

Millennium Challenge Corporation

**Sierra Leone
Constraints Analysis
Report
2021**



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Introduction

Situated on the tropical Atlantic coast of West Africa, Sierra Leone occupies an area roughly the size of West Virginia and is home to an estimated 8 million inhabitants. The country's economy, valued in 2019 at just over US\$4 billion dollars, or about US\$500 per capita, revolves primarily around low productivity agriculture and extractive mineral exports. Like many countries with a similar profile, poverty dominates Sierra Leone's economic landscape, with just over half the population living on less than \$1.90 per day. Growth has averaged about 6 percent annually over the previous two decades, but this number masks a roller coaster trajectory marked by shocks—particularly disease outbreak and commodity price drops—that can rapidly undo gradually-won gains. Coupled with the country's painstaking recovery from a devastating civil war that ended in 2002, Sierra Leone has struggled to transform from a rural, subsistence, small-holder agriculture economy into a more urban, modern, and productive one.



Figure 1 Map of Sierra Leone

Against this backdrop, the onset of the global COVID-19 pandemic has imposed unwelcome new challenges. Tourists have stayed home, exports have fallen, movement restrictions have choked the country's agriculture sector, and food insecurity rates have risen. Over 1 million additional people, concentrated primarily among the country's poor, reported emergency coping strategies in the wake of the pandemic, including selling property and other assets, in order to keep eating. Roughly half the country has reported downward adjustments in quantity and quality of food.

In 2013, MCC selected Sierra Leone for a Threshold Program (THP). At that time, the THP's Constraints Analysis (CA) identified power, water, and roads as the top binding constraints to the country's economic growth. In no small part due to the economic turbulence of the ensuing years, conditions in power and water since 2013 have not improved appreciably. Only about a fourth of the country's population has access to gridded power, most of which lives inside the capital Freetown. Meanwhile, domestic generating capacity, primarily in the form of hydropower dams, has not kept pace with a growing population's demand, resulting in frequent and persistent load shedding and rolling blackouts. In response to these shortfalls, the country relies heavily on costly diesel generators and offshore power ships to meet its electricity needs, raising the cost of business as well as the economy's dependence on imports of fuel and equipment. Meanwhile, access to drinking water remains critically low. Particularly in Freetown, issues of water access and quality remain problematic, adding stress to firms, households, and individual health and safety.

Additional major obstacles lie on the country's growth path. Looming large is the ever-present threat of malaria, Sierra Leone's leading cause of death. While malaria's incidence has steadily declined over the past decade, it continues to drive the country's high maternal and infant mortality rates, among the world's worst, and contributes to the country's large out-of-pocket medical expenses, depletes the availability and productivity of the workforce, and stymies human capital accumulation. Parallel to this, the country struggles to meet its growing population's food needs, particularly for staple crops like rice. Notwithstanding the agriculture sector's overall growth in value, stagnant rice yields have led to higher

dependence on food imports, exposing the country to rising international food prices and jeopardizing the population's food access and utilization.

In 2018, Sierra Leone's democracy experienced another successful transition of power with the election of President Julius Maada Bio. The current government, with whom this constraints analysis was conducted, is pursuing a national development plan through the year 2023 focused on growing human capital, agricultural productivity, and infrastructure investments.

Overview of History and Political Economy¹

Two themes consistently weave across the history and economics of Sierra Leone over the past two centuries: (1) the resilience of traditional, grass-roots power structures and (2) persistent vulnerability to unpredictable shocks of war, disease, and international economic volatility.

Resilient Chiefs: From Colonialism through the 21st Century

Accounts of Sierra Leone's history traditionally begin in 1787 when the British-owned Sierra Leone Company established a settlement on a peninsula off the West African coast frequented by Portuguese traders. Conceived as an effort to relocate London's impoverished population of escaped and freed slaves of African descent, the settlement, after fits and starts, gave rise to the colonial city of Freetown. Successive waves of migrants arrived from across the British Empire, including Jamaica and Nova Scotia, as well as West Africans liberated by the British from slave ships crossing the Atlantic. Early years in Freetown were hard scramble, as settlers struggled to acclimate to a new climate and geography as well as hostility from nearby local populations, but the British Crown's decision to center its West African colonial administration in Freetown cemented the city's status. Meanwhile, the confluence of different cultures gradually gave rise to a unique Freetown creole language, dubbed Krio, that bore hallmarks of the population's British and American past as well as elements of Yoruba, Portuguese, and even the local Temne.

In the ensuing decades, the growing population of Krio-speakers and their British governors built a trading economy based on groundnuts, palm oil and timber. Attention rarely ventured beyond the Freetown colony. But in the aftermath of the Berlin Conference of 1884-1885, in which European colonial powers parceled Africa's lands among themselves, the United Kingdom extended its occupation over a broader interior region called the Sierra Leone Protectorate. Unconcerned with the consent of the region's inhabitants, including the Temne and Mende peoples, British authorities applied a version of "indirect rule" over the population in which local chiefs would continue to govern, but with the assistance and within the broad restrictions of the British governor.

Who were the chiefs? Prior to the British arrival, chiefs in Sierra Leone occupied positions of leadership over populations at the local level. Whether as slave-trading warlords or in more agrarian-oriented roles, chiefs offered security and stability, rooted in unwritten rules of hierarchy and religious and cultural mores, in exchange for obedience to the chief's authority. Such reciprocity ensured a measure of responsiveness to the people's needs. Critically, chiefs controlled all communal land and also claimed an interest in other lands under their jurisdiction (Botazzi et al, 2016). Such claims could include a share of its produce, controlling the settlement of outsiders, witnessing land transactions, and serving as informal registrar of land ownership. The entry of outsiders or "foreigners" into land use agreements (*e.g.*, landlord

¹ Much of the material for this section draws from David Harris' 2014 book, "Sierra Leone: A Political History."

and tenant) was particularly nuanced, insomuch as relationships were more moral, political, and social and less contractual. Such conditions persist until this day (*Ibid.*).

Following the Crown's unwelcome effort to impose a dwelling tax on the protectorate, the "Hut Tax War of 1898" gave the colonial power its first taste of the chiefs' potent resistance, led by a Temne chief named Bai Bureh. Learning from this costly experience, the British opted to rule indirectly over the protectorate by formally delegating to paramount chiefs authority over matters of crime, taxes, resource allocation, and other public goods (Acemoglu et al., 2014). Among these "customary" laws included prohibitions of land ownership by individuals born outside the chiefdom, conferring ultimate ownership and authority of use upon the chief. As part of the bargain, the British promised the chiefs military support in exchange for the chiefs' loyalty to the Crown.

Emboldened by the shifting incentives, chiefs pursued newfound opportunities for rent-seeking, particularly in resource-rich areas, exploiting their positions as tax collectors, adjudicators, and directors of "communal labor," while increasingly neglecting their obligations to the populations. Social reciprocities between local chiefs and their subjects gradually eroded. Meanwhile, in colonial Freetown, legal institutions increasingly hewed to their British origins, casting two divergent paths of governance between Sierra Leone's colonial capital and interior protectorate, cementing a pattern of governance that would carry implications for the Sierra Leone's rule of law and economic growth for more than a century (Acemoglu et al. 2014).

By the 1950s, an increasingly organized alliance of protectorate chiefs began challenging Freetown's British and Krio-dominated elites for power. Led by Milton Margai, the Sierra Leone People's Party (SLPP) waged a campaign for self-determination culminating in 1961 when Sierra Leone negotiated its independence from the UK. Post-independence leadership swung repeatedly between Margai's SLPP and its splintered rival, the All People's Congress (APC), led by Siaka Stevens. With the exit of the British and the displacement of the Krio elite, divisions in the country reoriented broadly around ethno-regional dimensions, Mende versus Temne, north versus south. In 1968, the opposition APC won a closely challenged election, stirring further resistance, attempted coups, and other intrigues, paving the way for Stevens to declare a one-party state. His presidency, increasingly authoritarian, forcefully stifled dissent among civilians and political opponents, but critically, power structures remained intact through the long-standing decentralized chieftaincies that commanded patronage and spoils in exchange for political support.

In 2004, not long after the conclusion of Sierra Leone's civil war (see section below), the country's legislature passed the Local Government Act that devolved a significant portion of government decision making to the local level. Conceived as an effort to raise local participatory politics and stimulate a more responsive governance, the local councils that emerged often sat uncomfortably with the traditional chieftaincy. The Act transferred, at least nominally, a handful of duties and powers away from the chiefs, including the ability to decide tax rates. But to illustrate how conditions remained fundamentally unchanged, chiefs continued to collect taxes.

Shocks to the System: Civil War and Ebola

By 1991, political and economic conditions had deteriorated significantly. Prices of export commodities had fallen, imported food prices were rising, and basic essentials, including milk, kerosene, and medicine became increasingly scarce. Turning to multilateral lenders for assistance, the government accepted a raft

of conditionalities, including exchange rate devaluations, which further pushed import prices up, and the simultaneous discontinuation of rice and fuel subsidies. Government salaries, including for teachers and civil servants, went unpaid. Smugglers and soldiers, along with miners, increasingly conspired to ship diamonds extra-legally and pocket the gains, further depriving the government of revenue. Perceptions of elite corruption, particularly in Freetown, raised public discontent. Within a year, Siaka Stevens's successor, Joseph Momoh was overthrown in a coup, thus ending more than two decades of APC dominance.

With Sierra Leone's government in disarray, a group called the Revolutionary United Front (RUF), headed by a former Army corporal, seized the opportunity and entered from neighboring Liberia. The RUF rapidly claimed territory throughout the country's eastern province, asserting control over lucrative diamond mines, the revenue from which fueled the conflict's growth. While the motives of the RUF's leadership remain debated, some scholars observe that many fighters were drawn from the ranks of young, unlanded, rural men who nurtured grievances towards the local chieftaincies and the practice of customary law (Raleigh and De Bruijne, 2017; Peters and Richards, 2011). The RUF unleashed a wave of brutality and terror on the rural population of Sierra Leone, conscripting children into its forces and amputating countless victims as a warning to any who might resist, including the government. Lacking sufficient legitimacy and support across much of the population, national authorities struggled to rally the citizens. Elements of government militias, the Civil Defense Force, were even known to collaborate with the rebels, and in the eyes of some, the behaviors of both armed groups were indistinguishable. Over the course of a decade of fighting, contested elections, and two coups, over 50,000 people died, and at least half a million persons fled their homes.

By 2002, a combination of British, ECOWAS, and United Nations-backed forces intervened and quickly crushed the RUF, allowing the earlier-democratically elected leader, the SLPP's Ahmad Kabbah, to reassert control. Kabbah was peacefully replaced five years later by the APC's Ernest Koroma, effectively returning the country to a stable, democratic path. Significantly, despite the violent trauma of the conflict, the RUF failed to gain any genuine domestic support, nor did it spark any political reform. As such, Sierra Leone's fundamental power relationships did not budge. Patronage and spoils between Freetown's national leadership and the rural chiefdoms remained the *modus operandi* of governance. And consequently, the rights of Sierra Leone's rural citizens to housing, land, and political representation continued to derive from the chiefdom, not the state.

The civil war devastated Sierra Leone's economy. In the first year of the conflict, GDP fell by nearly 20% and growth remained flat or negative until the war's conclusion, leaving the population ranked last on the Human Development Index (Collier and Duponchel, 2012). But Sierra Leone was poor even before the war, and as such, the war's destruction fell not so much on physical but rather human capital. Through unemployment and atrophy, workers lost skills and know-how over the course of the war, and a generation of youth suffered from the lack of formal education. Workers abandoned wage-paying activities in urban centers and returned to subsistence agriculture for survival (*Ibid*). After the end of the civil conflict, agriculture and services, consisting primarily of low-productivity informal sector activities, led the economy's gradual rebound. With the aid of rising iron ore prices, per capita growth averaged about 6% over the period 2002-2014.

In 2014, a fresh shock struck Sierra Leone in the form of the Ebola virus disease epidemic, this time entering from Guinea. Transmitted rapidly through direct contact with fluids and tissues of infected victims, Ebola results in death in 50% of cases on average, with survivors experiencing a range of

debilitating symptoms, including fever, pain, headaches, impaired kidney and liver function, and internal bleeding (WHO, 2021). The [World Health Organization](#) called the West African Ebola outbreak the “most severe acute public health emergency seen in modern times.” Case counts quickly overwhelmed the country’s already-weak health system, and the government responded by sealing its international borders, closing schools, quarantining entire districts, and even imposing lockdowns. The restrictions on movement choked the agriculture sector as labor could not be hired to work fields, and crops could not be cultivated, harvested, or marketed (FAO, 2014). Food shortages and hunger resulted, prompting resistance to the restrictions. Sierra Leone stretched its resources to cover treatment costs, leaving patients of other diseases, including malaria, underserved. Between the years 2014 and 2015, Sierra Leone’s economy shrunk by 22 percent, and by 2019 it had not yet fully returned to its earlier high (WDI, 2021a).

