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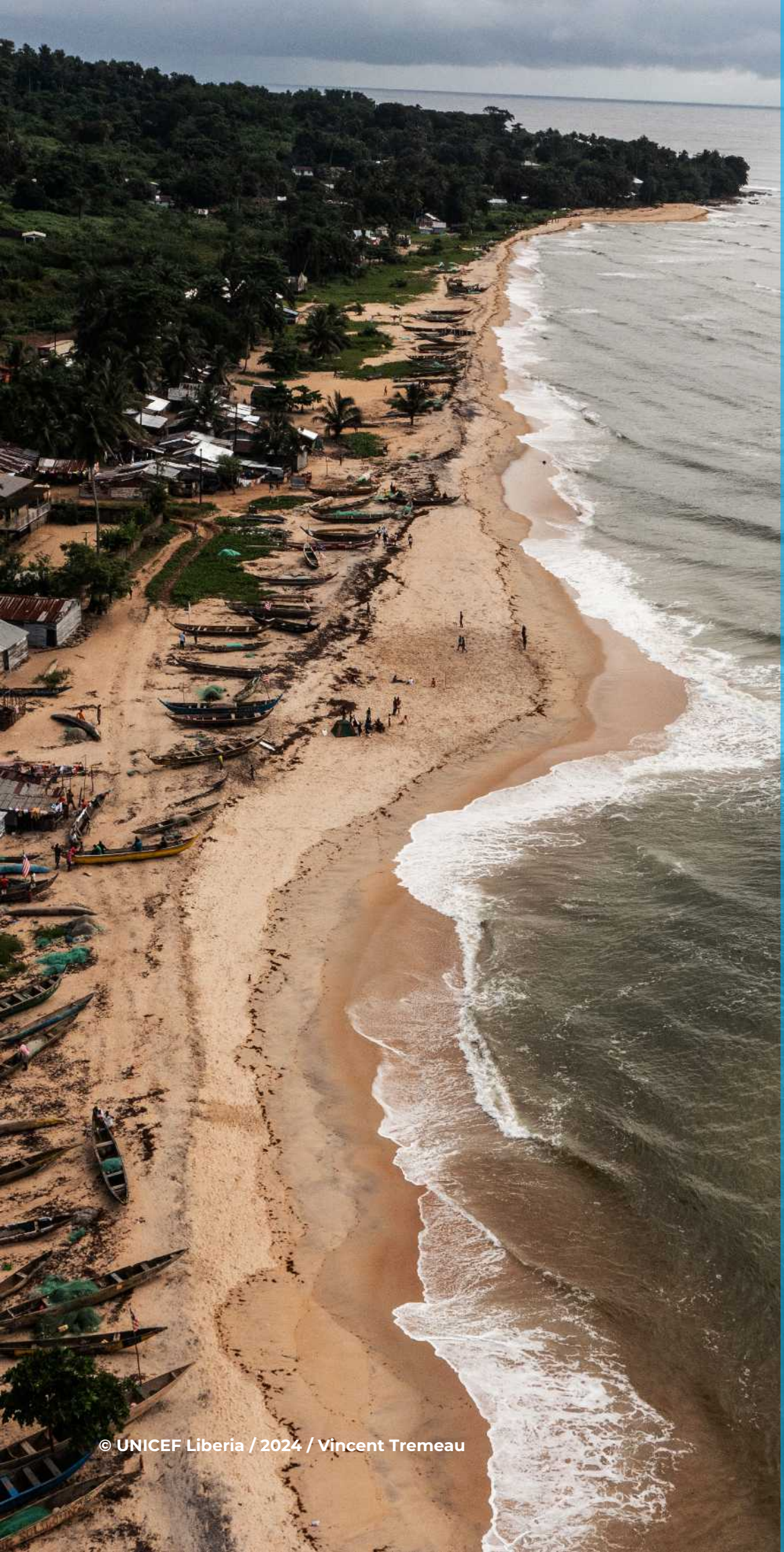


A CLIMATE LANDSCAPE ANALYSIS FOR CHILDREN

IN LIBERIA



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EXECUTIVE DIRECTOR FOREWORD



Photo of Emmanuel King Urey Yarkpawolo, Ph.D, The Executive Director of Environmental Protection Agency in Republic of Liberia

Climate change and environmental degradation represent one of the most profound development challenges of our time, with children bearing a disproportionate share of the risks and consequences. In Liberia, where nearly half of the population is under the age of 18, the intersection of climate vulnerability, environmental stressors, and multidimensional child poverty demands urgent, coordinated, and sustained action.

It is therefore with great appreciation that I welcome the Climate Landscape Analysis for Children (CLAC) in Liberia. This report provides a timely, evidence-based assessment of how climate change and environmental degradation are already affecting the lives, health, education, and future prospects of Liberian children, while clearly outlining the risks that will intensify in the absence of decisive intervention. The analysis reinforces a critical reality: safeguarding our environment is inseparable from safeguarding the rights, wellbeing, and development of our children.

Liberia continues to face increasing exposure to climate-related hazards, including flooding, coastal erosion, rising temperatures, air and water pollution, and land degradation. These hazards undermine essential services such as water, sanitation, healthcare, nutrition, education, and safe housing-services that are fundamental to child survival and development. As the national authority mandated to coordinate environmental protection and climate action, the Environmental Protection Agency recognises that children must be placed at the centre of climate adaptation, mitigation, and environmental governance efforts.

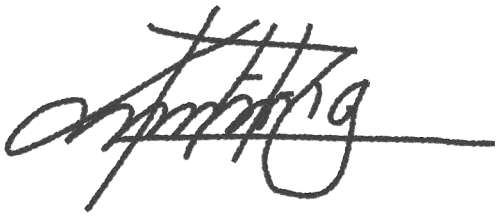
This CLAC report aligns strongly with Liberia's national priorities, including the Nationally Determined Contributions (NDCs), the National Adaptation Plan (NAP), the Environmental Protection and Management Law, and our commitments under the Sustainable Development Goals and the Convention on the Rights of the Child. Importantly, it also amplifies the voices of young people and climate advocates, whose leadership and lived experiences are indispensable to shaping resilient and inclusive solutions.

The Environmental Protection Agency remains committed to working closely with UNICEF, line ministries, local governments, civil society, development partners, and youth-led

organisations to translate the findings and recommendations of this report into concrete

action. This includes strengthening child-responsive climate policies, improving access to climate finance, enhancing institutional coordination, and supporting community-level interventions that build resilience while creating green and dignified livelihoods.

I commend UNICEF Liberia and all partners who contributed to this comprehensive analysis. I encourage policymakers, practitioners, development partners, and stakeholders across all sectors to utilise this report as a strategic reference and a call to action. Together, we can ensure that Liberia's response to climate change not only protects ecosystems but also secures a safe, healthy, and resilient future for every Liberian child.



Emmanuel King Urey Yarkpawolo, Ph.D
Executive Director
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UNICEF LIBERIA REPRESENTATIVE'S FOREWORD



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Climate change is fundamentally a crisis for children. In Liberia, it is already reshaping where children live, how they learn, what they eat, and whether they can access safe water, health care, and protection. The *Climate Landscape Analysis for Children* in Liberia provides a timely and compelling picture of how climate and environmental hazards are affecting children today and how these risks are projected to intensify in the years ahead. It offers clear, evidence-based recommendations to ensure that climate action in Liberia is child-focused, equitable, and grounded in the realities of those who are most at risk.

Liberia has a long history of collaboration with UNICEF to understand and respond to the situation of its youngest citizens, the

children in Liberia. Earlier studies and the recent *Situational Analysis of Children and Adolescents* (2025), documented how conflict, disease outbreaks such as Ebola, and entrenched poverty have shaped child well-being and the fulfilment of rights across sectors like health, nutrition, education, WASH, and protection. These analyses have underpinned successive Country Programme cycles and informed national policies and plans. Building on this legacy, the *Climate Landscape Analysis for Children* is the first dedicated effort in Liberia to bring together climate science, environmental data, and child rights analysis in one integrated assessment, explicitly examining how climate and environmental degradation intersect with existing deprivations.



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The findings of this report are stark. Children in Liberia face an overall high climate risk, driven by overlapping exposure to rising temperatures, floods, storms, water scarcity, sea-level rise, and environmental degradation such as air and water pollution, deforestation, and land degradation. Counties such as Bong, Grand Bassa, and River Gee experience some of the highest combined climate and vulnerability scores, with children in poor coastal and rural communities bearing the heaviest burden. These hazards undermine all aspects of children's rights: they increase the risk of malnutrition and disease, disrupt learning, damage homes and schools, force displacement, and heighten exposure to violence, exploitation, and psychosocial distress. Without urgent and child-sensitive adaptation and mitigation measures, climate change threatens to reverse hard-won gains in reducing child and infant mortality and expanding access to essential services.

At the same time, the report shows that climate action for and with children is possible and already underway. Recently, Liberia signed the *Declaration on Children, Youth, and Climate Action* during COP30, reaffirming the country's commitment to strengthening its leadership for future generations. This milestone was preceded by the inclusion of children and youth, as well as key services such as WASH, on which children depend for their growth, health and

development, in the updated NDC 3.0 for the first time in Liberia. The document sets ambitious, child-sensitive goals and targets that demonstrate the nation's commitment to safeguarding the well-being of children in the face of climate change. UNICEF is proud to have supported these achievements, including the development of the Climate Rationale for WASH, to support inclusive policies and investments that put children at the core of climate action, aligning with Liberia's priorities and the Paris Agreement. Furthermore, in line with SCAP, UNICEF remains committed to empowering children and youth to champion adaptation and resilience efforts while ensuring that UNICEF promotes sustainable practices across sectors.



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The *Climate Landscape Analysis for Children* was developed with government institutions, partners, and, importantly, Liberia's young climate advocates, whose ideas and aspirations are reflected throughout the report. Their engagement demonstrates that children and adolescents are not only victims of climate change but also powerful agents of change, ready to lead efforts in their schools, communities, and online spaces to protect their environment and future.



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This report also comes at a defining moment for UNICEF Liberia. As the Country Office prepares the new Country Programme Document (CPD) for 2026–2030, it has adopted a deliberate strategic move to elevate WASH and climate as a dedicated programme component, building on cross-cutting climate work already initiated under the current programme. The new CPD integrates climate resilience across health, nutrition, education, child protection, and social policy, with particular emphasis on climate-resilient WASH

systems, safe learning environments, and climate-smart health and nutrition services. UNICEF Liberia is also committed to supporting Liberia's engagement in global climate processes such as COP30, ensuring that the voices and priorities of children and young people are heard in national preparations and international negotiations. Through this dual focus—strengthening WASH and climate programming at country level and supporting wider climate-related initiatives—UNICEF aims to help Liberia protect children from climate risks today while building the foundations for a more sustainable tomorrow.



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The *Climate Landscape Analysis for Children* in Liberia is both a warning and a roadmap. It highlights the scale and urgency of the climate crisis for children, but also sets out practical, context-specific pathways for action; across policy, financing, programmes, and partnerships, to place children at the centre of climate and environmental decision-making. UNICEF Liberia is deeply grateful to the Government of Liberia, the Environmental Protection Agency (EAP), the National WASH Commission, sector ministries, civil society organisations, development partners, and the youth climate advocates whose knowledge and commitment made this report possible. As this analysis is translated into policy reforms, investments, and concrete interventions, UNICEF stands ready to work with all partners so that every child in Liberia can grow up in a safer, cleaner, and more climate-resilient environment.

Andrew Brooks
Representative, UNICEF Liberia.

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ACRONYMS

ADAP	Adolescent Development and Participation
ARIs	Acute Respiratory Infections
CAN-Liberia	Climate Action Network Liberia
CCA	Climate Change Adaptation
CEE	Climate, Energy and Environment
CEPIL	Climate and Environmental Protection Initiative of Liberia
CIFO	Climate Integration and Financing Office
CLAC	Climate Landscape Analysis for Children
CO_2	Carbon Dioxide
COP	Conference of the Parties (UN Climate Conference)
CYCLES	Center for Youth Civic Leadership and Environmental Studies
DEOH	Division of Environmental and Occupational Health
EIF	Environmental Justice Foundation
EMIS	Education Management Information System
EPML	Environmental Protection and Management Law
FAO	Food and Agriculture Organisation
FCI	Foundation for Community Initiatives
GCF	Green Climate Fund
GBV	Gender-Based Violence
GEF	Global Environment Facility
GHG	Greenhouse Gas
GPA	Grade Point Average
IMF	International Monetary Fund

LDCs	Least Developed Countries
LIPA	Liberia Institute of Public Administration
LISGIS	Liberia Institute of Statistics and Geo-Information Services
LYCA	Liberian Youth for Climate Action
MFDP	Ministry of Finance and Development Planning
MoGCSP	Ministry of Gender, Children and Social Protection
NAP	National Adaptation Plan
NACEL	National Alliance of Climate and Environmental NGOs of Liberia
NDC	Nationally Determined Contribution
NDMA	National Disaster Management Agency
NDMC	National Disaster Management Committee
NGO	Non-Governmental Organisation
NO_2	Nitrogen Dioxide
NTCU	National Technical Coordinating Unit
PM / $PM_{2.5}$	Particulate Matter / Fine Particulate Matter (<2.5 µm)
RE	Renewable Energy
SCF	Save the Children's Future
SEA	Sexual Exploitation and Abuse
SDGs	Sustainable Development Goals
SOPs	Standard Operating Procedures
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation

UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USD	United States Dollar
VOSEIDA	Volunteers for Sustainable Development in Africa
WASH	Water, Sanitation and Hygiene
WFP	World Food Programme
WHO	World Health Organisation
YOUNGO	Youth Non-Governmental Organisation (constituency of UNFCCC)

KEY DEFINITIONS

Adaptation	The process of adjusting infrastructure, systems, services and behaviours to become more resilient to climate hazards and seasonal variability.
Air pollution	The contamination of air due to the presence of substances in the atmosphere that are harmful to the health of humans and other living beings. Includes greenhouse gases and particulate matter.
Child vulnerability	Children's vulnerability to climate change and other environmental degradation because of poverty indicators, including a lack of access to safe housing, WASH, healthcare, adequate nutrition and education.
Climate change	Climate change refers to long-term, average shifts in temperatures and weather patterns. These shifts may be natural, but since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels (such as coal, oil and natural gas).
Climate hazard	A climate-related event or trend that may cause loss of life, injury, or other health impacts, including drought, flooding, cyclones, thunderstorms and temperature extremes.
Climate resilience	This refers to infrastructure, systems, services and behaviours that can survive, adapt, and function in the face of climate-related hazards and seasonal variabilities.
Drought	A drought is broadly defined as drier than normal conditions; that is, moisture deficit relative to the average water availability at a given location and season.
Ecosystem	A functional unit consisting of living organisms, their nonliving environment and the interactions within and between them.
Microplastics	Fragments of any type of plastic less than 5 mm in length.
Mitigation	Efforts to reduce or prevent the emission of greenhouse gases, for example by incorporating renewable technologies into infrastructure, systems and services
National Adaptation Plan (NAP)	This plan helps identify country-specific climate adaptation needs and develops and implements strategies to address them, to protect the most vulnerable communities from the impact of climate change.
Nationally Determined Contributions (NDC)	This is a climate action plan to cut emissions and adapt to climatic impacts. Each party to the Paris Agreement is required to establish an NDC and update it every five years
Particulate matter	Solid particles or liquid droplets found in the air. They are often hazardous to human health.
Renewable energy	Any form of energy from solar, geophysical, or biological sources that is replenished by natural processes at a rate that equals or exceeds its rate of use (e.g. solar and wind energy).
Water scarcity	Water scarcity is the lack of fresh water resources to meet the standard water demand. There are two types of water scarcity: physical water scarcity and economic water scarcity.



CALL TO ACTION BY ADOLESCENTS IN LIBERIA

We are pleased to share with you the Climate Landscape Analysis for Children (CLAC) in Liberia. The report compiles key data on the impacts of climate change on children in Liberia and outlines actions to address these challenges.

Climate change and environmental degradation remain a major concern for our country, and they are issues that young people care deeply about. According to a recent UNICEF U-Report poll, 87 per cent of young people surveyed stated they had already experienced the impacts of climate change firsthand.

It is Liberia's poorest children who are most at risk. Many continue to live in poorly built homes, have limited access to safe water and rely on unreliable energy sources, making them especially vulnerable to climate hazards such as flooding, drought and storms. Without action, the situation will worsen, putting more children's lives and futures in danger.

Young people in Liberia are committed to tackling the climate crisis and have already led inspiring efforts to protect the environment. But we cannot face this challenge alone. We need support from the Government of Liberia, UNICEF and other partners to scale up these efforts.

On behalf of Liberia's children, we call on the Government and its partners to:

Short-term actions (2–3 years):



1. **Expand community tree-planting campaigns and mangrove protection programmes**

   Partner with schools and NGOs to plant trees and mangroves to reduce heat, improve air quality, combat deforestation and protect Liberia's coastal communities. These low-cost, high-impact initiatives which can also foster environmental awareness and responsibility among children and their communities.

2. **Provide low-cost solar kits for rural areas**

   Distribute affordable solar kits to off-grid communities to provide clean, reliable lighting and reduce dependence on kerosene lamps, which contribute to indoor air pollution and health risks.

3. **Establish green jobs training programmes for young people**

   Collaborate with NGOs to train young people in practical green skills, such as solar panel installation, sustainable farming and waste management. These programmes will empower youth to lead climate action and improve their livelihoods.

4. **Establish waste recycling programmes in urban areas**

   Establish small recycling centres in key cities and offer incentives for waste collection and sorting. These centres can create local jobs, reduce pollution, and support cleaner urban environments.

5. **Establish climate change clubs in all every schools**

   Encourage schools to set up climate clubs where children can learn about environmental protection, develop leadership skills, and run small community-based projects.

