Sida's Helpdesk for Environment and Climate Change

SWEDISH UNIVERSITY OF AGRICULTURAL SCIENCES

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Environment and Climate Change Policy Brief for Liberia

Picture 1: On The World Map.

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Submitted to:
Embassy of Sweden in Monrovia

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Sida's Helpdesk for Environment and Climate Change is a government agency collaboration between the Swedish University of Agricultural Sciences (SLU), University of Gothenburg (GU) and Sida to promote enhanced integration of environmental issues and perspectives in Swedish development cooperation.

Executive summary

This Environment and Climate Change Policy Brief[1] has been developed in parallel with a Gap Analysis (separate document) to assist the Embassy of Sweden in Monrovia and Sida in preparing for a new development cooperation strategy for Liberia. The purpose of the Policy Brief is to provide support to the Embassy of Sweden in Monrovia in the process of identifying key environment and climate change challenges and opportunities and describe how they link to multi-dimensional poverty aspects in Liberia, and to support identification of a potential role for Swedish development cooperation. The assignment was conducted as a desk-study during three weeks in April-May 2020.

Liberia is well endowed with natural resources, including tropical forests, marine and water resources, various minerals, and rich biological and ecosystem diversity. However, Liberia is currently subject to a range of environmental challenges including deforestation and loss of biodiversity, inadequate WASH, deforestation, natural resource depletion, waste and pollution. Liberia is also vulnerable to climate change, which is expected to exacerbate many of the other challenges. A majority of Liberia's population, particularly those living in poverty, are directly depending on environmental resources for their livelihood, and access to land, forests, water, energy, etc., constitutes important safety nets. When access to the environmental resources is insecure or low, the people living in poverty risk losing their health, livelihood opportunities, as well as the sources of food and shelter.

Liberia is struggling with low environmental health indicators (particularly malaria, diarrhoea, and respiratory infections). Women, children and elders are disproportionally exposed. Other challenges include very low agricultural productivity and food insecurity/malnutrition, low or no access to electricity, local floods and land degradation, and locally high levels of pollution (e.g. mercury) and waste. These deprivations are, as is commonly the case, most serious for people living in poverty, both in rural areas and in densely populated areas (e.g. urban slums or camps), as they have few livelihood options.

Liberia's natural resources form the basis of the country's economy and offers a huge potential for poverty reduction and inclusive and sustainable economic growth – if environmental investments are made, if long-term needs are balanced with short-term gains, and if good governance prevails. However, the development context constitutes key constraints to respond to and manage the environmental challenges. Weak environmental institutions are unable to manage the pressures from the economic interests, to enforce environmental legislation, to ensure that adequate environmental measures are taken, or to balance the public goods against private gains. This is a serious impediment for poverty reduction, inclusive economic and sustainable development. General improvements in governance, including transparency, accountability, participation and the rule of law, can help the country to balance the need of making productive use of its natural resources with maintaining its asset base through development investments.

[1] This document has been altered from the original version submitted to Sida, whereby recommendations associated with specific projects and programmes have been omitted.

Based on the Policy Brief and the parallel Gap Analysis, conclusions are made and presented in Chapter 5, together with recommendations for Swedish environmental support to Liberia. The following areas are identified as relevant to include in the upcoming Swedish strategy for Liberia: i) environmental/natural resource governance and management, ii) forestry/biodiversity, agriculture/land use, iii) WASH, iv) electrification, and v) artisanal mining.

Contents

Definitions: Environment and Climate Change

- **Environment**: The concept has a wide coverage including natural resources, land use, biodiversity and ecosystem functions and services, and encompasses aspects related to climate change, resource depletion, environmental degradation and pollution. Climate change is included when environment is mentioned, even if it is not always explicitly expressed.
- **Climate change** is a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (UNFCCC, Article 1)
- **Environmental integration** (or environmental mainstreaming) refers to the systematic integration of environment into all domains. It is understood as a "strategy to make environment an integral dimension of the organisation's design, implementation, monitoring and evaluation of development policies and programmes"[2]. Sida's view on environmental integration includes measures to identify and i) reduce negative impacts, ii) enhance opportunities and iii) reduce/manage environmental impacts on the sustainability of the contribution. Sida's requirements on environmental integration is further detailed in Sida's Green Toolbox.
- **A crosscutting issue** is an issue that is linked with, or related to, other concerns. Although sometimes seemingly unrelated, the crosscutting issue can be affected by, or influence the outcomes of, interventions in a different area or sector. The underlying perspective is that different parts of a system are interconnected. Environment is treated as a crosscutting issue that permeates sectors, projects, and activities, rather than being the main focus of the activities.
- **Direct environmental impacts**: impacts that derive directly from the organisation and its staff, and direct activities, e.g. travels, electricity consumption, procurement (e.g. office supplies, catering, cleaning supplies, etc.), waste, etc.
- **Indirect environmental impacts**: refer to impacts associated with the programs/projects, for instance support to capacity development, infrastructure development, natural resource management, advocacy, or other types of development cooperation.

[2] OECD DAC (2014)

1. Background and approach

This Environment and Climate Change policy brief[3] was developed to assist the Embassy of Sweden in Monrovia and Sida in preparing for a new development cooperation strategy for Liberia.[4]

The Swedish Government has identified environment and climate change as one of five perspectives to permeate Sida's activities. This is reinforced in Sida's Environmental Policy[5], which states that the "bio-physical environment with well-functioning ecosystems and a stable climate is the foundation for development and all human life. Sustainable management of the earth's resources is therefore a prerequisite for reduced poverty and sustainable societies – for current and future generations." The Environmental Policy further requires that environmental aspects are systematically integrated into all Sida's operations and sectors.

The **purpose of this policy brief** is to provide support to the Embassy of Sweden in Monrovia in the process of identifying key environment and climate change challenges and opportunities and describe how they link to **multi-dimensional poverty** aspects in Liberia by using the Sida Multi-dimensional Poverty Analysis (MDPA) framework, and to support identification of a potential role for Swedish development cooperation.

The assignment was conducted as a desk-study during three weeks in April-May 2020. It is based on available reports, research papers and statistics. It should be noted that reliable information and statistics on environment and climate change issues pertaining to Liberia has to some extent been a challenge to obtain. Much information is from secondary sources, e.g. World Bank, UN or NGOs. This should be considered when reading this policy brief.

2. Key environment and climate change issues

The purpose of this chapter is to provide a summary of key environmental information, problems/challenges, causes and key drivers in Liberia. Here, environment is defined broadly and includes climate change, natural disaster risks, natural resources, biodiversity, ecosystems and their functions and services. An additional purpose of the chapter is to present relevant environmental indicators and, wherever possible, trends.

[3] This document has been altered from the original version submitted to Sida, whereby recommendations associated with specific projects and programmes have been omitted.
[4] The Policy Brief was written by Gunilla Ölund Wingqvist and Emelie Césarat Sida's Helpdesk for Environment and Climate Change, at the request of Jenkins Flahwor (Embassy of Sweden in Monrovia) and Åsa Bjällås (Sida, Africa department). The views expressed in this Environmental Policy Brief are those of the authors and do not necessarily represent the views of Sida.
[5] Sida, 2017

2.1. Environmental context

Liberia is situated in West Africa on the Atlantic Ocean between Sierra Leone and Cote d'Ivoire, and with Guinea in the north. Liberia boasts a variety of ecosystems and is rich in natural resources, including tropical forests, biodiversity, water, agricultural land, and mineral resources but suffers from widespread poverty. The climate is tropical, hot and humid, with cloudy and wet summers with frequent heavy showers, and dry winters with hot days and cool/cold nights. The country has almost 600 km of coastline, which is relatively long considering its size (less than a third the size of Sweden).

The country can roughly be divided into four geographical zones: the coastal plain, the rolling hills, the plateau and tablelands, and the northern highlands. The coastal zone includes lagoons, mangrove swamps, river-deposited sandbars, riparian and coastal vegetation. The rolling hills are characterized by hills, valleys and watercourses and tropical forests both to the southwest and southeast. Liberia is a fertile country and ***agricultural*** land covers 28% of the total land area.[6] Most of the agricultural land is situated in this zone.[7] ***Water*** is abundant in Liberia with access to many rivers and lakes. Only 0.1% of available freshwater resources are withdrawn for use, of which 9% is used for agriculture. This is low in comparison to an average of 80% for Sub-Saharan African countries, implying less irrigation.

Tropical forests, which cover almost 45% of Liberia's land area, constitute two of West Africa's three remaining blocks of tropical forest. These forests are recognised internationally as "biodiversity hotspots" and are, therefore, priorities for global conservation efforts.[8] About half of the population lives in or near forested areas and the forests are of tremendous importance for people living in poverty. The Liberian tropical forests and coastal ecosystems host rich *biodiversity* and provide a range of ecological goods and services for Liberia's communities such as timber, fuel, medicine and food. In addition, coastal ecosystems, like mangroves, also protect shorelines from storms and tidal surges and constitute important breeding grounds and nursery areas for many West African marine species.

Liberia is richly endowed also with other renewable (e.g. water, fish) and non-renewable (e.g. minerals, gold and iron ore) resources. Traditionally, the natural resources constitute the basis for both the Liberian economy and the livelihood of its people.

Liberia has plenty of ***marine resources*** and fishery is an important source of income and food. While Liberia's ***fishing*** *sector* is essentially a small-scale artisanal, foreign fishing activities are large scale, dominated by pelargic tuna fishing. In January 2020, 49 foreign-flagged ships (tuna purse seiners) were authorised to fish in the Exclusive Economic Zone (EEZ)[9]. There are also six demersal trawlers (flagged to China) authorised to fish in the EEZ.[10]

[6] WB data, https://data.worldbank.org/indicator/AG.LND.AGRI.ZS?locations=LR&view=chart
[7] UNEP, 2004
[8] GEF, 2017
[9] 20 of these 49 ships were 20 operating under the Sustainable Fisheries Partnership Agreement (SFPA) concluded with the EU and 29 flagged to other countries (EU, 2020)
[10] EU, 2020

Almost half of the Liberian population of around 5 million lives in ***urban*** areas.[11] The capital, Monrovia, is the country's largest city. Other urban areas include Buchanan (port city for rubber and iron exports), Harper, and the inland trade centre of Yekepa, near the border with Guinea.

The civil conflicts had severe impacts on the country's human and urban environment, economy, infrastructure and overall development, and serious impediments for environmental development and contributed to the key environmental challenges listed in chapter 2.2. Liberia's post-conflict recovery and development was further disrupted by the 2014/2015 outbreak of Ebola virus disease, which caused almost 4,000 deaths – the highest ever Ebola death toll in West Africa.[12]

2.2. Key environmental and climate change challenges

The key environment and climate change challenges in Liberia relate to:[13] deforestation, loss of ecosystems and biodiversity, land degradation, natural resource depletion, inadequate WASH, waste and pollution, and natural disasters. Climate change is expected to add to already existing stresses and enhance vulnerability to external shocks and crises. The environmental problems are often interconnected and mutually reinforcing. For instance, deforestation is linked to depletion of ecosystem functions and services and biodiversity loss, climate change, land degradation and reduced resilience to natural disasters. Left unmanaged, the environmental problems could exacerbate food insecurity, vulnerability and health problems, increase resource scarcity, and reduce livelihood opportunities and resilience.

Deforestation: Deforestation is a big problem in Liberia and the deforestation rate continues to be very high, estimated 0.5 - 0.7%[14]. The deforestation is mainly driven by commercial logging, settlement expansion and road construction, substinence (mainly shifting[15]) agriculture, large-scale plantations, mining, and wood fuel extraction for household use. The coastal forests, including mangrove, are also under severe pressure. The rate of mangrove deforestation could be as high as 65% since 1980.[16]

Loss of ecosystems and biodiversity: Deforestation of mangroves is having a direct impact on fish stocks as well as storm protection. Biological diversity in Liberia has declined significantly over the past 30 years. The rainforest- and coastal ecosystems and biodiversity are under threat on a variety of fronts, including destruction of habitat (e.g. the land degradation and clearing of land for infrastructure and agriculture), and overexploitation of resources (logging and increased pressure from charcoal and fuel-wood consumption, fishing and bush-meat hunting). Industrial agriculture, such as rubber plantations, are associated with significant environmental impacts including clearing of primary forests. In addition, the monoculture plantations reduce biological diversity, and can serve

[11] WB, 2017; CIA World Factbook
[12] WFP, 2019
[13] This list is not exhaustive; it does not represent a ranking or an order of priority. It is based on a broad review of the literature and does not represent any official statements on the state of environment in Liberia.
[14] World Bank 2017 estimates that the deforestation rate is 0.7%, while other sources presents lower estimations, e.g. World Bank 2018 estimates that the deforestation rate is 0.5%. In either case, the deforestation rate is high.
[15] Shifting agriculture, or "slash and burn" cultivation, means that you clear a forest area, use it for agricultural crops for 1-3 years and then let it regenerate for a long time.
[16] GEF, 2017

as vectors for insect and disease transmission to native trees. Coastal ecosystems are also threatened by the overexploitation of fish species and other species (e.g. sea turtles), beach sand mining, beach erosion and mangrove loss.

Land degradation, mainly soil erosion, is a problem, particularly in hilly regions or in densely populated areas. Land degradation is driven by deforestation, mining, unsustainable forestry practices, shifting agriculture, sand mining for urban construction and human settlements. Weaknesses in land-use planning and the land tenure system is contributing to land degradation.[17] Effects of land degradation include loss of soil and nutrients, hampering agricultural productivity and food security.

Natural resource depletion: Lack of good governance and the conflicts brought about uncontrolled extraction of many of Liberia's natural resources, including forests and minerals. There are signs that the bigeye tuna and yellowfin tuna stocks are overfished and/or overexploited, while the skipjack tuna stock is still within sustainability limits. The sardinella stock seems to be the only stock where fishing pressure could be increased. A 2016 study suggests that also demersal stocks are quite heavily overexploited.[18] Liberia continues to be affected by varying forms of illegal, unreported or unregulated (IUU) fishing.

Inadequate WASH: Despite Liberia's water abundance, the systems for water, sanitation and hygiene (WASH) are poor, particularly access to facilities for sanitation and hygiene (further described in Chapter 3.1). The absence of wastewater treatment results in water being unsafe, in many places polluted by industrial run off and household waste. Coastal waters are polluted from oil residue, untreated sewage, industrial chemicals and mining by-products.[19] The weak WASH system is one of the key environmental challenges in Liberia.

