



unicef   
for every child

# Analysis of the CCRI for Least Developed Countries

---

**Published by UNICEF**

Climate, Environment, Energy and Disaster Risk Reduction (CEED).


3 United Nations Plaza  
New York, NY 10017, USA

© 2023 United Nations Children’s Fund (UNICEF)

---

 [climate@unicef.org](mailto:climate@unicef.org)

 [www.unicef.org/environment-and-climate-change](http://www.unicef.org/environment-and-climate-change)

 **Suggested citation: *Analysis of the CCRI for Least Developed Countries*.  
New York: United Nations Children’s Fund (UNICEF), 2023.**

---

The findings, interpretations and conclusions expressed in this report are those of the authors and do not necessarily reflect the policies or views of UNICEF or the United Nations. The designations and maps used do not reflect a position by UNICEF on the legal status of any country or territory or of its authorities, or the delimitation of any frontiers.

This report presents an analysis of the Children’s Climate Risk Index (CCRI) for LDCs included in Global CCRI analysis. The analysis draws from Beta version of the Index as published in UNICEF’s report *The Climate Crisis Is a Child Rights Crisis: Introducing the Children’s Climate Risk Index*, 2021. The CCRI was developed by UNICEF in collaboration with the Data for Children Collaborative.

It is important to note that Small Island Developing States (SIDS) (<20,000 sq/km) were not included in the global CCRI analysis due to a lack of reliability and availability of data. However, to present the findings in this report for the 5 SIDS identified as LDCs, a separate analysis was conducted using publicly available datasets that correspond to the components and indicators used in the CCRI methodology.

---

## Acknowledgements

The analysis of the CCRI for Least Developed Countries (LDCs) was developed by Sophie Lee, UNICEF Climate, Environment, Energy and Disaster Risk Reduction (Lead Author and Project Manager) in collaboration with Margaretha Barkhof, UNICEF (Data Analysis, CCRI Methodology).

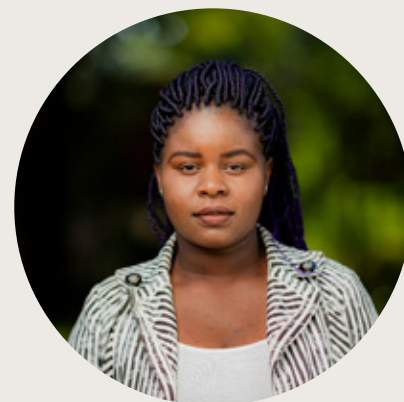
Overall leadership and guidance provided by Nicholas Rees, UNICEF Programme Specialist (Climate, Environment and Energy) and Gautam Narasimhan, UNICEF HQ Global Lead (Climate, Environment and Energy).

Additional UNICEF global contributions: Amy Wickham, David Duncan, Diego Fernando Lopez, Erik Kjaergaard, Fabio Friscia, Farai Tunhuma, Hedy IP, Hiroyuki Hattori, James Robertson, Jan Burdziej, Joan Pegram, Lars Bernd, Marc Overmars, Maria Del Carmen Porras Perez Guerrero, Michele Paba, Moa Cortobius, Nick Rice Chudeau, Rakshya Rajyashwori Thapa, Rei Yamada, Reis Lopez Rello, Ruben Bayiha, Tamara Plush, Tarik Hassan, Tin Htut and Zoraya El Raiss Cordero.

# Foreword

## **Brenda Mwale**

Climate Change Youth Advocate



Almost every child and young person will face challenges associated with climate change and a degrading natural environment. UNICEF's Children's Climate Risk Index reveals that 1 billion children are at "Extremely High Risk" of the impacts of climate change. That is nearly half of all children. And it is happening today.

In my country, Malawi, we are experiencing floods every year. These floods cause tragic deaths and the displacement of thousands, including children. Malawi is experiencing its worst cholera outbreak in decades, which came when the country was recovering from the impacts of tropical storms Anna and Gombe. The aftermath of the two climate shocks damaged water and sanitation infrastructure, forcing families and their children to rely on unsafe water and exposing them to a greater risk of disease.