Medium-term actions (5–10 years):



1. **Establish local renewable energy microgrids in rural areas**

   Build solar or wind microgrids in isolated communities to provide clean, reliable energy and reduce dependence on diesel generators, contributing to energy security and climate resilience, in line with the country's Nationally Determined Contribution targets (30 per cent clean energy by 2030).

2. **Support climate-resilient farming and fishing cooperatives**

   Establish cooperatives to support farmers and fishers in adopting climate-smart agricultural techniques, such as agroforestry, crop diversification and water-efficient practices. This can increase food security and protect rural livelihoods.

3. **Expand urban green spaces**

   Develop small urban parks and green spaces to improve air quality, reduce urban heat and create safe recreational areas for children and their families.

4. **Ensure climate-resilient drinking water and sanitation infrastructure for the most vulnerable communities**

   Collaborate with international partners to establish climate-resilient water and sanitation services, especially in drought-prone and flood-affected communities.

5. **Improved drainage systems in cities**

   Upgrade drainage infrastructure in Monrovia and other cities to reduce the frequency and severity of flooding during heavy rains, preventing damage to homes, schools and critical services.

Long-term actions (10–20 years):



1. **Ensure universal clean energy access by 2040**

   Continue scaling up renewable energy projects with the goal of generating 100 per cent of Liberia's energy from clean sources by 2040. Investments in solar, wind and hydro energy can improve energy access while also supporting economic growth.

2. **Establish and implement large-scale reforestation projects**

   Implement large-scale reforestation efforts in degraded areas with international funding and community involvement to restore biodiversity, improve soil quality, and capture carbon emissions.

3. **Establish a National Climate Research Centre**

   Establish a dedicated climate research centre to monitor climate impacts, conduct research and develop Liberia-specific climate adaptation solutions. The centre should also serve as a resource for decision-makers and the public while creating employment opportunities for young people.

4. **Expand eco-tourism in Liberia**

   Invest in eco-tourism infrastructure in protected areas to generate sustainable revenue and create jobs for young people while also preserving Liberia's rich natural heritage.

5. **Establish climate-resilient housing programmes**

   Develop affordable, climate-resilient housing for low-income families, prioritising communities in flood-prone areas. This includes using sustainable building materials and designs that can withstand extreme weather events and utilising clean energy sources such as solar.

We hope you will listen to the voices of young people and the evidence presented in the CLAC to create a better, more resilient future for Liberia's children—now and in the years to come.

Sincerely,

Arpu-Elizabeth Juasemai.



1

EXECUTIVE SUMMARY

Climate change poses a serious threat to children in Liberia, a threat that is expected to intensify in the coming years and decades as the world's climate continues to warm. Climate-related hazards, such as extreme heat, flooding, and drought, in addition to other forms of environmental degradation, such as air and water pollution and deforestation are increasingly impacting children's health and their right to a safe, healthy environment. Additionally, these challenges affect their access to essential services such as clean water, education, healthcare, nutrition, and basic protection *(Fig.1)*. These impacts are expected to worsen as climate change continues to intensify.

Liberia's children experience a high climate risk, as a combined result of medium-high exposure to a multitude of climate-related hazards and an extremely high vulnerability to these hazards, due to multidimensional child poverty.[1] Current projections indicate a hotter climate across all regions of the country, with increased frequency and intensity of storms, flooding, water scarcity and drought.

Unless urgent action is taken, these climate risks, combined with other environment-related hazards, such as pollution, threaten to undermine progress in reducing infant and child mortality rates. These rates have both halved since 2000 but may resurge as the country's epidemiological landscape continues to change.

It is Liberia's poorest children who will be most affected by these impacts. Climate change poses an imminent threat to children in Liberia, not only due to the projected frequency of extreme weather events but also because of the country's ongoing socio-economic challenges and other environmental issues such as air and water pollution, land degradation and biodiversity loss.

The Climate Landscape Analysis for Children (CLAC) aims to compile all available data and research on the potential impacts of climate change and environmental degradation on children in Liberia and recommend actions to address them. This includes recommendations on how UNICEF Liberia can further incorporate and strengthen work on climate- and environment-related issues in its

① EXECUTIVE SUMMARY

new Country Programme for 2025-2029. The report has been developed in consultation and collaboration with the Government and other partners. Most importantly, it also incorporates the ideas, hopes and perspectives of Liberia's young climate advocates.

It is hoped that the CLAC will encourage the Government and partners to unite and accelerate their efforts to ensure a safer, healthier environment for all of Liberia's children.

1.1. Key findings

- **Liberia faces an overall high climate risk for children, with Bong, Grand Bassa and River Gee facing the highest overall risks *(Map.4)*.** This high overall climate risk is leading to a multitude of issues for children, undermining all aspects of their health and overall, well-being *(Fig.1)*.

- **Since the 1950s, Liberia's mean annual temperature has risen by approximately 1.5°C, with faster warming observed in the central and southern plateau regions.** Projections, under a high-emission scenario, indicate a further temperature increase of 3.2°C by the 2080s, potentially exceeding 4.8°C by 2100.

- **This warming is expected to expose children to a multitude of health-related impacts including dehydration, heat stroke, premature birth, low birth weight, waterborne diseases, and vector-borne diseases like malaria, while also driving food insecurity through crop pests, livestock disease, and malnutrition.** Overheated classrooms hinder learning, increase absenteeism, and reduce concentration, especially in the 45 per cent 5% of schools without water access.[2] Heat also heightens risks of violence, anxiety, social isolation, and obesity as children are forced indoors, limiting play and social interaction.



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- Liberia faces increasingly erratic and intense rainfall, leading to increased flooding, crop loss, and livestock deaths, while also disrupting fishing activities and access to healthcare. For children, intense rainfall increases exposure to respiratory illnesses, surges in vector-borne diseases, and higher stunting rates in flood-prone communities.[3,4] Children living in Liberia's most flood-prone communities have some of the highest rates of stunting in the country. [5,6]

- **At the same time, since the 1960s, the country has experienced a gradual decline in mean annual rainfall, which has intensified the risks of drought and water scarcity.[7,8]** Around 30 per cent of children living in households that are dependent on rain-fed agriculture for their livelihoods, especially in counties such as Lofa and Grand Bassa, are particularly

vulnerable to malnutrition as a result of deepening poverty and food insecurity.

- **Rising ocean temperatures and the thermal expansion of seawater have led to sea levels rising by around 9 inches since the 1950s.[9]** If Sea levels rise by more than one metre, areas of major cities such as Monrovia, New Kru Town, River Cess, Buchanan and Robertsport will become submerged, displacing communities and contaminating water supplies.[10]

- **Over the past three decades, Liberia has experienced a concerning rise in air pollutants, including greenhouse gases such as nitrogen oxides (NOx), sulphur dioxide (SO_2) and methane (CH4).[11]** These pollutants are affecting local climates, contributing to global climate change and impacting children's health.



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- **Particulate matter (PM2.5) levels in Liberia currently stand at 42µg/m3, eight times the WHO standards.[12][13] An estimated 1150 deaths of children in Liberia each year could be avoided each year by reducing these levels to just 2µg/m³.[14]** Organic Carbon and Black Carbon form the majority of this PM2.5 in Liberia, which comes primarily from the burning of fossil fuels and biomass (wood and charcoal) for energy.[15] Particulate matter has been found to substantially increase the risk of miscarriage and stillbirth in countries across West Africa, including Liberia.[16] Air pollution also increases the risk of premature birth and the infant being low birth weight.[17] Additionally, for every increase of 5 µg/m³ in PM2.5, there is a corresponding one-point decrease in Grade Point Average (GPA) above WHO's recommended safe levels.[18][19] In Liberia, based on average annual exposure levels of 42µg/m3, this could potentially decrease children's GPA by approximately 8 points.

- **Affordable and reliable electricity access remains a major challenge for the children of Liberia - with just 32 per cent having access to electricity at home.[20]** Despite recent advancements, Liberia remains among the ten low-income countries in Sub-Saharan Africa with the lowest electricity access.

- **Liberia's heavy reliance on wood and charcoal, coupled with the use of inefficient traditional cookstoves, is fuelling deforestation.** This subsequently undermines key ecosystem services for children, including safe water supply and food supply, with significant implications for their health and nutrition.

- **Liberia faces a severe solid waste management crisis, especially in urban areas like Monrovia, where 800 tonnes of waste are generated daily, but only 45 per cent is collected, often dumped in**

1 EXECUTIVE SUMMARY

uncontrolled sites, while other regions lack effective waste management and recycling facilities This unsafe disposal contaminates soil and water with plastics, chemicals, heavy metals, pharmaceuticals and microplastics, posing serious risks to children's health and development.



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- **Both soil and water pollution continue to be significant issues for the country, leading to a multitude of health issues for children.** More than 1.5 million children in Liberia are estimated to have unsafe levels of lead in their blood, which can lead to a numerous health issues, including liver and kidney problems, lifelong neurological, cognitive and physical impairment, mental health and behavioural issues.[21] Additionally, around six deaths per 100,000 children in Liberia occur as a direct result of heavy metal and other chemical poisonings. [22]

- **The degradation of Liberia's natural environment also impacts children's cultural identity and sense of belonging.[23]** Traditional dances, and medicines, and families' livelihoods remain closely connected to forests, rivers, and coastal areas. These are being threatened by environmental degradation, leading to a loss of cultural heritage and community cohesion. Protecting and restoring these environments is crucial for preserving the cultural identity and well--being of Liberia's children.

- **Despite progress in recent years, significant gaps remain in Liberia's approach to climate adaptation for children.** Key sectoral policies, such as the Water and Sanitation Policy, the National Health Policy and the Disaster Risk Reduction Strategy, are outdated and require urgent revision. In addition, just three of the policies reviewed include adequate mentions of children's specific vulnerabilities to climate- and environment-related hazards and specific measures to protect children. Even fewer policies have been crafted with direct input from young people.

- **Liberia requires at least US$500 million by 2025 for climate mitigation and adaptation but faces significant financing gaps.[24]** To address this, it must strengthen its capacity to access funding from climate finance mechanisms, international donors, and financial institutions, while also enhancing its institutional capacity for climate assessments and child-focused project implementation.

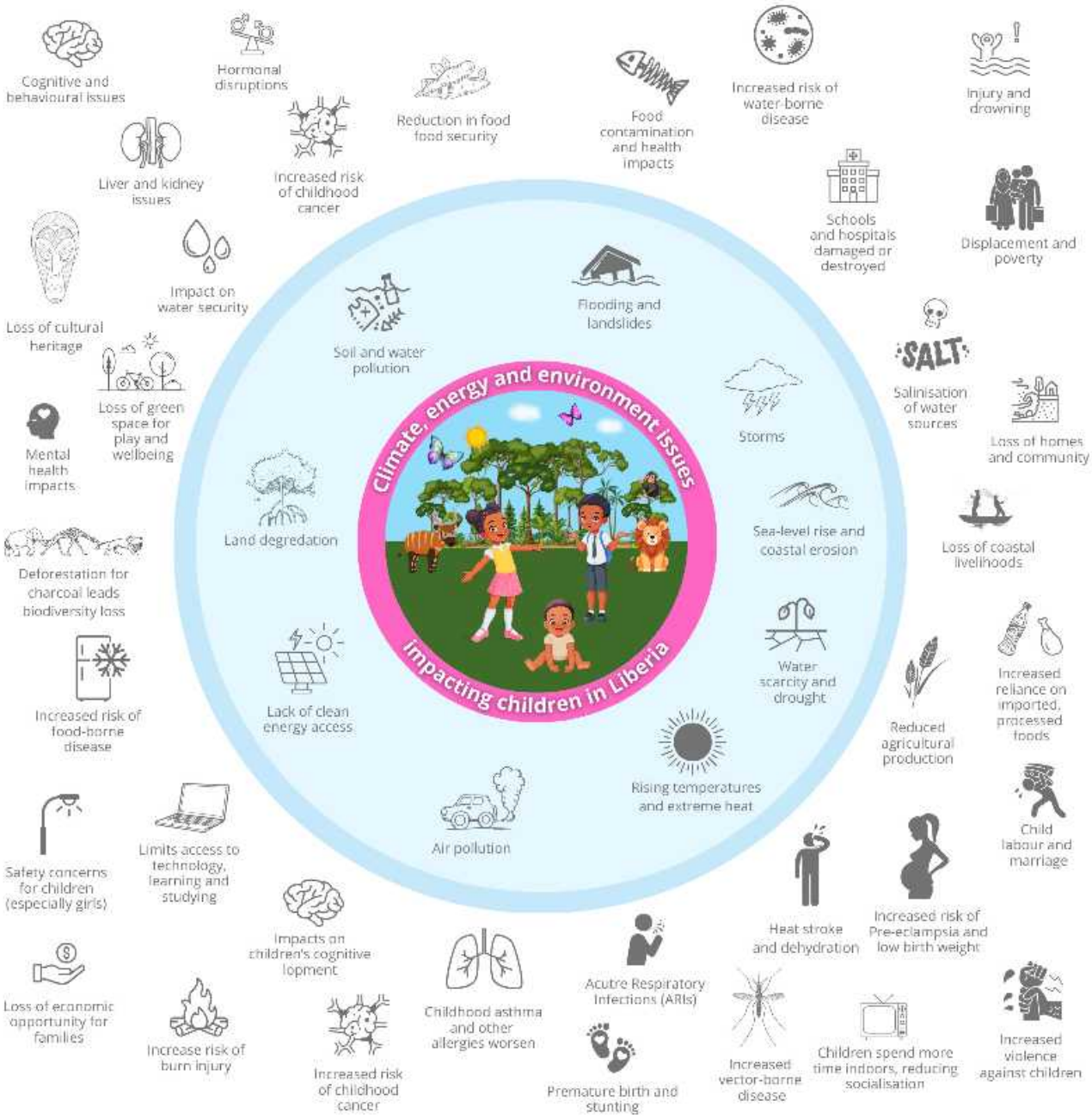


Figure 1: A summary of the climate and environment-related impacts

Table 1: Summary of observed and projected climate and environment-related hazards In Liberia and their impacts on children[25][26]

Climate and environment hazards and deprivation	Overall risk[25]	Observed trends	Projected changes	Most affected regions[26]	Potential impacts for children	The most vulnerable children
1. Rising temperatures 	Medium	• Mean temperatures have risen by 1.5°C since the 1950s. • More frequent, intense heatwaves across the country. • Rise in night-time temperatures during the hot season.	• Up to a 3.2°C mean temperature rise projected by the 2080s. • 99 per cent of Africa's children will be exposed to extreme heat by the 2050s.	• All regions, particularly those in the interior plateau (e.g., Nimba and Bong) and urban areas (e.g., Monrovia).	• Heatstroke and dehydration. • Increased incidence of pre-eclampsia in pregnant women. • Increased risk of low birthweight in infants. • Increased risk of chronic and acute malnutrition in children under five. • Increased risk of food- and waterborne diseases, including cholera. • Increased risk of vector-borne disease, including malaria and dengue fever. • Reduced concentration and learning at school. • Increased risk of violence and abuse. • Anxiety and other mental health disorders.	• Children living in extreme poverty, including those without access to water and electricity. • Children under five, particularly infants. • Children with disabilities and other medical conditions. • Orphans and other vulnerable children.
2. Storms, flooding and landslides 	High	• Annual rainfall patterns have become more erratic and intense. • Flash flooding impacts 50,000 people annually in Monrovia. • Riverine flooding and landslides are also common.	• Increased frequency and intensity of storms, floods and landslides.	• Riverine and coastal communities, particularly those in Grand Cape Mount, Borni, Montserrado (Monrovia), Margibi (Kakata), Grand Bassa, Rivercess and Lofa. • Landslide risk is highest in Maryland, River Gee and Grand Kru.	• Injury and death. • Salinisation of water sources, leading to safe water shortages for consumption and agriculture, displacement and health issues such as high blood pressure. • Destruction of homes, infrastructure and essential services for children. • Displacement and urban migration. • Financial hardship and stress for families. • Increased exposure to chemicals, pathogens and other toxins, which contaminate soil and water sources. • Increased risk of water- and vector-borne disease.	• Children living in extreme poverty, including those without access to safe housing. • Children living close to rivers and the ocean. • Children living in urban slums. • Children under five, particularly infants. • Children with disabilities and other medical conditions • Orphans and other vulnerable children.