Solid and hazardous waste and other pollution: Burning and dumping of waste is identified as one of the key environmental issues in Liberia.[20] Formal *solid waste management* services are only available in Monrovia.[21] Since the end of the civil war, Liberia's urban population (particularly in Monrovia and Paynesville) has increased by nearly 71%. However, the municipal capacity to provide municipal services – including waste management services – has not been able to keep up with the increasing demand and solid waste management has become an overwhelming task for the municipal authorities. In and around the capital city solid waste is heaping up and/or illegally dumped. Only about 50% of the household waste in Monrovia is collected and transported to a landfill. The rest is burned or buried in backyards, given to waste pickers ("scavengers"), or dumped in rivers or swamps (see Figure 1).[22]

[17] EU, 2006
[18] Reference to study in the West Africa Regional Fisheries Programme (WARFP) programme in EU, 2020.
[19] EPI, Wendling et al, 2018
[20] CIA World Factbook
[21] AfDB, 2019
[22] David Jr. et al, 2019

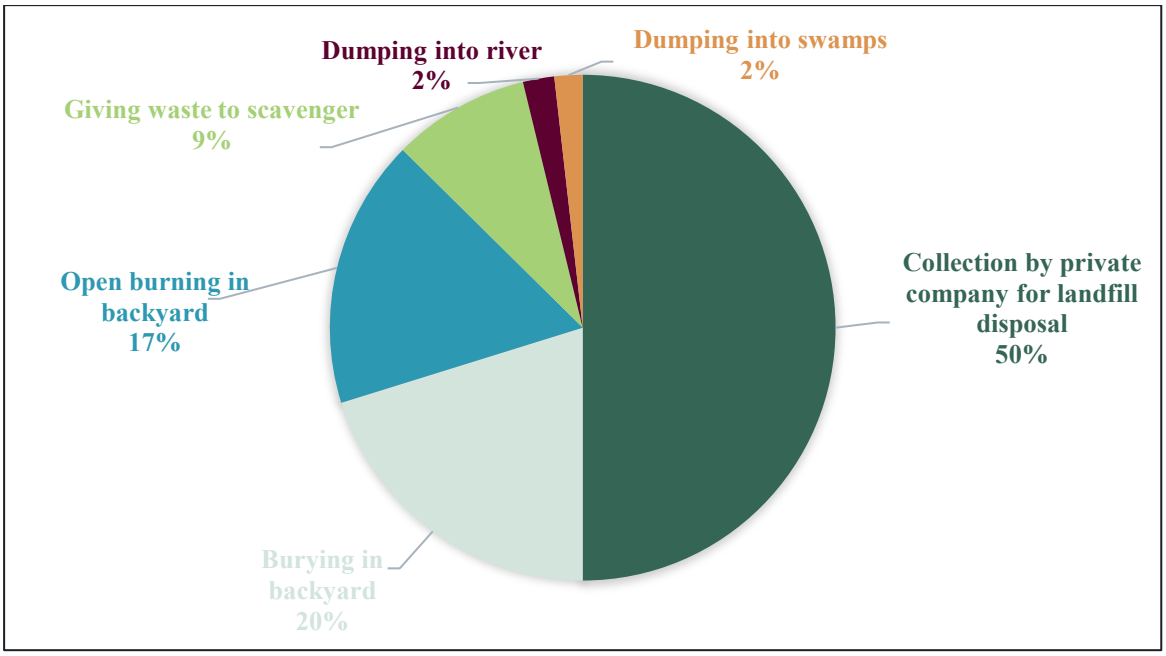

Figure 1: Waste disposal methods in Monrovia. Source: David Jr. et al., 2019.

Also *hazardous waste* generation is a growing problem and it is not managed in an adequate manner, posing threats to both human and environmental health. Hazardous waste amounts from e.g. mining and other industrial activities and hospitals/health clinics. During the Ebola epidemics, the need for appropriate medical waste management was highlighted. Hazardous medical waste, including used syringes and bloodied bandages, is randomly disposed together with other types of solid waste.[23]

Artisanal mining (ASM) is the greatest source of *mercury* emissions at a global level, emitting almost twice as much mercury as coal fired power plants. It has been estimated that two grams of mercury are released into the environment for each gram of gold recovered, and Liberia's 100,000 artisanal miners could be a large emitter of mercury.[24]

The generation and pollution from *e-waste* is a rapidly growing problem, due to increased demand and supply of electrical and electronic equipment (EEE). E-waste is both generated in Liberia and to a small extent also imported from other countries.[25]

Air pollution has been identified as one of the biggest global environmental health problems.[26] Ambient air pollution is mostly a local problem in urban areas, other densely populated areas, and around mining sites. Key sources of ambient air pollution include transportation (old vehicles and bad roads), energy use, mining and industrial activities and waste (e.g. open-air waste combustion). However, indoor air pollution (mainly from cooking) continues to be a health problem due to high dependency on wood for fuel.

[23] David Jr. et al, 2016
[24] UNEP, 2004
[25] In 2009 3,500 tons of EEE was imported to Liberia and it is estimated that 10% was e-waste (Strother et al., 2012)
[26] The Lancet commission (); EPI 2018 Wendling et al (2018).

Natural disasters: Liberia is exposed to different types of disasters, including epidemical, landslides, and hydro-meteorological (floods and storms) disasters, fires, and sea erosion. It is also affected by dust-laden harmattan winds blowing from the Sahara (December to March). Climate change and environmental degradation enhance these disaster risks. The Mano River region is exposed to multiple exogenous climate, conflict and disaster risks. As shown in Table 1, the epidemic disasters have had large death tolls, while hydro-meteorological disasters (storms and floods) affect many people.

Table 1. number of disasters in Liberia and their impacts, 1990-2019.

Table 1. Number of disasters in Liberia and their impacts, 1990-2019		
Disaster Type	**Total Deaths**	**Total Affected**
Epidemic viral (e.g. Ebola, Yellow fever)	4,829	11,041
Epidemic bacterial (including cholera and other diarrhoeal diseases)	605	23,312
Accidents (transport, fire)	109	966
Landslide	46	200
Hydrological/meteorological (floods and storms)	14	59,341
Insect infestation	0	500,000
Meteorological (cold wave 1990)	0	1,000,000

Source: The International Disaster Database EM-DAT

Climate change: Liberia is considered to be vulnerable to climate change, mainly due to high levels of poverty in combination with a high dependence on sectors sensitive to climate change, such as agriculture, fisheries, mining and forestry. The vulnerability is enhanced by the weak national capacity to handle predicted climate changes. Heavy rains, storm surges, sea level rise and increased erosion, put both urban and rural infrastructure at risk, particularly for the poor. Furthermore, heavily populated parts of the coast would be affected by frequent inundations, increased coastal erosion, and sea-level rise. Liberia is prone to flooding but not to drought, although that might change in the relatively near future depending on how Liberia for instance manages its forest resources, which can have significant implications on the microclimate.

2.3. Environmental performance

As described above, the environmental performance of Liberia is quite problematic. This is confirmed by the country's low score on the Environmental Performance Index, EPI 2018 (see Annex 1).[27] Liberia ranks 160 out of 180 countries.

Low scores can be attributed to civil unrest or weak governance. The 2018 EPI shows a positive correlation with a country's economic development as measured by its Gross Domestic Product (GDP), summarised in Table 2. Often Environmental Health improves with economic growth and

[27] The Environmental Performance Index (EPI) ranks 180 countries on 24 performance indicators across ten issue categories covering environmental health (air quality, water and sanitation, and heavy metals) and ecosystem vitality (biodiversity and habitat, forests, fisheries, climate and energy, air pollution, water resources, and agriculture): https://epi.envirocenter.yale.edu/

prosperity, while Ecosystem Vitality comes under strain from industrialisation and expanded economic activity.[28]

Table 2. EPI rank and score, Human development index rank, and GDP per capita estimates of selected African countries.

Table 2. EPI rank and score, Human development index rank, and GDP per capita estimates of selected African countries					
	Environmental performance			Human development	Economic development
Country	EPI 2018 Rank (1=best, 180=worst)	EPI 2018 score (0=worst, 100=best)		HDI Rank 2018 (1=best, 189=worst)	GDP per capita 2018 (estimates)
		Env. health	Eco. vitality		Current prices USD
Liberia	**160**	**44**	**40**	**176**	**728**
Mali	147	44	44	184	927
Niger	172	42	32	189	414

Source: EPI 2018 (Wendling et al., 2018); UNDP HDR 2019; and World Bank Data

As illustrated in Figure 2, Liberia scores very low on access to WASH (score under 5) (*Environmental Health*). Related to *Ecosystem vitality*, Liberia scores very low ("0") for Forests (high deforestation rate) and Water Resources (insufficient or no wastewater treatment). The score for air pollution is low (high emissions of nitrogen- and sulphur oxides). Also the score for agriculture (loss of nutrients) is low.

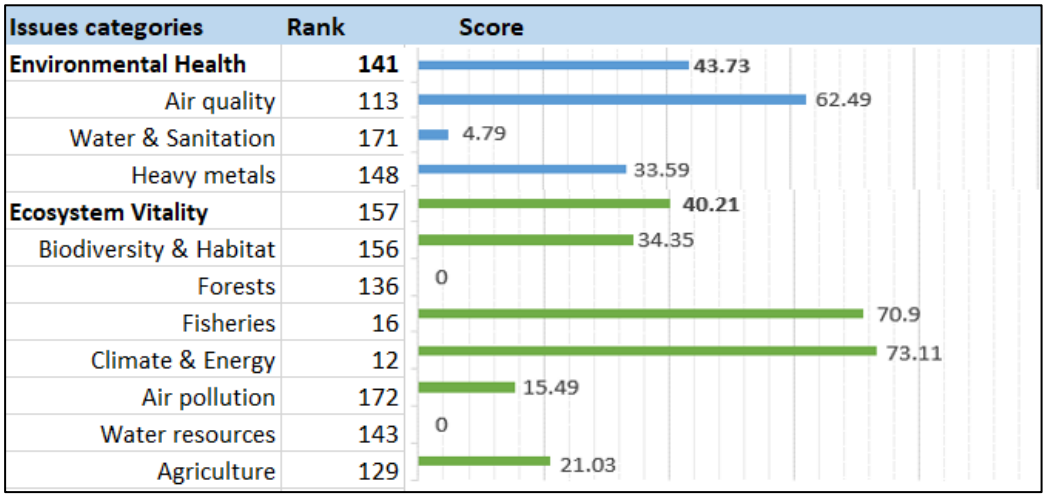

Figure 2. Liberia Environmental Performance Index Scorecard, divided into Environmental health and Ecosystem vitality (Rank: 1=best, 180=worst) Score: 0=worst, 100=best) (Source: EPI 2018, Wendling et al., 2018)

To ***summarise***, Liberia is a country rich in natural resources that offer huge potential for poverty reduction, power production and green economic growth. However, Liberia is currently subject to a range of environmental challenges including inadequate WASH, deforestation, natural resource depletion, waste and pollution. Liberia is also vulnerable to climate change, which is expected to exacerbate many of the other challenges.

[28] EPI Wendling et al., 2018

3. Who is poor and in what way? - Four dimensions of multidimensional poverty

The purposes of this chapter are: i) to link environmental aspects to the different dimensions of poverty and answer the question "who is poor in the different dimensions" linked to environment, and ii) to find the profile, or profiles, of the poor and vulnerable, i.e. those living in poverty or at the verge of falling into poverty due to environmental reasons.

Liberia has a population of around 5 million, with a high population growth (2.7%). More than half of the population lives in urban areas, with approximately one-third living within an 80-km radius of Monrovia.[29]

In 2016 almost 41% of the population lived below the international poverty line (USD 1.90/day). The poverty rates, which had been declining from 69% in 2007, increased again after the 2014/2015 outbreak of Ebola virus.

A recent household survey (LISGIS, 2017) shows large disparities between rural and urban areas, with 72% of the rural population being poor compared to 32% for urban areas. Extreme poverty is 16.5% at the national level (26% in rural areas and 7.2% in urban areas). By regions, Montserrado has the lowest rate of extreme poverty (2.7%), while the Southeastern B region has the highest (41%) as shown in Figure 3.

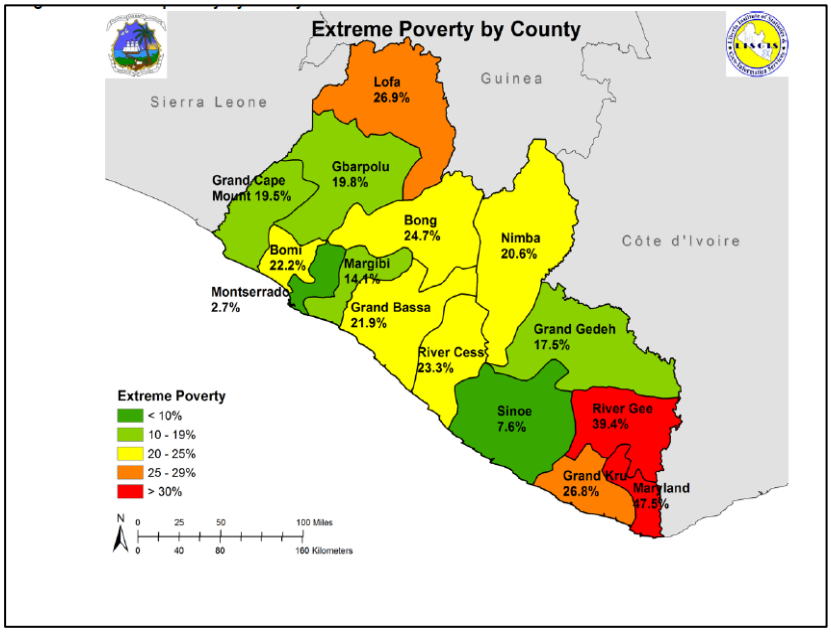

Figure 3. Extreme poverty in Liberia by county (Source: LISGIS, 2017)

Around 39% of the population are food poor (see Figure 4). While food poverty is still higher in rural areas (51%) than in urban areas (28%), the gap is smaller than with absolute poverty, showing the

[29] CIA World Factbook, 2020-estimates.

impact of subsistence farmers' contribution to food needs. Male headed households are on average poorer than female headed households with absolute poverty at 52% and 46% respectively.

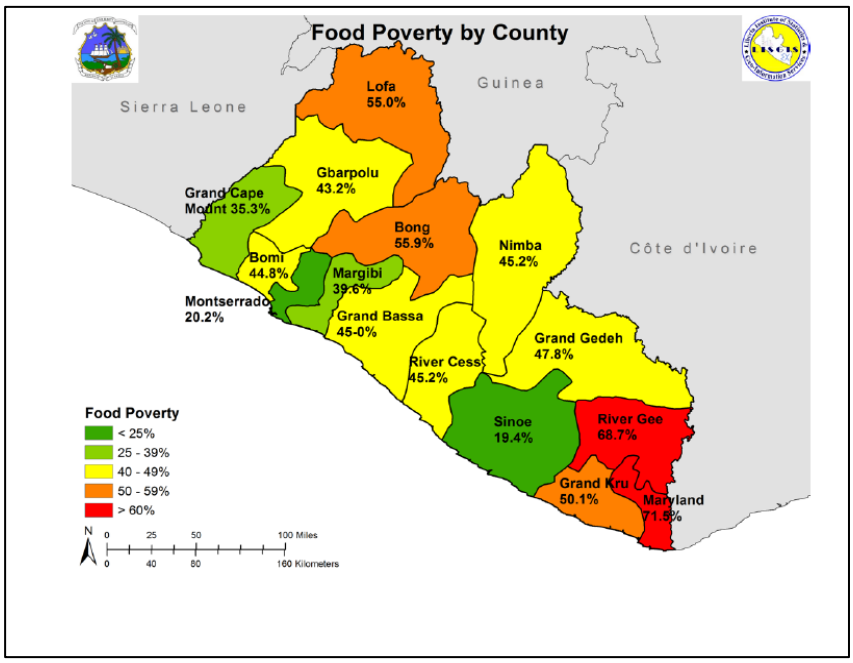

Figure 4. Food poverty in Liberia by county (Source: LISGIS, 2017)

The Gini index[30] of 35 in Liberia indicates that it has one of the more equal income distributions in Sub-Saharan Africa [31]. Still there are large regional differences in income levels and economic opportunities, which contribute to social and economic exclusion. While poverty rates are higher in rural areas and lower in urban areas, the inequality is higher in urban areas (32) than rural areas (27) as measured by the Gini index.