Volatile Resources: Sierra Leone’s Extractive Sector

Following the establishment of the protectorate, British interests turned to the region’s abundant agricultural and mineral resources. An early railway from the protectorate’s interior to Freetown served to move farm goods that ultimately reached markets in Europe. Over the course of the 20th century, Sierra Leone cultivated several cash crops for export, including tropical fruits, palm oil, coffee, and cocoa. But in the 1930s, the discovery of valuable diamonds, iron ore, bauxite, and rutile added fresh urgency to British, and later Sierra Leonian, export revenue-seeking efforts.

Diamonds, easily dredged in alluvial soils, offered low entry costs for firms and solo diggers. But profitable extraction coupled with the ease of smuggling attracted a range of illicit actors which authorities were nearly helpless to stop. Notwithstanding such leakage, in the years following independence, diamonds accounted for 70-80 percent of export earnings and soon became Sierra Leone’s top export. Meanwhile, iron exports similarly grew, supplying 40 percent of the UK’s consumption. Returns to state coffers grew, but high wages paid to iron ore miners soon drew workers out of agriculture, a sectoral labor shift that led to a shortage of rice. Consequently, a newfound dependence on high-priced food imports emerged by the early 1960s. In short, a kind of “Dutch Disease” crept into Sierra Leone’s economy as imports limited growth in other productive sectors thanks to the terms of trade afforded by high-value extractive exports. Since 2011, mineral ores have dominated Sierra Leone’s export portfolio, dwarfing its once rival diamonds, as well as cocoa, wood, and fish (Figure 2).

Sierra Leone’s government relied heavily on iron ore and other mineral exports to support its balance of payments, mobilize revenue, and to postpone difficult reforms. Rent seekers clustered in tradeables and secured privileged access to licensing, foreign exchange, and finance, while the government resisted

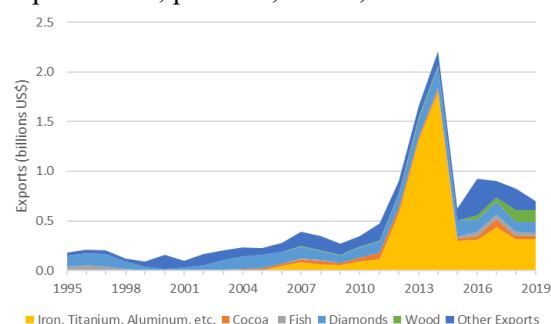


Figure 2 Major commodity exports, 2010-2019.
Source Data: [Observatory of Economic Complexity](#)

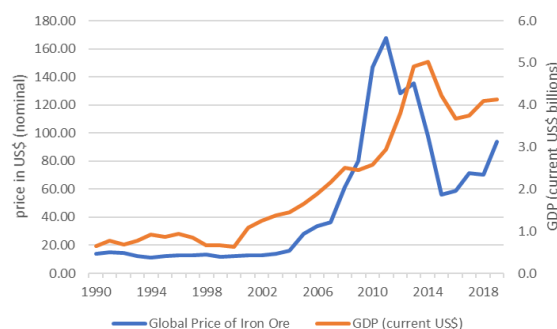


Figure 3 Sierra Leone GDP and Global Iron Ore Price, 1990-2019. Source: [WDI](#) and [St. Louis Federal Reserve](#).

widening its tax base. The sustainability of this strategy, of course, hinged entirely on international prices, and Sierra Leone's fortunes have tracked closely with the global price of iron ore (Figure 3). Over the period 2010-2013, high prices helped push Sierra Leone's economy to experience double digit growth. But the following years saw prices plummet, iron ore production fall, and in combination with the Ebola outbreak, per capita income growth fell to nearly zero. Iron ore price volatility, as well as prices for diamonds, cocoa, and coffee, consequently, expose Sierra Leone to large macro-level risks with predictable implications for the country's fiscal and trade balance, as discussed below.

Connecting Poverty to Economic Growth

Sierra Leone's unproductive rural sector, heavy dependence on resource extraction, and repeated susceptibility to macro-level shocks help explain its high rates of poverty. Understanding the landscape of Sierra Leone's poverty and its variation across space and economic activity can help locate the country's position along the path of structural transformation and ultimately inform its growth question.

Poverty in Sierra Leone

The 2018 Integrated Household Survey places the official poverty rate at 57 percent, reflecting a combination of insufficient income for food and non-food goods (SLIHS, 2019).² The food poverty rate, taken alone, reaches about 55 percent. Total poverty has fallen slightly since an earlier round of surveys in 2011, but urban areas accounted for nearly all the improvement. That said, owing to Sierra Leone's rapid population growth, the total number of poor and extreme poor in Sierra Leone actually rose, concentrating mostly in rural areas (Figure 4). Indeed, rural populations currently experience poverty at twice the rate of their urban counterparts, 74 and 35 percent respectively (*Ibid*). Poverty rates are highest in the districts of Tonkolili (84.8 percent) and Pujehun (84.6), while the lowest are found in Western Area Urban (16.3), where Freetown is located (Figure 5).

Meanwhile, growth in the economy has not favored the poor. Growth incidence curves reveal sizable differences in consumption growth across income levels. In greater Freetown, the highest per capita consumers also experienced the highest rates of consumption growth, ranging from 30 to 50 percent in the highest decile (Figure 6). In rural areas and small

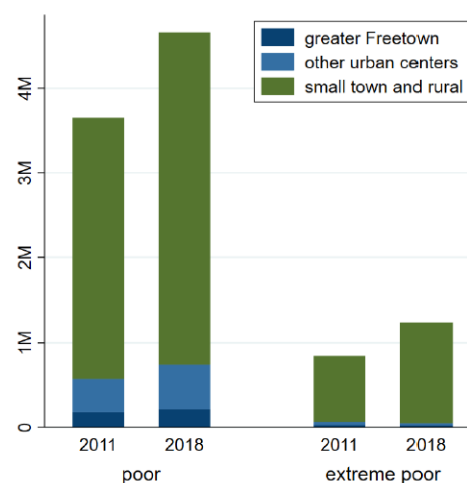


Figure 4 Changes in Composition of Poverty by Category and Location, 2011 to 2018. Source: World Bank (2021b).

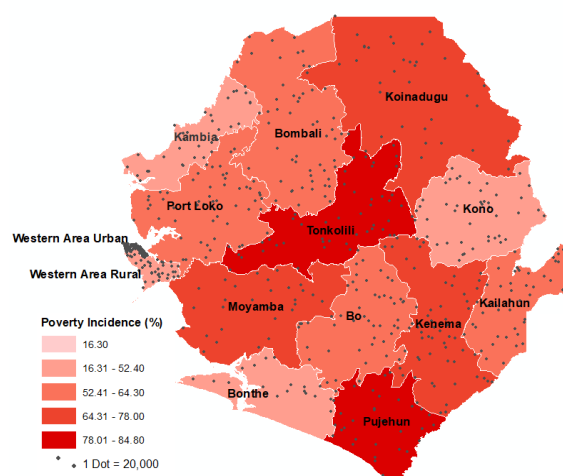


Figure 5 District-level distribution of Total Poverty Incidence and District Population. Source data: World Bank (2021b) and authors' calculations.

² The national poverty line is US\$2.87 in 2011 purchasing power parity terms. Using the international standard of \$1.90 a day (2011 purchasing power parity US\$), the poverty rate in Sierra Leone is about 41%.

towns, changes in consumption hovered around zero for the lowest half of the distribution and barely reached 5 percent in the upper half. Only cities outside Freetown see pro-poor consumption growth. These results reflect worsening inequality in the country, with the Gini coefficient for income rising from 0.33 to 0.37 over the period 2011-2018.

Perhaps not surprisingly, the strongest predictor of poverty in Sierra Leone is agricultural activity (World Bank, 2021b). Nearly 75 percent of agricultural households fall below the national poverty line, an outcome largely due to low productivity. Conversely, the biggest contributor to poverty reduction is urban residence, whether by birth or through migration.

Finally, the government of Sierra Leone Fiscal pursues a variety of subsidy and tax policies with varying incidences and effects across the income distribution. Details of these will appear separately in a report prepared by the Center for Equity (CEQ) Institute.

Structural Transformation in Sierra Leone

Key to diagnosing a country's growth constraints is identifying its stage in the process of structural transformation (Box 1). In Sierra Leone, nearly 60 percent of the population is rural, and correspondingly, about 55 percent of the labor force farms (Figure 7). Traditionally, structural transformation implies a shrinking agricultural share of the economy, but in the case of Sierra Leone, agriculture's share has in fact grown substantially, reaching 54 percent of GDP in 2019 (Figure 8). Driving this growth is area expansion in rice and yield improvements in cassava. But rice yields remain at the same levels today as 20 years ago, and per capita productivity remains similarly unchanged, albeit fairly volatile (Figure 9). Factoring in the country's rapidly growing population, per capita production of this staple crop has not grown, with implications for subsistence producers' food security. Cash crops like cocoa, palm oil, coffee, and groundnuts have similarly experienced stagnant or falling yields. As a result, in Sierra Leone, rural food poverty approaches 60 percent in rural areas, and over 80 percent of rural inhabitants report using food-related coping strategies, outcomes that point in part to inadequate production (World Bank (2021b; SLIHS, 2019)).

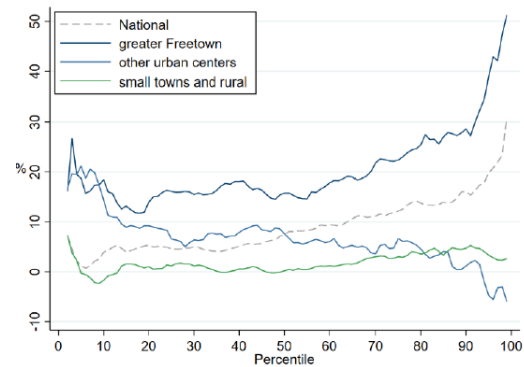


Figure 6 Growth Incidence Curves by Location, 2011-2018. Source: World Bank (2021b).

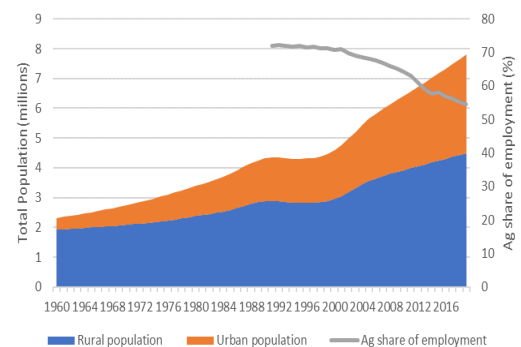


Figure 7 Rural and Urban Population, Agriculture Share of Employment. Source data: [WDI](#)

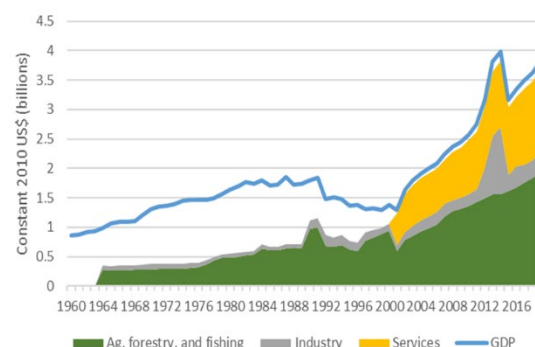


Figure 8 Sectoral Composition of GDP. Source data: Stats Sierra Leone

Another feature of structural transformation is lower food prices. But with Sierra Leone's current production conditions, rice prices have risen from about SLE 1.5 million per MT to 5.5 million over the last 10 years (constant 2014-2016 prices) (FAOSTAT, 2021). As a result, the food share of total expenditures remains very high with one source estimating that about 31 percent of all households spend at least 75 percent of their budgets on food (WFP, 2020). Apart from immediate food insecurity concerns, this carries implications for non-food demand, including goods and services produced in urban markets.

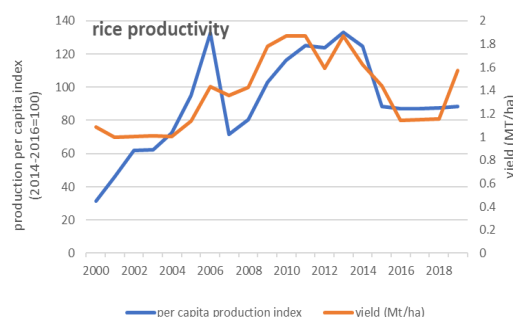


Figure 9 Rice yields and per capita productivity.
Source: [FAOSTAT](#).

Obstacles to food production include the lack of inputs, particularly improved seeds and fertilizer. Uptake of the locally-suitable New Rice for Africa (NERICA), which offers greater yields, hovers around 6 percent (SLIHS, 2019). Overall, improved seed varieties account for no more than 10% (WFP-FAO, 2015). And while Sierra Leone generally experiences plentiful rainfall, unpredictable weather harms yields and underscores the near complete absence of irrigation. Apart from technical inputs, the question of land also looms over the agriculture sector. Average plot sizes hover around 1 hectare, and opportunities for producers to expand area and achieve scale economies run into numerous challenges, not the least of which is the aforementioned customary law and the priorities of the local chief. Overall, land under cultivation accounts for only 50 percent of available agricultural land (FAOSTAT, 2021).