Climate and environment hazards and deprivation	Overall risk[25]	Observed trends	Projected changes	Most affected regions[26]	Potential impacts for children	The most vulnerable children
3. Sea-level rise and coastal erosion 	High	• Sea levels have risen around 9 inches since the 1950s. • Increased rate of coastal erosion (1 to 1.5m per year). • Saltwater intrusion into freshwater aquifers.	• Sea-level rise of 0.13 to 0.56m projected by 2050. • Intensified storm surges expected to impact coastal infrastructure and displace families. Coastal population expected to grow 70 per cent by 2050.	• All coastal regions, particularly those in Montserrado (West Point), Grand Bassa (Buchanan), Cape Mount (Robertsport) and Sinoe	• Injury and death. • Salinisation of water sources, leading to safe water shortages for consumption and agriculture, displacement and health issues such as high blood pressure. • Destruction of homes, infrastructure and essential services for children. • Displacement and urban migration. • Financial hardship and stress for families.	• Children living in extreme poverty in coastal regions, including those without access to safe housing (urban slums). • Includes the poorest children under five, children with disabilities and other medical conditions, orphans and other vulnerable children.
4. Drought and water scarcity 	Very low	• Decline in mean annual rainfall since the 1960s. • Later onset of the rainy season, the heavy reliance on rain-fed agriculture and shallow wells leave rural communities particularly vulnerable.	• Further decline in rainfall expected by 2050, especially during dry season. • More frequent agricultural droughts expected, reducing food security.	• All counties, particularly River Gee, Grand Kru, Sinoe, River Cess and Grand Bassa.	• Increased risk of malnutrition due to food insecurity and loss of livelihoods. • Increased risk of vector-borne disease, including malaria and dengue fever. • Increased concentration of toxins, bacteria and other contaminants in water. • Increased risk of waterborne disease, including cholera. • Increased risk of dehydration. • Increased risk of displacement, urban migration and exploitation.	• Children living in extreme poverty, including those from families without access to water • Children from remote rural communities that rely on rain-fed agriculture. • Children under five, particularly infants. • Children with disabilities and other medical conditions. • Orphans and other vulnerable children.
5. Air pollution and lack of clean energy access 	Medium	• Rise in greenhouse gas emissions since the 1950s. • Annual average levels of particulate matter (PM2.5) stand at eight times WHO standards. • 92 per cent of Liberia's energy comes from wood and charcoal - major source of air pollution. • Just 3 per cent of Liberia's children have access to electricity at home. • Only 6 per cent of households use solar energy.	• Air pollution levels expected to worsen due to population growth and economic development, unless urgent action is taken to accelerate the switch towards cleaning energy sources.	• Air pollution risk is highest in urban areas, especially Montserrado County (Monrovia). • Lack of clean energy access remains high across all regions, particularly in rural areas.	• Reduced lung function and respiratory problems. • Increased risk of Acute Respiratory Infections (ARIs), including bronchitis and pneumonia. • Aggravated allergies and asthma. • Increased cancer risk. • Developmental delays and cognitive impairments • Impaired motor skills. • Premature birth and stunting.	• Children living in urban areas. • Children living close to heavy industry or waste dumps. • Children living in extreme poverty, including those without access to water and electricity. • Children under five, particularly infants.

Climate and environment hazards and deprivation	Overall risk[25]	Observed trends	Projected changes	Most affected regions[26]	Potential impacts for children	The most vulnerable children
					• Accelerating forest degradation and deforestation, to supply biomass for fuel, leading to food and water insecurity issues. • Fire and burn risks, especially for young children. • Reduced economic productivity for families, impacting livelihoods. • A financial burden for families, diverting resources away from other expenditures for children. • Increased risk of food-borne disease and heat stroke due to the lack of cooling facilities. • Impact on children's ability to study and learn. • Lack of lighting poses security risks for children.	• Children with disabilities and other medical conditions, including asthma and allergies.
6. Land and water degradation 	High	• 1.5M ha of forest cover lost from 2001 to 2023 (16 per cent of total). • On average, each Liberian consumes about 0.17 cubic metres of wood annually (1-2 hectares of forest per capita per year). • Monrovia generates 800 tons of waste daily; 55 per cent is uncollected. • Water and soil pollution from solid waste, industrial waste and agriculture remains common.	• Land and water degradation will continue unless urgent action is taken. • Expected loss of soil productivity and reduced fishing.	• All regions, particularly Grand Gedeh, River Cess, Sinoe, Montserrado (Monrovia) and Nimba counties.	• Impact on livelihoods and household poverty. • Access reduction to essential ecosystem services (such as food and water). • Waterborne diseases, including diarrhoea, cholera and Hepatitis A and E. • Malnutrition and stunted growth. • Impaired cognitive development and reduced Intelligence Quotient (IQ). • Higher risk of miscarriage, low birth weights and congenital anomalies such as cleft lip. • Hormone disruptions, including early puberty. • Liver and kidney disease. • Childhood cancers. • Loss of cultural heritage. • Loss of green space impacts children's physical health and cognitive development. • Impact on emotional well-being, including increased anxiety and depression	• Children relying on surface water. • Children living near waste dumps. • Children from rural families. • Children living in urban slums. • Children under five, particularly infants. • Children with disabilities and other medical conditions


GRACE

2

INTRODUCTION

Situated on the Atlantic coast of West Africa, Liberia boasts a youthful and dynamic population, with approximately 48 per cent of its residents being under the age of 18 *(Map 1)*.[27] The country's young population is currently exposed to a range of climate and environment-related risks stemming from the nation's equatorial climate, diverse topography, and extensive coastline. These factors contribute to increased exposure to extreme weather events, such as heavy rainfall, coastal storms, flooding and landslides, as well as rising sea levels that threaten Liberia's 560-kilometre coastline.[28] Conversely, the dry season, influenced by the Sahara's harmattan winds, can lead to water scarcity in rural areas, during the months of November and March.

Map 1: Map of Liberia





Figure 2: UNICEF's Climate Risk Index, Liberia's children face an extremely high overall risk to climate and environment-related hazards, because of their combined physical exposure and vulnerability, due to multidimensional poverty ©UNICEF/Liberia

Projections indicate that, despite an overall potential decrease in annual rainfall, the intensity of rainfall events is likely to increase, exacerbating storm and flood risks, especially in the northern interior regions.[29]

Liberia's vast tropical rainforests, which house a wealth of biodiversity, are under considerable pressure from population growth, agricultural expansion and logging activities.[30] In addition, the degradation of coastal and marine ecosystems, including from soil and water pollution, threatens both livelihoods and food security, while air pollution remains a growing concern for children's health.

As such, according to UNICEF's Children's Climate Risk Index, children in Liberia face a high exposure to climate and environment-related hazards.[31] At the same time, children face an **extremely high vulnerability** to these hazards as a result of multidimensional poverty.[32] Though much has improved in child survival and development in Liberia since the end of its civil war in 2003, high levels of child poverty persist. The COVID-19 pandemic further exacerbated these struggles, especially for rural households where food prices have risen sharply in recent years, meaning around 80 per cent of households reporting food security concerns [33]

Today, at least half of the country's children live in poverty.[3435] Climate change is expected to push even more children into poverty in Liberia, as a result of livelihood loss, illness and rising food prices.[36] It is Liberia's most vulnerable children, especially those living in poor coastal and rural communities, who are most exposed to climate-related hazards and also face the greatest risks of sickness and injury.

Many of the leading causes of child mortality in Liberia, including malaria, diarrhoea, premature birth, and lower respiratory infections, are closely tied to climate and environmental conditions. Currently, one in 10 children in Liberia die before their fifth birthday due to these preventable and treatable diseases. [37]

It is an issue that Liberia's young people care deeply about. According to a 2024 UNICEF U-Report Poll, 87 per cent of young people surveyed stated they had already experienced the impacts of climate change.[38] They were most concerned about the direct impacts of this on their welfare, including injury, loss of life, damage to property and cost of living and wanted the Government to do more to protect them *(Fig.2)*. This includes tackling issues such as air, land and water pollution.

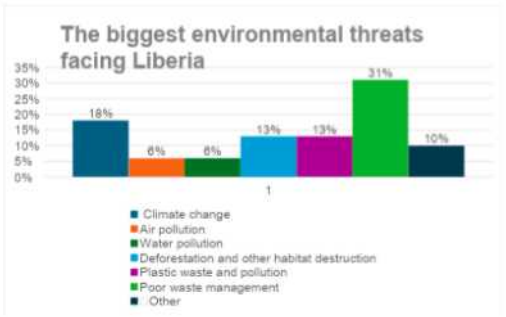


Figure 3: Results of the Liberia U-Report Poll (2024)[38]

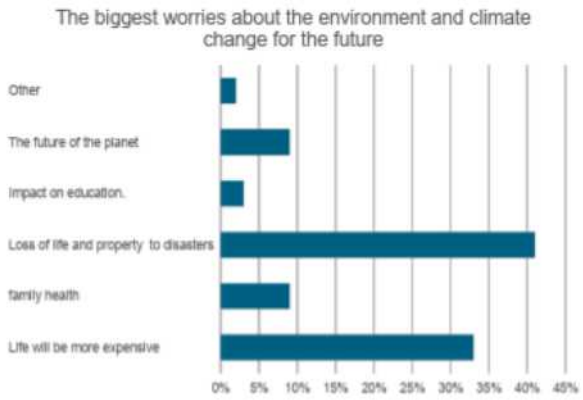


Figure 4: The biggest worries about the environment and climate change for the future

The Climate Landscape Analysis for Children (CLAC) aims to gather all available data and research on the potential impacts of climate change and environmental degradation on children in Liberia and recommend actions to address them. The report has been developed in partnership with the Government and other key stakeholders in the country. Most importantly, the CLAC includes the voices, aspirations and perspectives of Liberia's young people.



3

CLIMATE AND ENVIRONMENT HAZARDS

IN LIBERIA AND THEIR IMPACT ON CHILDREN

3.1 An overview

Children are uniquely vulnerable to climate change and environmental hazards due to their developing bodies and behaviours. They breathe more air, consume more food and water and have higher metabolic rates than adults, leading to greater exposure to pollutants and toxins.[39] Their organs and immune systems are still developing, making them more susceptible to diseases and health complications. Additionally, in Liberia, children are more likely to be affected by malnutrition and succumb to climate- and environment-related illnesses, such as cholera, typhoid fever and malaria.

Children's developing lungs and other organs are more susceptible to the harmful effects of pollutants, leading to increased illness.[40] Furthermore, exposure to environmental hazards during critical periods of development can result in long-term health issues, including cognitive impairments and developmental delays.[41]

Protecting Liberia's children from these hazards is therefore critical to their long-term survival and development. First important step in doing this is understanding children's specific exposures and unique vulnerabilities to each climate- and environment-related hazard.



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The following sections provide a more detailed analysis of each of the key climate- and environment-related hazards and the impacts they have had and will continue to have on the country's children. Evidence from Liberia has been referenced wherever available. Where it

③ CLIMATE AND ENVIRONMENT HAZARDS



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is not yet available, regional and global studies have been used as supportive evidence.

Map 2 highlights the most significant climate and environment-related hazards facing the country's children by region. *Map 3* provides a snapshot of the key vulnerabilities children face by region, including a lack of access to water and sanitation, nutritious food, healthcare, education, social protection and safe housing.

Maps 2 and 3 have been combined to create an Overall Children's Climate Risk Map for Liberia *(Map 4).*

Overall, the maps indicate that children across all counties in Liberia face a high Overall Climate Risk. The children of Bong, Grand Bassa and River Gee face some of the greatest combined risks. It is important to note that highly vulnerable children still exist across all counties. Specific groups of these children are detailed in *Table 2*.

Moving forward, it is critical that these vulnerable children receive priority support, with tailored protection measures and adaptation services to safeguard them from the impacts of climate change.

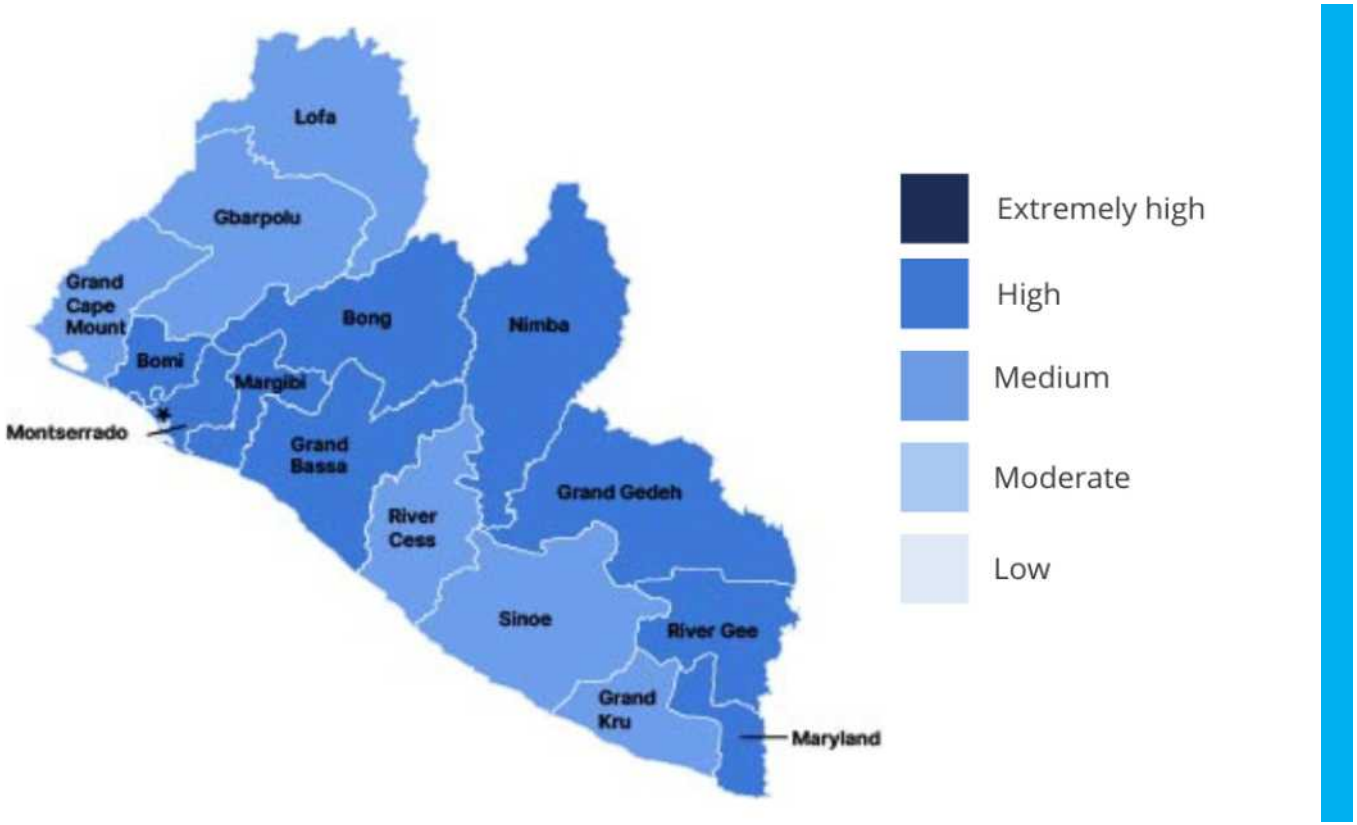
Table.2 Vulnerable groups of children in Liberia to climate and environment-related hazards[42][43]

Vulnerable Group	Description
Children from the poorest families	These children face multiple deprivations including lack of access to WASH, education, healthcare, basic nutrition, safe housing and electricity.
Children under five, particularly infants	Young children and infants are the most vulnerable to malnutrition, infectious diseases, and the health impacts of extreme temperatures.
Children with pre-existing medical conditions	This includes children with chronic illnesses, disabilities and others requiring continuous medical care and support, which may be disrupted during climate-related disasters. These conditions also leave them at increased risk of climate and environment-related illnesses such as extreme heat, ARIs and diarrhoea.
Orphans and other children not in the care of their biological parents	These children often lack stable support systems, making them more susceptible to neglect, exploitation and overall poverty.
Children living in rural communities	These children are at a greater risk of climate-related hazards such as water scarcity, impacting family livelihoods and rural support services.
Children in urban slums	These children often live in some of the worst housing conditions. Population density and poverty in these locations also remains high, further exacerbating vulnerability. Urban slums are also often located in some of the most exposed to hazards such as floods.
Girls and adolescent girls	Girls and adolescent girls face higher risks of abuse and exploitation, including early marriage, and limited access to education and health services due to gender disparities.
Migrant children and refugees	These children often lack legal protection and access to essential services, making them highly vulnerable to exploitation and abuse.
Children engaged in the worst forms of child labour	These children are exposed to hazardous working conditions, severely impacting their health, development, and education opportunities. In Liberia, these children include those involved in domestic labour and agriculture.

The map below provides a snapshot of the most important climate-related hazards facing Liberia's children: **flooding, extreme heat, water scarcity, air pollution and land degradation**. These hazards have been combined to create the overall hazard exposure score for each county.

Ranking	County	TOTAL HAZARD EXPOSURE SCORE BY REGION (out of 10)
1	Montserrado	7.33
2	Bong	6.83
3	Bomi	6.67
4	Grand Bassa	6.58
5	Maryland	6.42
6	Margibi	6.33
7	Nimba	6.17
8	Grand Gedeh	6.08
9	River Gee	6.08
10	Sinoe	5.92
11	Grand Cape Mount	5.83
12	Grand Kru	5.83
13	Lofa	5.83
14	River Cess	5.08
15	Gbarpolu	4.83

Map 2: Children's exposure to climate and environment-related hazards[444546]

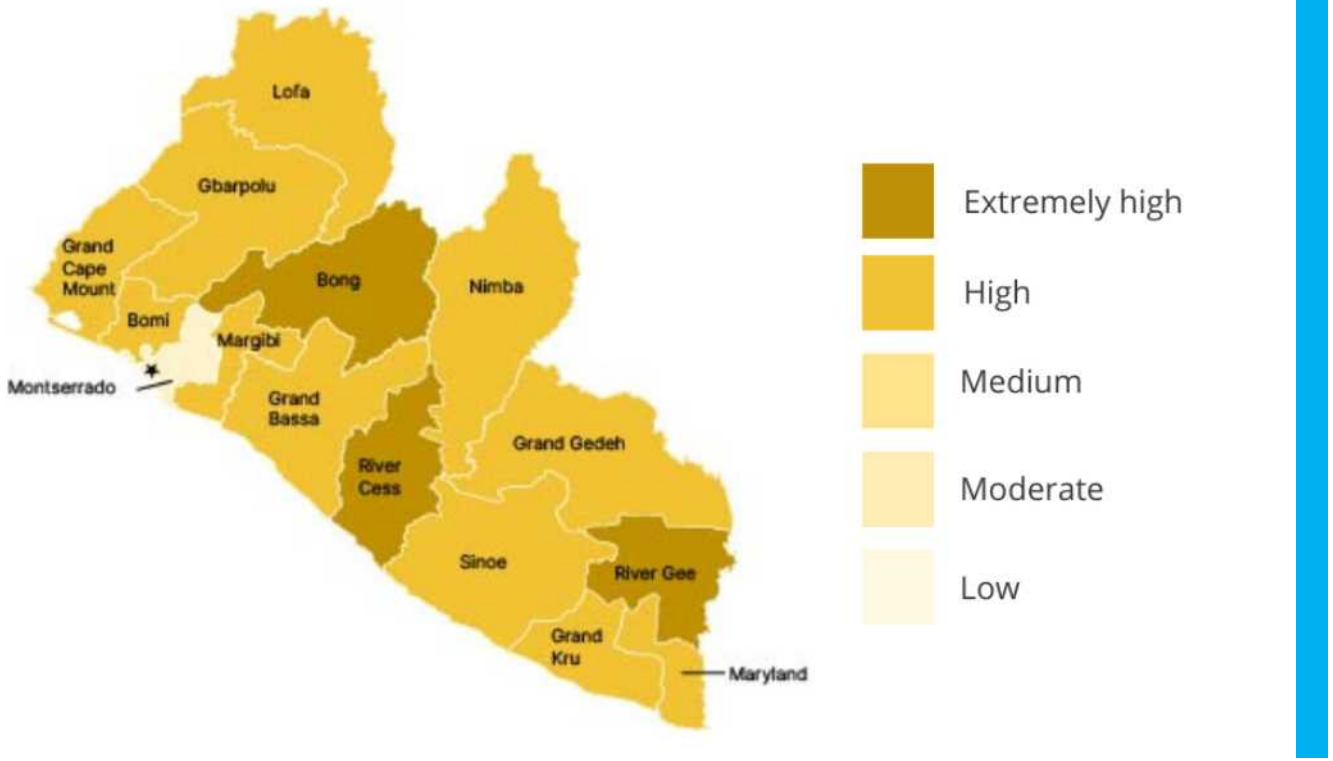


The results show that all counties face an overall medium-high exposure to climate and environment-related hazards. Montserrado, Bong and Bomi face the highest overlapping risks.