UNICEF's report shows how some children are more vulnerable to the impacts of climate change than others. The analysis reveals that 80 percent of the "Extremely High Risk" countries are Least Developed Countries (LDCs). Children in these countries face a deadly combination of exposure to multiple and climate and environmental shocks and high vulnerability due to inadequate essential services such as water, sanitation, healthcare, and education. This report also reveals the disconnect between where greenhouse gas emissions are generated, and where children and young people are experiencing the most intense climate-driven impacts. Whilst LDCs are the least responsible for rising global temperatures, we will pay the highest costs. And children will continue to suffer most of all.

UNICEF is launching this report at the Fifth United Nations Conference on the Least Developed Countries (LDC5) in Doha, Qatar, which is a once-in-a-decade opportunity to accelerate sustainable development in the places where international assistance is needed the most. The Doha Programme of Action (DPoA) reminds us that global resilience depends on LDCs getting the support they need. Crucially, the DPoA recognises the need to invest in children and young people. The Programme outlines commitments to strengthen youth participation mechanisms to facilitate young people's meaningful engagement, especially for girls and young people in vulnerable situations, in policies and activities that enhance sustainable development efforts.

Children and young people must be part of the solution. I come from Mponela in Malawi, which is a community

where tobacco farming and using trees as an energy source in our homes is leading to increased deforestation around the Mpanda Mountain. I started my climate journey as a way of building community awareness of deforestation and its effects. In my community, girls and boys can also be negatively stereotyped and not seen as actors to bring positive change, so my advocacy was also a way to empower the youth and show the community that as youth we can influence change. I started an afforestation project which led to planting more than 150,000 tree seedlings by involving the community, climate education in schools as well as clean up events to raise awareness on waste management.

The younger generation require green skills training, climate education, and access to resources and green job opportunities, so we can drive climate change solutions. Mainstreaming youth has to be taken seriously if we are to build generational success. Let our visions, commitments, policies be with and for young people and children to help build the future we want. Let youth and children in LDCs be at the forefront from grassroot level to policy making level.

Remember, if there is no meaningful youth and child engagement, then there is no youth and child participation. Children and young people from LDCs must be included in all climate plans, policies, and decision-making, including in the implementation and review of the DPoA.

At the LDC5 conference, I will not only be attending as a delegate but also carrying the voice of millions of affected children and youth. I will call on LDC leaders to let LDC5 create a platform for dialogue on youth development in LDCs, to create a space for discussions on policies to empower young people and children in LDCs, and to enhance their role in implementing the new Programme of Action, as well as the 2030 Agenda.

Young voices must be heard, young demands taken seriously, and young people must be consulted on the things that will affect our future.

# Table of Contents

Foreword	3
Executive Summary	5
Climate Risk for Children in Least Developed Countries	10
Methodology	22
<b>East Asia and the Pacific</b>	<b>25</b>
Cambodia	27
Lao People’s Democratic Republic	30
Myanmar	33
Solomon Islands	36
<b>Eastern and Southern Africa</b>	<b>39</b>
Angola	42
Burundi	45
Eritrea	48
Ethiopia	50
Lesotho	53
Madagascar	55
Malawi	58
Mozambique	60
Rwanda	63
Somalia	65
South Sudan	68
Uganda	71
United Republic of Tanzania	74
Zambia	77
<b>Latin America and the Caribbean</b>	<b>79</b>
Haiti	81
<b>Middle East and North Africa</b>	<b>84</b>
Djibouti	86
Sudan	88
Yemen	90
<b>South Asia</b>	<b>92</b>
Afghanistan	94
Bangladesh	96
Bhutan	99
Nepal	102
<b>West and Central Africa</b>	<b>105</b>
Benin	109
Burkina Faso	112
Central African Republic	114
Chad	117
Democratic Republic of the Congo	120
The Gambia	122
Guinea	124
Guinea-Bissau	126
Liberia	128
Mali	131
Mauritania	133
Niger	135
Senegal	138
Sierra Leone	140
Togo	142
<b>Small Island Developing States</b>	<b>145</b>
Kiribati	147
São Tomé and Príncipe	149
Timor-Leste	151
Tuvalu	153
Union of the Comoros	155
Recommendations	157
Call to Action	164
References	167



# Executive Summary

The climate crisis is a child rights crisis. It is a direct threat to a child’s ability to survive, grow, and thrive. Children and young people are the least responsible for climate change, and yet will bear the greatest burden of its impacts.