Meanwhile Sierra Leone's population is rapidly urbanizing, averaging over 3 percent annually over the period 2010-2019, but this has not accompanied an evolution into higher value productive activities. Rather, urban workers engage in informal, low-productivity services earning meager wages. Much of this owes to the workforce's low levels of human capital, and infrastructural complements to labor's inputs remain sorely missing, namely electricity. Two-thirds of Sierra Leone's power derives from costly, imported sources, including power ships and diesel generators, rolling blackouts are prolonged and frequent, and less than half the urban population is connected to a grid.

In short, Sierra Leone's signals of structural transformation are at once incomplete and misleading. The agriculture sector is growing, but productivity in key crops remains low, resulting in low per capita food availability. Meanwhile, urbanization is rapidly growing, but this masks the poor infrastructure and low private investment necessary to stimulate higher-value production and gainfully employ an ever-growing bulge of young workers. (Sierra Leone's median age is about 19 years.) Such conditions imply an imminent limit to urbanization's poverty reducing effects (World Bank, 2021b). Changing this dynamic requires identifying pathways in which the country's rural sector can reach higher productivity, satisfy its food security needs, and release workers capable of participating in higher-value labor markets. In a complementary fashion, singling out barriers to productive activities in urban settings, particularly in terms of large infrastructural inputs, can incentivize investments that create jobs and further raise incomes.

Box 2: Structural Transformation as a Framework for Understanding Growth

Since Adam Smith, economists have observed that incomes rise when rural, traditional agricultural workers gradually transition to modern activities in urban settings. Critically, this transition hinges on

unlocking paths to productivity growth, both in rural and urban economies, by raising output in the farm sector, developing human capital, and preparing urban public goods, *i.e.* infrastructure, necessary for investment and ultimately job and income growth (Gollin, 2009).

Traditionally, productivity growth in agriculture allows subsistence producers to solve what Schultz (1953) called the “food problem.” Satisfying household food requirements drives the emergence of crop surpluses onto the market, and helps push food prices down, effectively raising the real incomes of non-farm workers (Eberhardt and Vollrath, 2018; Gollin, Parente, Rogerson, 2007). Meanwhile, with greater per-person and per-area productivity and lower food prices, redundant farm labor sees its income fall. The emergence of higher non-farm wages, usually in cities, helps stimulate rural-to-urban migration as workers seek better employment opportunities. For this reason, in settings where the vast majority of the population is rural and engaged in farming, relaxing constraints to agricultural productivity and human capital formation can play a critical role in preparing workers for new labor markets (Henderson et al, 2018; Kogel and Prskawetz, 2001).

Meanwhile, to absorb newly released rural labor, cities must be prepared. Modern industries with economies of scale, *i.e.*, manufacturing, as well as ICT, tourism, logistics and transport, require critical infrastructural inputs, such as power, transportation, WASH, as well as access to finance and effective institutions of governance. Human capital also matters, inasmuch as even the simplest modern activities rely on literate, numerate workers to operate machinery, computers, and other technologies.

Gender and Social Inclusion

Constraints to economic growth, and more generally, conditions of the overall economy, government, and society, can differentially affect specific segments of Sierra Leone’s population. Features of gender, age, geography, and ethnicity often pose heightened barriers to accessing economic opportunities and public goods and services, and the discussions above touch on poverty’s correlation with geography, urban-rural status, and age. Gender, however, also shapes a variety of outcomes, ranging from health, land tenure, education, and employment.

Gender disparities in Sierra Leone are large. The female-to-male life expectancy ratio is the second lowest world-wide, maternal mortality is third highest, and infant mortality is the second highest. Gender-based violence—this includes sexual violence and FGM—remains pervasive. Sixty percent of women in Sierra Leone have experienced physical violence since age 15. The consequences of such violence for health, human capital, and productivity are life-long.

Meanwhile, women play outsized roles in Sierra Leone’s dominant agriculture sector but capture relatively little returns. Women farmers grow mostly food crops, often for subsistence, including rice, maize, vegetables, cassava, and groundnuts, while men dominate more profitable cash crops, *e.g.*, palm oil, cacao. On average, women hold 25 percent less land than their male counterparts, age 26 to 64, a consequence of unequal customs of inheritance and access to finance. Disparities in access to finance further constrain women from purchasing agricultural input with implications for yields and ultimately profits. Women also participate heavily in value-adding activities such as processing cassava, vegetables, and fish. But processing technologies remain largely out of reach, owing not just to low access to finance but also to virtually non-existent electricity infrastructure, rendering their work less productive, more time consuming, and arduous.

Separately, household tasks, including water and firewood collection, fall unevenly on women, resulting

in greater time spent away from education and other productive activities. Care-related tasks, both for children and other dependents, disproportionately fall on women, further limiting their ability to grow their human capital and enter the work force.

Top Binding Constraints to Growth

Sierra Leone confronts a long list of challenges in growing its economy. The Constraints Analysis aims to diagnose which elements in the economy are most binding on its growth based on a suite of empirical tests, couched in larger lessons about growth paths, both historical and present-day, and close consultation with country counterparts. From the analysis, four main binding constraints emerge.

- **Power** Sierra Leone lacks sufficient power resources, in terms of generation, transmission, and distribution, to support firm and household activities with heavy consequences to private sector investment and job creation.
- **Health** Malaria, Sierra Leone's leading cause of death, poses a costly burden on people's health, productivity, and finances.
- **Food Insecurity and Supply** Low food production and high food prices force a large segment of the population to sacrifice their diet and livelihoods in order to survive.
- **Water** Poor drinking water infrastructure, particularly in the capital Freetown, imposes large firm and household costs in terms of time, health, money, and security.

An important element of the empirical tests entails comparisons to countries similar to Sierra Leone. Following an analysis of specific geographic, demographic, and economic dimensions, the details of which appear in the Appendix, five comparator countries emerged: **Guinea, Liberia, Cote de Ivoire, Tanzania, and Nicaragua.**

The following sub-sections address each one of these Top Binding Constraints in more detail. Later sections touch on the additional constraints that the analysis considered.

Power

A key input into any economy's production function is power. Without reliable electricity, factories struggle to operate their equipment and machinery, and firms cannot fully exploit modern computing and communication technologies. Such conditions harm productivity, reduce profitable output, and ultimately erode private investment. Meanwhile, households without electricity struggle to cook and store food, withstand temperature extremes, and must limit many activities to daylight hours, with direct implications on incomes, time use, and health (Kojima et al., 2016; Cook, 2011). Within the framework of structural transformation, inadequate electric power generation and access effectively discourages investments in factories, shops, and offices, thus stalling the productivity-enhancing transition of rural labor to urban markets. Sierra Leone's nearly non-existent manufacturing sector is a testimony to this.

In Sierra Leone, poor power generation and distribution infrastructure along with weak institutional governance regularly result in frequent and prolonged outages in Freetown and other urban centers. Much of the remaining population—this includes virtually all of SL’s rural population—remains completely disconnected from the country’s main grid. As a result, per capita and per GDP unit consumption rates are the lowest among comparators (Figure 10) and among the lowest in the world.

Sierra Leone’s power sector consists of a generating-transmitting entity, a distributor, and a regulator. The state-owned Electricity Generation and Transmission Company (EGTC) produces hydropower from dams located in the country’s interior, the largest being the Bumbuna I plant. A transmission line directly connects the plant to Freetown, where nearly all the electricity is consumed, but along this line, and throughout the remainder of the distribution network, losses approach 40 percent (World Bank, 2016).

Hydropower generation varies substantially year-round owing to seasonal rains, and as such, domestic power supply fluctuates dramatically (Figure 11). To circumvent this constraint, Sierra Leone’s distributor, the Electricity Distribution and Supply Authority (EDSA) separately contracts independent power providers (IPPs), namely Turkish-owned off-shore power ships, to supply the grid, accounting for nearly 90 percent of supply during certain times of the year. Unlike renewable hydropower, power ships rely on costly heavy oil, the price of which is built into supply contracts with EGTC, exposing the government’s fiscal balance to global oil market fluctuations.

‘A consequence of inadequate supply is service disruption owing to load shedding, *i.e.*, rolling blackouts, and unplanned outages. Households with grid connections report having power about 15 hours a week on average (SLIHS, 2019). The World Bank’s Doing Business indicators show that disruption frequency and duration for firms put Sierra Leone close to the bottom of all countries that report data. SAIDI and SAIFI values are an average 62.4 hours and 24 instances of outages per year, respectively. According to World Bank’s Enterprise Survey, losses attributable to service disruptions equal almost 16 percent of annual sales (World Bank, 2021c). Firms respond by pursuing alternative energy sources. Seventy percent of firms report owning diesel generators as either a primary source of power or a back-up in the event of blackouts or outages, supplying nearly 50 percent of their power needs (World Bank, 2021c).

A separate obstacle is access. In 2018, only about 21 percent of SLE’s households were connected to an electrical grid (SLIHS, 2019), up from about 13 percent in 2011 (Kojima et al., 2016). Nearly all this growth owes to grid expansion in Freetown. Rural households, to work around this access constraint,

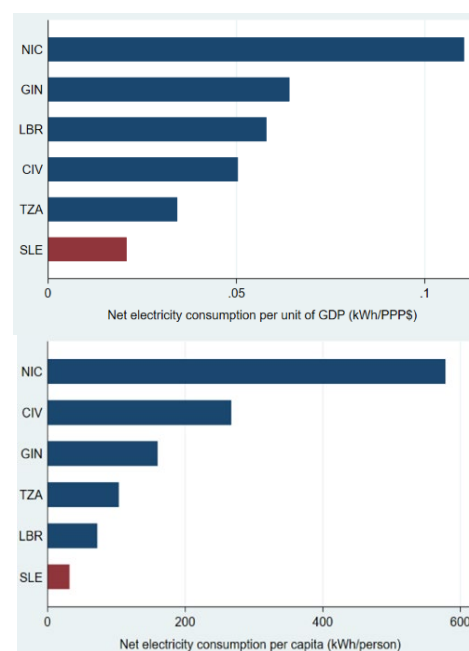


Figure 10 Per GDP Unit and Per Capita Electricity Consumption among Comparators. [Source data]

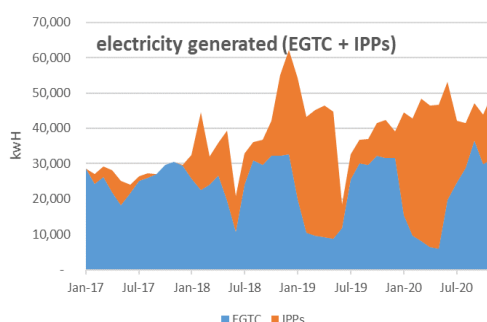


Figure 11 Power Generation by Source. Source data: Government of Sierra Leone

Health

A country's population, or human capital endowment, plays a critical role in that country's productivity level and growth story. A healthy and adequately skilled workforce not only provides the labor and entrepreneurial talent necessary for economic activities but also includes members responsible for building and maintaining the institutions and public goods which serve as crucial complementary inputs to the labor of their fellow citizens.

In Sierra Leone, poor health is a major constraint to investment, growth, and poverty reduction, reducing the effectiveness of the existing workforce and making investing in human capital more difficult. Analysis of household survey data suggests that, in 2018, 25 percent of working-age Leoneans had experienced an illness or injury within the previous 4 weeks (SLIHS 2018). The same group reported being unable to perform their usual activities for 6 days on average due to this illness or injury. Even among the working age population, malaria—the largest impact of which is on children and pregnant women—still appears to be the most common cause of these reported illnesses: fever was a reported symptom for 50 percent of these illness/injury episodes; and, among the 55 percent that sought care, 54 percent received a malaria diagnosis. This sickness burden varies greatly between districts and appears correlated with poverty. In Tokolili district, which has the nation's highest poverty rate, 42 percent of the working age population was sicked or injured in the previous four weeks—resulting in, on average, eight lost days for the sick/injured.