The map below provides a snapshot of the most important climate-related vulnerabilities for children in Liberia. These include **key multidimensional child poverty indicators; including lack of access to Water, Sanitation and Hygiene (WASH), healthcare, food security, education, access to electricity and clean cooking fuels.** All these vulnerabilities have then been combined to create the total vulnerability score for each county.

Ranking	Country	TOTAL HAZARD EXPOSURE SCORE BY REGION (out of 10)
1	Bong	9.87
2	River Cess	9.80
3	River Gee	9.20
4	Gbarpolu	9.00
5	Grand Bassa	9.00
6	Grand Kru	9.00
7	Sinoe	9.00
8	Grand Cape Mount	9.00
9	Maryland	7.87
10	Rivercle	7.47
11	Lofa	7.20
12	Margibi	7.20
13	Bomi	7.07
14	Grand Gedeh	6.80
15	Montserrado	3.87

Map 3: Children's vulnerability to climate and environment-related hazards[47][48]

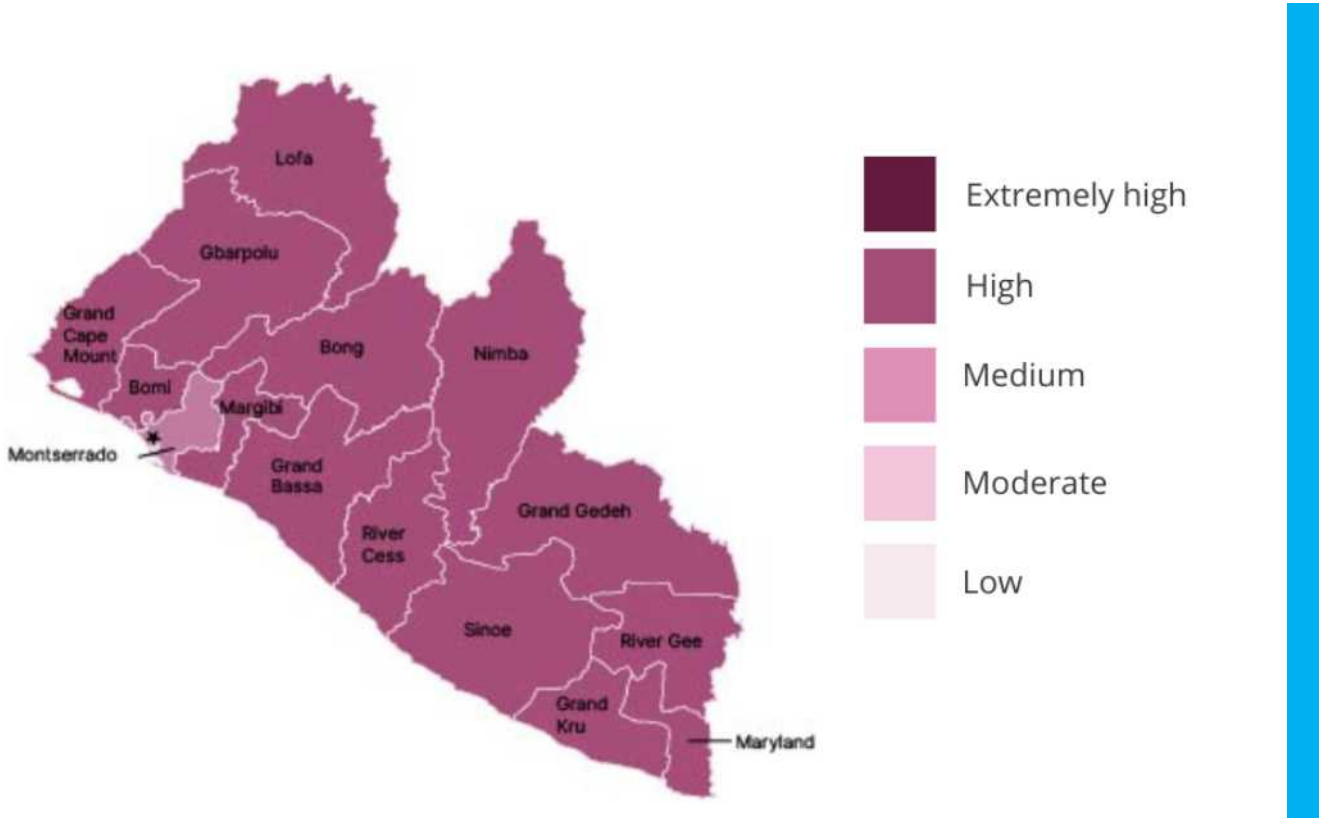


The results show that all counties, except Montserrado, experience an overall high vulnerability to climate and environment-related hazards. Bong, River Cess and River Gee have the highest vulnerabilities.

In Liberia, the children facing the greatest climate change risks are the ones who are most exposed to climate hazards *(Map.2)* and are highly vulnerable due to multidimensional child poverty *(Map.3)*. **As such, a Children's Climate Risk Score for each county has been developed by combining the Climate Hazard and Child Vulnerability scores.**

Ranking	County	Total Children's Climate Risk Score (out of 10)
1	Bong	7.85
2	Grand Bassa	7.29
3	River Gee	7.24
4	Maryland	7.14
5	Sinoe	6.96
6	River Cess	6.94
7	Grand Cape Mount	6.92
8	Grand Kru	6.92
9	Bomi	6.87
10	Nimba	6.82
11	Margibi	6.77
12	Lofa	6.62
13	Grand Gedeh	6.44
14	Gbarpolu	6.42
15	Montserrado	5.60

Map 4: Children's Combined Climate Risk



The results show that all counties, except Montserrado, face an overall high Climate Risk for children. Bong, Grand Bassa and River Gee face the greatest overall combined risks.

3.2 Climate Hazards

3.2.1 Rising temperatures and extreme heat

a. Current situation and future projections

Since the 1950s, Liberia's mean annual temperature has risen by approximately 1.5°C, with faster warming observed in the central and southern plateau regions *(Fig.2)*.[47][48] The country's interior regions have experienced more rapid warming than coastal areas.[49] The duration and frequency of heatwaves in Liberia have also increased in recent years, with 2023 being the hottest year globally.[50]

Projections, under a high-emission scenario, indicate a further temperature increase of 3.2°C by the 2080s, potentially exceeding 4.8°C by 2100 *(Fig.2)*.[51] This warming is projected to increase the frequency and intensity of heatwaves in Liberia, while also leading to higher temperatures year-round. Additionally, a significant increase in the frequency of "hot" days and nights is projected across the country.[52] This warming is expected to be the most intense in the northern inland areas compared to the coastal zones.

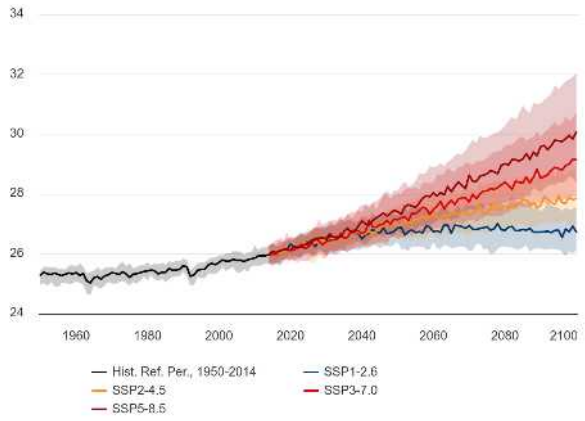


Figure 5: Historical and projected changes in average surface air temperatures in Liberia under different emissions scenarios[57]

Table 3 : Explanation of key projected

Emissions pathway	Description
SSP1-1.9	A scenario with very low emissions and strong climate policies, aiming to limit warming to 1.5°C by 2100
SSP1-2.6	A low emissions pathway, compatible with keeping global warming well below 2°C by 2100
SSP2-4.5	A moderate emissions scenario, representing middle-of-the-road socio-economic trends
SSP3-7.0	A higher emissions scenario with less focus on sustainability and more socio-economic challenges
SSP5-8.5	A very high emissions pathway driven by fossil fuel use and minimal climate policy intervention.

However, children living in urban areas, such as Monrovia, will also experience higher than normal temperatures, exacerbated further by the urban heat island effect, where buildings and pavements absorb and re-emit more heat than natural landscapes, exacerbating heat exposure. This heightened heat exposure poses significant health risks, including heat-related illnesses and worsening of existing health conditions. [53]

b. The impact on children

- **Health impacts**

By 2050 it is estimated that 99 per cent of Africa's children will be exposed to extremely high temperatures (exceeding 35°C), where, on average, 83.54 or more days a year exceed 35°.[54] Children are particularly susceptible to extreme heat for multiple reasons. They are less able to regulate body temperature than adults and are more prone to heatstroke and dehydration.[55]

Research from other countries has shown that the risk of both premature birth and stillbirth is much higher among mothers

3 CLIMATE AND ENVIRONMENT HAZARDS

who experience extremely high temperatures during the week before giving birth.[56] Premature birth currently accounts for 39 per cent of neonatal deaths in Liberia.[57]

A meta-analysis from 19 African countries, including Liberia, found the risk of both pre-eclampsia in pregnant women and low birthweight in infants are linked to extreme heat, resulting from the mothers' heat stress during the prenatal period.[5859]



Figure 6: Evidence from Liberia shows that the risk of both pre-eclampsia in pregnant women and low birthweight in infants is linked to extreme heat, resulting from the mothers' heat stress during the prenatal period ©UNICEF/Liberia

Conversely, extreme temperatures have also been linked to an increased risk of macrosomia (infants born significantly overweight) in Liberia.[60]

Rising temperatures are expected to increase the incidence of vector-borne diseases such as malaria, dengue and yellow fever in Liberia.[61] Malaria is already a leading cause of morbidity and mortality in Liberia, accounting for 32 per cent of under five deaths.[62] n Liberia, there will be a likely increase in these cases due to more favourable conditions for mosquito breeding.[63] Dengue fever, already present in neighbouring Côte d'Ivoire, could expand into Liberia as temperatures rise. [64]

Rising temperatures can also cause waterborne pathogens to bloom, including E. coli and giardiasis, exposing children to a greater risk of waterborne disease.[656667] The risk will be greatest for the 35 per cent and 91 per cent of households in Liberia that still do not have access to basic water and sanitation facilities respectively. [68]



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Just 32 per cent of Liberia's children have access to electricity at home. These children face the greatest exposure to extreme heat and food-borne diseases, such as E. coli and salmonella, due to a lack of home cooling and refrigeration.[6970] Additionally, for those who do have access, electricity prices remain the highest in Africa, consuming around 50 per cent of per capita GDP compared to 10 per cent in other SSA countries. [71]

- **Nutrition impacts**

Extreme heat has an impact on both the quality and quantity of food available to children in Liberia, thereby affecting their nutritional status. A study of more than 32,000 children aged 3-36 months across West Africa found that extreme heat exposure (over 35°C) increased the prevalence of stunted growth from chronic malnutrition by 12 per cent and acute malnutrition by 29 per cent.[72] Around 28 per cent of children under five in

Liberia are considered to be stunted (low height for their age).[73]



Figure 7: Fall Armyworm, a pest that destroys crops such as rice and maize in Liberia, reproduces much more quickly, as temperatures warm - with implications for food security and child nutrition ©UNICEF/Liberia

Rising temperatures reduce moisture levels, increasing stress on crops and exacerbating pests and diseases (such as grasshoppers, black pod and coffee rust), which thrive in hotter conditions.[74][75] This will likely reduce agricultural food production in Liberia. For example, Fall Armyworm, a pest that destroys crops such as rice and maize in Liberia, has been found to reproduce more rapidly in warmer climates.[76]

Chickens, cattle and other livestock become more stressed at higher temperatures, shedding larger amounts of enteric pathogens (e.g. Salmonella and E. coli).[77] This has been found to affect the pathogen prevalence in crops, water and produce, increasing rates of disease and mortality among children. This, in addition to the death of livestock, from water scarcity and climate-related disease, also increases children's risk of malnutrition.

Warmer temperatures have been found to increase the transmission of soil-transmitted helminths (e.g. hookworm and ancylostomiasis) across Africa.[78] All of these parasites are a direct threat to children's nutrition - leading to nutrient deficiencies and stunting.

Increasing temperatures have also been linked to an increased absorption of heavy metals by crops and livestock, making them less safe for human consumption.[79][80] Increased climate stress may also lead to additional fertiliser and pesticide use to maintain yields. Children's small bodies leave them particularly vulnerable to these toxins, with major health repercussions.[81][82]

- **Education impacts**

Extreme heat negatively impacts children's ability to attend school - and concentrate in class. [83]



Figure 8: In Liberia, schools, particularly those in rural communities lack access to electricity and fans for cooling, which can make classroom temperatures unbearable ©UNICEF/Liberia

Research from other West African countries has found that children may miss school when temperatures exceed 30°C, particularly when there is a lack of access to safe water.[84]

In Liberia, schools, particularly those in rural communities, also lack access to electricity and fans for cooling, making classroom

③ CLIMATE AND ENVIRONMENT HAZARDS

temperatures unbearable for both children and teachers. These hotter temperatures have been found to reduce cerebral blood flow and increase heat-related fatigue, limiting children's ability to concentrate in class.[85] This in turn can lead to reduced academic performance and attainment.



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While no specific data for Liberia exists, illnesses, including malaria and waterborne diseases, have been listed as key reasons for student and teacher absenteeism in other West African countries.[86] Diarrhoea and other infectious diseases are among the key causes of this absenteeism, particularly in schools without access to basic WASH facilities for students and staff. Just 55 per cent of schools in Liberia have access to basic water facilities.[87] While no national data exists for sanitation coverage in schools, an even greater number are thought not to have access to basic sanitation facilities.

- **Child protection impacts**

Emerging research at the global level has found that extreme heat is placing women and children at a greater risk of violence and abuse in the home.[88] While limited research exists in Liberia, research from other countries suggests that climate change and other forms of environmental degradation increase children's risk of violence at home. This is due to the increased economic stress placed on parents, increased time spent indoors and other psychological impacts caused by extreme heat.[8990]

Research from other countries has also shown that extreme heat and rising temperatures increase stress and anxiety among children also, triggering various mood and behavioural disorders, in children and adults alike.[919293] These risks, likely to increase with further warming, are thought to be triggered by thermoregulatory stress and subsequent negative neurological response to heat.[94]

Extreme heat can also prevent children, particularly young people, from socialising and playing outdoors. This limits their ability to exercise, socialise and connect with nature and their cultural heritage. Studies from other countries have shown that this can increase the risk of social isolation, anxiety and depression.[95] It can also increase the risk of childhood obesity, which currently affects around 10 per cent of children and young people (aged 10-19) in the country.



Figure 9: Extreme heat can also prevent children, particularly young people, from socialising and playing outdoors ©UNICEF/ Liberia

3.2.2 Storms, flooding and landslides

a. Current situation and future projections

Liberia's rainy season, spanning from May to October, is heavily influenced by the African monsoon, with only occasional rainfall occurring outside these months. Coastal rainfall is heavy, exceeding 3,000 mm annually and reaching up to 5 metres in Monrovia, while interior regions receive less, often below 2,000 mm per year.[96]

Since the 1950s, the country has experienced a slight overall decrease in annual precipitation levels; however, overall rainfall patterns have become more erratic and intense.[97] This trend is expected to intensify in the coming decades, with a projected decrease in rainfall by 2100 *(Fig.3)*.[9899100]

Urban and coastal populations, including those living in the capital Monrovia, face some of the greatest flood risks, due to high population densities and a higher proportion of impermeable surfaces, increasing the risk of flash flooding *(Map.5)*.[101] In June and July 2024, around 50,000 people in and around Monrovia were affected by flash floods, exacerbated by inadequate drainage systems and poorly constructed homes.[102]



Figure 10: Flash flooding across Monrovia remains a common occurrence, affecting thousands of children each year ©KMTV-Liberia

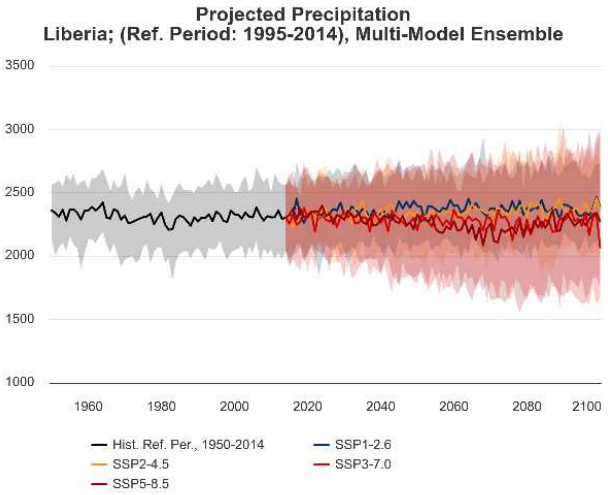


Figure 11: Past and projected changes in rainfall for Liberia[108]

Additionally, communities living in riverine areas, including the Mano, Lofa, St. Paul, St. John, Cestos and Cavalla also face a heightened exposure to flooding.