Climate change is also deeply inequitable. UNICEF’s report *The Climate Crisis Is a Child Rights Crisis: Introducing the Children’s Climate Risk Index (CCRI)*<sup>1</sup> is the first child-focused climate risk index that ranks countries based on children’s exposure to climate and environmental shocks, as well as their vulnerability to those shocks, based on their access to essential services. The report reveals that approximately **1 billion children** live in one of the **33 countries**<sup>1</sup> classified as at **“Extremely High Risk” of the impacts of the climate crisis**. Children in these countries, like **Central African Republic, Chad, Guinea, and Guinea-Bissau** face a deadly combination of exposure to multiple climate and environmental shocks, with a high vulnerability due to inadequate essential services such as water, sanitation, and hygiene (WASH), healthcare, and education.

Understanding children’s climate risks and vulnerabilities is essential for determining the full extent to which climatic and environmental threats may affect their well-being, if not their very survival.

Utilizing the global CCRI data, this report provides country-level assessments of children’s exposure to climate and environmental hazards, shocks, stresses, and underlying vulnerabilities in Least Developed Countries (LDCs) – to help prioritize action, including appropriate adaptation measures for those most at risk. **It finds that:**

<sup>1</sup> Central African Republic, Chad, Nigeria, Guinea, Guinea-Bissau, Somalia, Niger, South Sudan, Democratic Republic, of the Congo, Angola, Cameroon, Madagascar, Mozambique, Pakistan, Afghanistan, Bangladesh, Benin, Burkina Faso, Ethiopia, Sudan, Togo, Cote D’Ivoire, Equatorial Guinea, Liberia, Senegal, India, Sierra Leone, Yemen, Haiti, Mali, Eritrea, Myanmar, and the Philippines.

 **153**

**million children are highly exposed to heatwaves**

This is likely to worsen as global average temperatures increase and weather patterns become more erratic.

 **50**

**million children are highly exposed to cyclones**

This is likely to get worse as high-intensity cyclones (i.e., categories 4 and 5) increase in frequency, rainfall intensity grows, and cyclone patterns shift.

 **79**

**million children are highly exposed to riverine flooding**

This is expected to intensify as glaciers melt and precipitation increases due to higher water content in the atmosphere because of higher average temperatures.

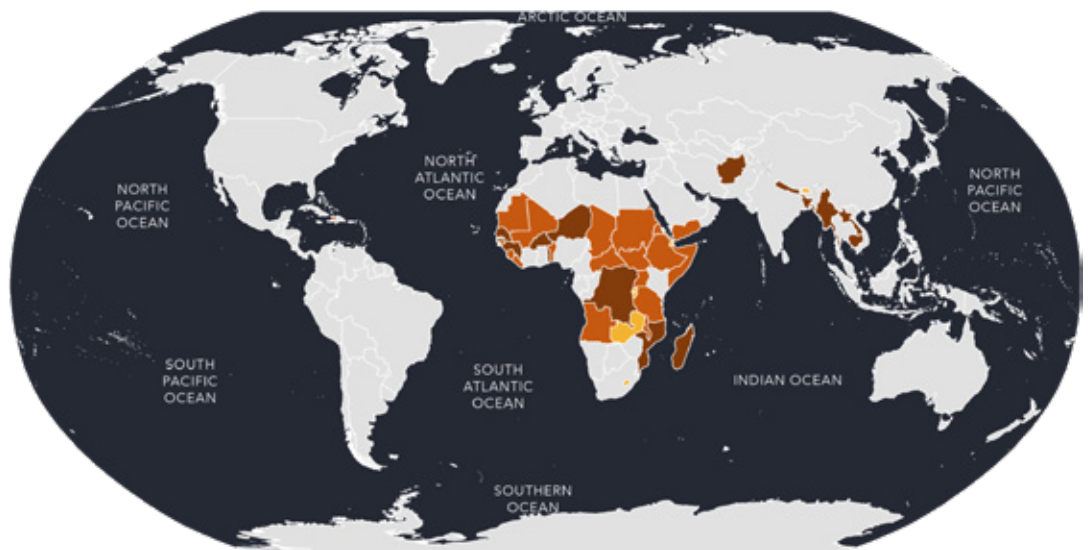
 **55**

**million children are highly exposed to coastal flooding**

This is likely to worsen as sea levels continue to rise, with the effects magnified considerably when combined with storm surges.