Macro-level indicators from WDI corroborate this story of poor health outcomes (Figure 14). Although these indicators have improved markedly over the past two decades, outcomes remain poor relative to comparators and the rest of the world. Further, in some cases, progress appears to have recently slowed such that future convergence may not be guaranteed. Life expectancy at birth was 55 years in 2019—an increase of 15 years since 2001, but still fifth lowest life expectancy in the world and recent trends suggest the Sierra Leone is not on track to catch up with comparators in this regard. The story is similar for under-5 and maternal mortality, which are not only important in their own right, but also serve as an indicator of the overall functioning of a health system. Under-5 mortality in Sierra Leone remains 4th highest in the world, but the rate has halved from 22% of live births to 11% in 2019. Further, current progress suggests that performance on this outcome is likely to converge with that of comparator

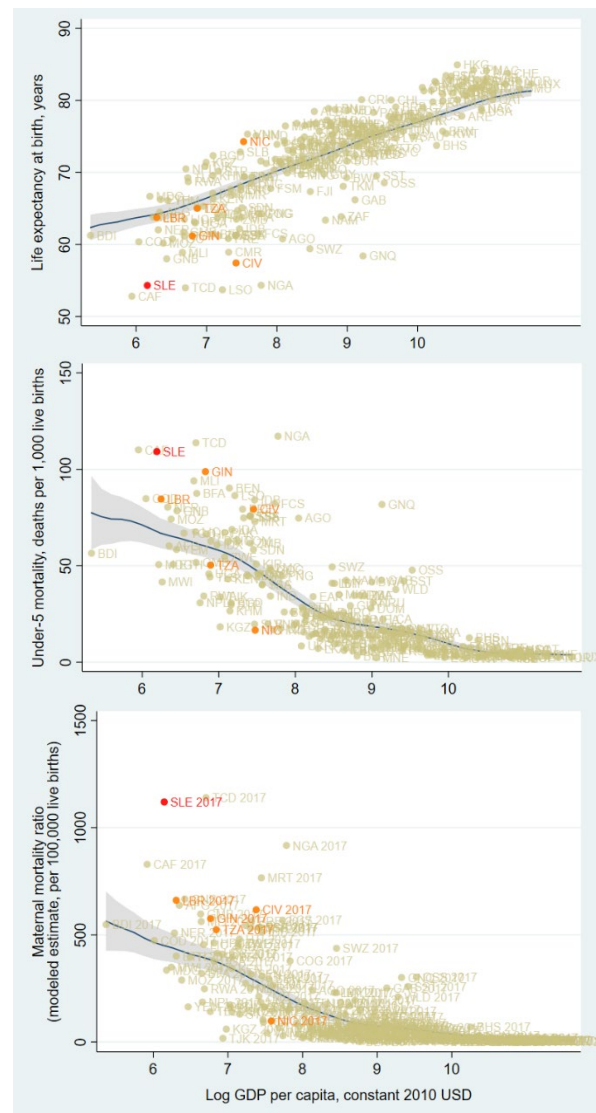


Figure 14 Health indicators relative to income level.
Source: WDI

countries in the near future. Conversely, progress on maternal mortality has been more problematic. Despite rapid improvements during the first decade of the 21st century (from 2480 deaths per 100,000 live births in 2001 to 1360 deaths by 2010), this progress has since stalled and remained at 1,120 deaths per 100,000 live births in both 2016 and 2017, the second highest rate in the world.

The Global Burden of Disease Study also shows improvements over time but a country where the burden of disease remains high, and largely driven by preventable infectious diseases (Figure 15). The overall annual disease burden decreased from 362,321 disability adjusted life-years (DALYs) per 100,000 population in 1999 to 171,730 DALYs/100k in 2019. The top five causes of disability and death in 2019 were malaria (9,961 DALYs/100k), neonatal disorders (7,379), lower respiratory infections (5,628), congenital defects (2,850), and diarrheal diseases (2,599). By these estimates, Sierra Leone's disease burden from malaria was the highest in the world in 2019 (Figure 16).

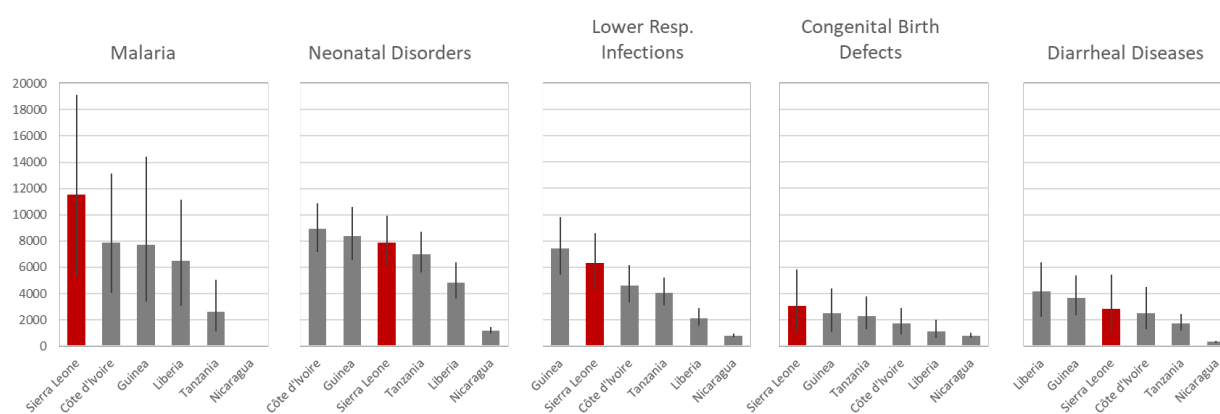


Figure 15 Annual DALYs per 100,000 population relative to comparators for Sierra Leone's top 5 causes of disease and disability, Source: IHME GBD

Malaria is most deadly for those with reduced immunity to the parasite, namely children, pregnant women and other adults not previously exposed (CDC). Infections are often asymptomatic in adults who survived childhood infections, but these cases can serve as a reservoir for infecting vulnerable family or community members (Topazian et. al., 2020), and malaria can still be linked to increased absenteeism and decreased earnings in adult workforces (see, e.g., Lukwa et. al. 2019; Dillon, Friedman and Serneels, 2013). Finally, cerebral malaria can also cause long lasting brain damage (Idro et. al. 2011). Macro-indicators suggest that the prevalence of malaria and the burden it poses both appear to have decreased substantially over the past two decades. However, the WHO prevalence estimates included substantial swings up and down during this period, and measurements of anemia prevalence—an easier to measure symptom of malaria—have stagnated or potentially risen slightly in recent years. Sierra Leone was designated as a U.S. President's Malaria Initiative (PMI) focus

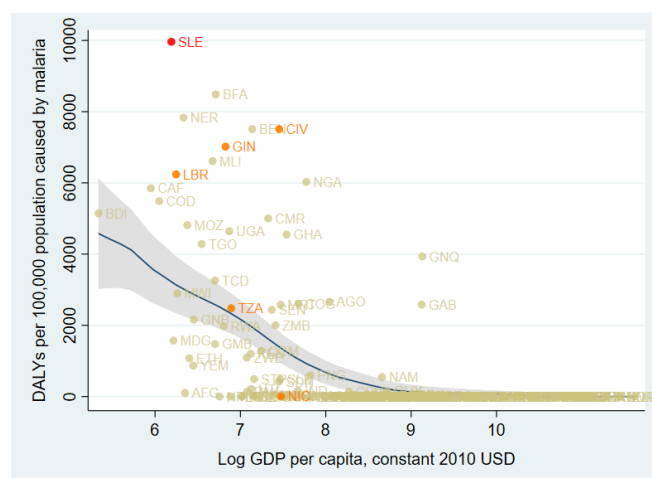


Figure 16 DALYs per 100k population caused by malaria relative to income level, Source: IHME GBD and WDI

country in 2017, receiving \$15 million in funding for fiscal years 2017, which has since decreased to \$14.5 million for FY 2021. The Global Fund is another important player in the push to control and eventually eradicate Malaria in Sierra Leone, disbursing \$14.9 million in budget year 2020.

While Malaria appears to play the largest role in death, disability, and absenteeism in Sierra Leone, it is not the only driver of poor health among the population. One hundred percent of the population is exposed to PM 2.5 particulate air pollution levels exceeding WHO guidelines. In 2016, 324 deaths per 100,000 annual deaths were attributable to household and ambient air pollution and 81 deaths per 100,000 were attributed to unsafe water, unsafe sanitation and lack of hygiene (WHO GHO). Finally, while the prevalence of under-five stunting and other indicators of malnutrition are improving, recent trends in food insecurity could threaten this progress. Chronic undernourishment is also a key risk factor driving vulnerable to other sources of illness and injury.

Despite Sierra Leone's poor health outcomes, the country's out-of-pocket health expenditures are high, both for its income level and among its comparators (see category stack labeled "Other domestic revenues" in Figure 17 and Figure 18). High spending directed at poor outcomes reveals that the population views poor health as a critical constraint, allocating an outsized portion of its budget to overcome it. Moreover, in the presence of more binding constraints, high international health-related funding during the Ebola epidemic could have crowded-out local and private spending. But evidence of such an effect has been short-lived, and out-of-pocket health spending has since begun to rise again (WHO GHED).

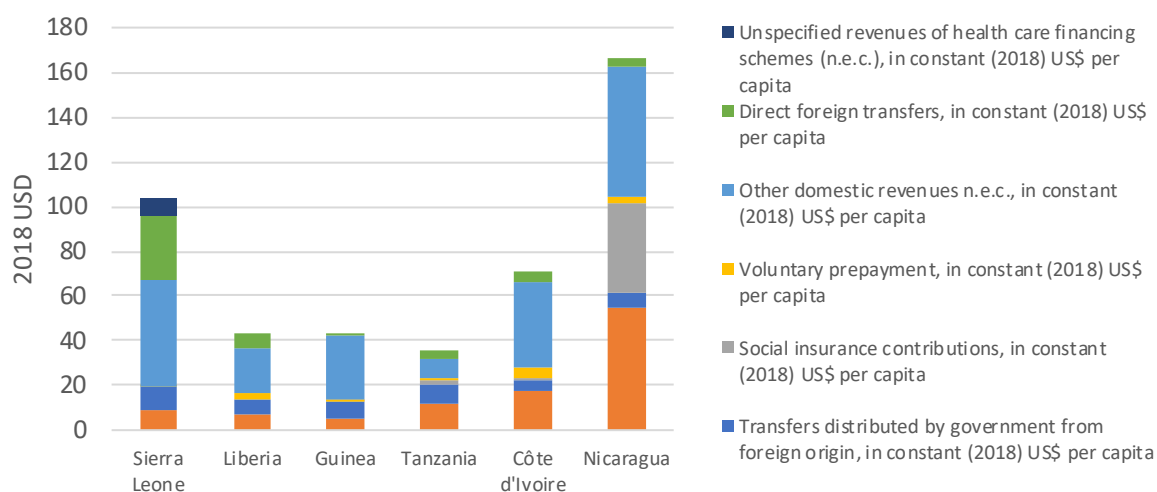


Figure 17 Average annual per capita health expenditures by financing source, 2014-2018, Sierra Leone and comparators. Source: WHO GHED

The health constraint is particularly binding in light of Sierra Leone's low-income level, insomuch as health spending has a higher opportunity cost for households with less total income available for other consumption items (Figure 18, right panel). In 2018, 17 percent of Leoneans lived in households with health expenditures greater than or equal to ten percent of their total household expenditures, and 4 percent lived in households in which health expenditures exceeded twenty five percent of total expenditures (SLIHS 2018). Exposure to health shocks is even greater in poorer districts. In Tonkolili district, the average household spent about 8 percent of their total expenditures on health expenses. Around 27 percent of households spent more than 10 percent, and 8 percent spent above 25 percent.

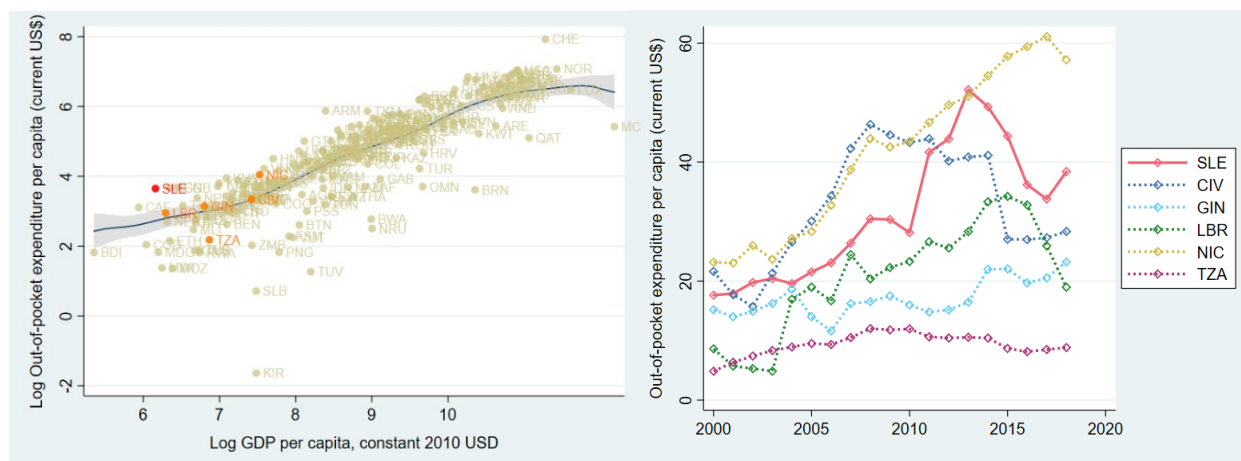


Figure 18 Per capita out-of-pocket health expenditures relative to income level (left) and trends relative to comparators (right), Source: WDI

Food Insecurity and Supply

As described earlier, solving the “food problem” is often an important step on the path of structural transformation, particularly in its earliest stages. Sierra Leone continues to face a serious food problem, insomuch as its citizens contend with worsening rates of food insecurity, and its farmers struggle to produce enough food to meet both their own needs as well as supply the market. This section describes food security and its different channels of impact and presents basic indicators of its prevalence across various health and economic dimensions in Sierra Leone.