Liberia also faces a high risk of landslides, triggered by heavy rainfall, particularly in regions with high rainfall, steep terrain and high rates of deforestation.[103]

Map 5: Map of Liberia's most flood-prone areas[104]

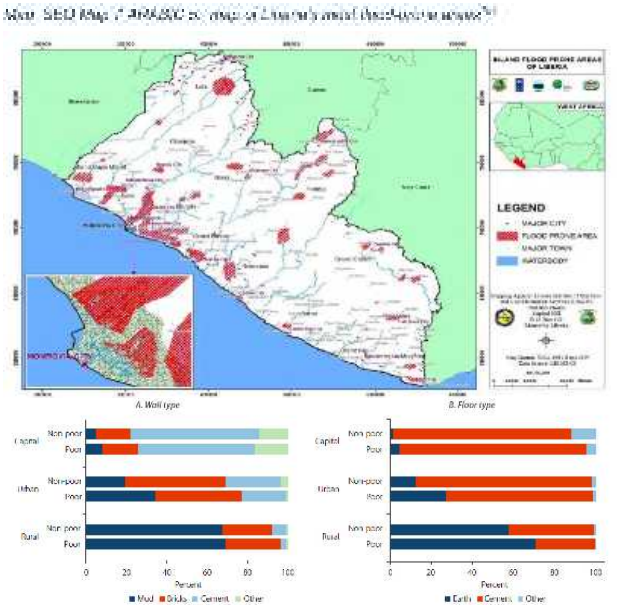


Figure 12: Housing quality materials and poverty[111]

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Liberia's coastal location along the Atlantic Ocean also makes it susceptible to the impacts of coastal storms, including strong winds and storm surges. These events can lead to flooding, coastal erosion and damage to infrastructure. While tropical cyclones (hurricanes) are relatively rare in Liberia, the country is not entirely immune to their effects; occasionally, the fringes of such storms can impact the country.[104]



Figure 13: The destruction of homes, healthcare centres, schools, roads and other infrastructure due to flooding, has significant implications for children's health, nutrition, education and overall wellbeing. ©Afrik21

b. The impact on children

- **Direct impacts**

Over the[105] l past few years, severe flooding has caused significant damage across Liberia, with many children losing their homes due to flood damage.n 2018, flooding across Montserrado County affected 8,712 children.[106] In June 2024, torrential rains led to flash floods affecting over 35 communities in Monrovia, displacing approximately 22,060 individuals, with about 60 per cent being women, children and other vulnerable groups.[107]

Flooding in Liberia leads to the disruption of essential services for children, including healthcare, food access, education and safe water and sanitation.[108][109] The destruction of homes, healthcare centres, schools, roads and other infrastructure has significant implications for their health, safety, nutrition, education and overall well-being.

In rural areas, around 77 per cent of children live in homes made from natural materials such as mud and sticks, which offer little protection from heavy rain, storms and flooding *(Fig.4)*.[110] This leaves children more vulnerable to floods and storms, increasing their risk of injury and displacement. Children are particularly vulnerable during floods; they are less capable of protecting themselves physically from immediate dangers, such as fast-moving water and collapsing structures, leading to a higher risk of drowning, injury and psychological trauma.

- **Health impacts**

Heavy rain, flooding and landslides in Liberia regularly disrupt water and sanitation services, damaging latrines and other sanitation systems, which can contaminate water supplies and surrounding environments, leading to the spread of waterborne diseases. Liberia has experienced several cholera outbreaks over the years, often exacerbated by flooding and inadequate sanitation infrastructure.[111] Prolonged exposure to faecal contamination has been linked to stunting amongst children.[112][113] The Government has stated that they expect waterborne disease risk to increase as the country's climate continues to change, including cholera, which is expected to surge by at least 10 per cent by 2100.[114]

Around 77 per cent of the population lacks access to basic sanitation services, with 35 per cent of the population still practising open defecation.[115] Even where basic sanitation services exist, the majority of systems are not considered as flood-resilient,

meaning that during the rainy season effluent washes into the surrounding environment, contaminating food and water supplies.[116] The destruction of roads during the rainy season also impedes access to victims during the 2014-2016 Ebola epidemic.[117]

Intense rainfall in Liberia has been linked to respiratory illnesses among children, including pneumonia, due to lower temperatures and increased time spent indoors.[118][119]

In Liberia, the incidence of vector-borne diseases surges during and just after the rainy season which spans from May to October. During this period, increased rainfall creates favourable breeding conditions for mosquitoes, rats and other vectors. A significant proportion of malaria cases are reported during these months, in addition to Lassa fever, which triples during the rainy season in Liberia.[120][121][122]



Figure 14: Heavy rain, flooding and landslides in Liberia regularly disrupt water and sanitation services for children ©UNICEF/2017

- ***Nutrition impacts***

Children living in Liberia's most flood-prone communities have some of the highest rates of stunting in the country *(Maps.6a and 6b).*[123][124] This has been linked to a multitude of factors, including higher rates of poverty, market disruptions and an increased risk of waterborne illness and other diseases in flood-prone areas.

Firstly, Liberia's primary crops such as rice, cultivated by 74 per cent of Liberian farmers, are highly sensitive to flooding and storms. These events lead to waterlogging, the erosion of nutrient-rich topsoil and an increased risk of rot and pest infestation. Other key crops like cacao, coffee and rubber, which form the backbone of Liberia's agricultural exports, are also vulnerable to unpredictable weather, with implications for rural livelihoods.[125]



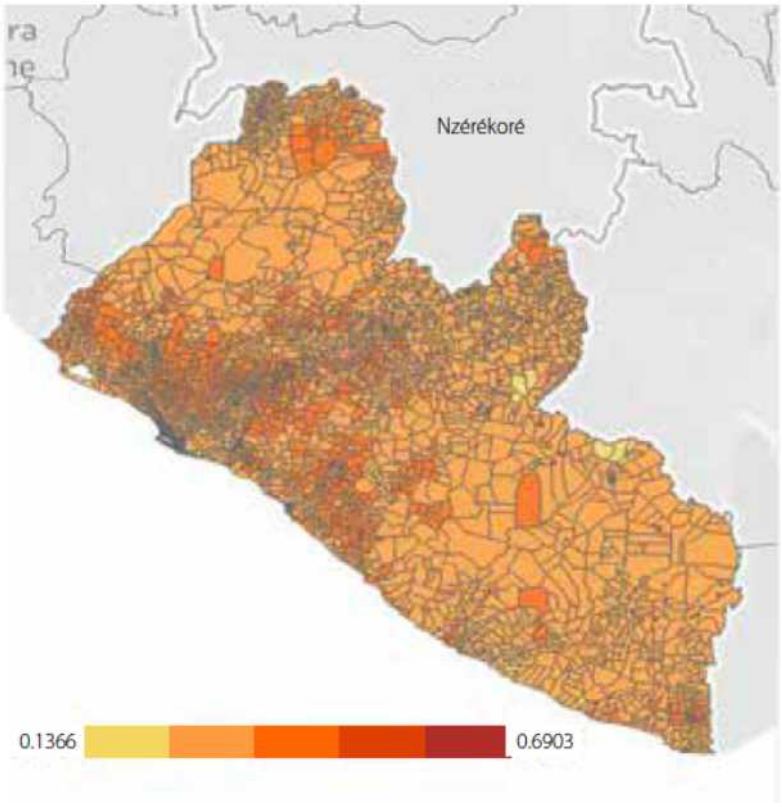
© UNICEF Liberia / 2024 / Vincent Tremeau

Heavy rainfall and storms have been found to cause the death of livestock and disrupt fishing activities in coastal regions.[126] Additionally, heavy rainfall and flooding affect livestock, increasing the risk of injury, death and disease.[127] Both of these issues reduce protein availability for Liberia's children - leading to deficiencies and stunting.

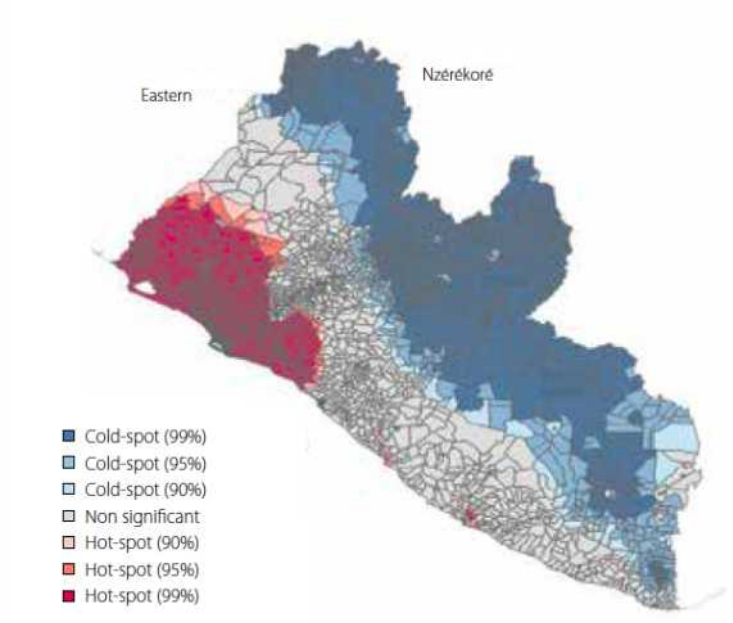
Finally, each year, flooding has a major impact on Liberia's road networks, severely limiting access to markets, with major implications for national food security and food prices.[128] It is the poorest households that are the worst affected by these price shocks.

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Map 6: Childhood stunting levels[129130]



Map 7: Share of population with hotspots of exposure to high risk of flooding[139140]



3.2.3 Water scarcity and drought

a. Current situation and future projections

Despite having one of the highest levels of water resources per capita in Africa, Liberia's changing seasonal rainfall patterns and rising temperatures are increasingly straining water access for children, especially in rural areas.

Since the 1960s, the country has experienced a gradual decline in mean annual rainfall, which has intensified the risks of drought and water scarcity.[131][132] Around 30 per cent of children living in households dependent on rain-fed agriculture for their livelihoods, especially in counties such as Lofa and Grand Bassa, are particularly vulnerable.[133][134]

Looking ahead, projections indicate an overall decline in annual rainfall by 2050, with specific reductions anticipated during the dry season in southern regions (Fig.3).[135][136] These changes will likely intensify water scarcity, reduce agricultural productivity and increase the risk of drought. Such trends underscore the importance of sustainable water management and adaptation strategies to address the projected impacts on vulnerable communities, particularly children, who are at risk from both limited water access and increased exposure to waterborne pollutants.



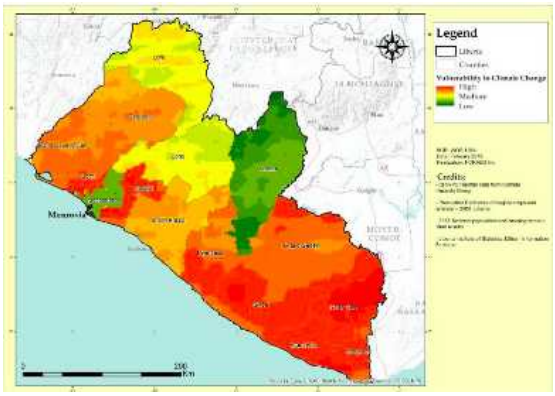
Figure 15: Projections for Liberia indicate an overall decline in annual rainfall by 2050, with specific reductions anticipated during the dry season in southern regions, increasing the risk of water scarcity and drought

b. The impact on children

- **Nutrition impacts**

Liberia's agriculture sector is highly vulnerable to the impacts of climate change, creating significant implications for future national food security and child nutrition *(Map.7)*. Drought and water scarcity have been found to increase malnutrition through two main channels: insufficient food intake, due to reductions in food production and availability and diseases exacerbated by a lack of food and access to safe water. The counties of River Gee, Grand Kru, Sinoe, River Cess and Grand Bassa face some of the highest vulnerabilities.

Map 8: Climate change vulnerability map for Liberia's agriculture sector



IIn addition, when crops fail, food production falls, food prices increase and household poverty rises. In Liberia, the poorest quintile devotes about 76 per cent of its budget to food, making them highly susceptible to shocks that affect food production and availability.[137]

In Liberia, staple crops such as rice, along with key cash crops such as cacao and coffee, are highly sensitive to drought conditions.[138] This vulnerability directly impacts rural incomes and deepens poverty, reducing the funds families can allocate to essential needs like food, education and healthcare for their children. As a result,

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droughts not only threaten food security but also exacerbate inequalities in health and educational opportunities for children in rural communities.

Research from other West African countries has shown that children born in a drought year are 72 per cent more likely to be stunted than those born in a non-drought year.[139] The impacts of this have persisted into adulthood, in the form of stunting (low height for age), impaired cognitive development and lower earnings.[140] Around 28 per cent of children under five in Liberia are considered to be stunted.[141]



Figure 16: In Liberia, staple crops like rice, along with key cash crops such as cacao and coffee, are highly sensitive to drought conditions ©UNDP

The majority of Liberia's population relies on food imports, much of which is processed and contains preservatives, salt and sugars, all of which have been linked to childhood obesity and Non-Communicable Diseases (NCDs) such as diabetes among children.[142][143] Currently, around 10 per cent of children and young people (aged 10-19) are classified as obese in the country.[144]

A decrease in water volume, combined with an increase in temperatures can also lead to a relative increase in the concentration of biological and chemical contaminants found in the water that children consume.[145] Most of Liberia's rural population currently relies on shallow wells that are highly sensitive to rainfall fluctuations, especially during the dry season from December to April.[146][147] As these wells dry up, many turn to surface water sources, which often have poorer quality due to pollutant concentration. This can lead to numerous health issues including diarrhoea and neurological conditions, as a result of exposure to heavy metals, microplastics and other toxins *(see 3.3.3 Land and Water Degradation)*.

Hotter, more intense dry seasons have also been linked to increased pneumonia and COVID-19 risks, partly due to a reduction of key hygiene practices such as handwashing.[148] Just 3 per cent of Liberians currently have access to basic handwashing facilities with soap at home, further exacerbating their vulnerability to infectious diseases.[149]



Figure 17: In Liberia, the poorest quintile devotes about 76 per cent of their budget to food, making children in these families more vulnerable to the drought-related impacts of food insecurity and malnutrition ©UNICEF/Liberia

3.2.4 Sea-level rise and coastal erosion

a. Current situation and future projections

Liberia's 580 km low-lying coastline faces mounting threats from climate change, with sea-level rise and coastal erosion among the most urgent adaptation challenges.

Rising ocean temperatures and the thermal expansion of seawater have led to sea levels rising by around 9 inches since the 1950s.[150] This, combined with coastal storms, has accelerated coastal erosion rates, which now average around 1 to 1.5 metres annually *(Map.8)*. This erosion is reshaping landscapes and displacing communities, heightening the need for protective interventions.[151]

Map 9: A mean shift in coastline from

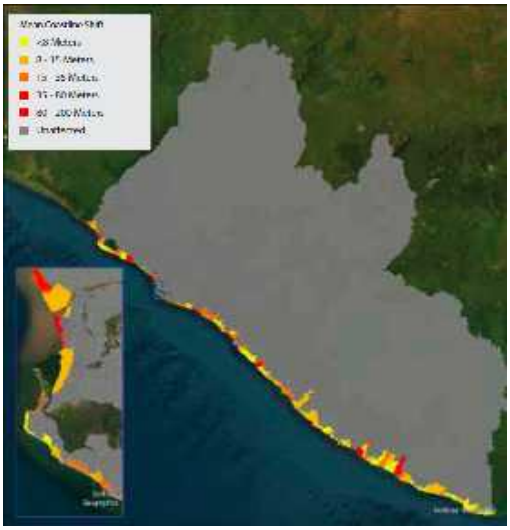




Figure 18: The coast of Liberia is losing around 1-1.5 metres of land annually due to sea-level rise ©UNICEF Liberia

Additionally, as ocean temperatures rise, annual storm surges from the Gulf of Guinea intensify, raising tides by over two metres during the dry season.[152] These elevated tides place further pressure on coastal ecosystems and infrastructure, amplifying the effects of erosion and posing significant risks to the 60 per cent of Liberians who currently live in coastal areas.[153][154] Beyond climate-driven erosion, human activities such as sand mining, mangrove removal and waterfront construction further compound the erosion problem, removing natural barriers that once helped protect against the sea's encroachment.

Although much of Liberia's coastline remains sparsely populated, the capital, Monrovia, is particularly vulnerable due to its high population density. This includes children in urban slums such as New Kru Town. The city's coastline is rapidly shifting, with satellite imagery from 2000 to 2021 illustrating these significant changes *(Map.9)*.[155] With a high concentration of low-income populations in these coastal areas, these shifting coastlines exacerbate risks for communities already facing economic challenges and exposure to other climate-related disasters such as coastal storms and flooding.