3.1. Environment and the Resource dimension of poverty

Resources are a key feature of environmental linkages to multidimensional poverty. Being poor in terms of resources means not having access to, or power over, good quality environmental resources needed to sustain a decent living standard. Environmental resources necessary for human wellbeing include water and sanitation, energy, forests, biodiversity and ecosystems, land and fertile soil, and clean air. In order for people to make use of the resources they need to be available, accessible, affordable, appropriate and of good quality.

Inadequate access to environmental resources of good quality and sufficient quantities creates a myriad of problems, particularly for people living in poverty. Degradation and overexploitation of

[30] Gini index measures the degree of inequality in the distribution of family income in a country, where 0 indicates perfect equality and 100 indicates complete inequality. The more equal a country's income distribution, the lower its Gini index, e.g., a Scandinavian country with an index of 25. The more unequal a country's income distribution, the higher its Gini index, e.g. a Sub-Saharan country with an index of 50.

[31] A Gini index of 35.3 (2016) is on par with Sierra Leone (34 in 2011), and Niger (34.3 in 2014), and significantly more equal than Cote d'Ivoir (41.5, 2015) and the DRC (42, in 2012) (World Bank Data)

environmental resources, e.g. deforestation, soil erosion and pollution of air, water and soil, are challenging peoples' ability to work and secure a livelihood in agriculture, fishing and other sectors on which many of the world's poor are dependent. This leads to reduced household income, negative effects on health, deprivation of life chances and generally constitute severe obstacles to social and economic development.

The examples below illustrate the environmental challenges in Liberia and its implications for people living in poverty.

Based on figures from 2004, WHO (2009) estimated that, 30% of the total burden of disease in Liberia was due to environmental risk factors. [32] Newer data from the Institute for Health Metrics and Evaluation (IHME) at the University of Washington implies that the health situation in Liberia, including environmental health, is improving. However, malaria, diarrhoea, and respiratory infections (including asthma) continue to constitute the major causes of death in the country (Annex 3). The key risk factors for death and disabilities include malnutrition, and inadequate access to WASH and clean air (Figure 5).

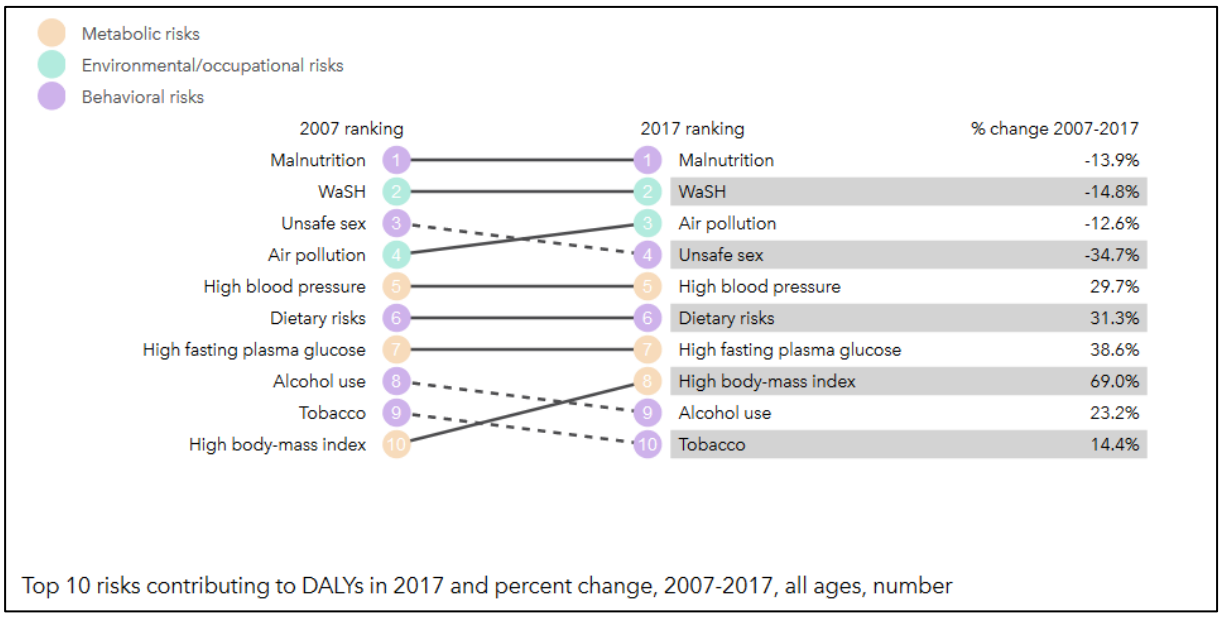

Figure 5. Risk factors driving deaths and disabilities in Liberia (2007 and 2017) (Source: IHME http://www.healthdata.org/liberia)

Access to WASH: Liberia scores very low on access to and quality of WASH services. A majority of the population has access to basic water services. However, access to sanitation is very bad, where most of the population (particularly in rural areas) only has access to 'limited' or 'unimproved' sanitation services and no hygiene services (Figure 6). The high level of open defecation (OD) in Liberia (60% in rural and 19% in urban areas) is alarming.

The trend for access to basic water and sanitation services is improving slightly in both rural and urban areas. Even if the open defecation (OD) rate is distressing, there has been a positive trend

[32] WHO, 2009

particularly in rural areas, where OD has decreased from almost 80% in 2000. The trend for access to hygienic (handwashing) facilities is not changing, i.e. it is stable at a very low level. [33] The weak WASH services often result in diarrhoea, which is causing over 6,600 deaths annually in Liberia (see Table 3). 22% of children under five are subject to incidence of diarrhoea, compared to 15% as a Sub-Saharan Africa average.[34]

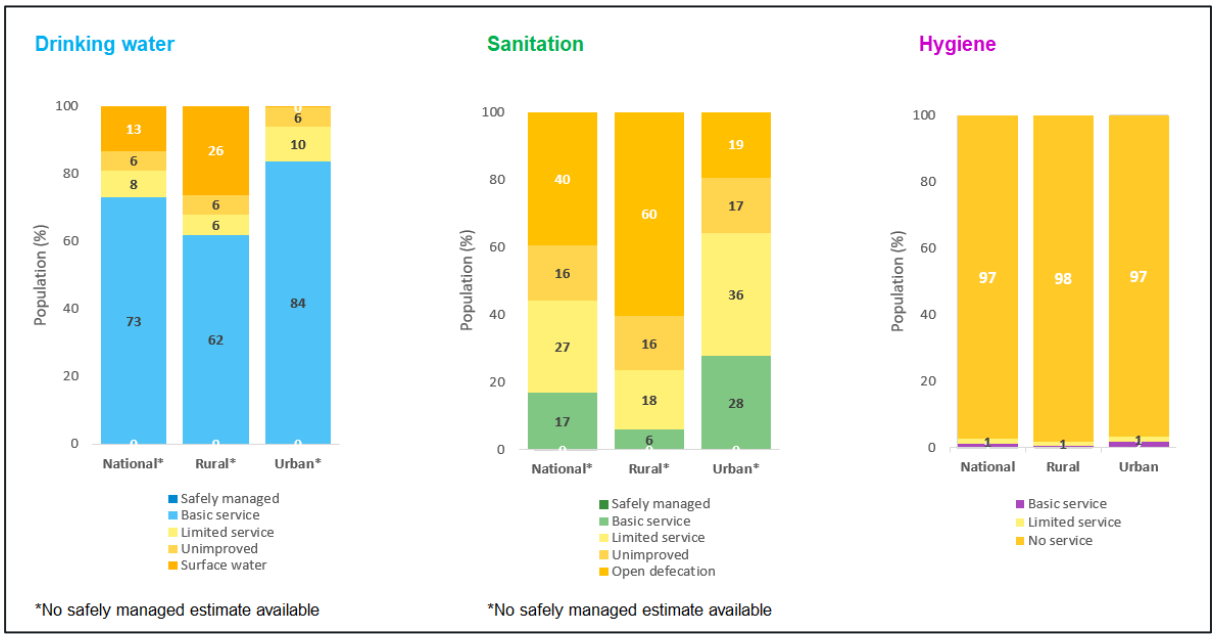

Figure 6. Water, sanitation and hygiene (WASH) ladders, estimates for Liberia (Source: WHO-UNICEF JMP, 2019)

The WASH situation in schools is very problematic, with almost half (47%) of primary and secondary schools lacking access to water and 39% lacking access to sanitation, and 41% lacks hygiene (handwashing) services.[35] The absence of handwashing facilities compounds the risk for transmission of diseases (including the covid-19), especially in densely populated areas including IDP camps and urban slum.

For WASH in health care facilities (HCF) access to information is weak, but it appears that the situation is quite grave; 50% of the HCFs lack access to water (for 50% data is insufficient). 3% of the HCF have access to basic sanitation, 73% to limited sanitation while 24% of HCFs lack access to sanitation. 36% of the HCF have access to basic hygienic services (for 64% the data is insufficient) and 67% have access to basic waste management services.[36]

Access to water and sanitation has strong gender implications, partly because the responsibility to collect water mostly lies with women (and children). Girls are particularly vulnerable to the lack of sanitation and hygiene facilities in school during menstruation (or in public places where they work) and are more vulnerable to ridicule or harassments if sanitation facilities are not available or not

[33] WHO-UNICEF JMP, 2019.
[34] World Bank, 2017.
[35] WHO-UNICEF JMP, 2019.
[36] JMP, 2019

safe. Furthermore, girls and women are more vulnerable to infections if they cannot urinate but must "hold it".

***Access to agricultural land and markets*:** Access to land and tenure security is very important for people's livelihoods and agriculture employs around 70% of the labour force in Liberia.[37] Women account for 80% of agricultural labour force.[38] Most poor Liberians live in large households and derive at least some of their income from smallholder farming. The agriculture is small scale and largely rain fed. Poor households tend to have undiversified income sources, high dependency ratios, and older and less-educated heads of household. Poor households also tend to be located relatively far from key infrastructure, markets, and public institutions.[39] As mentioned above, Liberia is a food insecure country. In the 2016 household survey, 51% of the households reported they suffered from food shortages, with higher incidence in rural areas (59%) than in urban areas (44%).

***Access to energy*:** Less than 20% of Liberia's population has access to electricity, with a mere 1.3% of the rural population having access to electric power. In 2014, the Liberia Electricity Corporation provided power to 4.5% of the population. Other sources of power include community generator (4.9% of the population), own generator (4.4%), and vehicle batteries (3.9%). Access to electricity is important also for health care facilities, providing better light, refrigeration, use of medical appliances, sterilisation, and communication. Liberia has one of the world's highest electricity tariffs at US$0.35/kwh, which constraints access for people living in poverty[40]. One of the most critical impacts from the lack of electricity is the high demand for alternative sources of energy. Given the abundance of Liberia's forests, fuelwood and charcoal became the principal energy sources, and consumption skyrocketed both during and after war. Wood and charcoal is the dominant source for domestic energy in Liberia. It results in deforestation and high indoor air pollution, which contributes to respiratory diseases mainly affecting women, children and elderly. In Liberia 7% of children-under-five suffer from acute respiratory infections (compared to 5% on average in Sub-Saharan Africa)[41]. Air pollution is the third largest risk factor for deaths and disabilities in the country (Figure 5).

Access to other natural resources: *Fisheries* have long contributed to the livelihoods of coastal populations in Liberia. Fish protein is the most important animal source in the country (65%) and the most traded commodity after rice.[42] The Liberia's fishing sector is essentially a small-scale artisanal sector supporting livelihoods of an estimated 15,000 coastal fishers and 25,000 fish processors and traders.[43] Despite the rich fisheries resources Liberia is a net importer of fish with high levels of food insecurity, illegal fishing and mismanagement. The fishery sector could contribute tremendously to food security and job creation through enhanced production, conservation planning, and value chain development.[44]

[37] CIA World Factbook
[38] WPF, 2019
[39] World Bank Group, 2018
[40] AfDB, 2019
[41] World Bank, 2017
[42] AfDB, 2019
[43] EU, 2020
[44] AfDB, 2019

Artisanal small-scale *mining* (ASM) is mainly a poverty driven activity, and it has the potential to provide livelihood benefits and diversify household economies. In Liberia, it is estimated that some 100,000 people are active in the ASM sector, particularly mining gold and diamonds. If the sector is well managed, it has the potential to contribute to reducing unemployment, and to employ thousands of the youth in Liberia. The Ministry responsible for mines is making efforts to formalise activities of the ASM sector.[45] Artisanal mining is, however, associated with the clearing and excavation of large areas of forest and riverbeds and the uncontrolled discharge of metals, metalloids, cyanide and suspended solids, which can clog and pollute rivers. Artisanal miners are exposed to mercury and other types of hazardous waste and pollution. Children are very vulnerable to exposure of these types of pollutants and may develop serious problems with physical growth, cognitive development and general health.

***Deforestation, loss of biodiversity*:** Forests are fundamental to the Liberian population, providing sources of subsistence, economic activity and cultural identity. The forests also provide medicines, construction materials, fuel, food and commodities to sell for cash. They are of great cultural importance to nearly all Liberians.

Waste is a major hygiene concern, especially in urban or densely populated areas. The waste collection and disposal are major challenges and only about 50% of household waste is collected in Monrovia. It can only be assumed that it is the poor urban areas that has less service while the richer part of the capital has more frequent waste collection.

3.2. Environment and the Opportunities and Choice dimension of poverty

The global 2019 SDG assessment ranks Liberia 157 of 162 countries. As illustrated by Figure 7, Liberia is doing well for SDG12 (Responsible consumption and production) and SDG13 (Climate action), and reasonably well for SDG10 (reduced inequalities) and SDG14 (Life below water). Major challenges remain to achieve all the other SDGs, particularly SDG1 (No poverty), SDG4 (Quality education), SDG7 (Affordable and clean energy), and SDG9 (Industry, innovation and infrastructure). Map of SDG fulfilment on the African continent, and trends for Liberia's SDG fulfilment are detailed further in Annex 2.

All the deprivations described in the previous chapters, and the challenges of Liberia to attain the SDGs, are strongly linked with lack of opportunities and choice. Being poor in terms of opportunities and choice means that people lack the possibility to use available environmental resources and ecosystem services for their own benefit, to lift themselves out of poverty. Poverty in this dimension can take the form of limited access to markets, few opportunities for livelihood diversification, inability to invest in improved agricultural technology, low access to education, or barriers to access, or change into, clean energy sources. It can also be restricted by lack of health.

[45] AfDB, 2019

Figure 7. Assessment of Liberia's fulfilment of the SDGs (Source: SDG Center for Africa and Sustainable Development Solutions Network, 2019).

Poverty in this dimension is often a *consequence* of deprivation in any of the other three dimensions (resources, power and voice, and human security) that negatively affects the possibility to escape poverty. This disabling context sets the limits to how development could be realised.

A vast majority of the poor Liberian population are vulnerable to external shocks, such as floods and storms, with little ability to either minimize their exposure to natural disasters or cope with them. In 2018, 15,000 people were displaced in the country due to disasters.[46] The Liberian refugees from the civil war have recently returned to their homes, but Liberia is also a host for some 12,000 Ivoirian refugees escaping instability in their country.[47] People living in refugee or IDP camps, who are lifted up from their regular life and livelihood options, have in general very little choice and opportunity other than to pursue pragmatic survival strategies based largely on the harvesting of natural resources, such as fuel wood collection/charcoal production. There is often increased competition over resources and overexploitation as a result.