Definitions and Impact Channels

Food security, defined by the [United Nations’ Committee on World Food Security](#) as “physical, social, and economic access to sufficient, safe, and nutritious food that satisfies food preferences and dietary needs for an active and healthy life,” remains out of reach for a large segment of Sierra Leone’s population, notwithstanding the agriculture sector’s large and growing share of the economy. Food insecurity arises in several ways (Figure 19). For rural, subsistence farming households, inadequate food production, itself a function of an array of agricultural inputs, plays a major role. In urban and other market settings, domestic production still matters, but so too do food prices, low incomes, and the preferences of consumers. Local food prices also move in tandem with several macro-level variables, including domestic inflation, exchange rates, and international food prices.

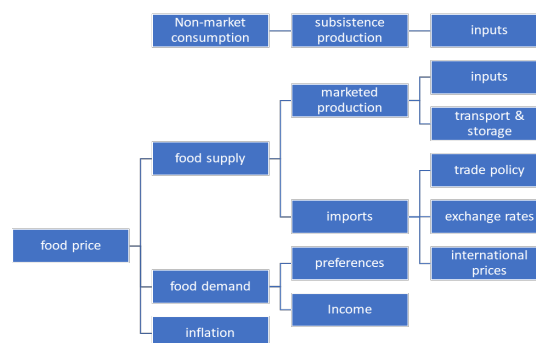


Figure 19 Linkages Among Determinants of Food Security

Food insecurity and supply operate across multiple elements of an economy (de Janvry and Sadoulet, 2010). The most direct link is to human capital, a catch-all term for the skills, know-how, and physical ability to produce goods and services, which requires a minimum level of human nutrition and health (Fogel, 2004). Food insecurity also impacts human capital through education, insomuch as poor diets or household farm labor duties deprive children of opportunities to study or diminish their learning abilities

(Jyoti et al., 2005). Separately, food insecurity raises individual and household-level risks. If survival is at stake, risk-averse households may sell productive assets (e.g., land, machinery), decline opportunities to invest, or incur debts to smooth consumption (Musemwa et al., 2015). Farmers may also shift to greater subsistence production, diversify their crop mix, and consequently forego the benefits of specialization and commercialization (Ellis, 1998).

Food security and supply can also contribute to macro-level risks. To the extent that domestic food production does not meet consumption needs, consumers must turn to imports, at once exposing them to international food price volatility and potentially driving upward the overall domestic price level. Greater import dependency not only drives prices up in local currency units—*ceteris paribus* more imports will push the exchange rates down— but also depletes a country’s foreign exchange holdings. Potentially more impactful are the food insecurity’s threats to political stability and civil conflict (Bellemare, 2015; Breisinger et al., 2014).

Indicators and Comparisons

Food insecurity rates in Sierra Leone are among the world’s highest, second highest among comparators, and have risen consistently since 2015 (WDI, 2021). In 2019, about 30 percent of the population was reported to be severely food insecure and an additional 50 percent moderately food insecure (Figure 20). Severe food insecurity includes forced reduction of food quantities, skipping meals, going hungry, or going a whole day without eating because of a lack of money or other resources. Moderate food insecurity denotes exposure to low quality diets and potentially reduced quantity of food normally eaten due to lack of money or other resources

The World Food Program, applying a different survey instrument to collect samples in early and mid-2020, capturing conditions immediately before and during COVID-19, reports over 1 million additional people became food insecure during the first half of 2020 (WFP, 2020b). By the WFP’s estimates, over 5 million people are food insecure, with the highest rates observed in districts Port Loko (89 percent), Falaba (79 percent), and Bombali (77 percent). That said, the greatest number of food insecure inhabitants (608,000) lives in the capital Freetown. Results from the survey point to COVID-related movement restrictions as a major cause of newfound food insecurity, but more long-standing contributors include poor harvests, high food prices, and failing health or death of family members.

Measures and taxonomies of food insecurity abound. A popular approach decomposes the concept into four distinct elements: (1) availability, (2) access, (3) stability, and (4) utilization. In Sierra Leone, the strongest signals pertain to access and stability, but evidence across all four elements is considered.

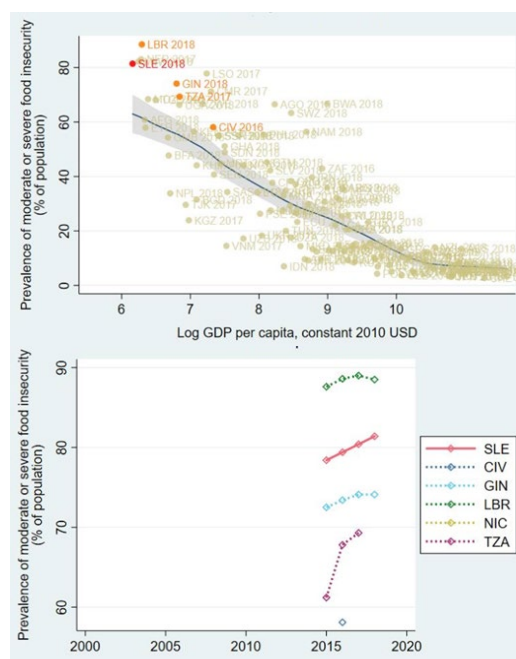


Figure 20 Prevalence of Food Insecurity by GDP and among Comparators. Source Data: [WDI](#).

Availability refers to the supply of food, itself function of physical, managerial, and institutional inputs that ultimately determine yields, production, and marketed quantities. In Sierra Leone, food availability trends have varied across crops, but for the major staple rice, it has not substantially changed in the past 20 years. As mentioned earlier, yields have not consistently risen, and in the past decade, the amount of total production available per capita has actually fallen (Figure 21). Meanwhile, cassava, a common cultivated substitute for rice, particularly useful during lean seasons, has grown rapidly over the past two decades. Underlying this are strong yield improvements, but levels still remain roughly half of local potential (ITC, 2020).

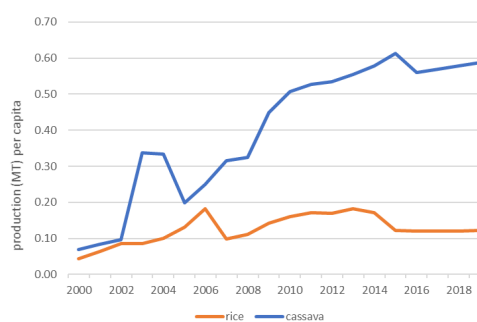


Figure 21 Staple Food Availability as Measured by Total Production Per Capita: Source Data: [FAOSTAT](#)

Access is the ability of consumers to afford food sold in markets. Access varies with food prices and consumers' incomes, each of which have upstream determinants as well. Surveys capture access by reporting respondents' experience consuming food, whether meals were skipped, portions reduced, and the quality and diversity of the food. Answers to these questions inform the designations of moderate or extreme food insecurity, as described above (Figure 20), or "malnourished," if observations of dietary quality and quantity are available. In Sierra Leone, malnourishment has steadily declined over the past two decades, but still remains high at roughly one-quarter of the population, higher than all comparators except Liberia (FAOSTAT).

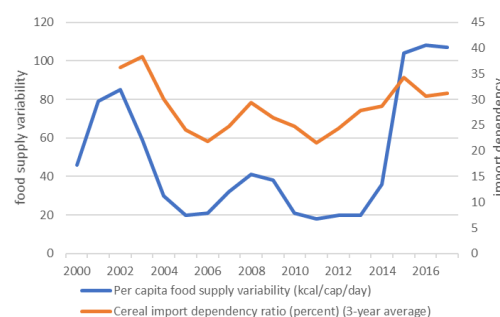


Figure 22 Food supply variability and Import Dependency. Source Data: FAOSTAT

Stability describes the consistency of food access or availability over time. Variations in prices, owing either to seasonal shifts in supply, international market volatility, or macro-level shocks, can push food out of reach for many consumers. Similarly, shocks to production, whether idiosyncratic (e.g., loss of labor) or systemic (e.g., drought) can reduce food availability unexpectedly. In Sierra Leone, two measures of stability, per capita food supply variability and cereal import dependence have swung dramatically over the past 20 years (Figure 22). Meanwhile, local prices for rice in Sierra Leone have similarly exhibited twice the volatility (coefficient of variation = 0.16) as observed in comparator countries Guinea and Cote d'Ivoire (Figure 23). Another indicator of stability is the rate of food price inflation. The last ten years have witnessed rapid increases in food price levels, due to a combination of domestic inflation, depreciating exchange, and the generally rising demand for food owing to a growing population (Figure 24).

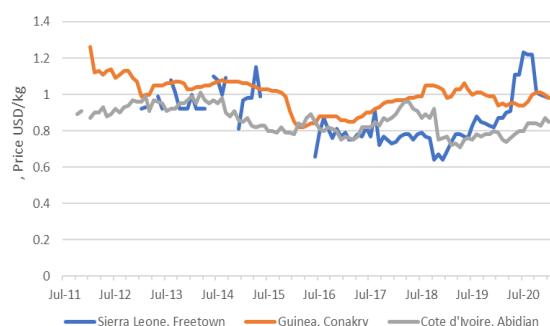


Figure 23 Rice Prices Among Available Comparators. Source Data: [FAO GIEWS FPMA Tool](#)

Utilization refers to food's final consumption, *i.e.*, eating, and the consequences to physical health. Common indicators that capture utilization are observable height-for-age and weight-for-age measurements, *i.e.*, stunting, wasting, as well as birthweights. For Sierra Leone, each of these indicators is trending downward, though the rate of stunting has recently plateaued and remains high at 30 percent of the population. Comparators for which data exist place Sierra Leone among the worst performing in the group (FAOSTAT).

Food Budgets and Coping Strategies

A strong signal of vulnerability to food insecurity is a household's share of expenditures for food. For households with large food budget shares, shocks to food prices can threaten their ability to eat or cover other necessary expenses, such as housing or health care. High food budget shares also discourage risk-taking and other entrepreneurial activities. In Sierra Leone's most recent household survey, the average household reported spending 61 percent of its expenditures on food (SLIHS, 2108).⁴ More recent surveys administered since the onset of COVID-19 indicate that over thirty percent of households report food expenditures exceeding 75% of total budgets (WFP, 2020b). In districts Karene and Tonkolili, the rate exceeds 50 percent of households. Meanwhile, large food budget shares are sensitive to food prices rises. As indicated earlier, dramatic food price inflation has raised the overall price level of staple crops. The evidence for rice is stark. Both nominal and real prices have increased substantially (roughly 100 percent and 50 percent, respectively) over the past three years (Figure 25).

Surveys administered during the ongoing COVID crisis indicate a significant uptick in household's coping strategies WFP estimates a 45% increase in reduced expenditures, smaller portions, skipping meals, and reallocating household consumption away from adults and towards children (WFP, 2020b). The largest percent changes are observed in rural districts, including Bombali, Kenema, Koinadugu, and Kono.

Meanwhile, WFP (2020b) reports rises in economic coping strategies in response to food security shocks associated with COVID-19 (Figure 26). An

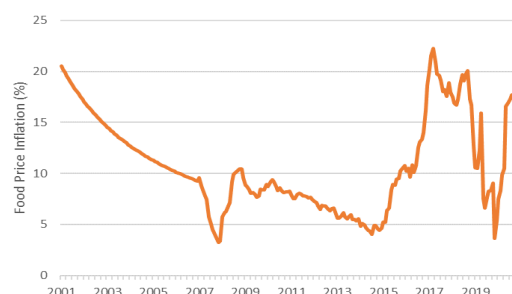


Figure 24 Food Price Inflation. Source Data: [FAOSTAT](#)

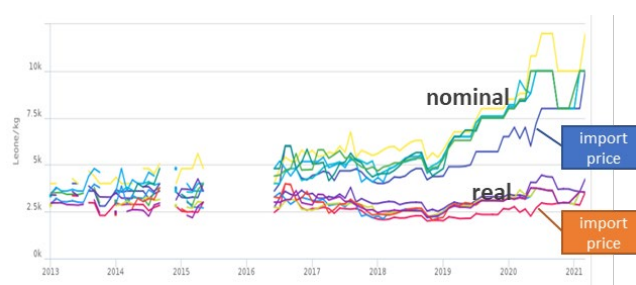


Figure 25 Real and Nominal Retail Prices of Rice across Multiple Localities and Imports. Source: [FAO GIEWS FPMA Tool](#)

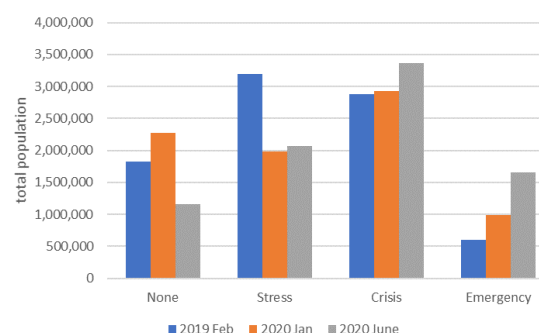


Figure 26 Changes in Economic Coping Strategies, pre and post-COVID. Source data: WFP (2020a, 2020b)

⁴ The World Food Program's as yet unpublished Comprehensive Food Security and Vulnerability Analysis for 2020 puts this number at 63 percent.

additional 1 million people in Sierra Leone have resorted to “emergency coping strategies” to maintain food consumption, accounting for one-fifth of all households. Such strategies include selling land or housing and other irreversible losses. Over three million people employed “crisis coping strategies,” such as selling productive assets, *e.g.*, farm equipment, transportation. Numbers for the severe “stress”-level coping strategies as well as those who reported “none” actually fell from the previous survey period in 2019, primarily because so many people shifted to the more severe options.