Map 10: Yearly change in coastline from 2000 to 2021, Monrovia, Liberia[156]



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Figure 19: Rising sea levels significantly impact West Point township, home to about 75,000 people in Liberia's capital, where cholera and other waterborne diseases also remain a pervasive threat

Future projections for Liberia indicate a sea-level rise of 0.13 to 0.56 metres by 2050, which, combined with increasingly intense storms, is anticipated to worsen land erosion, increasing the loss of homes and communities.[156][157] This sea-level rise is also expected to increase the risk of saline intrusion into the country's coastal aquifers. In addition, Liberia's coastal population is expected to expand to 70 per cent by 2050 due to population growth and urban migration to cities such as Monrovia, intensifying the potential human and economic costs of this increased coastal erosion.[158][159]

b. The impact on children

- **Direct impacts**

Sea-level rise and coastal erosion pose a direct threat to children's lives, as rising waters undermine homes and infrastructure and displace families. This can lead to injury and death - in addition to financial hardship and psychosocial stress for children. For example, in recent years, the coastal community of West Point in the nation's capital, Monrovia, has suffered immense coastal erosion and flooding, forcing tens of thousands of inhabitants to evacuate their homes, exposing them to hunger and disease.[160]

If sea levels rise by more than one metre, areas of major cities such as Monrovia, New Kru Town, River Cess, Buchanan and Robertsport will become submerged.[161] Liberia's Environmental Protection Agency has expressed concern that this will lead to mass migration across the country.[162] This displacement may also leave children more vulnerable to violence, exploitation, abuse and trafficking.[163]

Slower-onset hazards such as waterlogging and saline intrusion in coastal regions, gradually contaminate school water supplies, where they exist and cause buildings to deteriorate, making them more susceptible to collapse. This poses a direct danger to children's safety and overall health.[164]

- **Health impacts**

Sea-level rise can also lead to the salinisation of water sources and the destruction of agricultural landsive de**, with implications for Liberia's food and water security.[165]** Consuming water with high levels of salinity has major health implications for children, leading to conditions including hypertension and reduced cognitvelopment.[166] Brackish, or slightly saline water, combined with warmer temperatures, also provides a perfect breeding ground for cholera bacteria. Cholera eradication remains an ongoing challenge for the country with 5,933 suspected cholera cases reported between 2011-2019; coastal counties such as Montserrado and River Cess accounting for most of these cases.[167]



Figure 20: Ensuring Liberia's water and sanitation services are made more resilient to climate-related hazards, such as flooding and sea-level rise, will be critical to prevent waterborne diseases and the salinisation of water sources in coastal regions ©UNICEF

3.3 Other forms of environmental degradation

3.3.1 Air pollution and a lack of clean energy access

a. Current situation and future projections

i. Air pollution

Over the past three decades, Liberia has experienced a concerning rise in air pollutants, including greenhouse gases such as nitrogen oxides (NOx), sulphur dioxide (SO_2) and methane (CH_4) *(Fig.5)*.[168] These pollutants affect local climate, contribute to global climate change and affect children's health (Table.4). The primary sources of these emissions include the transportation sector, energy production and industrial activities, predominantly concentrated in urban areas such as Monrovia.

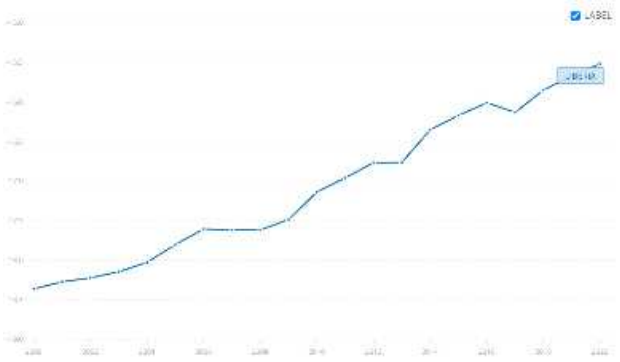


Figure 21: Total greenhouse gas emissions, including LULUCF (Mt CO2e), in Liberia[182]



Figure 22: Liberia's continued high dependence on charcoal and wood is a major source of air pollution in the country ©LiberiaEPA

The combustion of fossil fuels in vehicles and power plants releases significant amounts of NOx and SO_2, which not only degrade air quality but also contribute to the formation of ground-level ozone. Additionally, wind patterns transport these pollutants to rural regions, extending their harmful effects beyond urban centres..[169][170]

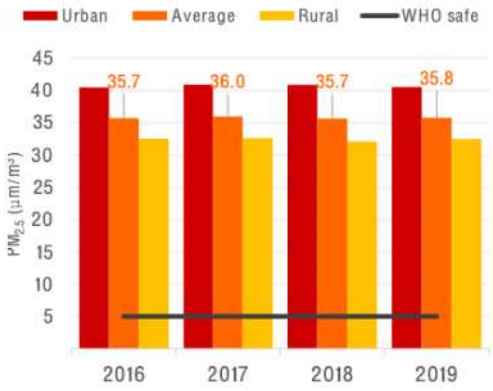


Figure 23: Average annual exposure to particulate matter (PM2.5) in Liberia (micrograms per cubic metre)

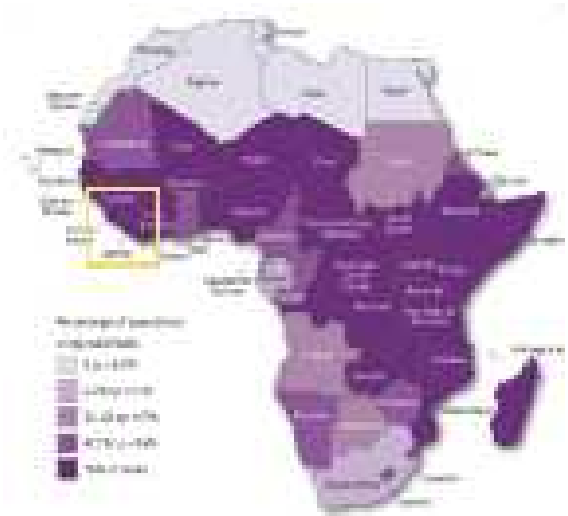
Particulate matter, especially $PM_{2.5}$, one of the most dangerous air pollutants for children, has remained consistent in recent years *(Fig.11)*. **At 42µg/m3, annual average levels are currently eight times the WHO**

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standards.[171172] Organic carbon and black carbon form the majority of this PM2.5 in Liberia, which comes primarily from the burning of fossil fuels and biomass (wood and charcoal) for energy.[173] Unpaved roads, open waste burning and various industrial processes also contribute to the issue. Children are additionally exposed to numerous other air pollutants - all of which have the potential to impact their health and development (Table.4). As such, air pollution remains a critical concern for Liberia's young people.[174]

As of 2021, 92 per cent of Liberia's total energy supply came from biomass (charcoal and wood), highlighting the country's dependence on non-commercial energy sources.[175] Around 8 per cent of the total energy supply came from fossil fuels. This heavy dependency on biomass not only elevates both indoor and outdoor air pollution but also contributes to deforestation and land degradation. The burning of biomass, such as wood and charcoal for cooking, remains prevalent, with serious implications for children's health.

Map 11: The per centage of households relying on solid fuels for cooking in Africa[176]



ii. A lack of clean energy access

Less than 1 per cent of the population has access to clean cooking fuels, leading to an unsustainable reliance on charcoal and wood *(Map.10)*.[176177] Affordable and reliable electricity access remains a major challenge for the children of Liberia – with just 32 per cent with access to electricity at home, one of the worst rates in Africa.[178] Notably, approximately 6 per cent of the population now uses solar power for lighting, indicating a positive shift towards renewable energy solutions.[179]



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Table 4 : Key sources of air pollution that are harmful to children in Liberia[180181182]

Air Pollutant	Key Source	Impacts on Children
Particulate Matter (PM10 and $PM_{2.5}$)	Industrial activities, vehicle emissions, construction sites, unpaved roads, burning of coal and wood for cooking/heating, fires and chemical reactions.	Acute Respiratory Infections (ARIs), reduced lung function, aggravated allergies, ear infections, eczema and impaired cognitive development.
Carbon Monoxide (CO)	Vehicle emissions and the burning of waste and biomass.	Impaired oxygen delivery to tissues, reduced brain and organ function, headaches, dizziness, developmental delays and, in severe cases, death.
Ozone (O_3)	Vehicle emissions, industrial emissions and chemical reactions in the atmosphere.	Decreased lung function, increased frequency of asthma attacks, respiratory infections and increased hospital admissions for respiratory issues.
Nitrogen Oxides (NO_2)	Vehicle emissions, energy production, agriculture, industrial processes and human waste.	Increased risk of asthma, wheezing, reduced lung function, respiratory infections and exacerbation of pre-existing respiratory conditions.
Benzene	Vehicle emissions, industrial activities, tobacco smoke, household products, paints and unvented gas appliances.	Increased risk of leukaemia, developmental and reproductive toxicity, dizziness, headaches and long-term damage to the immune system.
Benzo(a)pyrene (BaP)	Vehicle emissions, industrial processes, cigarette smoke and wood burning.	Known carcinogen, linked to increased risk of cancer, respiratory issues and developmental toxicity, with potential impacts on lung function.
Polycyclic Aromatic Hydrocarbons (PAHs)	Incomplete combustion of fossil fuels, biomass burning, industrial processes and vehicle exhaust.	Increased risk of respiratory conditions, neurodevelopmental issuesa nd potential carcinogenic effects.
Persistent Organic Pollutants (POPs)	Agricultural pesticides, industrial chemicals (PCBs) and by-products of manufacturing and waste incineration.	Disruption of endocrine and immune systems, developmental delays and increased susceptibility to infections and chronic diseases.
Heavy Metals	Industrial emissions, mining activities, lead-based paints and contaminated water and soil.	Impaired cognitive development, lower IQ, attention disorders, behavioural issues, learning disabilities and neurological damage.
Sulphur Dioxide (SO_2)	Fossil fuel combustion (coal and oil), industrial processes and motor vehicles.	Irritation of the respiratory system, worsening asthma symptoms, increased respiratory infections and eye irritation.
Volatile Organic Compounds (VOCs)	Motor vehicles, industrial processes and household products (paints, solvents).	Cause eye, nose and throat irritation, headaches, nausea, dizziness; in long-term exposure, can cause liver, kidney, or central nervous system damage, along with developmental harm.

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Figure 24: Around 6 per cent of Liberia's population now uses solar energy for lighting ©World Bank

The country's high levels of solar irradiance presents a significant potential for solar energy generation *(Map.11)*.[183] Additionally, Liberia's six major rivers—Mano, St. Paul, Lofa, St. John, Cestos and Cavalla—offer substantial hydropower potential.[184] Focusing on the restoration and enhancement of existing hydropower facilities, coupled with policies that encourage private investment in renewable energy projects, are essential for expanding Liberia's sustainable energy output and reducing reliance on biomass.

Map 12 : Solar energy potential in Liberia[185]



b. The impact on children

i. Air pollution

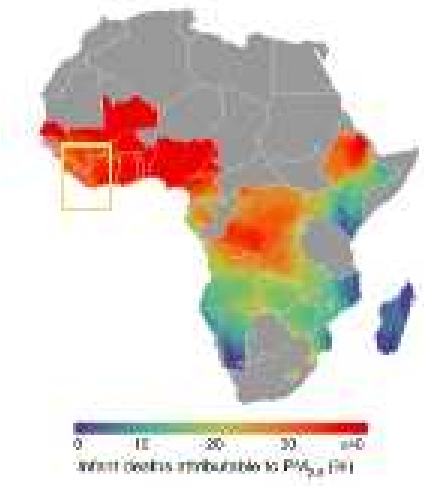
- **Health impacts**

Particulate matter ($PM_{2.5}$) levels in Liberia currently stand at 42µg/m3, eight times the WHO guideline. An estimated 1,150 child deaths in Liberia could be avoided annually by reducing these levels to just 2µg/m³ *(Map.12)*.[185] Reductions in air pollution are estimated to have more impact on infant health in Africa than most other health interventions.[186]

In Liberia, this high exposure to $PM_{2.5}$, in addition to other pollutants, including nitrogen oxides (NO_2), sulphur dioxide (SO_2), volatile organic compounds (VOCs) and ozone (O_3) poses significant health risks, including respiratory infections, reduced lung function, asthma and cancer *(Table.4)*.[187188189190191192193]

Global evidence has also linked early-life exposure to $PM_{2.5}$, nitrogen dioxide and sulphate with stunting among children, with major implications for the long-term health and cognitive development of children.[194]

Map 13: Avoided infant deaths from reduced $PM_{2.5}$ exposure[195]



Particulate matter has been found to substantially increase the risk of miscarriage and stillbirth in countries across West Africa, including Liberia.[195] Air pollution also increases

the risk of premature birth and the low birth weight.[196] Low birth weight has been linked to high temperatures, further compounding the impacts of air pollution on children.[197]

This is because air pollution traps heat, making temperatures more extreme and dangerous for children (see *extreme heat*). Research has found that death tolls are three times higher on hot days which also have high levels of fine particulate air pollution ($PM_{2.5}$).[198]

In Liberia, the widespread use of traditional cooking methods, such as open fires and inefficient stoves fuelled by biomass such as wood and charcoal, significantly elevates the risk of burn injuries, particularly among children under five.[199] These practices not only expose young children to open flames and hot surfaces but also contribute to indoor air pollution, leading to respiratory issues.



Figure 25: Liberia's heavy reliance on charcoal and wood for cooking is fueling air pollution and deforestation in the Country, in addition to increasing the risk of burn injuries for children ©UNDPLiberia

- **Education impacts**

Air pollution, including PM2.5, NO2, carbon monoxide and ozone, pose a significant threat to children's cognitive development.[200] Research has shown these pollutants impair cognitive functions, affecting children's memory, attention, and overall academic performance.[201][202]

Additionally, for every increase of 5 µg/m³ in $PM_{2.5}$, there is a corresponding one-point decrease in Grade Point Average (GPA) above WHOs recommended safe levels.[203][204] In Liberia, based on average annual exposure levels of 42µg/m3, this could potentially decrease children's GPA by approximately 8 points. Children exposed to high levels of pollution face not only immediate learning difficulties but also long-term disadvantages in terms of employability, economic potential, and health outcomes, perpetuating cycles of poverty.

ii. A lack of clean energy access

- **Health and nutrition impacts**

Limited access to clean energy in Liberia poses significant challenges for children, affecting their health, safety, and overall well-being. The absence of electricity hampers the cooling of homes, schools, and healthcare centres, increasing children's vulnerability to heat-related illnesses such as heat stroke (see *3.2.1 Rising Temperatures and Extreme Heat*).



Figure 26: Air pollution and a lack of electricity have both been found to affect children's learning ©UNICEF

This issue is exacerbated by the country's existing energy access challenges, including high energy prices.

Inadequate lighting in streets and homes heightens security risks, particularly for girls, who may face increased dangers in poorly illuminated areas. Children with autism and other special needs

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also struggle to adapt to low-light environments, impacting their comfort and development. Furthermore, the lack of reliable energy undermines livelihoods, as families cannot engage in income-generating activities that require electricity, thereby affecting their economic stability and children's quality of life.

A lack of clean energy access in schools and homes can lead to the inadequate refrigeration of foods, increasing the risk of food-borne diseases. It also hampers the storage and trade of locally produced food, affecting food production and livelihoods. Power shortages in hospitals may undermine life-saving care and vaccine storage, while children with specific health needs may struggle to keep their medication at the proper temperature.

Many families cannot afford diesel generators for electricity and water supply and those who can, may face financial burdens - diverting families' resources away from other purchases, including healthcare and nutritious food for children. Generators also produce localised air and noise pollution, impacting children's health and overall wellbeing.

Finally, Liberia's heavy reliance on wood and charcoal, coupled with the use of inefficient traditional cookstoves, fuels deforestation. This subsequently undermines key ecosystem services for children, including safe water and food supplies, with significant implications for their health and nutrition (see *3.3.3 Land and water degradation*).

- **Education impacts**

In Liberia, the lack of electricity has profound implications for children's education, both at home and in schools. Without electricity, children often study in dimly lit or completely dark environments, severely limiting their ability to complete homework or prepare for exams after sunset. This disadvantage disproportionately affects children in rural areas, where alternative sources of light, such as solar lamps, are less accessible.

Additionally, the absence of electricity at both home and school means limited access to information technology equipment like computers, which are vital for developing digital skills. These skills are increasingly critical for future employment opportunities, leaving Liberian children at a significant disadvantage in the modern job market.



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In schools, the lack of electricity directly affects learning conditions. Poorly ventilated classrooms become stifling in Liberia's hot and humid climate, causing children to struggle to concentrate and underperform academically. The absence of lighting further impacts the quality of education, especially during the rainy season when natural light is limited. Moreover, inadequate electricity access contributes to health issues that indirectly affect education. Without refrigeration, food safety is compromised, leading to a higher prevalence of food-borne diseases. Children suffering from such illnesses, or heat-related conditions, are more likely to miss school, further disrupting their learning and development.