Other external shocks, such as political instabilities, failed harvests, or price drops on the global market compound with environmental shocks and affect households in poverty relatively more than the more well-off households. Typically, households in poverty live with small margins, fewer opportunities and are more vulnerable to all kinds of shocks (i.e. low adaptive capacity). Reoccurring natural disasters have both immediate and long-term impacts; direct effects include e.g. damage on properties and on humans. Secondary effects include crop loss in agriculture production, and risk for food insecurity.

To lack opportunity and choice can also hamper people to sustainably manage available natural resources and ecosystem services in both a short- and long-term perspective. Stress over resource scarcities and livelihood opportunities typically result in overexploitation of agricultural lands and forest resources. People with limited opportunities can also have harder times to adapt their livelihoods to climate change and strengthen community resilience. With such high poverty levels as in Liberia, many groups are vulnerable, including the urban poor, small-scale farmers and miners.

[46] IDMC, 2019
[47] CIA World Factbook

The majority of Liberians, especially women, depend on agriculture-related activities for their livelihoods. However, the productivity is low, over 90% of agriculture is subsistence-based, and the country depends on imports for over 60% of its basic food needs. The food insecurity levels are high and 20% of the households do not have access to an adequate diet. Of Liberian children under age 5, an estimated 32% are stunted (low height-for-age) and 6% are wasted (low weight-for-height). There are large regional disparities in food security, as illustrated in Figure 4. Underlying factors of food insecurity include insufficient agricultural productivity, bad infrastructure and road network, and long distances over which imported commercial rice and condiments must be transported from their ports of entry. This is combined with poor food value chains including storage, processing and marketing channels, high post-harvest losses, unequal access to and control of productive resources, especially for women; and low institutional capacity. As a result, incentives to produce marketable surpluses are limited. All these factors affect the livelihoods of small-scale producers, especially women, who account for more than 50% of the workforce in agriculture, forestry and fishing.[48]

Land is a key resource for both human survival and economic development, and vice versa: no or insecure access to land is a major constraint to having opportunity and choice. Currently, tenure is insecure and indigenous land in particular is considered open for exploitation.[49] Other challenges, beside insecure land tenure in rural areas, include lack of improved crop varieties, lack of integrated pest management techniques, degradation of the natural resource base, loss of biodiversity, structural inequalities and the effects of climate change.[50]

Environmental degradation, lack of access to, or competition (even conflict) over natural resources, are negatively affecting people's livelihood opportunities. People living in poverty are also commonly exposed to higher risks such as unsanitary living conditions (e.g. in peri-urban areas, on marginal land or in displacement camps) and high-risk vocation. Urban or densely populated areas with inadequate waste management services compels people to dispose of their waste in streets or open spaces where it often ends up blocking drainage, causing health risks, water stagnation, pollution and flooding.

The low access to WASH in schools and high environmental burden of disease (see Chapter 3.1) affect children's ability to attend school and benefit from education with far-reaching consequences, including (but not limited to) weaker job opportunities and low confidence to participate fully in democratic processes and getting their voice heard. The long-term impacts from stunting and from high exposure to heavy metals and other chemicals around mining sites, may have severe impacts on children's cognitive capabilities, further hampering their future opportunities and choices to transfer out of poverty.

The low access to electricity is an obstacle to achieve opportunity and choice. For instance, lack of lights aggravates studying and learning. Lack of access to electricity makes it more difficult to improve agricultural productivity, reduce post-harvest losses through proper storage, pump water

[48] WFP, 2019
[49] ESCR-Net, 2018
[50] WFP, 2019

(e.g. for irrigation), and add value to agricultural products. Furthermore, it hampers charging your mobile phone and thereby getting access to information.

3.3. Environment and the Power and Voice dimension of poverty

Being poor in terms of power and voice means that people lack the ability to articulate their concerns, needs and rights in an informed and meaningful way, and to take part in decision-making affecting these concerns. Promoting power and voice contributes to ensure that people's knowledge and concerns are listened to and understood.

Human rights principles and governance – how decisions are made and power exercised – have a strong effect on environmental actions and outcomes. Achieving sustainable management of the environment is a complex task and many perspectives need to be taken into consideration. All people should have the possibility to participate meaningfully in public consultations, planning and political processes that affect their environment and livelihood opportunities without being discriminated[51]. Power and voice are often related to access to information, and the ability to participate and hold duty bearers accountable.

Liberia has enjoyed more than a decade of peace and stability since the second civil war ended in 2003. During this time, the country has made considerable progress rebuilding government capacity, re-established the rule of law, and ensured the political rights and civil liberties of citizens. Currently, Liberia scores higher than the Sub-Saharan average on Voice and Accountability in the Worldwide Governance Indicators (see Figure 8, Chapter 4.2). However, there is still room for improvement. Liberia's constitution provides for freedom of speech and the press, but these rights are often restricted in practice.[52]

The civil society in Liberia is rich and diverse. Most CSOs are small community-based service delivery organisations working on niche projects for their members at community level and a few larger organisations are active at sector level in governance and accountability. Liberian CSOs also played a key role during the Ebola crisis, through the provision of basic services. Different evaluations and studies indicate that Liberian CSOs enjoy a relatively favourable enabling environment, which supports the ongoing state building process. Both legal and policy frameworks recognize the need and added value of CSO engagement.[53]

In order to restore peace to the country, the Liberian government has developed a post-conflict reconstruction plan that focuses on attracting private sector investments. There are huge economic interests in the natural resource sector in Liberia, including mining, oil and land (for instance palm oil and rubber plantations). Palm oil company concessions extend over vast areas (estimated at 10% of the country in 2016[54]) that feature a mix of forest-dependent communities, high biodiversity value forest, including coastal forests, and competing natural resource interests such as logging, mining

[51] UN Special Rapporteur on human rights and the environment website
[52] Freedom House
[53] AfDB, 2019
[54] Global Witness, 2016

and rubber. Inadequate consultations and compensations in relation to investment projects, which have not offered many jobs for local people, have sometimes resulted in tensions among communities due to loss of livelihood options and destruction of religious sites.[55] Historically and still today, affected communities say they lack agency to engage with the companies.[56]

Liberia is testing community forestry, which (if done right) has great potential for participatory and inclusive forest management. However, the community forestry is being undermined, for instance by logging companies getting access to forests before permits are awarded to communities, or by signing agreements with local elites. Local communities, in particular indigenous groups, do not have adequate capacity to participate meaningfully, thereby having little agency over local elite and private companies.[57]There appears to be little or no environmental monitoring from Liberian Authorities, and disclosure of information regarding pollutants. Lack of access to information hampers the public's ability to know, form opinion and to be part of consultations. However, it seems that there are some monitoring and evaluations being performed by civil society. For instance, Mighty Earth (2019) made an evaluation of environmental and social performance of Firestone Rubber Plantation in Liberia, which is the single largest rubber plantation in the world. Identified key issues include serious water contamination and "unfair dismissal of union officials, summary eviction from company housing, and continuing poor labour practices, including problems transferring Firestone's pension liabilities to the state".[58]

3.4. Environment and the Human Security dimension of poverty

Being poor in terms of human security, describes how violence and insecurity constrain a person's, household's or community's ability to move out of poverty.

Natural disasters can have a negative impact on human security when people's houses and assets are destroyed, and people are injured or even killed. Women, children and elders are the most vulnerable to natural disasters. When natural and other types of disasters combine, the impact on human security can be severe. Floods add burden to the communities and areas already weakened by conflicts.

The strategy of the Liberian government is to welcome private (including foreign) investments, as a means to promote post-conflict reconstruction and development. Foreign companies are interested in the natural resources, including iron ore, palm oil and gold. However, a country where land disputes were a key driver of the civil war and where land continues to be a highly contested topic, land-intensive sectors like agriculture and mining risk creating renewed conflict. These investments and land-use changes have so far only delivered limited development. They do not contribute to broad based employment but cause a wide range of human rights problems, and could spark

[55] Gobal Witness, 2016; the Guardian, 2012.
[56] Mighty Earth, 2019
[57] Global Witness, 2018
[58] Mighty Earth, 2019

conflicts between communities, companies and the Liberian government and even contribute to increased risk of violence.[59] Human rights defenders have been harassed, even killed.[60]

Global Witness (2018) has identified some security risks with the community forestry efforts in Liberia. Instead of being empowered, the communities risk becoming disempowered and indebted to logging companies. The permitting system in Liberia risks being highjacked by logging companies, and a weak Forestry Development Authority. This may result in resentment, increasing inequalities and serious risks of future conflict.[61]

Land is, as mentioned previously, one of the key assets and access to land is of tremendous importance. Women continue to face discrimination in the exercise of marital rights and parental authority, inheritance and access to land rights and financial services.[62] In September 2019, President Weah signed into law two important measures: the Land Rights Act, which aims to formalize communities' ownership of ancestral land; and the Local Government Act, which is intended to give more powers to local political subdivisions through decentralisation.[63]

Liberia's economic strategy has not contributed to broad based employment (for example the Foreign Direct Investment-laden and export-oriented mining sector employs only 2% of the workforce). High unemployment rates make it hard for people to cope with increased costs of living. In January 2020, demonstrators in Monrovia protested rising living costs. The crowd accused the government of corruption and abuse of power. This is an example of the fragile situation.

The control of natural resources, including land, timber and mineral wealth, has been linked to the armed conflict. Laying solid foundations for the sustainable development of the country's natural resources is of central importance to Liberia's future in order to maintain peace and security.[64]

To ***summarise***, Liberia's rich natural resources have played a significant role in the conflicts of the region, but also hold the key to its future development. A vast majority of the Liberian population, particularly those living in poverty, are directly depending on access to environmental resources for their livelihoods. Access to land, forests, water resources, fish, WASH, energy, etc. constitutes their safety net. When access to these resources is low, for instance, when land is lost or degraded, forests are cut down, WASH facilities are unavailable or not accessible, and the energy sources are polluting the air, the people living in poverty risk losing their health as well as the sources of food and shelter. These deprivations are closely linked to a lack of choice and opportunities, inadequate voice and accountability and weak human security. On the other hand, improving access to and quality of the environmental resources, if people are able and capable to use available environmental resources and ecosystem services for their own benefit, it could have large benefits for human health, food security and livelihood opportunities and for their opportunity to lift themselves out of poverty.

[59] Schuit, 2015
[60] Green Advocates
[61] Global Witness, 2018
[62] WFP, 2019
[63] Freedom House
[64] UNEP, 2004

4. The development context

The multidimensional poverty framework is based on the understanding that poverty is dynamic and not a static condition. People who live in poverty are not inherently destined to stay in poverty, and people who are higher up on the socio-economic ladder today can - depending on changing circumstances - fall into poverty in the future.

This chapter presents a wider perspective, providing information of poverty at a structural level and a description of the development context including information on the linkages between environmental aspects and the four development context areas; i) economic and social context, ii) political and institutional context, iii) peace and conflict and iv) environment (Note: the environmental context of Liberia is described in chapter 2).

4.1. Environment and the Economic and Social context

Liberia is a low-income country highly dependent on its natural resources for economic development as it is richly endowed with water, mineral resources, forests, and a climate favourable to agriculture. Its principal exports are iron ore, rubber, diamonds, and gold. Moreover, palm oil and cocoa are emerging as new export products.[65]

Looking back on Liberia's economic development, the civil conflicts between 1989 and 2003 seriously hampered the country's economy and overall development. [66] In the beginning of the last decade, the country achieved high growth rates. However, the Ebola crisis between 2014 and 2016 negatively affected economic development and forced the economy into a recession. Real GDP growth recovered to 2.5% in 2017, largely driven by mining (gold and iron ore), forestry, and agriculture. During the past two years, Liberia has faced uncertainty due to declining mining exports and rising inflation and currency depreciation. Real GDP growth, after declining to 0.4% in 2019, is expected to recover to 1.6% in 2020. To-date the economic development is still heavily dependent on improved performance of natural resource use and is highly vulnerable to international commodity prices.[67] It should be noted that these expected numbers for 2020 were estimated before the corona outbreak of 2020. The outbreak is expected to seriously affect the global and as well as the Liberian economy, how much remains to be seen.

Agriculture (including forestry and fishing) is the backbone of the country's economy as it contributes to 34% of the GDP.[68] Agriculture is seen as both a potential growth sector and a sector that can contribute to poverty reduction as many of the poor people are engaged in subsistence agriculture. Although Liberia enjoys conditions favourable for agricultural growth, the agriculture sector is characterised by low productivity. The low farm yields and poor agricultural practices, results in high rates if imported foodstuffs. Over 50% of foodstuffs are imported, where rice accounts for over 80%.[69] Major challenges to agricultural productivity include impaired market access due to

[65] CIA World Factbook
[66] WFP, 2019
[67] AfDB, 2019
[68] CIA World Factbook
[69] AfDB, 2019

limited road networks; limited scope for crop diversification; poor food value chains, lack of access to markets and low institutional capacity.[70] Furthermore, environmental degradation, such as deforestation and soil erosion, as well as climate variably and climate change adds pressure on the sector and negatively affects productivity.

Traditionally, Liberia has relied on **forestry** (rubber and timber) and **mining** (gold, diamonds, and iron ore) as major sources of income. In 2016, total natural resources rents accounted for 50% of GDP where forest rents represented 32% GDP and mineral rents 17% GDP.[71]

Liberia's government is seeing great opportunities for investments in the **forestry sector.** However, domestic timber value chain is short and constrained by inadequate technical expertise, poor regulations and continuous use rudimentary hand tools, and consequently low-quality products.[72]

The **mining sector** is important for the Liberian economy and has the potential to contribute significantly to employment, income generation, and infrastructure development. Development in the mining sector as well as oil exploration is encouraged by the Liberian government.[73] Increased mining activity including oil could entail major economic opportunities but also significant environmental and social risks. Unless they are managed in a sustainable way, based on competent environmental and social impact assessments and full implementation of associated mitigation measures, the environmental and social costs can be expected to be high.

Alongside the sectors mentioned above, the **fisheries** sector also plays an important role in the economic development and well-being of Liberia. In 2018, the catch was estimated at just over 13,000 tons worth approximately value EUR 5.5 million with small pelagics dominating (40% of total catches).[74]

As already mentioned, the government of Liberia is promoting increased agricultural productivity (including forestry and fisheries) as well as exploitation of the mining sector for economic growth. The potential for economic growth is closely linked with development of Liberia's natural resources including forests, minerals, land, water, and biodiversity. It is thus important that the development is sustainable, including environment and social aspects. There is a lack of awareness and knowledge amongst decision makers about the value of Liberia's natural capital.[75] In the short term to medium term, exploitation of these natural resources may generate large economic benefits. However, in the long-term unsustainable use of these natural resources increases not only environmental degradation, but decreases economic growth, increases social tensions and decreases livelihood opportunities.

In its Indicative Nationally Determined Contributions (INDC) reporting to UNFCCC (2015), Liberia estimates that if a low-carbon development strategy is followed, the country will save an estimated 11.7 million tons of CO_2 per year, while generating $58.7 million in revenues annually. The Land Use,

[70] WFP, 2019
[71] AfDB, 2019
[72] AfDB, 2019
[73] AfDB, 2019
[74] EU, 2020
[75] GEF, 2017

Land-Use Change and Forestry (LULUCF) sector is a Greenhouse gas (GHG) sink. The energy, transportation and waste sectors are included in the INDC report as sectors relevant for climate mitigation efforts.