Water, Sanitation and Hygiene (WASH)

Water and sanitation services play a crucial role in a country’s economy. They feature prominently as inputs for water-intensive production processes, but also as complementary inputs for less water-intensive firms, and finally as foundational public services relied upon by the households that make up firms’ workforce and customer base. In economies characterized by high levels of informality and self-employment, the distinction between household and productive use of water becomes less relevant for the small household enterprises whose services and products comprise a large portion of economic activity and employment. Inadequate water and sanitation services and infrastructure can pose a binding constraint to private investment, economic growth and poverty reduction through any of these channels. When these services are absent, unreliable, or unusually costly, this can reduce the returns on investments to the point that they are no longer profitable. Households also suffer, both through health impacts of unsafe water, sanitation and hygiene as well as through the time and financial costs of circumventing the obstacle presented by inadequate WASH services.

In Sierra Leone, the WASH constraint is most acutely felt in the political and economic capital city, Freetown, where the manifestation of the constraint is closely connected to the country’s experience of urbanization and internal migration (see category “Western Urban” in Figure 27). Freetown’s municipal water utility, the Guma Valley Water Company (GVWC), was established in 1961 to serve a population of up to 500,000 which the Western Area Urban district surpassed in 1988 (UN Population Division). The population of Greater Freetown (Western area rural and urban districts) in 2021 is currently estimated to be 1.7 million (2015 census projections). Migration has played a major role in this growth. The 2015 census revealed that 20 percent of those enumerated in Greater Freetown had lived in another region 5 years prior. Five years prior, that number was only 8.5 percent. Overall, around 55 percent of Greater Freetown residents in 2015 were born elsewhere. The impact of this population growth has not only increased demand for water but led to losses of perennial water sources owing to rising informal settlements in deforested catchment areas. Finally, thanks to the region’s topography, many settlement areas suffer from flooding, saltwater intrusion, and pressure drop-offs, rendering water service provision even more difficult.

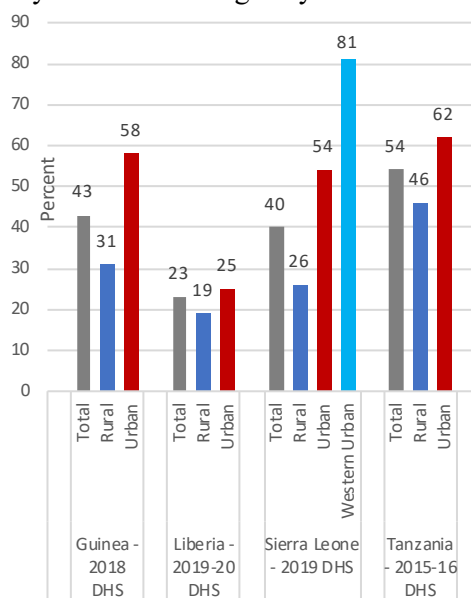


Figure 27 Share of population living in households using piped water or water from a tube well or borehole with water not available for at least one day, Source: DHS Statcompiler

Low prices for water in Freetown mask the true costs of access. GVWC charges residential customers US\$0.25 per cubic meter of water, which is one of the lowest rates in the world according to IBNET data. However, this rate is not cost-reflective, and combined with high levels of non-revenue water (56 percent), results in revenues that do not cover operating costs, much less capital expenditures which have mainly been financed by donors (MCCU). One result of this lack of investment combined with population growth is declining access to piped water. Household survey data shows that the share of the population of the Western region using piped water or public standpipes fell from 42 percent in 2008 to 28 percent in 2019 (DHS).

However, access to GVWC services does not guarantee reliable access to water. The 19 wards with GVWC service only receive water on an intermittent basis: twice a week for 4 to 6 hours (MCCU). Many households instead rely on boreholes and protected wells, rising from 19 percent of the population in 2008 to 30 percent in 2019. However, DHS data shows that the share of the Freetown population in 2019 living in households using either piped water or water from a borehole that has had water unavailable for at least one day is extremely high (81 percent) relative to urban households overall in Sierra Leone (54 percent) and urban households in comparator countries with comparable data (Tanzania 2016 – 62 percent; Guinea 2018 – 58 percent; Liberia 2020 – 25 percent). Households without access to piped or well water may rely on Freetown’s Alternative Water Service Provider (AWSP) sector which re-sells raw water from GVWC and other sources, and includes bottled water producers, packet water producers, water kiosks, water tanker services and private standpipes. AWSP firms sell water at prices much higher than GVWC charges for residential piped water service, but still at rates much lower than corresponding rates for water in other SSA cities.

While enterprise survey data reveal few firms reporting water insufficiencies (falling from 7 percent in the 2009 round to 3 percent in the 2017 round), anecdotal evidence suggests that this may not reflect the experience of particularly water-intensive firms located in Freetown. In 2018, the local Coca-Cola affiliate, Sierra Leone Bottling Company, moved production to Guinea and turned its bottling facility into a distribution facility, reportedly in part due to difficulties obtaining sufficient water supply from boreholes or the GVWC network.

For a large share of Freetown households, concerns about reliability or quality are dwarfed by the sheer time costs of accessing water (Figure 28). Only 26 percent of Freetown’s population lives in households with water on-premises; the remaining 74 percent must travel off premise to access water; for 32 percent of the population, this requires a round trip of greater than 30 minutes. This share of households facing large time costs to access water is extremely high relative to the average share of urban and rural households facing similar high time costs in Sierra Leone, and the average shares for urban households in comparator countries.

The large time costs of the WASH constraint are accompanied by other costs, including health and safety costs. The annual WASH attributable mortality

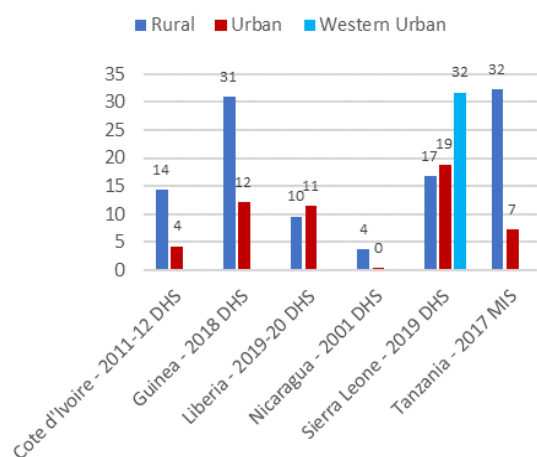


Figure 28 Population living in households with water more than 30 minutes away round trip, by location, Source: DHS Statcompiler

rate in Sierra Leone in 2016 was 81 deaths per 100,000 population—much higher than the comparable rate in comparator countries (Figure 29).⁵ MCC’s Threshold Program in Sierra Leone also observed that long travel distances to access water exposes Leoneans to crime, including gender-based violence.

Outside of Freetown, WASH is a less binding constraint.⁶ One explanation for this could be that Sierra Leone has abundant internal freshwater resources per capita—meaning that, in many parts of the country, water is more readily available and less costly to obtain than is the case for water-stressed countries. The high levels of water-stress in Freetown are, in contrast, explained not only by population growth and underinvestment but also by some geographic features of the peninsula. An old granitic rock formation called the Freetown complex covers about 80 percent of the peninsula and prevents groundwater from being productive for large scale water supply investment (2017

Hydrogeology Report of Sierra Leone). Productive groundwater can be obtained around the coastal areas of Freetown, but this is affected by saltwater intrusion and may be contaminated by flooding and inadequate sanitation services.

Other Constraints to Growth

In addition to the main binding constraints discussed above, this analysis considered an array of other potential constraints to economic growth. The findings conclude that these constraints, while still binding, reveal weaker signals than the Top Binding Constraints. However, in certain cases, weaker signals may ultimately owe more to scarce data and the team’s time resource limitations than evidence of a weak impact.

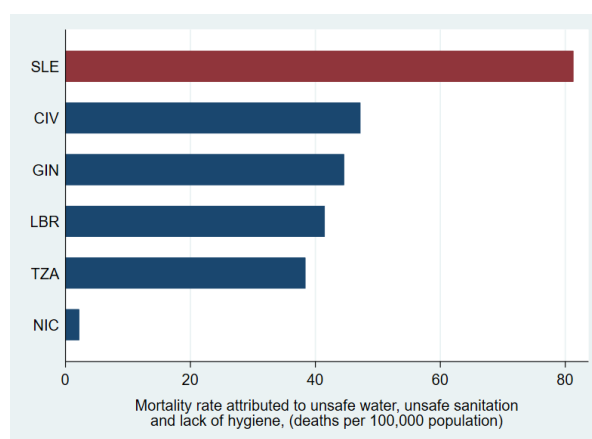


Figure 29 WASH attributable mortality rate relative to comparators, Source: WDI

⁵ Although much lower than the equivalent mortality rates due to other risk factors or causes, e.g. household and ambient air pollution (324 annual deaths / 100k population), malaria (220-259 deaths per 100k).

⁶ In particular, rural households rely on surface water or unprotected springs at a much higher rate than is the case for rural households in comparator countries—likely exposing members of these households to higher risks of contracting water-borne diseases if they are not treating water from these sources properly (DHS survey data).

Micro Risks to Appropriation of Returns

Micro risks usually pertain to property rights, corruption, and taxes. The extent to which firm profits and assets are vulnerable to expropriation can significantly determine private sector investment. In Sierra Leone, arguably the largest of micro-risks, particularly outside of Freetown, is “customary law,” in which, as described earlier, local chiefs exercise authority over a range of social, political, and economic domains (Acemoglu et al, 2014). Currently, 190 chiefdoms operate in Sierra Leone (Figure 30), each of which is governed by a Paramount chief, drawn from and elected for life by a handful of ruling families. At first glance, the institutions of the chieftaincy would appear unpopular. Undemocratic, authoritarian, and idiosyncratic, chiefs personally hold sway over local property rights and resource allocations, presenting ample opportunities for rent-seeking and discouraging investment. And as described earlier, chiefs conscript communal labor for harvesting, road building, and general infrastructural upkeep, traditions believed to stir resentment among local youths (Sawyer, 2008). That said, surveys of rural communities reveal relatively sanguine outlooks towards local chiefs who are better suited to resolving conflicts and adjudicating disputes than reputedly corrupt and slow-moving local magistrates and courts (*Ibid*; Fanthorpe, 2006). But while public opinion confirms the resilience and relative appeal of the institution, its impacts on economic outcomes are significant, with perhaps the greatest effects felt on land use and tenure.

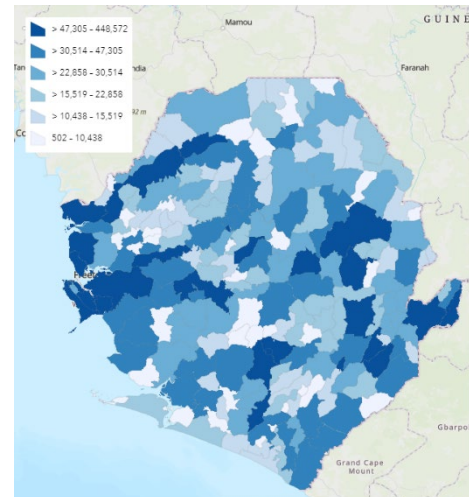


Figure 30 Sierra Leone's 190 Chiefdoms and Population. Source: [Government of Sierra Leone Integrated GIS Portal](#)

Land Use and Tenure

Within a chiefdom, land ownership extends only to few prominent families. Landless inhabitants, typically drawn from local tenants, migrants, youth, and other vulnerable groups, can reach land use agreements with owners but generally lack standing in the eyes of customary law, leaving them susceptible to exploitation and abuse. Chiefs may intervene to settle disputes, but their shared interests with local elites often compromises any impartiality. Meanwhile, commercial relationships between outsiders, *e.g.*, businesses from Freetown or investors from abroad, and local authorities are subordinate to larger matters of lineage, personal relationships, and patronage. Firms seeking land must not only navigate the maze of obligations to national and district level authorities, but also to local chiefs and local landholders (Botazzi et al., 2016).