Figure 27: Liberia is home to one of the last remaining dense blocks of tropical rainforest in West Africa, which supports rich biodiversity, including chimpanzees ©Liberia Chimpanzee Rescue and Protection

3.3.2 Land and water degradation

a. Current situation and future projections

i. Land degradation and biodiversity loss

Liberia is home to the largest remaining blocks of dense tropical rainforest in West Africa, covering approximately 68 per cent of its land area.[205] These forests are rich in biodiversity, hosting numerous endemic and endangered species, including the pygmy hippo and pangolin. However, the country faces significant challenges in preserving this biodiversity due to pressures from population growth, urbanisation and agricultural expansion, which threaten vital ecosystems essential for children's survival and development.[206]

From 2001 to 2023, Liberia lost approximately 1.5 million hectares of tree cover, equivalent to a 16 per cent decrease, largely fuelled by the country's unsustainable demand for charcoal.[207] **On average, each Liberian consumes about 0.17 cubic metres of wood annually, amounting to 1-2 hectares of forest per capita per year.**[208] Moreover, unsustainable agricultural practices, such as land clearance and shifting cultivation, along with illegal logging and mining activities, are major threats to land and forest resources. Additionally, extreme heat and increased rainfall intensity are leading to slower tree growth and, in more severe cases, rotting because of waterlogged tree roots.[209]

.**Deforestation and other forms of land degradation have adversely affected the**

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country's water cycle, leading to reduced water quality and availability for children, as well as increasing the risk of flooding and landslides.[210211] Soil erosion and sedimentation have also increased, impacting agricultural productivity and food security. The loss of forest cover also threatens wildlife habitats, leading to a decline in biodiversity and natural resources, including traditional foods and medicines, which are critical to Liberian children's cultural heritage.[212213]

Liberia's coastal regions face growing environmental pressures, amplified by the concentration of its population in these areas. [214]

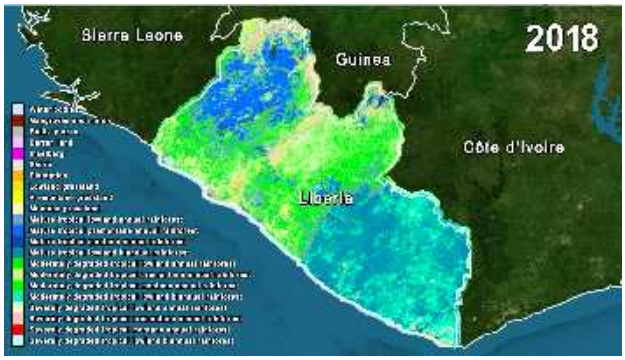


Figure 28: From 2001 to 2023, Liberia lost approximately 1.5 million hectares of tree cover, equivalent to a 16 per cent decrease, largely fuelled by the country's unsustainable demand for charcoal ©EcoHubMap

Coastal and marine ecosystems, including mangroves, estuaries and beaches, are vital for biodiversity, food security and livelihoods. These ecosystems support endemic, threatened and migratory species while providing critical nursery grounds for fish.[215] However, rising ocean temperatures and acidification, driven by increased carbon dioxide levels, reduce marine productivity and threaten traditional fish supplies - a critical source of protein for the country's children.[216]

Human activities such as sand mining, mangrove removal and the construction of waterfront structures exacerbate coastal erosion and increasing vulnerability to storms and sea-level rise.[217] These practices destroy natural defences, such as mangroves, that buffer the coast from wave damage and storm surges. Intense rainfall and rising sea temperatures further erode mangrove ecosystems, leaving coastal areas even more exposed to climatic hazards.[218] The loss of mangroves also has significant ecological consequences, disrupting habitats and food sources for fish and other marine species, with significant implications for national food security.[219]

Map 14: Land degradation in Liberia[220]



Coastal urbanisation, sand mining and the exploitation of mangroves for fuel further compound these challenges, undermining the resilience of Liberia's coastal regions.[220] Without sustainable management of these ecosystems, the combined impacts of human activity and climate change further endanger marine biodiversity and the livelihoods of communities that depend on these vital resources.

ii. Soil and water pollution

Soil and water pollution is a pressing issue in



Figure 29: Rising sea temperatures and plastic pollution impact Liberia's coastal and marine ecosystems - with effects on livelihoods and food security for children.

Liberia, with significant consequences for the food and water children rely on for their survival. In a 2024 U-Report Poll, these issues were cited by young people as the greatest environmental threats facing Liberia *(Fig.2)*.[221]

In Liberia, this pollution originates from multiple sources *(Table.5)*.[222223224225226] **Firstly, Liberia continues to face a solid waste management crisis, particularly in urban areas like Monrovia, which generates approximately 800 tonnes of solid domestic waste daily**.[227] In Monrovia, about 55 per cent of this waste remains uncollected and even the collected waste is often dumped in uncontrolled sites.[228] The situation is worse in other parts of the country, many of which lack effective waste management services. In addition, limited recycling facilities exist across he country and waste collection, when available, is often erratic.[229]

This unsafe disposal leads to contamination of soil and water by plastics, chemicals, heavy metals, pharmaceuticals and microplastics, all of which have profound impacts on children's health and development *(Table.5)*. For instance, microplastics from the breakdown of plastic bottles and water packets accumulate in the environment and eventually in children's bodies, posing greater risks to them than adults.

Plastic pollution, especially from plastic bottles and water packets, is a key source of pollution in Liberia's coastal and marine habitats.[230] When plastic breaks down over time, it creates microplastics—tiny fragments less than 5 mm in length—that can enter water, soil and air. These microplastics accumulate in plants and animals, making their way into children's bodies, where they accumulate at a greater rate than among adults.

The growing use of fertilisers and pesticides by farmers seeking to maintain crop yields is another source of soil and water degradation in the country.[231]

3 CLIMATE AND ENVIRONMENT HAZARDS

Table 5 : Key sources of water and soil pollution and their potential impacts[251252253254255]

Pollution category	Example types	Key sources	Impacts on children
Biological contaminants 	Bacteria and other pathogens	• Unprotected latrines and poorly maintained sewerage systems • Faecal contamination from livestock	• Diarrhoea and other forms of waterborne disease. • Reduced nutrient absorption and stunted growth. • Decreased cognitive development and school attainment.
	Pharmaceuticals, narcotics and stimulators		• Hormone disruption in children, including early puberty and thyroid issues. • Antibiotic resistant bacteria. • Impacts on mood and mental health.
Chemical contaminants 	Pesticides and fertilisers	• Agriculture • Household gardens	• Hormone disruption in children, including early puberty, obesity and thyroid issues. • Low birth weight, impaired cognitive function and development. • Promote algal blooms, which are toxic to children. • Cancer.
	Salt	• Agriculture fertilisers • Sea-level rise	• Hypertension. • Impaired cognitive development.
	Sulphates	• Industrial discharges • Agricultural runoff	• Diarrhoea, dehydration and gastrointestinal irritation. • Nutrient malabsorption, leading to malnutrition.
	Heavy metals	• Corrosion of old pipes and plumbing fixtures • Old vehicle exhausts and discarded vehicles • Paint, batteries, electronic and household waste • Industrial waste • Unprotected landfills and poor solid waste management	• Lifelong neurological, cognitive and physical impairment. • Mental health and behavioural problems. • Liver and kidney problems.
	Hydrocarbons	• Gasoline and petroleum products • Urban run-off	• Foetal impacts, including low birth weight, skeletal malformations and increased incidence of miscarriage. • Decrease in the numbers of blood-forming cells. • Respiratory difficulties including bronchitis, asthma and wheezing. • Cancer, including blood and lymph cancers.
	Polychlorinated biphenyls (PCBs)	• Industrial processes • Electrical equipment • Improper disposal of PCB-containing products	• Reduced IQ and behavioural issues. • Fetotoxic effects with reduced birth weight. • Increased congenital anomalies, such as cleft lip.
	Microplastics	• Plastic waste and unprotected landfills	• Hormone disruption, including early puberty. • Low birth weight. • Impaired cognitive function and development.

Agricultural runoff introduces harmful chemicals into water systems, further jeopardising children's health and damaging ecosystems. Additionally, the widespread practice of open defecation and the absence of climate-resilient sanitation systems exacerbate the risk of faecal contamination, especially during heavy rainfall and flooding.[232]

Liberia's lack of a comprehensive sewage and wastewater treatment system further compounds these challenges.[233] Industrial effluents are frequently discharged without regulation, polluting water bodies and impacting freshwater and coastal ecosystems. Rising sea temperatures and the destruction of mangroves and wetlands further degrade saltwater and freshwater fisheries, vital sources of nutrition and income for Liberian communities.

Sea-level rise is also leading to the salinisation of freshwater sources, with major implications for freshwater habitats and children's health.[234]

b. The impact on children

i. Land degradation and biodiversity loss

- **Health and nutrition impacts**

Land and water degradation in Liberia significantly undermines the essential ecosystem services that children depend on for their survival and development.[235] Deforestation and water pollution exacerbate the country's water security challenges, while soil degradation and habitat loss diminish agricultural productivity, compromising food security for children.

The degradation of coastal and marine environments, including mangroves and wetlands, exacerbates these challenges.[236][237] These ecosystems are vital for Liberia's fisheries, which serve as a key source of protein for many communities.[238][239]

As mangroves and wetlands are destroyed, fish populations decline, undermining local food security and threatening children's nutrition. Families face additional economic burdens as safe, local food supplies dwindle, driving up food prices and reducing the livelihoods of those dependent on agriculture and fishing. These pressures can fuel rural-urban migration as families search for better opportunities, but this shift may increase the risks of child poverty, illness and malnutrition in overcrowded urban areas.

- **Mental health impacts**

The degradation of Liberia's natural environment also impacts children's cultural identity and sense of belonging.[240] Traditional dances, medicines and families' livelihoods remain closely connected to forests, rivers and coastal areas. These are threatened by environmental degradation, leading to a loss of cultural heritage and community cohesion. Protecting and restoring these environments is crucial for preserving the cultural identity and wellbeing of Liberia's children.



Figure 30: Liberia's solid waste management crisis leads to the pollution of air, water and soil across the country ©Local Voices Liberia

3 CLIMATE AND ENVIRONMENT HAZARDS

Promoting a strong connection between children and their natural environment can foster a sense of belonging and cultural pride, while also supporting physical health, cognitive development and emotional wellbeing.[241] Encouraging outdoor activities and nature-based education can help young people understand the importance of environmental stewardship and empower them to protect and restore natural habitats, ultimately contributing to long-term sustainability and reducing the risk of adolescent psychiatric disorders, such as anxiety and depression.

ii. Soil and water pollution

- **Health impacts**

Water pollution, stemming from Liberia's inadequate access to sanitation services, industrial discharges, mining activities and lack of effective solid waste management, exposes children to a number of biological and chemical contaminants *(Table.5)*. These toxins have the greatest impact on children, especially infants, in whom they accumulate in greater concentrations.[242] Children's immature defence systems and developing organ systems leave them particularly vulnerable. They can also lead to developmental delays and affect brain and behaviour development.[243]

In Liberia, inadequate waste management practices are a key contributor to soil and water pollution.[244] Children living near waste dump sites are particularly vulnerable to respiratory illnesses and other health issues resulting from exposure to these pollutants.[245]

A lack of access to safe water and sanitation services is also a key source of soil and water pollution in Liberia, responsible responsible for around 77 per cent of deaths from diarrhoea in the country.[246] The majority of these deaths occur in children under five.

More than 1.5 million children in Liberia are estimated to have unsafe levels of lead in their blood, which can lead to a myriad of health issues, including liver and kidney problems, lifelong neurological, cognitive and physical impairment, mental health and behavioural issues.[247] Additionally, around 6 deaths per 100,000 children in Liberia occur as a direct result of heavy metal and other chemical poisonings.[248] Exposure to both heavy metals and industrial chemicals has been linked to an increased risk of childhood cancer.[249]

Microplastics, another key source of chemical contamination - fuelled by the country's solid waste management crisis - have been linked to numerous neurological and behavioural issues in children, in addition to cancer.[250] Children living in and around Liberia's urban and coastal communities as well as waste dump sites remain particularly exposed to microplastic pollution.



Figure 31: Liberia's children are being exposed to a myriad of biological and chemical contaminants, which affects their health and overall wellbeing ©UNICEF Liberia



4

THE POLICY ENVIRONMENT FOR CHILDREN

Over the past decade, Liberia has made significant strides in integrating climate change considerations into its national strategies and legislative frameworks. As a Party to the United Nations Framework Convention on Climate Change (UNFCCC), Liberia has submitted two National Communications and a Nationally Determined Contribution (NDC).[256257258] The updated NDC, aligned with the National Adaptation Plan (NAP), includes an unconditional target to reduce emissions by 10 per cent below business-as-usual by 2030. These commitments align with the Sustainable Development Goals (SDGs) and the country's long-term sustainable development vision, Liberia's Rising Vision 2030, highlighting the country's efforts to create a more sustainable and resilient society.[259]

The Environmental Protection Agency (EPA) of Liberia serves as the principal body for climate policy, collaborating with various ministries, including the Ministry of Agriculture and the Ministry of Lands, Mines and Energy, to incorporate climate action across sectors.



Figure 32: It is estimated that Liberia requires at least USD 500 million by 2025 to support mitigation and adaptation activities in the country ©FAO Liberia

Liberia has additionally taken several steps to integrate climate action and environmental protection within its national policy framework, aiming to align with international frameworks while also addressing domestic needs.

Despite these policy frameworks, significant gaps remain in Liberia's approach to climate



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adaptation for children. Key sectoral policies, such as the Water and Sanitation Policy, National Health Policy and Disaster Risk Reduction Strategy, are outdated and require urgent revision. In addition, just three of the policies reviewed include adequate mentions of children's specific vulnerabilities to climate- and environment-related hazards with specific measures to protect children. Even fewer policies have been crafted with direct input from young people (*see ANNEX III: A CHILD FOCUSED POLICY ANALYSIS FOR CHILDREN IN LIBERIA*).

It is estimated that Liberia will require substantial investment of at least USD 500 million by 2025 to support mitigation and adaptation activities in the country.[260] As such, significant financing gaps remain and Liberia must strengthen its capacity to leverage international support, from the private sector, International Financial Institutions (e.g. World Bank and IMF) and other international donors, such as the major climate funds (e.g. Green Climate Fund and Global Environment Facility). Liberia must also strengthen its institutional capacity to access these funds, carry out comprehensive climate-focused assessments and implement child-focused climate projects effectively.[261]



5 RECOMMENDATIONS

5.1 Overall recommendations

- **Ensure child-critical services are inclusive and climate-resilient.** Prioritise interventions to make child-critical services, such as health, education, WASH and child protection, more inclusive and resilient to climate-related hazards and environmental impacts. Efforts should focus on children living in Liberia's most flood-prone, drought-affected and disaster-prone areas, addressing all aspects of child vulnerability and deprivation. Partnerships with government, civil society and development actors should be strengthened to deliver holistic interventions that increase the resilience of communities and children.

- **Scale up investment in Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) centred on children.** Accelerate investment in child-centred DRR and CCA measures to protect children from floods, storms, droughts and heatwaves. This requires mobilising additional resources beyond the existing donor base, through engagement with private sector actors and climate finance entities such as the Green Climate Fund (GCF) and the Global Environment Facility (GEF). Liberia should leverage opportunities such as the 2025 UN Climate Change Conference (UNFCCC COP 30) in Brazil, to present evidence on the impacts of climate change on its children and advocate for increased financial support from key donors and international partners.

- **Empower children and young people to build disaster preparedness and climate resilience.** Equip children and young people with the knowledge and skills to prepare for and respond to climate-related disasters and long-term climate change impacts. Ensure their active participation in disaster- and climate-related decisions that affect their lives, especially those of children in hazard-prone communities. Child-friendly civic education and climate literacy programmes should be scaled up to build their capacity as agents of change.



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- **Integrate child-specific measures into Liberia's DRR, climate policies and other key sectoral policies.** Key opportunities for this include the upcoming NDC 3.0 and the

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updating of other national and local DRR and climate policies. Climate-related risks to children should also be mainstreamed into other key sectoral policies, such as Health, Education, WASH, Social Protection and Child Protection to ensure that all essential sectors are climate-resilient and able to protect children during and after climate shocks.

- **Strengthen the capacity of government and stakeholders in child-centred DRR and Climate Change Adaptation (CCA).** Enhance the capacity of government ministries, humanitarian actors and community stakeholders to deliver child-centred DRR and CCA measures. This includes identifying and providing technical training for key partners in integrating child-sensitive risk reduction into local and national climate plans. Local-level data collection on child vulnerabilities should be expanded and shared among stakeholders to inform evidence-based decision-making and the design of targeted child-focused climate actions.



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- **Strengthen Liberia's Early Warning Systems to protect children from climate-induced threats. Expand the capacity and reach of Liberia's Early Warning Systems to facilitate timely identification, monitoring, preparedness and response to climate-induced threats affecting children.** Strengthen coordination between the National Disaster Management Agency (NDMA), the Ministry of Health, the Ministry of Education and the Ministry of Agriculture, ensuring information flows efficiently between local and national levels. Early warning alerts should be tailored to reach vulnerable households with children, particularly in flood-prone and remote communities, using accessible communication channels to ensure timely response and evacuation where necessary

5.2 Programme-specific recommendations

5.2.1 WASH

Collaborate with the Ministry of Public Works, the Ministry of Health, the Liberia Water and Sewer Corporation, the Environmental Protection Agency (EPA), the National WASH Commission, the National Disaster Management Agency, UNDP, WHO, NGOs and other key national partners to strengthen climate-resilient WASH services for children and communities. More specifically, this includes:

a. Evidence generation

- Work with SIWI to conduct a national WASH climate risk assessment to identify children's exposure to climate-related hazards and their specific vulnerabilities, prioritising the most hazard-prone areas identified by the CLAC.
- Integrate monitoring and evaluation metrics that assess inequalities and climate-related resilience in WASH services for children at all levels.
- Work with the National WASH Commission to develop joint financing plans and assess opportunities to access major WASH financing from climate donors, including



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the Green Climate Fund (GCF) and the Global Environment Facility (GEF).

b. Policy and advocacy

- Advocate for access to climate-resilient WASH services for all children in Liberia. This includes promoting the adoption of national targets and indicators for monitoring progress towards climate- and disaster-resilient WASH services under the WASH Compact, to increase political commitment and accountability.
- Ensure that all WASH policies and strategies, including the National WASH Strategy, incorporate measures that address climate change, pollution and environmental degradation to protect WASH services for children in communities, schools, healthcare centres and public places.
- Establish and enforce Minimum Standards for WASH infrastructure siting and construction, ensuring climate resilience and appropriate measures to remove pollutants from water.
- Strengthen the integration of climate-resilient WASH services into all relevant national and local environment policies, including health, education, Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs).
- Advocate for improved solid waste management in communities, healthcare centres and schools, ensuring effective recycling, safe waste disposal and reduced

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environmental contamination for children.