Liberia is a member of the Extractive Industries Transparency International (EITI) and the Kimberly Process. Liberia's EITI covers the mining and timber sector as well as agriculture and the nascent oil and gas sectors. Liberia was suspended by the EITI board in September 2018 for failing to submit a report and meet the requirement related to a multi-stakeholder group (MSG). The temporary suspension was lifted again on 6 March 2020, when the requirements were fulfilled.[76]

There are also costs associated with the weak WASH situation in the country. In 2012, the Water and Sanitation Program (WSP) estimated that Liberia lost USD 17.5 million annually due to poor sanitation (access time, premature deaths, productivity losses and costs for health care). WSP states that this figure likely is underestimated as it does not include costs for epidemic outbreaks, funerals, water pollution, or losses related to negatively affected cognitive development and tourism. Investments in improved sanitation is in fact cheaper than not having access to it. The economic burden of poor sanitation falls most heavily on the poorest.[77]

Moreover, climate change, land degradation, pollution to soils, water and air, lack of access to water, and reoccurring natural disasters pose significant risks to Liberia's economic development and its possibility to attain sustainable development.

4.2. Environment and the Political and Institutional context

Liberia is party to more than ten multilateral environmental agreements (MEA) conventions[78] and has adequate environmental governance institutions at national and local government levels.[79] The country's policy frameworks are by and large adequate for managing environmental challenges. However, institutional capacity and effectiveness at national and local level is weak in Liberia. This is further hampered by a lack of good governance, including lack of transparency and accountability, and insufficient coordination across government agencies and other actors, and cross-sectoral cooperation.

The World Bank's World Governance Indicators[80] for Liberia shows that four out of the six governance indicators are lower than sub-Saharan African average. These include the indicator for

[76] EITI, Liberia website.
[77] WSP, 2012
[78] United Nations Convention on Biological Diversity (CBD); Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); Convention on Migratory Species (CMS); UN Framework Convention on Climate Change (UNFCCC); Paris Agreement; Ramsar Convention on Wetlands of International Importance; Cartagena Protocol on Biosafety; UN Convention to Combat Desertification/Land Degradation (UNCCD); The Basel Convention Prohibiting the Movement of Hazardous Chemicals; The Stockholm Convention on Persistent Organic Pollutants (POP); and The Montreal Protocol on Ozone Depleting Substances (source: https://www.informea.org/en/countries/LR/parties)
[79] AfDB, 2019
[80] The six indicators are: 'voice and accountability' (43.35 of 100); 'political stability and absence of violence and terrorism' (40 of 100); 'government effectiveness' (8.65 of 100); 'regulatory quality' (14.42 of 100); 'rule of law' (16.83 of 100); and 'control of corruption' (20.19 of 100)

"Government Effectiveness", "Regulatory Quality", "Rule of Law" and "Control of Corruption", illustrated in figure 8 below, with "Government effectiveness" as the lowest score, confirming the weak institutional capacity and implementation challenges mentioned above.

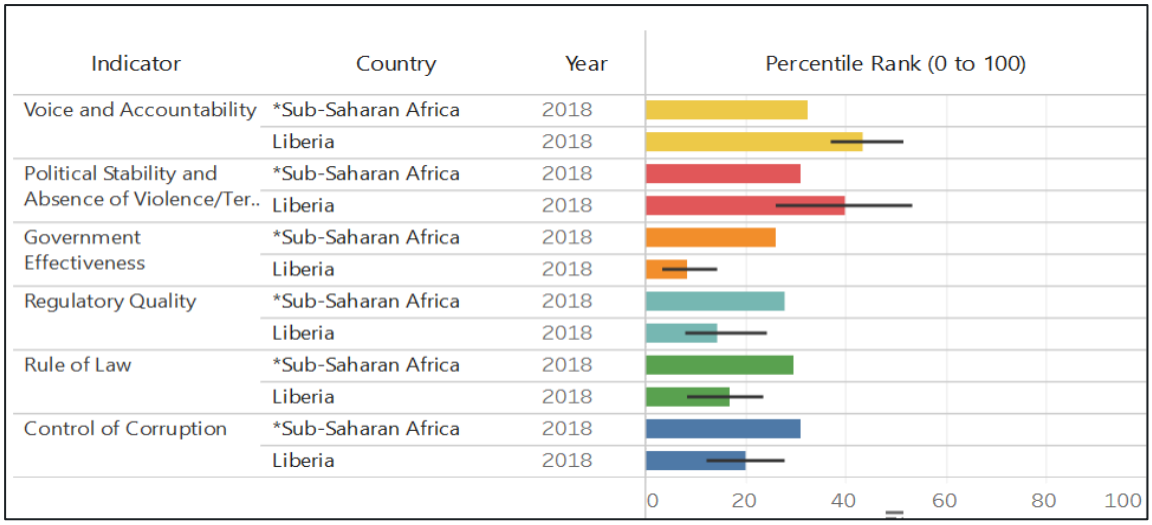

Figure 8. Worldwide Governance Indicators for Liberia and the average for Sub-Saharan Africa (0 = worst and 100 = best) (Source: Kaufmann et al., 2010)

Weak governance is strongly correlated with negative environmental outcomes and is closely associated with social issues such as corruption, social exclusion, and lack of trust in authorities. A growing body of research indicate that an impartial bureaucracy, and factors related to corruption and government effectiveness, are of particular importance for environmental outcomes. [81] Moreover, according to the EPI 2018, economic development often correlates with improved *Environmental Health*, but at the same time *Ecosystem Vitality* generally becomes more challenged. To balance these dimensions good governance is critical for a sustainable environmental development.[82]

Important national policies, regulations, procedures and legal provisions relating to the environment in Liberia include i) Liberia National Environmental Policy (2003), ii) The Environmental Protection Agency Act (2003), iii) The Environmental Protection Agency Regulations and Procedures.

The national environmental policy mandates a comprehensive set of laws and legal framework to protect the environment through sustainable development and management. It also establishes the Liberia Environmental Protection Agency (EPA) and the institutional arrangements that support the agency, to protect the environment. The EPA is responsible for monitoring, coordinating, and supervising the sustainable management of Liberia's environment. [83]

Still, law enforcement remains weak and regularity authorities such the EPA seldom has the adequate human and financial resources necessary to address legal enforcement. Specific areas that

[81] Ölund Wingqvist et al., 2012
[82] EPI 2018
[83] Liberia Land Authority, 2017

need improvement include addressing inconsistencies in legislation and how it is applied, lack of integrated planning between different sectors, and inadequate law enforcement

The EPA also has the statutory mandate to coordinate the MEAs, although implementation can be placed at other ministries/departments. Liberia has submitted national reports for the Basel Convention, CBD, CITES, CMS, Ramsar, and UNFCCC.[84] According to the national reports, the MEAs are being implemented but much work is still needed particularly concerning *implementation*. For instance, the 5th National Report to the CBD (2014) recommends that Liberia updates its 2004 National Biodiversity Strategy & Action Plan (NBSAP). Other recommendations include (but are not limited to): strengthening the enforcement and monitoring of forest biodiversity; make livelihood activities around protected areas sustainable and ensure community leadership and adequate livelihood options; and complete and implement community rights law. The National Report (2009) to CITES also states that laws have been updated to accommodate the MEA, but implementation is lagging a bit, for instance related to monitoring and enforcement.

The organisations responsible for environment (Environmental Protection Agency) and forests (Forest Development Authority, FDA) are particularly weak. FDA is reported to have weaker educational qualifications than staff in other Liberian ministries or international comparators, and they lack adequate access to in-service training.[85] FDA reports that while having skills related to administration and biology, they lack other vital skills e.g. related to law and trade.[86] EPA reports that the greatest challenge to implementing the Ramsar convention is inability to control waste disposal and constructions in wetlands due to increasing population and uncontrollable agricultural and mining activities.[87] Capacity enhancement of both EPA and FDA would be required to deliver good management and governance of environmental sectors.

Moreover, there is a lack of data and Liberian government institutions are facing shortages of scientific information pertaining to environmental management.

Land tenure is one of the important institutions for sustainable development, and a highly relevant issue in Liberia. Unequal access to land and insecure land tenure are affecting people's livelihoods, particularly the rural poor, who are dependent upon land and land-based resources. The absence of a clear land-rights policy has resulted in competing and often overlapping land rights. The situation is even more complex in areas affected by mining, forestry and agriculture concessions.[88] Land rights are also important to women's economic empowerment, as customary practices impede women's access to land, and weak tenure security undermines their incentives to invest in enhancing the productivity of the land they use. The recently approved Land Rights Act creates a foundation for significant reforms in this area.[89] Effectively addressing land rights and tenure security issues will be vital to achieve sustainable and inclusive growth and address key drivers of state fragility.

[84] InforMEA website https://www.informea.org/en/countries/LR/parties
[85] World Bank, 2018
[86] Liberia National Report to CITES 07/08
[87] Liberia National Report to Ramsar, 2018,
[88] Liberia Land Authority, 2017
[89] World Bank, 2018

Liberia has taken important steps towards transparent management of natural resources. However, rural communities still face the risk of their land and resource rights being undermined. The Green Advocates International is a founding member of the Liberian Publish-What-You-Pay Coalition, Extractive Industries Transparency Initiative and the Kimberley Process Civil Society Coalition. They also work to empower communities by communicating the content, context, and implications of land contracts. Moreover, they continue to push for greater fiscal accountability and responsibility in government, co-authoring a critical report with Global Witness into several of the mining contracts recently issued by the Liberian government.[90]

4.3. Environment and the Peace and Conflict context

The civil conflicts in Liberia between 1989 and 2003 resulted in the death of more than 250,000 people and the forced displacement of a third of the population, with negative impacts on the country's economy and overall development. [91] Many studies and reports show that there are clear linkages between the country's natural resources (forest and minerals) and the conflict. Natural resources were not only a source of the 14-year conflict in Liberia and the wider region, but it also sustained the conflict. Moreover, the conflict destroyed both natural resources and manmade infrastructure e.g. vital infrastructure in the energy, water, sanitation, waste management and housing sectors has been partially or totally destroyed with severe social and environmental impacts as a result.[92]

Despite significant progress in recent years, the country is still considered fragile. There are challenges linked to the legacy of the civil war. Moreover, the strong dependence on primary commodities with highly volatile prices makes the country vulnerable to external economic shocks. [93]

Recent assessments show that land disputes and corruption continue to be a trigger of conflict. Disputes related to overlapping boundaries, rightful ownership, conflicting claims and land grabbing are most common among communities as well as between communities and concessionaries where lack of transparency is an issue. Often concession contracts are negotiated with little or no consultation and agreements are seldom shared with local communities. Moreover, concession companies' production of palm oil, rubber, mining extraction (gold, diamond, iron ore) have severely affected the environment and its surroundings. [94]

Illegal mining sites are also a problem and a source of conflict. Artisanal small-scale mining (ASM) is seen as a livelihood option for many people in Liberia. ASM is a driver of deforestation and environmental pollution, as well as a source of conflict and social unrest.[95]

To conclude, effective and strong management to promote the sustainable use of natural resources including tenure security is central to prevent future conflict in Liberia.

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[90] EU 2006
[91] WFP, 2019
[92] UNEP, 2006
[93] WFP, 2019
[94] UNDP, 2019
[95] World Bank, 2018b

To ***summarise***, the potential for economic growth in Liberia is closely linked to development of its natural resources. The government of Liberia is promoting increased agricultural productivity (including forestry and fisheries) as well as exploitation of the mining sector for economic growth. In Liberia, corruption, weak institutions and the lack of good governance is a serious impediment for poverty reduction and environmentally sustainable development. Despite significant progress in recent years, the country is still considered fragile, with a high risk of relapsing into crisis if the current peace and socio-economic stability are not carefully nurtured. effective and strong management to promote the sustainable use of natural resources including tenure security is central to prevent future conflict in Liberia.

5. Conclusions and issues to consider

The purpose of this chapter is to give some conclusions based on this desk study and present some issues for Sida to consider.

The environmental challenges in Liberia, including their drivers, pressures, impacts as well as authorities' responses, are intertwined (further described below). Hence, if and when relevant, it is good with a ***holistic approach*** where underlying drivers and pressures are taken into account when supporting responses to certain impacts. In many cases, the ***underlying drivers*** include weak institutional capacity and lack of good governance including corruption.

With this in mind, the Helpdesk would like to highlight that general improvements in ***governance***, including transparency, accountability, participation and the rule of law, are supportive also for more inclusive and sustainable use of natural resources, and is maybe particularly important related to the mining and forestry/agricultural sectors and their land use. Support to improve environmental (including natural resources) governance and management is especially important as the governing institutions are identified as particularly weak.

Improving ***access to services***, such as WASH, electricity, health care, food, in itself helps to improve choice and opportunities of people living in poverty. In addition to that it also constitutes a foundation for the transition to a more inclusive and sustainable development. People who are healthy and have enough food are also able to work and be more productive. In Liberia, a majority of the people living in poverty are involved in in agriculture, fishery and small-scale artisanal mining (ASM). Hence, these sectors appear to be important for both economic development, food security and job creation.

Based on the identified environmental problems and opportunities in this Policy Brief, the Helpdesk ***recommends*** that Sida considers including some the following sectors/areas in the next strategy period: i) environmental/natural resource governance and management, ii) forestry/biodiversity, agriculture/land use, iii) WASH, iv) electrification, and v) ASM.

5.1. Environmental/natural resource governance

High value natural resources are prone to corruption; strong institutions and ***good governance*** are of key importance for sustainable natural resource governance and inclusive environmental management. Transparency, participation, accountability and integrity are important human rights principles as well as key governance mechanisms.

Accountability: In Liberia, the communities feel that they have too little agency in relation to big companies and would in many cases need empowerment. Promotion of *meaningful participation*, where the people have access to relevant *information*, are invited and have the capacity to participate before decisions are made, and have access to *complaint mechanisms*, and ***justice*** including fair compensation and remedies, are fundamental aspects of inclusive and sustainable natural resource management.

One way to control corruption is to work with ***transparency*** related to monitoring and disclosure of *natural resource rents*, for instance in accordance with the Extractive Industries Transparency Initiative (EITI) and the Kimberly Process. Liberia has had challenges fulfilling the requirements of EITI, why Sweden may want to investigate if more support is needed for the EITI implementation in Liberia (possibly support to Liberia EITI).

Also assessments of consequences of development activities, including ***environmental impacts*** (e.g. Strategic Environmental Assessment (SEA) or Environmental Impact Assessments EIA)), should be available and accessible, so that people can understand how they could be affected. It is good practice that permits, concessions or licences to extract natural resources are linked to an EIA and the resulting environmental management plan (EMP). ***Implementation*** of the EMP is important and should be ***monitored*** by sector or environmental authorities. Monitoring capacity is often limited. With transparent permitting processes, communities that are affected can (e.g. assisted by CSOs and NGOs) monitor that EMPs are implemented and other environmental requirements fulfilled.

Liberia has reportedly a vibrant civil society, although it appears that most CSOs/NGOs are involved with service provisioning. Civil society can also have an important watchdog function, which could be developed in Liberia.