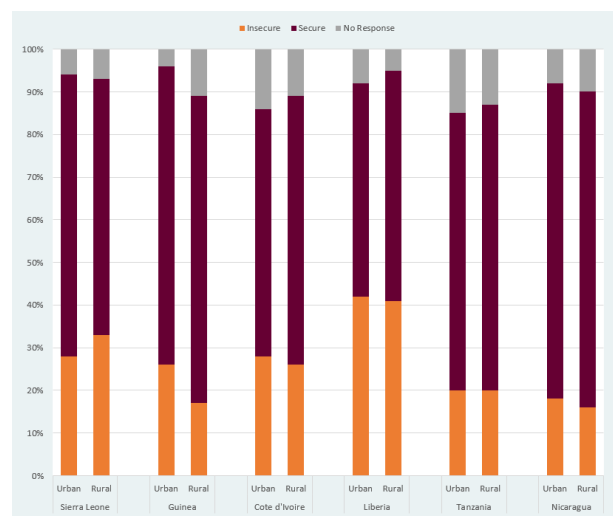


Figure 31 Perception of tenure insecurity and security. Source date: [Prindex](#).

For these reasons, land use in Sierra Leone is fraught with risk and uncertainty. Data from different surveys confirm that firms view land tenure and land security as a major obstacle to investment. Sierra Leone ranks unfavorably not only among most comparators but all countries in terms of respondents' perception of tenure insecurity, with over one-third reporting tenure insecurity. Among comparators, only Sierra Leone reports higher insecurity in rural settings (Figure 31). Contributors to tenure insecurity include the risk of eviction, disagreements or deaths among families, seizures by government, and issues with customary authorities (Figure 32).

Consistent with these individual respondent results, an increasing number of Sierra Leonian firms report land as their biggest constraint. While the overall rate, around 12 percent, does not rank as high as other constraints, it still exceeds all comparators.

Insomuch as land remains the largest input in agriculture, constraints on land use and tenure likely hamstring scale economies and ultimately growth in agricultural productivity.

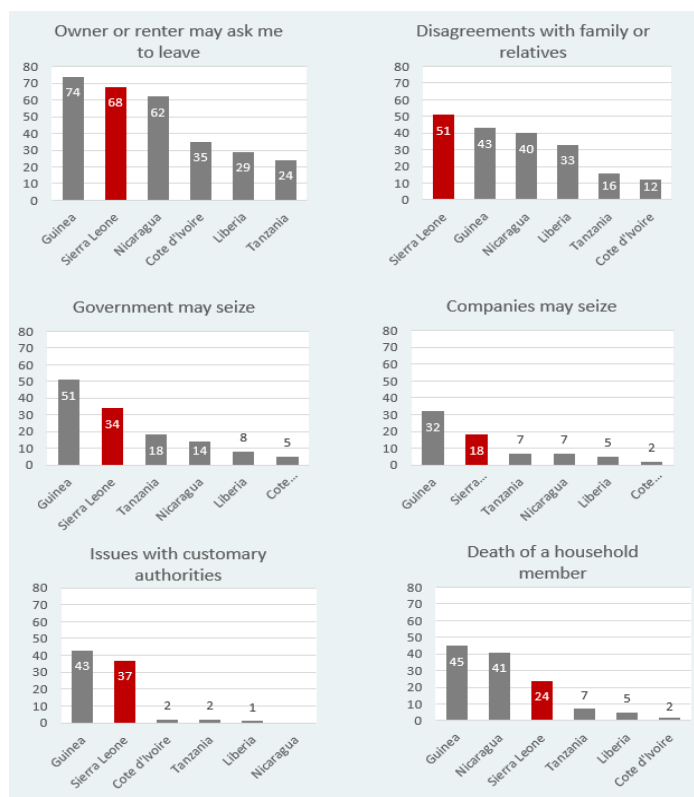


Figure 32 Reasons for Tenure Insecurity. Source data: [Prindex](#)

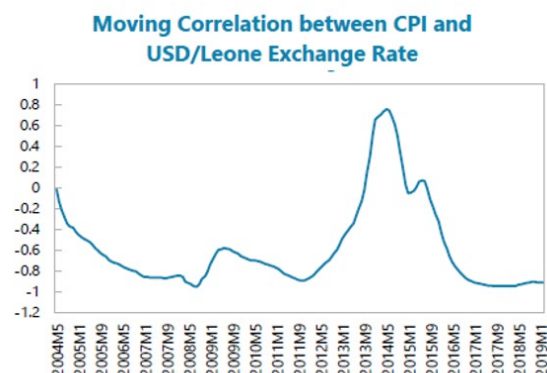
Macro-level Risks to Appropriation of Returns

Unpredictable macroeconomic conditions can threaten profits by discouraging firms and households from investing. Rapid or unexpected inflation, *e.g.*, a central bank suddenly printing money, can disrupt supply chains, cause uncertainty, and discourage savings. Exchange rate volatility can raise costs for firms that rely on imports or sell to foreign customers. Even without volatility, gradual appreciation or depreciation of the currency can differentially affect their profitability relative to purely domestic firms by decreasing the completeness of exported products or increasing the prices of imported inputs or machinery. Finally, perceptions of the current and future tax increases, government spending, public good provision, and costs of finance, including debt sustainability, may affect firms' judgements of investment profitability.

In Sierra Leone, it is impossible to ignore the impact of macroeconomic shocks and vulnerabilities on the economy in recent history and its ongoing delicate position. As discussed earlier, a massive spike in FDI during a period of record-high global demand for iron-ore was followed by a collapse in iron-ore prices and the devastating impact of the Ebola epidemic in 2014 and 2015. Recovery from these shocks was arguably delayed in response to fiscal mismanagement, and donors withdrew support in the run-up to the 2018 elections, leading the government to fall into arrears and resort to central bank financing (IMF 2021). As a result, “over these two years, inflation spiked to double digits, the current account deficit

widened from 15.1 percent of GDP to 21.1 percent, and the currency depreciated by more than 50 percent” (IMF 2020).

After the 2018 elections, the new administration demonstrated an increased commitment to governance reforms and re-engagement with IMF. This included reforming “fuel subsidies and duty waivers, and implement[ing] outstanding revenue, expenditure and debt management reforms” as well as the 2019 Bank of Sierra Leone Act, which included measures to “bolster the institution’s independence and accountability” and limit the circumstances under which monetary financing could be utilized (IMF 2020). This re-engagement led to the approval of a 43-month Extended Credit Facility (ECF) by the IMF, which, at its second review in early 2020, reported positive steps towards targeted reforms and promising—albeit risk prone—medium-term growth prospects.



Sources: Sierra Leonean authorities; and IMF staff estimates.

Figure 33 Correlation between Inflation and Exchange Rate

In terms of COVID-19 impacts, while the shock has reduced the short-term growth outlook, weakened exports, worsened food security, and increased debt stress, IMF staff note that the pandemic response has been well managed so far and that macroeconomic impacts have been less severe than initially expected (IMF 2021). A substantial monetary expansion driven by increased support from development partners has not led to increased inflation so far, initially elevated levels of food inflation moderated in the second half of 2020, and acute banknote shortages that appeared in late 2020 appear to have been resolved (ibid).

Despite progress since 2018 in implementing reforms and the largely successful response to the COVID-19 pandemic, Sierra Leone faces a difficult recovery due to longstanding macroeconomic vulnerabilities. There is limited fiscal space to finance the massive development needs of a country with an urgent mandate to improve living standards and whose infrastructure stock was essentially reset during the civil war. A heavy reliance on imported food and essential items tightly links movements in the exchange rate to consumer prices (Figure 33). The country must often confront the possibility of balance of payments crises due to delayed disbursements from the development partners financing a large portion of the government budget or the longstanding vulnerability posed by a narrow export base subject not only to volatility in global commodity prices but also disruptions due to production or contract issues affecting this small number of firms responsible for a large share of exports (Figure 34). All of these vulnerabilities are reflected in the following assessment by IMF staff of the “substantial risks” that could undermine the economic recovery from the COVID-19 pandemic.

Higher spending needs or lower-than-expected support from development partners could exacerbate the already strained fiscal and debt sustainability situation. Risks to inflation would arise from a larger-than-anticipated exchange rate depreciation, or higher-than-projected monetary financing of the deficit, particularly

	2020 Proj.	2021 Proj.
Total revenue and grants	7,980	9,271
Revenue	5,507	6,415
Other, Capital Transfers from BSL (CCRT Debt Re	352	331
Grants	2,122	2,524
Expenditures and net lending	10,249	11,269
Overall balance including grants	(2,269)	(1,998)
Financing	2,269	1,998
External financing (net)	692	244
Domestic financing (net)	1,512	676
G20 debt initiative (deferment)	65	101
Financing Gap	0	978
Second RCF disbursement (prospective)	...	594
World Bank budget support grant (prospective)	...	384
Remaining Gap	...	0

Sources: Sierra Leonean authorities; and Fund staff estimates and projections

Figure 34 Fiscal Finance Gap (Billions of Leones)

if the authorities face delays in external financing (including from the IMF), difficulties accessing sufficient domestic bank financing, or challenges in further reprioritizing expenditures in the event of a shock. Food price inflation might remain high given the heavy reliance on food imports, putting continued pressure on an already largely food insecure population. Financial stability risks are elevated as a result of lower interest rates on government securities and high non-performing loans. Delays in resuming iron ore production or in bringing new mines on stream could undermine exports and worsen external imbalances. Policy slippages, amidst heightened social and political pressure—particularly given existing capacity constraints and the already tight budgetary situation—or lack of progress on anticorruption reforms could aggravate the above risks. In this context, increased tensions between the two main political parties could stall reform momentum and jeopardize nascent investor confidence. (IMF 2021)

However, many of these vulnerabilities stem from issues largely outside of the short-term manageable control of policymakers – and those that are possible to mitigate are largely already being addressed through existing or planned reforms and policy measures. Residual risk is largely attributable to the underlying structure of the economy and the need to continue investing in replacing the infrastructure, institutions and human capital damaged during the war. The GoSL and its partners therefore must continue with the balancing act of minimizing macro-risks while continuing to fund development priorities necessary for economic diversification and structural diversification. Accordingly, we do currently view macroeconomic risks as a most binding constraint to investment, growth or poverty reduction. However, many of the risks discussed in this section could easily rise to the level of most binding constraint as a result of either further exogenous shocks or policy missteps in managing the delicate recover—and thus warrant continued surveillance to monitor potential impacts on the ability off MCC investments to address the top binding constraints.

Transport

Transportation infrastructure significantly shapes the final cost of goods. Poor infrastructure—rough or unpaved, roads, inadequate networks, missing bridges—can add sizable time and money costs to shipments, effectively posing a barrier to market entry, particularly for rural areas. In agriculture settings, perishable foods can spoil *en route* owing to washed-out unpaved roads that cause delays. Added transport costs (e.g., fuel, depreciation) can render price-sensitive commodities unmarketable. Access to roads in general correlates strongly with poverty (World Bank, 2019).

In Sierra Leone, the condition of roads, while not ideal, has improved considerably since first being identified as a binding constraint in the 2013 Constraints Analysis. As of 2016, about 10 percent of roads are paved. As of 2017, Sierra Leone's Rural Access Index (RAI) is about 32 percent, meaning that roughly one-third of its rural population lives within 2 kilometers of an all-season road. This average obscures a wide variance, with RAIs in districts

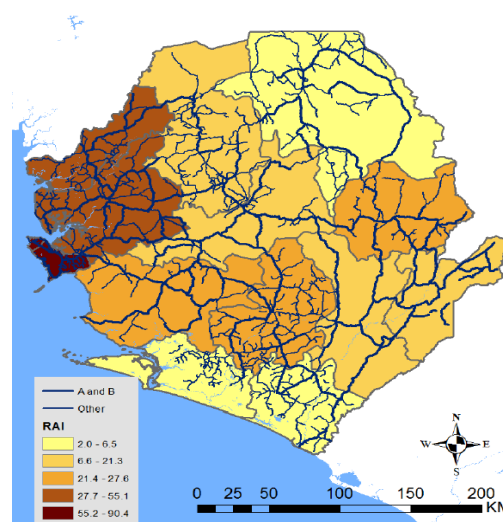


Figure 35 Road Networks and Rural Access Index.
Source: World Bank (2019).

One useful indicator of road network accessibility plots road density against population density, wherein country observations roughly trace an upward sloping relationship between the two variables (Figure 36). Relative to comparators, Sierra Leone's road density does not stand out. As a complementary measure, the Global Competitiveness Index measures travel times between different city-pair combinations to construct an index of road connectivity. Sierra Leone scores favorably, just below the world's median value, and from a different angle, the World Bank's Enterprise Surveys show that road is the least significant business obstacle for a small and decreasing fraction of polled firms, falling from 10 percent in 2010 to less than 2 percent in 2017.

In countries with weak financial institutions or poorly developed financial markets, inadequate access to credit can constrain firms and entrepreneurs from obtaining capital for land, buildings, equipment, and technologies for production.