- Advocate for improved quarterly water quality testing in schools, healthcare centres and communities, ensuring rapid response to contamination threats.

c. Implementation

- Work with the Ministry of Public Works, the Ministry of Education, the Ministry of Health, NGOs and other key national partners to implement school- and community-based WASH programmes that increase access to climate-resilient water and sanitation services for children in hazard-prone areas.
- Strengthen WASH sector capacity by rolling out training and enforcing minimum standards for WASH infrastructure to ensure climate-resilient WASH services for all.
- Adopt innovative technologies that enhance climate resilience across WASH services, such as water conservation techniques, low-carbon strategies and circular sanitation solutions. This includes scaling-up sustainable energy solutions, such as solar-powered water systems that are ensuring reliable access in off-grid regions.

5.2.2 Health

Collaborate with the Ministry of Health, the Environmental Protection Agency (EPA), the Liberia Medicines and Health Products Regulatory Authority, the National Public Health Institute of Liberia, UNDP, WHO, NGOs and other key national partners to integrate climate and environmental risks into child health policies, strengthen healthcare resilience and protect children's wellbeing. More specifically, this includes:

a. Evidence generation

- Conduct national and sub-national assessments on children's environmental health, prioritising high-risk areas and disaggregating data by age, gender and geography.
- Improve the availability of climate- and environment-related health data through household surveys, health information systems and surveillance systems.
- Expand blood lead level testing and integrate results into national surveys or sentinel surveillance to monitor toxic exposures.



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b. Policy and advocacy

- Incorporate child-focused climate health considerations into national policies, including NDCs, NAPs and disaster risk reduction strategies.
- Institutionalise children's environmental health within government by reviewing and clarifying mandates across health and environment ministries.



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- Advocate for policies that mitigate environmental hazards such as air pollution, lead exposure and extreme heat, with a focus on maternal, newborn, child and adolescent health.
- Promote investment in climate-resilient health systems, including strengthened community health workforces, primary healthcare and climate-adaptive risk communication.
- Strengthen health policies by integrating air quality monitoring, disaster risk reduction and environmental health measures into school health programmes.
- Ensure that all healthcare centres regularly update Emergency Response Plans, maintaining stockpiles of essential medicines and PPE and implement robust contingency measures.

c. Implementation

- Develop and promote dietary guidelines for parents, caregivers and children, emphasising healthy eating and sustainable food choices.
- Coordinate with FAO/WFP to promote school gardening programmes, fostering hands-on learning experiences about sustainable nutrition and food security.
- Encourage community-based food gardens in public spaces to enhance local food resilience and involve youth in sustainable agriculture.

5.2.3 Nutrition

Collaborate with the Ministry of Agriculture, the Ministry of Health, the Liberia Institute of Statistics and Geo-Information Services (LISGIS), the Liberia Agricultural Research Institute, FAO, WFP, NGOs and other key national partners to integrate climate adaptation, food security and nutrition strategies that prioritise children's wellbeing. More specifically, this includes:

a. Evidence generation

- Conduct studies to assess climate change impacts on food security and child nutrition, including vulnerability mapping.
- Enhance nutrition surveillance within high-risk areas and integrating findings into national Early Warning Systems.

b. Policy and advocacy

- Incorporate climate adaptation and disaster risk reduction into national food security and nutrition strategies.
- Advocate for stronger nutrition labelling regulations and improved marketing regulations for unhealthy, highly processed foods.
- Promote investment in nutrition-sensitive climate policies to ensure access to diverse and nutritious foods, especially for children and pregnant and lactating women.

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- Ensure that dietary guidelines include climate-smart nutrition principles to guide families towards sustainable, nutritious food choices.

c. Implementation

- Develop and promoe dietary guidelines for parents, caregivers and children that emphasise healthy eating and sustainable food choices.

5.2.4 Education

Collaborate with the Ministry of Education, the Environmental Protection Agency (EPA), the National Disaster Management Agency, the Liberia Institute of Statistics and Geo-Information Services (LISGIS), universities, civil society organisations (CSOs), UNDP, UNESCO and other key national partners to integrate climate change education, disaster preparedness and sustainability initiatives into national education systems. More specifically, this includes:

a. Evidence generation

- Conduct multi-hazard, child-centred risk assessments focused on the education sector to inform policies and interventions to ensure climate-resilient education for all children.

- Integrate climate change, environmental and disaster risks into Education Management Information Systems (EMIS) to track and respond to school disruptions caused by climate hazards.

b. Policy and advocacy

- Advocate for child-focused climate change and disaster risk reduction (DRR) education to be embedded into national education policies, including National Education Policy and the National Climate Change Learning Strategy.
- Update the national curricula at all levels, to embed climate and environment-related education across science and geography, making it more practical and engaging for students.
- Establish minimum standards for school construction, ensuring climate risks, including extreme heat, flooding and earthquakes, are fully integrated into site selection, design and infrastructure development.
- Ensure that education sector contingency plans incorporate climate risks by establishing Standard Operating Procedures (SOPs) for disasters and emergencies, including early warning systems, school safety drill and emergency response measures.

c. Implementation

- Develop climate- and disaster-resilient learning environments, including the establishment of temporary learning spaces for children affected by climate-induced displacement.
- Expand school-based climate action initiatives, integrating climate change, environmental sustainability and disaster risk reduction (DRR) education into classroom and extracurricular activities.
- Ensure that schools in high-risk areas prioritise retrofitting, repair and relocation measures to enhance climate resilience.
- Pilot green school initiatives, including a Green Star accreditation system, based on environmental sustainability practices in education institutions across Liberia, in collaboration with the EPA and the Ministry of Education.
- Strengthen environmental education at all levels, ensuring that climate and sustainability topics are made more practical and relevant to young people.



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- Provide teacher training and professional development on climate change, sustainability and risk reduction, equipping educators with modern teaching techniques and updated curriculum content.
- Partner with youth entrepreneurs to support green skills training, climate hackathons and innovation competitions, ensuring that young people gain the skills required for employment in the green economy.
- Establish environmental mentorship programmes and opportunities for green internships in collaboration with key partners such as the Ministry of Education, the EPA, UNDP and the private sector.

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5.2.5 Child Protection, Migration and Adolescent Development and Participation (ADAP)

Collaborate with government ministries, civil society organisations, humanitarian actors and other key national partners to strengthen child protection systems, address migration challenges and promote adolescent participation in climate action. More specifically, this includes:

a. Evidence generation

- Conduct research on the impacts of climate change, environmental degradation and disasters on child protection services to identify service gaps and inform strategies to enhance child protection during climate-related emergencies.
- Collect and analyse data from young people on pressing climate and environmental issues while actively seeking their opinions and insights to shape youth-centred policies and inform youth-led advocacy on climate action.

b. Policy and advocacy

- Advocate for the inclusion of child-specific considerations in national climate, environment and disaster management policies to ensure that children's rights, protection and wellbeing are prioritised in policy frameworks and action plans.
- Advocate with community leaders, humanitarian actors and government agencies to prioritise gender-based violence (GBV) risk mitigation and response in climate and disaster contexts, including securing dedicated financial and human resources for GBV prevention and survivor support.



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c. Implementation

- Strengthen child protection systems to ensure quality services that address climate- environment- and disaster-related risks, including integrating climate-responsive case management, mental health support and protection services for vulnerable children.
- Implement programmes that educate and empower children and young people to advocate for their rights to a clean, healthy and sustainable environment, incorporating civic education initiatives that build youth leadership in climate action and support their engagement in community advocacy.
- Train emergency and frontline workers on GBV prevention, risk mitigation and response in humanitarian and protracted crisis settings, including training on protection from sexual exploitation and abuse (SEA) to safeguard vulnerable populations during emergencies.
- Empower migrant and displaced children and young people, as well as those living in

high-risk areas, to meaningfully engage in climate policy and action by supporting participatory processes that ensure their needs, perspectives and rights are reflected in local and national climate policies.

5.2.6 Social Protection

Collaborate with the Ministry of Gender, Children and Social Protection, the Ministry of Labour, the Ministry of Finance and Development Planning, the National Social Security & Welfare Corporation, UNDP, UNICEF, FAO, WFP and other key national partners to ensure climate-responsive social protection systems that safeguard vulnerable children and families. More specifically, this includes:



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a. Evidence generation

- Assess the social and economic impacts of climate change, environmental degradation and disasters on vulnerable children and youth, including displaced and migrant populations.
- Integrate climate risks into national and sub-national child poverty analysis to inform targeted social protection interventions.

b. Policy and advocacy

- Advocate for the inclusion of shock-responsive and adaptive social protection in climate policies and financing strategies to protect vulnerable populations.
- Strengthen financing for social protection, ensuring adaptive cash transfers, livelihood support and social services respond to climate shocks.



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- Embed climate and disaster risk considerations in social protection policies to ensure proactive interventions in high-risk areas.
- Support the development of an emergency contingency fund for social protection programmes, ensuring rapid cash assistance and livelihood recovery measures during climate-related crises.
- Advocate for the allocation of contingency funding for the provision of basic school materials for children whose belongings have been damaged or lost due to flooding or other natural disasters.

c. Implementation

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- Work with the Ministry of Gender, Children and Social Protection (MoGCSP), UNHCR and other key national partners to ensure migrant and displaced children can access temporary safe shelters during floods and other natural disasters.
- Work with the Ministry of Gender, Children and Social Protection (MoGCSP) and other partners to implement climate-responsive cash transfer programmes targeting households affected by climate shocks, environmental degradation and disasters.
- Enhance the capacity of social workers and community leaders in climate risk management and resilience-building.
- Establish referral mechanisms to link vulnerable families with climate-resilient livelihoods, financial support and essential services.
- Promote social protection incentives for green initiatives, such as financial assistance for low-income households adopting renewable energy solutions.
- Ensure universal health coverage for vulnerable children and families and strengthen child protection mechanisms to prevent exploitation and abuse during crises.



6

ANNEXES

ANNEX I: A CHILD FOCUSSED POLICY ANALYSIS FOR CHILDREN IN LIBERIA

No.	Title	Ministry	Year	Summary	Mentions of children and youth in relation to Climate Energy and the Environment (CEE)			Specific measures to tackle the impact of CEE on children
					Climate	Energy	Environment	
Climate, Energy and Environment Policy and Strategy								
1	National Policy and Response Strategy to Climate Change	Environmental Protection Agency	2018	It aims to guide national response measures in to address climate change. The strategy further guides the integration of climate change issues into national development planning processes at national, county, district and local levels for effective coordination. It also outlines policies for adaptation and mitigation in key sectors of the country.	✓	✗	✓	Yes – It outlines children's vulnerabilities and specific actions to protect them.
2	Update Nationally Determined Contribution	Environmental Protection Agency	2021	Outlines the country's commitments to reducing greenhouse gas emissions and adapting to the impacts of climate change under the Paris Agreement.	✗	✗	✗	The NDC was informed by a Youth Dialogue and includes a commitment to mainstream climate actions, capacity building, climate finance and youth concerns into every sector activity by 2025. However, there is no specific mention of younger children or specific measures to protect them from climate change impacts.
3	National Environment Policy	Ministry of Foreign Affairs	2003	It aims to promote sustainable development and environmental conservation that meets the needs of present and future generations. It provides a comprehensive framework for implementing national environmental objectives and plans, ensuring sound management of resources and the environment and preventing exploitation that could cause irreparable damage.	✗	✗	✓	It does not specifically address the unique vulnerabilities or needs of children in relation to environmental issues such as drought, heat, or air pollution. However, mentions the need to engage and educate them on environment-related issues.
4	National Adaptation Plan (2020-2030)	Environmental Protection Agency	2020	It aims to guide national response measures in to address climate change. The strategy further guides the integration of climate change issues into national development planning processes at national, county, district and local levels for effective coordination. It also outlines policies for adaptation and mitigation in key sectors of the country.	✗	✗	✗	None mention. Children mentioned only in terms of their increased vulnerability.
5	Environmental Protection and Management Law (EPML)	Environmental Protection Agency	2002	Sets up a legal framework for sustainable environmental development and protection, managed by the Environmental Protection Agency in collaboration with regulatory ministries, organisations, and the public.	✗	✗	✓	Mentions impacts of gasoline and paint on children's health and development, but no specific measures to protect them.
6	National Energy Policy	Ministry of Land, Mines and Energy	2009	Aims to to establish a strategic framework for providing modern, reliable, affordable, and environmentally sustainable energy services, thereby driving economic growth and sustainable development.	✗	✗	✗	No specific mentions of children and youth in the Policy. However, youth were consulted on the policy draft.

No.	Title	Ministry	Year	Summary	Mentions of children and youth in relation to Climate Energy and the Environment (CEE)			Specific measures to tackle the impact of CEE on children
					Climate	Energy	Environment	
Other Sector Policies								
7	Liberia National Vision 2030	Governance Commission of Liberia	2012	This document aims to formulate a shared, long-term national and global vision for Liberia. The stated 'building blocks' of the vision are: economic prosperity; social and demographic harmony; democracy; environmental protection; cultural vibrance; and technological innovation.	✗	✗	✗	The document outlines broad strategies for national development, including environmental sustainability and climate resilience, but does not detail the unique vulnerabilities or needs of children concerning these challenges.
8	Pro-Poor Agenda For Prosperity And Development.	Ministry of Finance and Development Planning	2018	Seeks to increase the strength and trust of state institutions, and provide greater income security while reducing poverty and increasing climate resilience.	✗	✗	✗	While the PAPD addresses various environmental challenges and outlines strategies for climate change adaptation and mitigation, it does not specifically mention children in relation to climate change impacts such as drought, heat, or air pollution.
9	Children's Law	Ministry of Gender, Children, and Social Protection	2011	A comprehensive legal framework aimed at safeguarding and promoting the rights and welfare of children within the country	✗	✗	✓	Mentions children's right to a safe and healthy environment, and the importance of their freedom to express their rights in this regard. Also mentions a child's right to safe water and sanitation. Does not however mention climate change, food security or any other environment-related issues or provisions relating to children.
10	National Health Policy and Plan	Ministry of Health and Social Welfare	2013	Aims to enhance the health and social welfare of the population by providing a comprehensive framework for delivering quality health and social services.	✗	✗	✗	The Policy and Plan mentions child vulnerabilities and measures to protect their health, but none specifically in relation to climate change and environmental degradation. No mention of climate change or pollution, or other environment-related threats to children's health, beyond WASH.
11	Water and Sanitation Policy	Ministry of Land, Mines and Energy	2009	The policy provides guidance and direction in institutional, economic, and legal reforms aimed at improving WASH governance and enhancing access to safe water and sanitation for all Liberians.	✗	✗	✓	Mentions children's unique vulnerabilities to a lack of WASH access. Limited mentions of pollution and no mention of climate change - including in relation to children and young people.
12	National Disaster Management Policy		2012	Establishes an institutional and operational framework to reduce disaster risk, and it aims to build a resilient community in the context of sustainable development.	✓	✗	✓	Mentions specific vulnerabilities of children and young people and outlines specific measures to protect them. Explicitly mentions climate-related disasters. Emphasises the need for education and capacity building among these groups.
13	Food and Agriculture Policy and Strateg	Ministry of Agriculture	200 8	Aims to increase productivity and incomes of Liberia's subsistence farmers, improving nutrition and the state of agriculture. It also aims at slowing deforestation, develop adaptation mechanisms to cope with climate change impacts.	✓	✗	✓	Clearly outlines the specific vulnerabilities of children to food insecurity and malnutrition, including in relation to climate change. Brief mention of young people, in relation to rural livelihoods and the need to strengthen their resilience and capacity.

ANNEX II: LIST OF RELEVANT CLIMATE AND ENVIRONMENT PARTNERS IN LIBERIA WORKING WITH CHILDREN

Government	UN Agencies	International Organisations and NGOs	NGOs	Youth organisations	Academic institutions
• Environmental Protection Agency (EPA) • Climate Integration and Financing Office (CIFO), MFDP • National Disaster Management Agency (NDMA) • Ministry of Health • Ministry of Gender, Children, and Social Protection • Ministry of Education	• UNICEF • UNDP • FAO • WHO • WFP • UN Environment Programme (UNEP)	• Save the Children • World Vision • CARE International • Green Climate Fund (GCF) • Red Cross Liberia • YOUNGO	• Environmental Justice Foundation (EJF) • Defence for Children International - Liberia • SOS Children's Villages Liberia • Volunteers for Sustainable Development in Africa (VOSIEDA) • Greenlife West Africa • Save The Children's Future - SCF, Inc • National Alliance of Climate and Environmental NGOs of Liberia (NACEL) • Climate and Environmental Protection Initiative of Liberia (CEPIL) • Foundation for Community Initiatives (FCI) • Climate Action Network Liberia (CAN-Liberia)	• Liberian Youth for Climate Action (LYCA) • Youth Go Green Network • Youth Climate Justice Secretariat • Center for Youth Civic Leadership and Environmental Studies (CYCLES) • Youth Alive Liberia • Liberia Youth for Climate Actions • Youth Climate Change Initiative	• University of Liberia • Liberia Institute of Public Administration (LIPA) • African Methodist Episcopal University



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