study of Extension and Advisory Services. Developing Local Extension Capacity (DLEC) Project. June 2017. National Millennium Compact Development Project (NMCDP). Monrovia. www.digitalgreen.org/wp-content/uploads/2017/09/Liberia_Desk-Study.pdf

Tappan, G.G., Cushing, W.M., Cotillon, S.E., Hutchinson, J.A., Pengra, B., Alfari, I., Botoni, E., Soulé, A. & Herrmann, S.M. 2016. *Landscapes of West Africa: A window on a changing world.* Garretson, South Dakota, USA, United States Geological Survey.

Tarway-Twalla, A.K. 2013. Agricultural productivity, climate change and smallholder farmer's entrepreneurship: A case study of the central and western regions of Liberia. ICBE-RF Research Report No. 49/13. Dakar, Investment Climate and Business Environment Research Fund. [Cited 8 September 2023]. www.issuelab.org/resources/34973/34973.pdf

Truth and Reconciliation Commission. 2009. *Volume 2: Consolidated Final Report*, Monrovia, Truth and Reconciliation Commission of Liberia.

UN-Habitat (United Nations Human Settlements Programme) & Cities Alliance. 2017. *A National Urban Policy for Liberia – Discussion Paper.* Nairobi, UN-Habitat, Cities Alliance and Liberia. Ministry of Internal Affairs

UNCDF (UN Capital Development Fund) and UNDP (United Nations Development Programme). 2021. Financing Agricultural MSMEs in Liberia Livelihoods and Employment Creation Project. www.rfilc.org/wp-content/uploads/2022/01/Financial-Study-of-financing-Agricultural-MSMEs-in-Liberia.pdf

UNDP (United Nations Development Programme). 2023. Human Development Insights. UNDP. New York, United Nations Development Programme. [Cited 5 September 2023]. https://hdr.undp.org/data-center/country-insights#/ranks

USAID (United States Agency for International Development). 2017. *Assessment of Chronic Food Insecurity in Liberia.* https://fews.net/sites/default/files/documents/reports/Liberia%20Chronic%20Food%20Insecurity%20Report.pdf

USAID. 2020. *Off-Grid Solar Market Assessment Liberia.* Washington, DC, USAID and Pretoria, Power Africa.

Van Soelen, R.W. & Van Hoolwerff, R. 2018. Youth employment in agriculture through business development and education. In: *Urban Agriculture Magazine*: 35, November 2018. RUAF, The Hague, the Netherlands.

Weisse, M., Goldman, E. & Carter, S. 2023. Tropical primary forest loss worsened in 2022, despite international commitments to end deforestation. *Global Forest Review*. 27 June 2023. Washington, DC, World Resources Institute.

WFP (World Food Programme). 2022. Country brief Liberia. In: *WFP*. Rome. [Cited 5 July 2023] https://docs.wfp.org/api/documents/WFP-0000144161/download/?_ga=2.121636425.350672389.1670418410-576940120.1667471447

WFP. 2023. Liberia Annual Country Report 2022: Country Strategic Plan 2019−2023. [Cited 15 September 2023]. https://docs.wfp.org/api/documents/WFP-0000147969/download/

World Bank. 2010. Liberia: gender-aware programs and women's roles in agricultural value chains. Policy memorandum. Washington, DC, World Bank.

World Bank. 2020a. *People and Forest Interface: Contribution of Liberia's Forests to Household Incomes, Subsistence, and Resilience*. Washington, DC, World Bank.

World Bank. 2020b. Youth opportunities project in Liberia helps young people increase their earning potential. *World Bank Results Brief,* 10 November 2020. [Cited 15 September 2023]. www.worldbank.org/en/results/2020/11/10/youth-opportunities-project-in-liberia-helps-young-people-increase-their-earning-potential

World Bank. 2021a. *Climate Risk Country Profile: Liberia.* Washington, DC, World Bank.

World Bank. 2021b. Poverty & equity brief: Liberia. April 2021. Washington, DC, World Bank.

World Bank. 2022. Prevalence of stunting – Liberia. In: *World Bank Data*. Washington, DC. [Cited 20 March 2023]. https://data.worldbank.org/indicator/SH.STA.STNT.ZS?locations=LR

World Bank. 2023. Population, total – Liberia. In: *World Bank Data.* [Cited 20 March 2023] https://data.worldbank.org/indicator/SP.POP.TOTL?locations=LR

World Obesity.org. 2023. Liberia. In: *Global Obesity Observatory*. London. [Cited 5 September 2023]. https://data.worldobesity.org/country/liberia-121/

Worldometer. 2022. Liberia population (Live). In: *Worldometers.info*. Dover, Delaware, USA. [Cited 5 September 2023]. www.worldometers.info/world-population/liberia-population/

Wuor, M. & Mabon, L. 2022. Development of Liberia's fisheries sectors: current status and future needs. *Marine Policy*, 146: 105325.

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