5.2. Forestry/biodiversity & agriculture/land-use

It makes sense to take a holistic approach to these sectors as they are closely interconnected: the forests (including mangrove) constitute the habitat for most biological diversity in Liberia. If the forests are threatened, so is the biodiversity. Deforestation is one of the key environmental problems in the country. Besides loss of biodiversity, there are also other impacts from deforestation, including loss of ecosystems and their functions and services (e.g. water regulation, water purification, climate regulation, erosion control, provisioning services (food, building material, medicine, etc.). Therefore, directly or indirectly, deforestation can result in loss of livelihood opportunities for local communities and food insecurity. The importance of biodiversity is increasingly being understood and can be exemplified by the last years' pollination problems due to mass losses of bee populations.

Forests are being cleared for agricultural purposes***,*** for large-scale industrial plantations as well as for new small-scale agricultural plots. Drivers, or underlying causes, include inadequate agricultural practices and scarcity of agricultural land for small-scale farmers, low agricultural productivity, tenure insecurity which leads to reluctance to invest in productivity enhancements, and weak access to markets to buy agricultural inputs and sell agricultural products.

Possible responses to deforestation could address any of the above-mentioned challenges, including the drivers, pressures or impacts. Example of responses include e.g. support to funding for '***avoided deforestation'*** through different REDD+ schemes. Utilising the forests for the benefit of the people could mean ***community forestry*** with care taken to local power structures. There is also a need for improved ***management*** and ***governance*** (e.g. regulation, monitoring and enforcement as well as participation, transparency and accountability)

Improving food security will require enhanced agricultural productivity, including improved ***land use practices*** and support to agricultural inputs (e.g. improved seeds and tools). Access to ***electricity***

could help to improve agricultural productivity through improved storage facilities to reduce post-harvest losses, or pumping of water for irrigation, or processing and value added of the agricultural produce. It is also possible that access to electricity would lead to increased use of mobile telephones, and improved access to information related weather conditions and market prices, etc.

Large-scale plantations generally do not produce food but cash crops, e.g. rubber or palm oil. They can, if managed well, contribute with some job opportunities, at least in the initial stage. Liberia needs ***strong institutions with capacity*** to manage the negative sides of industrial plantations (e.g. biodiversity loss, both through the clearing of forests as well as through monocultures) and harness the positive aspects (job opportunities and economic development).

If not already done, it would be beneficial for Liberia to develop a ***national land use plan***, including areas for industrial plantations, and assess the social and environmental consequences and the economic costs and benefits of various land use options. Such and SEA could help to identify criteria for sustainable land management, as well as challenges and opportunities.

5.3. WASH

One of the most alarming and noticeable deprivations for both urban and rural poor, is the lack of access to improved WASH facilities (including safe water supply, sanitation, hygiene, waste management, faecal sludge management and/or wastewater treatment). Investments in equitable and sustainable WASH and solid waste management could help to boost the environmental health performance of the whole country. The inadequate access to WASH and inefficient water resource management can result in spreading of water- and vector borne diseases (e.g. diarrhoea, malaria and river blindness) with severe ***health implications***. It can also obstruct disease control (e.g. covid-19). The SDGs are talking about ***universal*** access to WASH, why there is a need to look beyond the households and also address WASH in schools, health care facilities, and public spaces. There is a strong ***gender dimension*** in WASH access.

The needs are immense and possible responses could be linked to pretty much any part of the WASH governance system, including ***regulation*** to promote *equitable* and *sustainable* access to WASH, improved interagency ***cooperation***, development of ***guidelines*** (e.g. for WASH in schools or health clinics, water quality or water source protection) and support to ***behavioural changes***.

Investments are needed in all areas, including water supply, safe sanitation and hygiene, in improved WASH in health care facilities, schools, urban and rural water supply, urban sewage, drainage or storm water management, or pollution control / wastewater treatment plants, or faecal sludge management.

5.4. Energy/electrification (small-scale)

Solid fuels (e.g. wood and charcoal) provide 98% of all domestic energy consumed in Liberia, which contributes to the high indoor air pollution. Air pollution is the main source of the high levels of respiratory diseases, and women, children and elderly are most exposed. Access to electricity is very low in and almost non-existent in rural areas.

Access to affordable electricity is an ***enabler*** of choice and opportunity and may present many different options for people to leave poverty behind. For instance, electricity may provide opportunities for farmers to improve agricultural ***productivity*** (as mentioned in Chapter 5.2), facilitate ***housework*** (cooking, grinding, pumping water, cooling) as well as other types of work where power is needed. Electricity may also produce ***light*** during dark evenings, which would facilitate for children to do homework, for families to read, or do needlecraft or other types of handicrafts. Electric power will also enhance access to ***information*** and entertainment, from radio or TV, access social media, and charging of batteries.

Furthermore, electricity is needed at *health clinics* and *schools*, to treat illnesses more efficiently (see Chapter 3.1) and provide improved learning opportunities for students.

Electricity production is commonly associated with environmental problems, but these can be avoided if the energy source is ***renewable*** and sustainable, for instance from solar home systems or micro/mini grids based on small-scale hydro or solar power. ***Micro/mini-grids*** have the advantage over large grids that they can be quick to install and relatively inexpensive. Solar home systems, micro- and even mini grids generally address lower-tier electricity consumers. These types of systems provide electricity often at a higher cost per kWh than grid electricity, but can have important positive effects on household, agriculture and small business productivity, especially in services. However, as tariffs for grid electricity are already high in Liberia, why the difference may not be large. The small grids could be designed to be able to hook up to a large national grid when that time comes. Of course, environmental impact assessments should be done as appropriate.

One potential challenge particularly for solar home systems is the use of batteries and particularly, the associated increased generation of ***e-waste***. E-waste is categorised as hazardous waste and Liberia has today not the institutional capacity to manage it in a safe manner. E-waste including old batteries are likely to end up either in the bush, or in an unsanitary landfill, with risk for leakages and pollution of hazardous substances with severe health consequences (e.g. carcinogenic, neurotoxic, reprotoxic, endocrine disrupters, persistent, bio-accumulative and toxic, and other hazards).[96]

Some companies that provide pay-as-you-go "PAYGO" services are members of GOGLA[97] and take responsibility for recycling or sending back used products to producers. The risk for uncontrolled dumping of e-waste is larger when solar systems (particularly of lower quality) are sold in stores (over desk).

5.5. Mining

Artisanal small-scale (ASM) mining is reportedly driven by poverty; poverty and hope for a better life in the wake of low agricultural productivity and few job other opportunities. The mining sector is important for the livelihoods of many artisanal miners and their dependents and offers huge potential for ***income generation***. However, mining, including ASM, is a dirty business and the culprit of many environmental challenges in Liberia, including deforestation and land degradation, pollution

[96] Miliute-Plepiene et al., 2019.
[97] https://www.gogla.org/e-waste

and waste generation. The ***mercury*** used in for gold panning is a case in point. In addition to the short-term health impacts from uncontrolled mining where environmental considerations are not taken, there are also long term consequences from the hazardous waste, making the land useless and the water resources potentially toxic for hundreds or thousands of years. Minimizing and mitigating the environmental impacts from mining is important. This will require a ***strong environmental protection authority*** that is capable and mandated to propose policies and legislation, regulate, inspect, control and enforce laws and policies.

In addition to the big environmental problems, artisanal mining is also associated with a variety of ***human security challenges***, including bad working safety conditions. In many areas, artisanal mining is still uncontrolled, and the local population seldom benefit adequately from the inherent mineral wealth of the country. Efforts to ***regulate*** artisanal mining is needed but must consider local power structures.

The fight against corruption is especially important in the mining sector, and measures to improve transparency is important, for instance to fully integrate and implement EITI standards (see Chapter 5.1).

Finally, the Helpdesk recommends Sida to investigate the opportunities to ***integrate environmental*** (including natural resources, climate and biodiversity) perspectives in other types of democracy/human rights support, as there may be synergetic effects. It should also be noted that ensuring the protection of Human Rights Defenders is of great importance also related to environmental rights.

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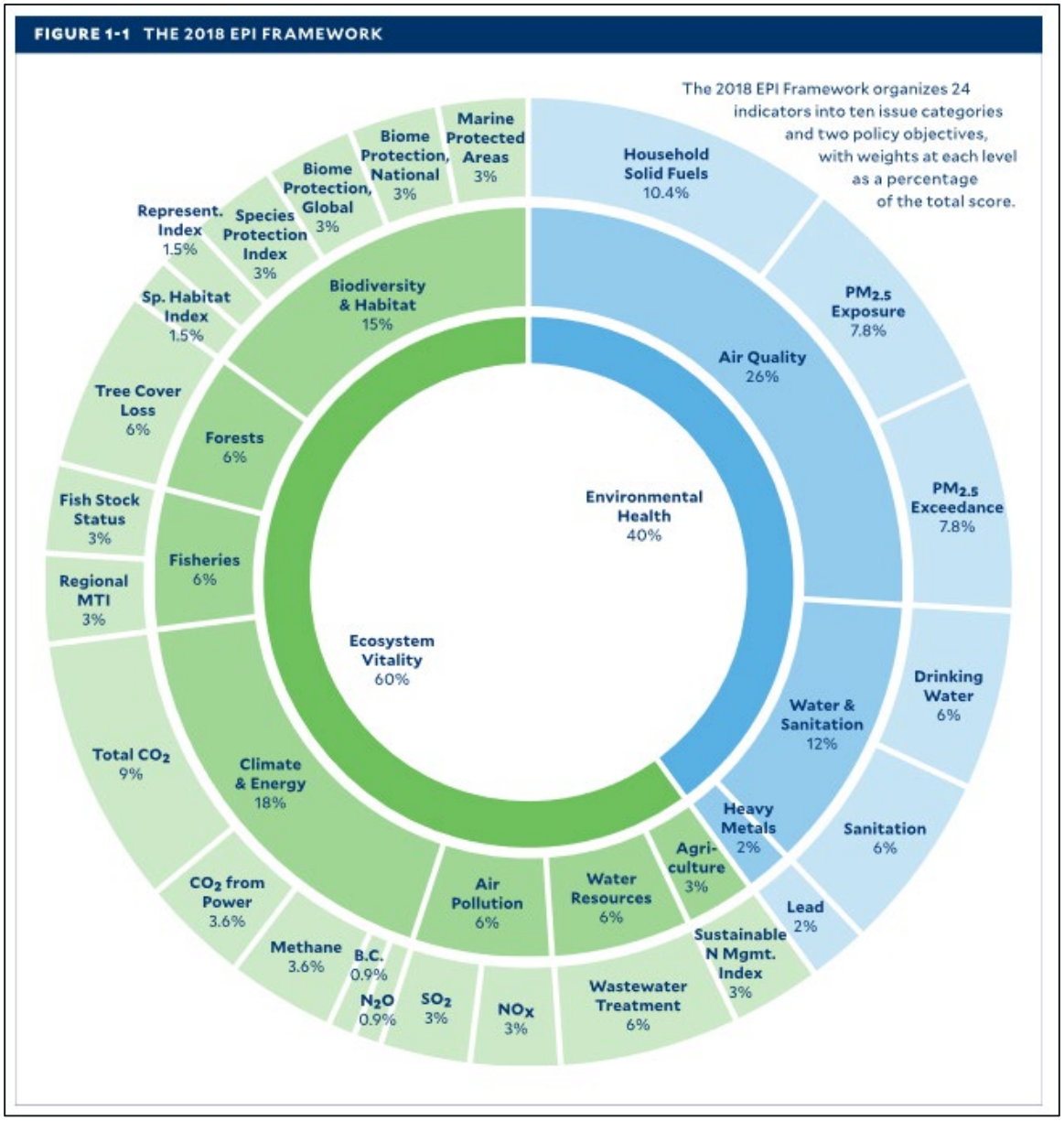
Annex 1. Environmental Performance Index (EPI)

The Environmental Performance Index (EPI) ranks 180 countries on 24 performance indicators across ten issue categories covering environmental health (air quality, water and sanitation, and heavy metals) and ecosystem vitality (biodiversity and habitat, forests, fisheries, climate and energy, air pollution, water resources, and agriculture): https://epi.envirocenter.yale.edu/

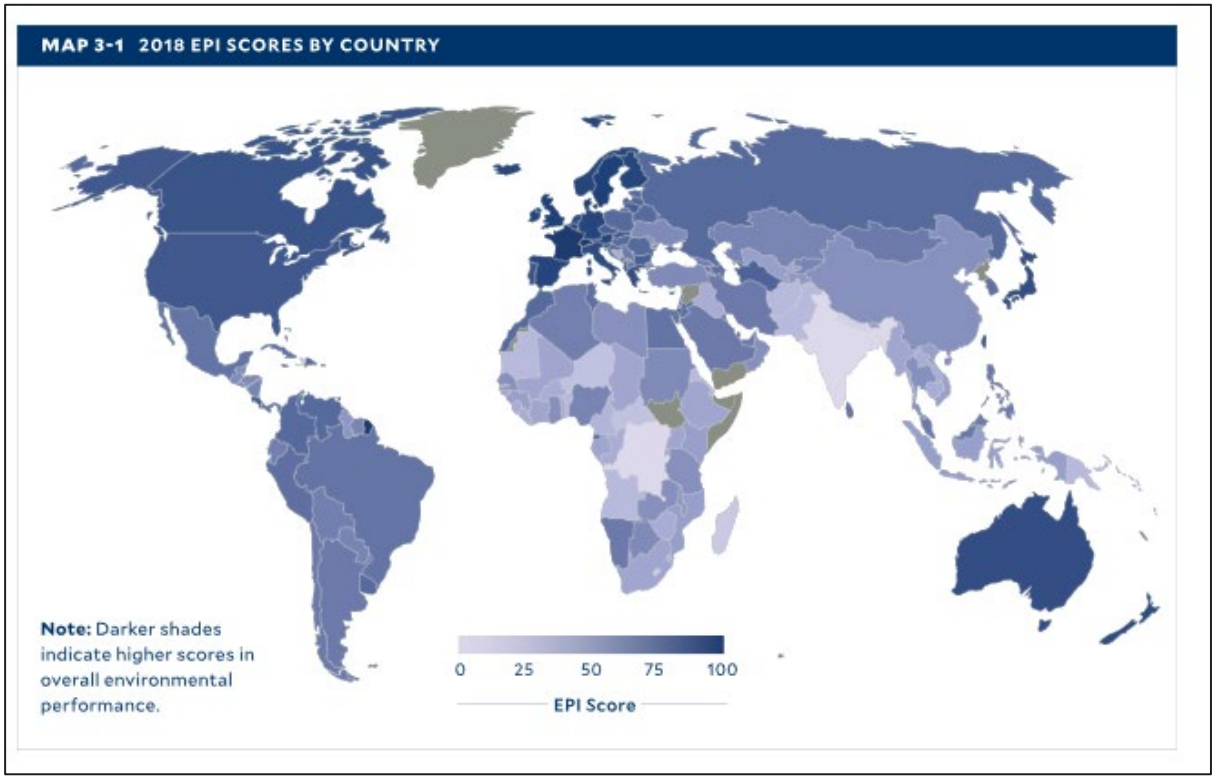
Figure A1-1. The 2018 EPI framework



EPI 2018 map: EPI Scores by country

Liberia ranks as 160 of 180 countries in the EPI 2018, with a score of 41.62. Low scores on the EPI are indicative of the need for national sustainability efforts on several fronts, especially cleaning up air quality, investing in WASH and wastewater treatment, protecting biodiversity, and reducing GHG emissions.