Low lending to the private sector may have several causes. One possibility is low aggregate savings. Indeed, the majority of Sierra Leone's population does not engage the formal financial sector. In 2017, only 20 percent of the adult population held a bank account, the lowest among comparators, and deposits are about 20 percent of GDP, at the low end of the comparators' range. (Dalberg, 2021). Low deposit rates, currently at 5 percent and falling steadily due to inflation, may explain the low levels of savings in the country.

Low levels of lending also owe to the absence of credit risk and information services necessary for banks to make informed lending decisions. Only about 2 percent of the adult population appears in a public credit registry, updates are conducted manually, and information is limited to commercial banks (Dalberg, 2021).

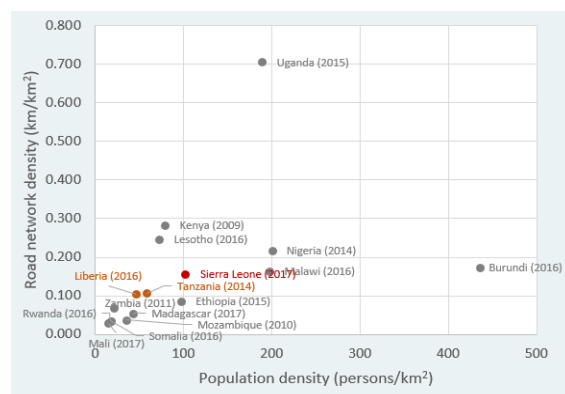


Figure 36 Road Network Density versus Population Density: cross-country comparisons. Source data: World Bank (2019)

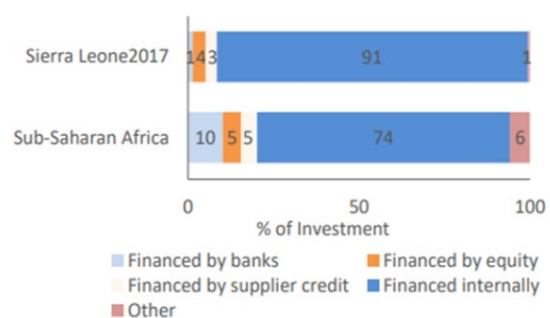


Figure 37 Sources of Credit for Firms, Sierra Leone and Sub-Saharan Africa. Source: [World Bank Enterprise Survey](#)

But if the demand for investment were high, deposit rates and interest rates would converge as banks compete for loanable funds. Evidence, however, points to a wide gap between these two rates, currently around 18 percent, the largest among comparators (Dalberg, IMF). Low risk domestic lending to government may explain part of this gap, but the dearth of profitable lending opportunities to the private sector also likely plays a role. In fact, private sector borrowing appears very weakly correlated with fixed capital formation, a useful indicator of firm-level investment in factories, machinery, and equipment, suggesting that little to no firm-level borrowing goes towards productivity-boosting physical capital investments (Figure 39).

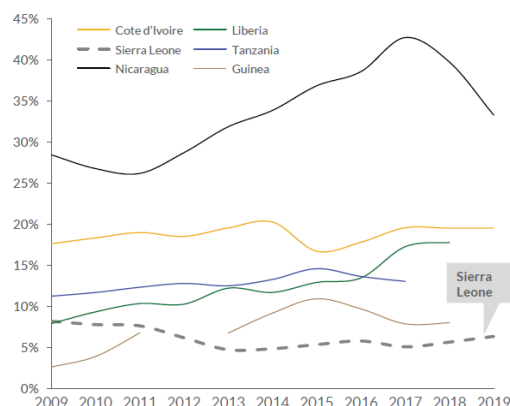


Figure 38 Ratio of Private Sector Credit to GDP. Source: Dalberg, Bank of Sierra Leone

Complementing this finding is the presence of well-developed informal lending networks, called *osusus*. An *osusu* is a fixed-term, micro-scale savings scheme in which participants contribute to a collective pot of savings that can be loaned and repaid (SLIHS, 2019). Known to compete with more formal micro-finance operations and the larger formal banking sector, *osusus* capitalize on advantages afforded by smaller personal, high-trust networks, better information, and more effective resolution of loan repayment failures. After personal savings, *osusus* are the largest source of financing for small-scale entrepreneurs and play a significant role in women's access to finance.

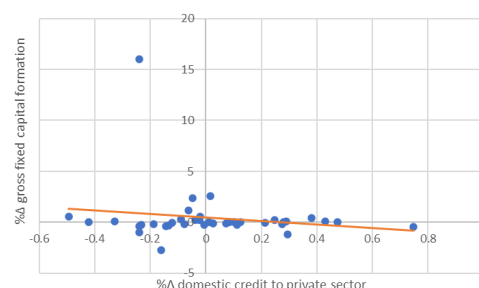


Figure 39 Domestic Credit to Private Sector and Gross Fixed Capital Formation. Source Data: WDI (2021).

In short, signals surrounding access to finance in Sierra Leone, are mixed. While information asymmetries and government crowding out effects constrain lending, the dearth of bankable investment opportunities and the presence of informal networks that compete with more costly formal options suggests the demand-side of the equation is arguably unconstrained.

Education

In addition to being healthy, a country's workforce must have the requisite skills to carry out current economic activities as well as the ability to acquire new skills and adapt to the changing needs of a rapidly developing country. Skills are also important for a country's stock of entrepreneurs and for the civil servants responsible for building and maintaining the countries institutions and providing critical public goods. While a great deal of skill-acquisition happens on-the-job, high quality formal education prepares workers with foundational skills that enable them to continue learning throughout their lives and reduce the costs of providing vocational or on-the-job training. Inadequate education can be a binding constraint when the education system is not adequately preparing sufficient numbers of youth to provide employers and other institutions with a workforce that can be cost-effectively trained to meet the demands of their jobs.

Available evidence suggests that the education system does not significantly constrain private investment, economic growth and poverty reduction. The civil war significantly reduced access to education for a generation of Sierra Leoneans, but the last decade has seen progress. While adult (age 15+) literacy dropped from 34.8 percent in 2004 to 32.4 percent in 2013, it then increased rapidly to 43.2 percent by 2018 (WDI). Further, the literacy rate among youth aged 15-24 is higher than the adult rate and steadily rising—increasing from 47.9 percent in 2004 to 57.0 percent in 2013 to 66.6 percent in 2018. This is higher than the corresponding youth literacy rate in all comparators except Tanzania and Nicaragua. Available data on primary and second enrollment and completion rates shows similarly positive trends even before the launch of the new “Free Quality Education for All” initiative, which launched in August 2018 and allows for free tuition, teaching and learning materials for all children and represents a 21% of total budget allocations.

Formal firm surveys also suggest that the education and skills of the workforce is not seen to be a particularly large obstacle. The share of Enterprise Survey respondents indicating that an inadequately educated workforce was their biggest obstacle decreased from 2.3% of firms in the 2009 round to 0.0% in the 2017 round. Further, in both survey rounds, formal firms did not report offering on-the-job training at an unusually high rate relative to comparators—as might be the case if firms were trying to get around a skills or education binding constraint. A final piece of evidence comes from the 2014 Labor Force Survey, which reveals that workers with more education have higher unemployment rates and are more likely to work in government than workers with lower levels of education. This could be explained by graduates queuing for highly desirable government jobs, which we wouldn’t expect to see if education was a binding constraint for a private sector, which would compete to entice these educated workers into employment.

Natural Capital

While iron ore and other mineral extractions represent a significant portion of Sierra Leone’s economy, other valuable elements of the country’s natural resource capital are under threat. These include the loss of land and forests, poor management and contamination of water resources, and increasing threats to coastal zone resources. The agriculture sector, through slash-and-burn cultivation practices, fuelwood collection, and illegal logging activities all contribute to land degradation and deforestation. Agro-chemicals have contaminated groundwater and reduced soil fertility. Rapidly growing demand for housing, particularly in the capital Freetown, has forced unplanned, informal settlements onto areas prone to landslides, mudslides, and flooding, while landfills and untreated sewage harm soil and water quality.

Meanwhile, unsustainable fishing practices, including illegal, unregulated, and unreported activities, threaten the long-term viability of Sierra Leone’s fish stock, a major source of nutrition and a key component of the country’s food economy. Accompanying this threat is the pressure on mangrove ecosystems, as wood from mangrove trees fuels fish smoking for preservation and serves as the raw material for boat building. Rice farming similarly encroaches on the soil and water that makes up mangrove ecosystems. Ultimately, degraded mangroves ecosystems raise the risks of coastal flooding and harm the habitats of key marine species populations.

Compounding these challenges is Sierra Leone’s changing climate. Estimated annual temperatures are expected to rise from 1 to 2.5 degrees by 2060, which, along with more extreme variation in precipitation could disrupt food production and availability. Sea level rises could damage coastal ecosystems due to flash floods, saline intrusions, and coastal erosion.

Conclusions

This Constraints Analysis identifies four main binding constraints: power, health, food security and supply, and WASH in Freetown. These constraints not only bind on the country's economic growth but also carry unique implications for poverty reduction. Relaxations in these constraints, furthermore, can reduce certain barriers to the Sierra Leone's structural transformation. Outside of the top constraints, Sierra Leone suffers from additional challenges, chief among which are the country's micro and macro-risks. While the report does not identify these two additional areas among the main binding constraints, analysis and consultations point to their looming effect over the country's long-run growth path.

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Appendix: Selection of Comparators

The Constraints Analysis relies on comparisons between Sierra Leone and a set of comparator countries in order to benchmark its performance across different variables. Comparators are ideally selected based on their shared characteristics with Sierra Leone. In an effort to apply objective criteria to the selection of comparators, the Constraints Analysis drew from two categories of variables for the purpose of establishing a country's "similarity." The first is a suite of exogenous **physical geography** variables, known to help explain growth.

- *Average distance to the coast* captures both the size of a country as well as its proximity to markets. Coastal access is a well-known advantage for economic growth since it affords trade opportunities. [Source.](#)
- *Soil quality* proxies for innate agricultural productivity, a feature highly correlated with early-stage economic growth. [Source.](#)
- *Tropical climate* reflects a range of conditions known to affect economic growth. In agriculture, winter freezes help kill harmful pests. For humans, cold snaps can check mosquito-born illnesses, e.g. malaria. [Source.](#)
- *Resource endowment* is the percent of GDP attributable to natural resource extraction activities (oil, minerals, metals, forests). Intuitively, having resources to dig up and sell can be pretty advantageous to incomes (Source: WDI, 2021.)
- *Log distance to Sierra Leone* This variable aims to capture all the unobservable features that are correlated with proximity to Sierra Leone. This could include other features of climate, geography, and human variables (see below) that potentially explain growth, etc. To quote Walter Tobler's first law of geography, "All things are related, but closer things are more related!" (Source: Authors calculations using ArcGIS.)

The second set is a suite of long-run **demographic and economic** variables, also believed to influence growth outcomes.

- *Ethnolinguistic diversity* captures the abundance of different ethnic and language groups in a country. In the growth literature, greater diversity along these dimensions is associated with more conflict, with consequences for governance, equity, and peace. For simplicity, this analysis uses a popular index variable from [Fearon \(2003\)](#).
- *Population density* reflects domestic market size, a useful proxy for gauging domestic demand for production, averaged over the period 2000-2018 (Source: WDI, 2021).
- *Poverty gap* speaks to poverty's entrenchment in a country, averaged over the period 2000-2018. (Source: WDI, 2021).
- *GDP per cap* helps filter out rich countries, averaged over the period 2000-2018. (Source: WDI, 2021).

For each variable (except the distance to Sierra Leone), the analysis applies the [Mahalanobis Distance](#) method to generate a multi-dimensional “distance” between each country and Sierra Leone. The shorter the distance, the “more similar” these countries are in terms of their attributes. Specifically, the method calculates each country’s deviation from Sierra Leone, divides it by the variable’s standard deviation, then adjusts the overall data’s covariance matrix (to compensate for correlations among variables) to ensure that each variable’s independent effect is captured.

From this emerges a list of countries ranked by closeness to Sierra Leone (Figure 41). A number of countries are obvious picks: **Guinea** and **Liberia**, not only for their geographic proximity but also for the common economic and demographic features. From here, a measure of judgment enters the process. The analysis selected **Cote d’Ivoire** as a reasonable neighborhood “aspirational” comparator as well as **Tanzania**, which adds a measure of geographic diversity. Extending that theme, far-away **Nicaragua**, also aspirational, nevertheless shares some underlying conditions with Sierra Leone.

Sierra Leone	0
Guinea	1.950506
Liberia	2.268309
Guinea-Bissau	4.619558
Cote d'Ivoire	7.264157
Togo	8.288507
Cameroon	9.875931
Cyprus	10.41695
Tanzania	11.13708
Portugal	11.5983
Ecuador	11.63064
Dominican Repuk	11.86321
Croatia	11.93685
Peru	12.01578
Nicaragua	12.09012
Colombia	12.4774

Figure 40 Top 15 "Closest" Countries According to Selection Criteria. Source: Authors’ calculations.