Figure A1-2. Environmental Protection scores by country (100=best, 1=worst environmental **performance)**



Note*:* Darker shades indicate higher scores in overall Environmental Performance **(Source: EPI website available (2020-03-16):** https://epi.envirocenter.yale.edu/results-overview

EPI rank, score and regional standing

FIGURE ES-1 THE 2018 EPI RANKINGS Rank, EPI Score, and Regional Standing (REG, shown in color) for 180 countries

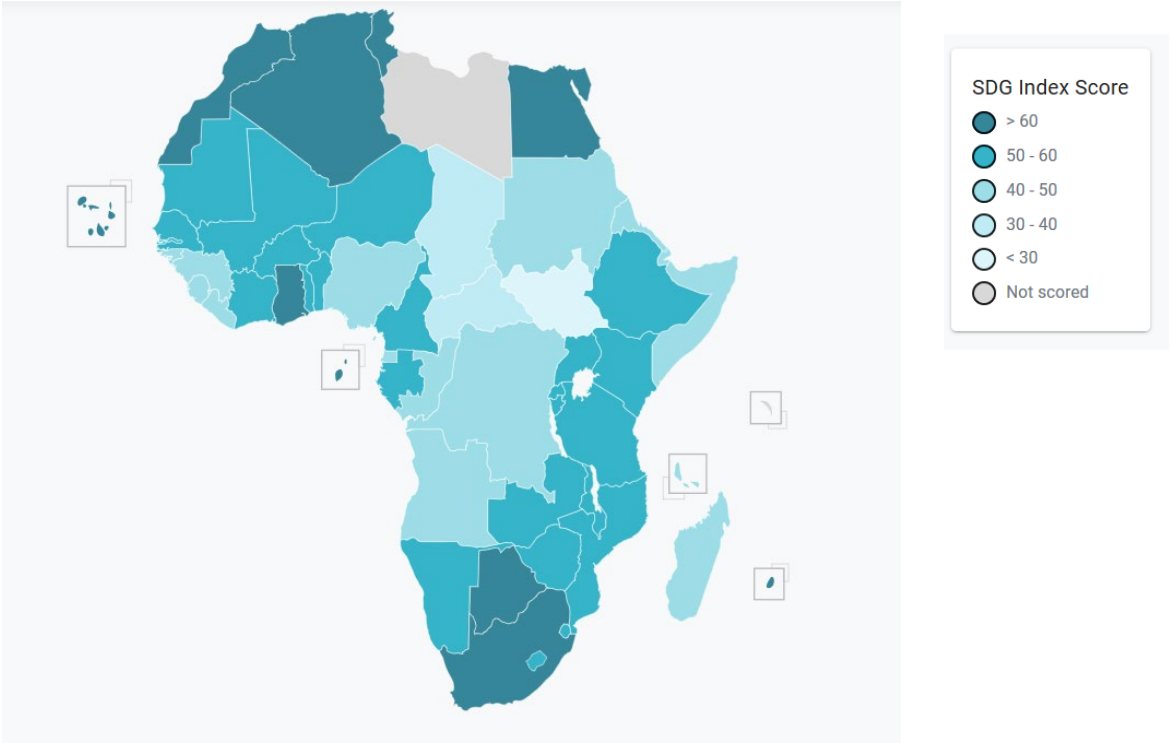
RANK	COUNTRY	SCORE	REG
1	Switzerland	87.42	1
2	France	83.95	2
3	Denmark	81.60	3
4	Malta	80.90	4
5	Sweden	80.51	5
6	United Kingdom	79.89	6
7	Luxembourg	79.12	7
8	Austria	78.97	8
9	Ireland	78.77	9
10	Finland	78.64	10
11	Iceland	78.57	11
12	Spain	78.39	12
13	Germany	78.37	13
14	Norway	77.49	14
15	Belgium	77.38	15
16	Italy	76.96	16
17	New Zealand	75.96	1
18	Netherlands	75.46	17
19	Israel	75.01	1
20	Japan	74.69	1
21	Australia	74.12	2
22	Greece	73.60	18
23	Taiwan	72.84	2
24	Cyprus	72.60	19
25	Canada	72.18	20
26	Portugal	71.91	21
27	United States of America	71.19	22
28	Slovakia	70.60	1
29	Lithuania	69.33	2
30	Bulgaria	67.85	3
30	Costa Rica	67.85	1
32	Qatar	67.80	2
33	Czech Republic	67.68	4
34	Slovenia	67.57	5
35	Trinidad and Tobago	67.36	1
36	St. Vincent & Grenadines	66.48	2
37	Latvia	66.12	6
38	Turkmenistan	66.10	7
39	Seychelles	66.02	1
40	Albania	65.46	8
41	Croatia	65.45	9
42	Colombia	65.22	2
43	Hungary	65.01	10
44	Belarus	64.98	11
45	Romania	64.78	12
46	Dominican Republic	64.71	3
47	Uruguay	64.65	3
48	Estonia	64.31	13
49	Singapore	64.23	3
50	Poland	64.11	14
51	Venezuela	63.89	4
52	Russia	63.79	15
53	Brunei Darussalam	63.57	4
54	Morocco	63.47	3
55	Cuba	63.42	4
56	Panama	62.71	5
57	Tonga	62.49	3
58	Tunisia	62.35	4
59	Azerbaijan	62.33	16
60	South Korea	62.30	5
61	Kuwait	62.28	5
62	Jordan	62.20	6
63	Armenia	62.07	17
64	Peru	61.92	6
65	Montenegro	61.33	18
66	Egypt	61.21	7
67	Lebanon	61.08	8
68	Macedonia	61.06	19
69	Brazil	60.70	7
70	Sri Lanka	60.61	6
71	Equatorial Guinea	60.40	2
72	Mexico	59.69	8
73	Dominica	59.38	5
74	Argentina	59.30	9
75	Malaysia	59.22	7
76	Antigua and Barbuda	59.18	6
77	United Arab Emirates	58.90	9
78	Jamaica	58.58	7
79	Namibia	58.46	3
80	Iran	58.16	10
81	Belize	57.79	10
82	Philippines	57.65	8
83	Mongolia	57.51	9
84	Serbia	57.49	20
84	Chile	57.49	11
86	Saudi Arabia	57.47	11
87	Ecuador	57.42	12
88	Algeria	57.18	12
89	Cabo Verde	56.94	4
90	Mauritius	56.63	5
91	Saint Lucia	56.18	8
92	Bolivia	55.98	13
93	Barbados	55.76	9
94	Georgia	55.69	21
95	Kiribati	55.26	4
96	Bahrain	55.15	13
97	Nicaragua	55.04	14
98	Bahamas	54.99	10
99	Kyrgyzstan	54.86	22
100	Nigeria	54.76	6
101	Kazakhstan	54.56	23
102	Samoa	54.50	5
103	Suriname	54.20	15
104	São Tomé and Príncipe	54.01	7
105	Paraguay	53.93	16
106	El Salvador	53.91	17
107	Fiji	53.09	6
108	Turkey	52.96	24
109	Ukraine	52.87	25
110	Guatemala	52.33	18
111	Maldives	52.14	10
112	Moldova	51.97	26
113	Botswana	51.70	8
114	Honduras	51.51	19
115	Sudan	51.49	14
116	Oman	51.32	15
117	Zambia	50.97	9
118	Grenada	50.93	11
119	Tanzania	50.83	10
120	China	50.74	11
121	Thailand	49.88	12
122	Micronesia	49.80	13
123	Libya	49.79	16
124	Ghana	49.66	11
125	Timor-Leste	49.54	14
126	Senegal	49.52	12
127	Malawi	49.21	13
128	Guyana	47.93	20
129	Tajikistan	47.85	27
130	Kenya	47.25	14
131	Bhutan	47.22	15
132	Viet Nam	46.96	16
133	Indonesia	46.92	17
134	Guinea	46.62	15
135	Mozambique	46.37	16
136	Uzbekistan	45.88	28
137	Chad	45.34	17
138	Myanmar	45.32	18
139	Côte d'Ivoire	45.25	18
140	Gabon	45.05	19
141	Ethiopia	44.78	20
142	South Africa	44.73	21
143	Guinea-Bissau	44.67	22
144	Vanuatu	44.55	7
145	Uganda	44.28	23
146	Comoros	44.24	24
147	Mali	43.71	25
148	Rwanda	43.68	26
149	Zimbabwe	43.41	27
150	Cambodia	43.23	19
151	Solomon Islands	43.22	8
152	Iraq	43.20	17
153	Laos	42.94	20
154	Burkina Faso	42.83	28
155	Sierra Leone	42.54	29
156	Gambia	42.42	30
157	Republic of Congo	42.39	31
158	Bosnia and Herzegovina	41.84	29
159	Togo	41.78	32
160	Liberia	41.62	33
161	Cameroon	40.81	34
162	Swaziland	40.32	35
163	Djibouti	40.04	36
164	Papua New Guinea	39.35	21
165	Eritrea	39.34	37
166	Mauritania	39.24	38
167	Benin	38.17	39
168	Afghanistan	37.74	22
169	Pakistan	37.50	23
170	Angola	37.44	40
171	Central African Republic	36.42	41
172	Niger	35.74	42
173	Lesotho	33.78	43
174	Haiti	33.74	12
175	Madagascar	33.73	44
176	Nepal	31.44	24
177	India	30.57	25
178	Dem. Rep. Congo	30.41	45
179	Bangladesh	29.56	26
180	Burundi	27.43	46

ASIA · CARIBBEAN · EASTERN EUROPE & EURASIA · EUROPE & NORTH AMERICA
LATIN AMERICA · MIDEAST & NORTH AFRICA · PACIFIC · SUB-SAHARAN AFRICA

*Figure A1-3. The Environmental Performance Index (EPI) country rank, score, and regional standing for 180 countries (Source: EPI (Wendling et al., 2028) (*https://epi.envirocenter.yale.edu/2018-epi-report/executive-summary)

Annex 2. Fulfilment of the SDGs, Africa SDG index 2019 report

Map of Africa SDG index by country



Source: SDG Center for Africa and Sustainable Development Solutions Network (2019). *Africa SDG Index and Dashboards Report 2019*. Kigali and New York: SDG Center for Africa and Sustainable Development Solutions Network. https://countries.africasdgindex.org/#/

SDG fulfilment performance by Liberia

LIBERIA

Performance by Indicator

	Value	Rating	Trend
SDG1 – End Poverty			
Poverty headcount ratio at $1.90/day (% population)	42.9	●	↓
Poverty headcount ratio at $3.20/day (% population)	73.8	●	↓
SDG2 – Zero Hunger			
Prevalence of undernourishment (% population)	38.8	●	↓
Prevalence of stunting (low height-for-age) in children under 5 years of age (%)	32.1	●	↗
Prevalence of wasting in children under 5 years of age (%)	5.6	●	↑
Prevalence of obesity, BMI ≥ 30 (% adult population)	9.9	●	↑
Cereal yield (t/ha)	1.3	●	→
Sustainable Nitrogen Management Index	NA	●	••
Human Trophic Level (best 2-3 worst)	2.1	●	↑
SDG3 – Good Health and Well-Being			
Maternal mortality rate (per 100,000 live births)	725	●	→
Neonatal mortality rate (per 1,000 live births)	25.1	●	↗
Mortality rate, under-5 (per 1,000 live births)	74.7	●	↗
Incidence of tuberculosis (per 100,000 population)	308.0	●	↓
New HIV infections (per 1,000)	0.5	●	↗
Age-standardised death rate due to cardiovascular disease, cancer, diabetes, and chronic respiratory disease in populations age 30-70 years (per 100,000 population)	17.6	●	→
Age-standardised death rate attributable to household air pollution and ambient air pollution (per 100,000 population)	170	●	••
Traffic deaths rate (per 100,000 population)	35.1	●	↓
Life Expectancy at birth (years)	62.9	●	→
Adolescent fertility rate (births per 1,000 women ages 15-19)	128.8	●	→
Births attended by skilled health personnel (%)	61.1	●	••
Percentage of surviving infants who received 2 WHO-recommended vaccines (%)	86	●	↑
Universal Health Coverage Tracer Index (0-100)	51.4	●	→
Subjective Wellbeing (average ladder score, 0-10)	4.1	●	↑
SDG4 – Quality Education			
Net primary enrolment rate (%)	36.8	●	↓
Lower secondary completion rate (%)	37.3	●	••
Literacy rate of 15-24 year olds, both sexes (%)	49.1	●	••
SDG5 – Gender Equality			
Demand for family planning satisfied by modern methods (% women married or in unions aged 15-49)	37.2	●	↗
Female to male mean years of schooling, population age 25 + (%)	57.4	●	↗
Female to male labour force participation rate (%)	94.0	●	↑
Seats held by women in national parliaments (%)	12.3	●	→
SDG6 – Clean Water and Sanitation			
Population using at least basic drinking water services (%)	69.9	●	→
Population using at least basic sanitation services (%)	16.9	●	→
Freshwater withdrawal as % total renewable water resources	0.1	●	••
Imported groundwater depletion (m^3/year/capita)	7.6	●	••
Anthropogenic wastewater that receives treatment (%)	0.0	●	••
SDG7 – Affordable and Clean Energy			
Access to electricity (% population)	19.8	●	→
Access to clean fuels & technology for cooking (% population)	0.7	●	→
CO_2 emissions from fuel combustion / electricity output ($MtCO_2$/TWh)	NA	●	••
SDG8 – Decent Work and Economic Growth			
Adjusted Growth (%)	-7.6	●	••
Prevalence of Modern Slavery (victims per 1,000 population)	7.4	●	••
Adults (15 years +) with an account at a bank or other financial institution or with a mobile-money-service provider (%)	35.7	●	↗
Unemployment rate (% total labor force)	2.4	●	↑
Fatal work-related accidents embodied in imports (deaths per 100,000)	0.0	●	••

	Value	Rating	Trend
SDG9 – Industry, Innovation and Infrastructure			
Population using the internet (%)	8.0	●	→
Mobile broadband subscriptions (per 100 inhabitants)	11.6	●	→
Logistics performance index: Quality of trade and transport-related infrastructure (1=low to 5=high)	1.9	●	↓
The Times Higher Education Universities Ranking, Average score of top 3 universities (0-100) *	0.0	●	••
Number of scientific and technical journal articles (per 1,000 population)	0.0	●	→
Research and development expenditure (% GDP) *	0.0	●	••
SDG10 – Reduced Inequalities			
Gini Coefficient adjusted for top income (1-100)	33.2	●	••
SDG11 – Sustainable Cities and Communities			
Annual mean concentration of particulate matter of less than 2.5 microns of diameter (PM2.5) in urban areas ($\mu g/m^3$)	18.0	●	→
Improved water source, piped (% urban population with access)	7.4	●	↓
Satisfaction with public transport (%)	18.2	●	→
SDG12 – Responsible Consumption and Production			
Municipal Solid Waste (kg/day/capita)	NA	●	••
E-waste generated (kg/capita)	NA	●	••
Production-based SO_2 emissions (kg/capita)	0.8	●	••
Imported SO_2 emissions (kg/capita)	0.7	●	••
Nitrogen production footprint (kg/capita)	1.0	●	••
Net imported emissions of reactive nitrogen (kg/capita)	-53.3	●	••
SDG13 – Climate Action			
Energy-related CO_2 emissions per capita (tCO_2/capita)	0.2	●	↑
Imported CO_2 emissions, technology-adjusted (tCO_2/capita)	0.0	●	••
People affected by climate-related disasters (per 100,000 population)	334.5	●	••
CO_2 emissions embodied in fossil fuel exports (kg/capita)	0.0	●	••
SDG14 – Life Below Water			
Mean area that is protected in marine sites important to biodiversity (%)	98.3	●	↑
Ocean Health Index Goal-Clean Waters (0-100)	48.4	●	→
Percentage of Fish Stocks overexploited or collapsed by EEZ (%)	17.6	●	↑
Fish caught by trawling (%)	6.1	●	••
SDG15 – Life on Land			
Mean area that is protected in terrestrial sites important to biodiversity (%)	16.4	●	→
Mean area that is protected in freshwater sites important to biodiversity (%)	48.6	●	→
Red List Index of species survival (0-1)	0.9	●	→
Permanent Deforestation (5 year average annual %)	0.9	●	••
Imported biodiversity threats (per million population)	0.6	●	••
SDG16 – Peace, Justice and Strong Institutions			
Homicides (per 100,000 population)	3.2	●	••
Unsentenced detainees (%)	0.7	●	↗
Population who feel safe walking alone at night in the city or area where they live (%)	40.3	●	↓
Property Rights (1-7)	3.7	●	••
Birth registrations with civil authority, children under 5 years of age (%)	24.6	●	••
Corruption Perception Index (0-100)	32	●	↓
Children 5-14 years old involved in child labour (%)	20.8	●	••
Transfers of major conventional weapons (exports) (constant 1990 US$ million per 100,000 population) *	0.0	●	••
Freedom of Press Index (best 0-100 worst)	30.3	●	→
SDG17 – Partnerships for the Goals			
Government Health and Education spending (% GDP)	5.2	●	••
High-income and all OECD DAC countries: International concessional public finance, including official development assistance (% GNI)	NA	●	••
Other countries: Government Revenue excluding Grants (% GDP)	15.7	●	••
Tax Haven Score (best 0-5 worst) *	0	●	••

*Imputed data point

3. COUNTRY PROFILES

Source: SDG Center for Africa and Sustainable Development Solutions Network (2019). Africa SDG Index and Dashboards Report 2019. Kigali and New York: SDG Center for Africa and Sustainable Development Solutions Network. https://github.com/sdsna/2019GlobalIndex/blob/master/country_profiles/Liberia_SDR_2019.pdf

Annex 3. Health data for Liberia

The Institute for Health Metrics and Evaluation (IHME) is an independent population health research centre at UW Medicine, part of the University of Washington, that provides rigorous and comparable measurement of the world's most important health problems and evaluates the strategies used to address them. IHME makes this information freely available so that policymakers have the evidence they need to make informed decisions about how to allocate resources to best improve population health. The figures below are gathered from their website http://www.healthdata.org/liberia

***Table** A3-1.Trends: Life expectancy in Liberia 1990 and 2017, for women and men*

	Expected		Observed	
	1990	2017	1990	2017
Female	51.9	60.0	51.4	65.2
Male	49.1	57.9	46.8	63.7

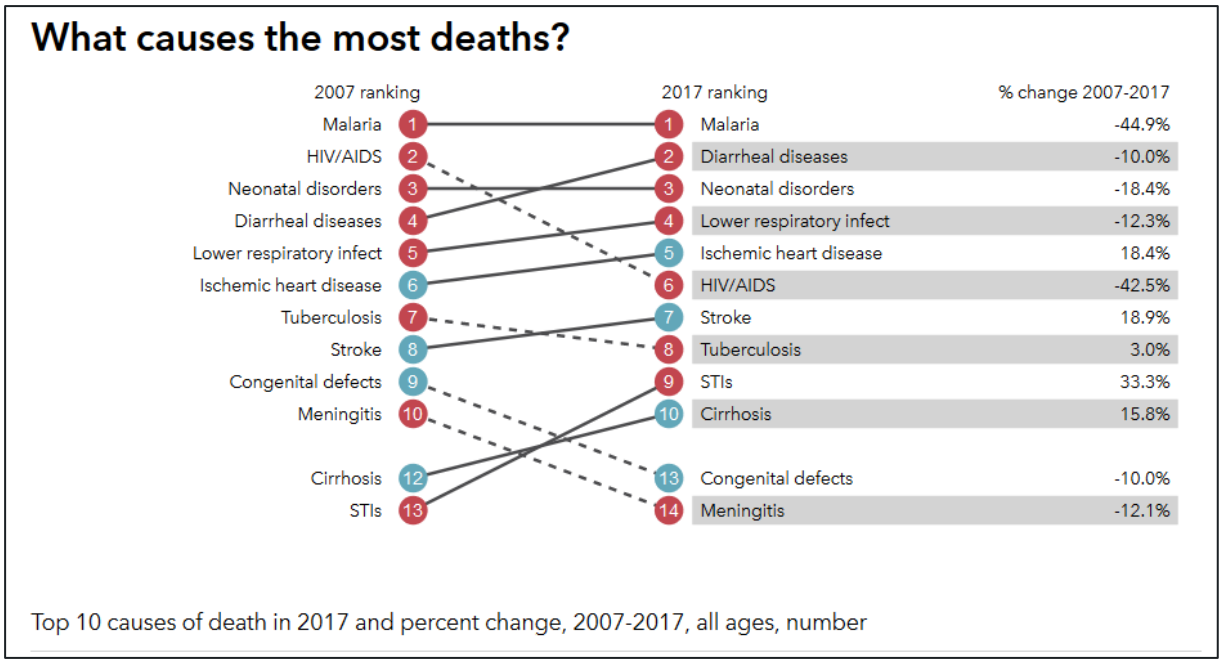


Figure A3-2. Major causes of death in Liberia (2007 and 2017)

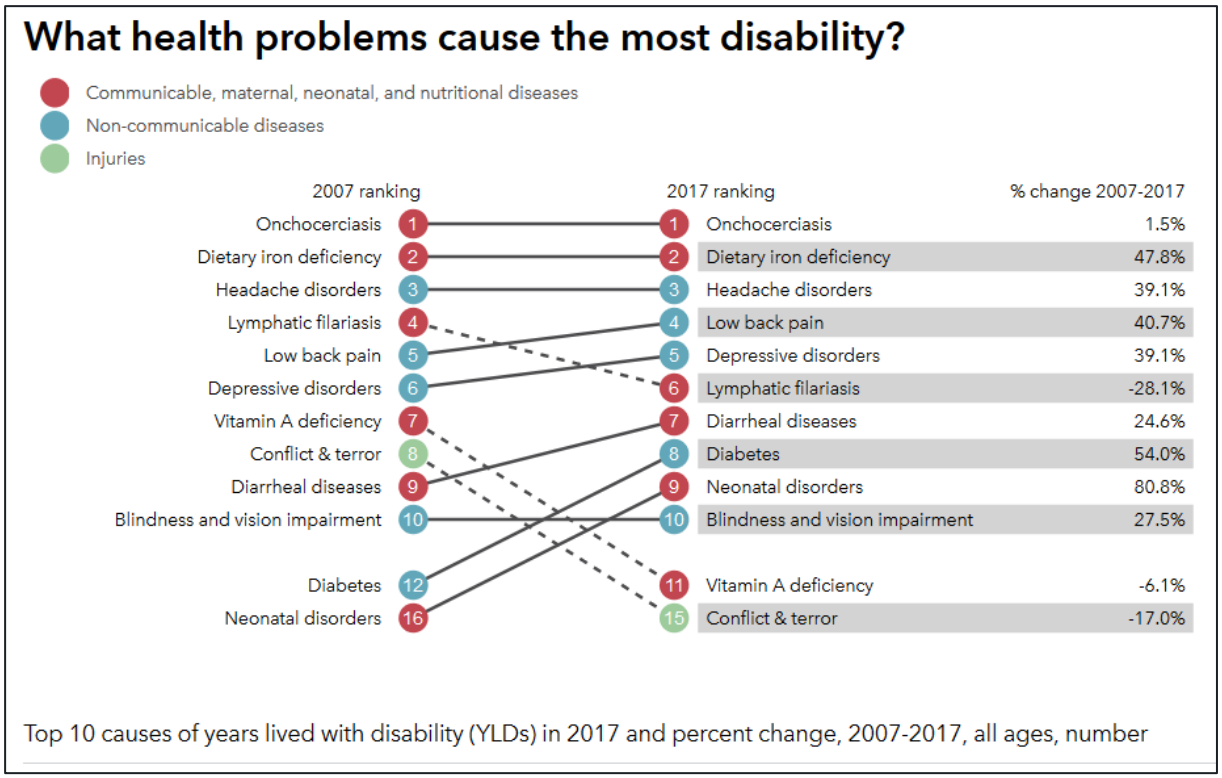


Figure A3-3. Health problems that cause most disabilities in Liberia (2007 and 2017)

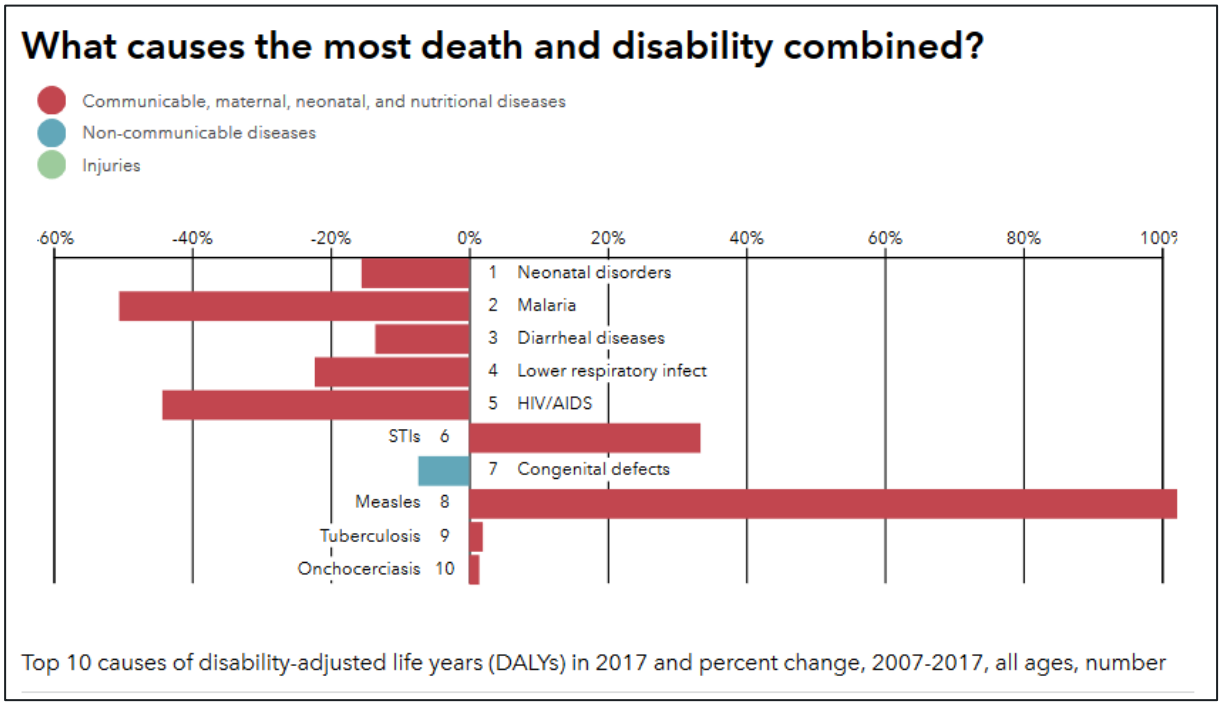


Figure A3-4. Combined causes of death and disability in Liberia

Figure A3-4 shows the top 10 causes of death and disability (DALYs). It can be used to compare DALYs across locations relative to the group average. Comparison groups were chosen based on the GBD regional classifications, known trade partnerships, and socio-demographic indicators.

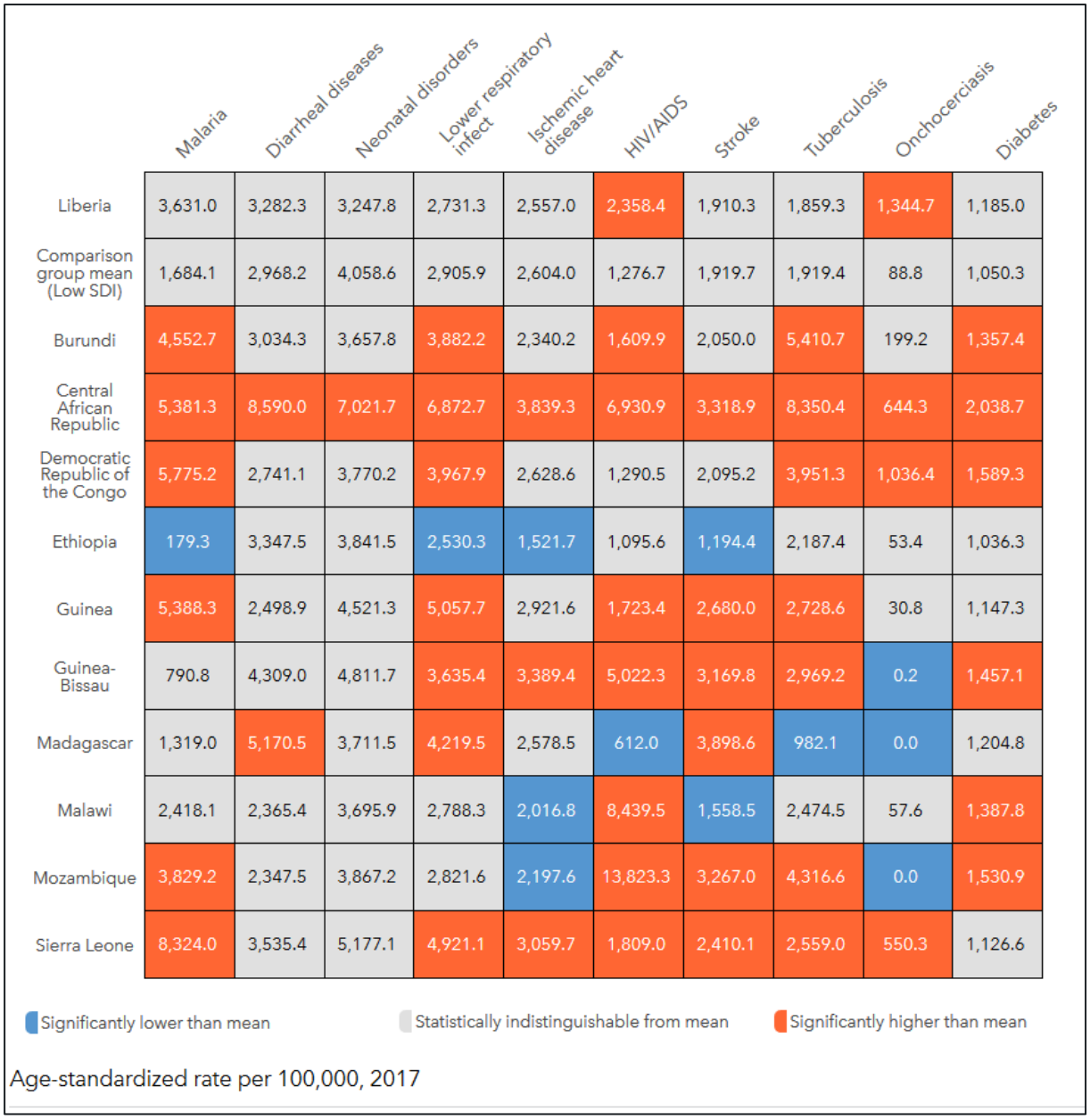


Figure A3-5. How do causes of death and disability compare to those in other locations?