**Exposure to climate and environmental hazards, shocks, and stresses for LDCs included in CCRI analysis (Pillar 1 of the CCRI)**

- Extremely High
- High
- Medium-High
- Low-Medium
- Low
- No data



Source: UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index*, 2021. This map displays only the LDCs included in the CCRI analysis.

 **125**

**million children are highly exposed to water scarcity**

This is expected to worsen as climate change increases the frequency and severity of droughts, water stress, seasonal and interannual variability, and contamination – and as demand and competition for water increases.

 **462**

**million children are highly exposed to vector-borne diseases, such as Malaria and Dengue among others**

This is likely to worsen as temperature suitability and climatic conditions for mosquitos and pathogens that transmit these diseases spreads.

 **414**

**million children are highly exposed to air pollution that exceeds international limits of 10µg/m<sup>3</sup>\***

This is likely to get worse unless there is a reduction in fossil fuel combustion that causes air pollution.

\*The Annual Air Quality guideline has changed since this analysis to PM2.5 >= 5 g/m<sup>3</sup> (WHO, 2021).

 **249**

**million children are highly exposed to lead pollution due to exposure from contaminated air, water, soil, and food**

This is expected to worsen in the absence of more responsible lead-containing product manufacturing, consumption, and recycling.

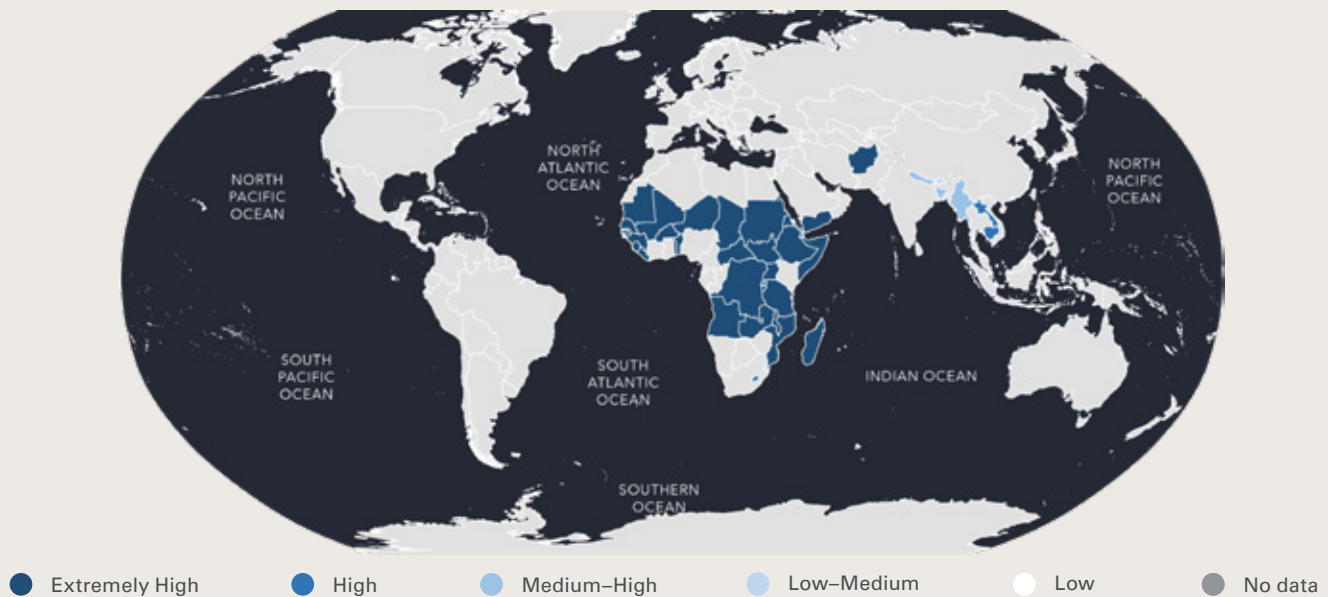
## A lack of essential services increases child vulnerability to climate change in LDCs

All children face challenges associated with climate change and a degrading natural environment. Some children, however, are more vulnerable to the impacts of climate change than others – depending largely on the availability, quality, equity, and sustainability of key and essential services for children, such as WASH, healthcare, nutrition, education, and social protection, among others. The resilience of services significantly affects the capacity of individuals and communities to manage and recover quickly from the impacts of climate shocks.

For example:

- A child who doesn't have access to clean water is more vulnerable to climate and environmental hazards, shocks, and stresses.
- A child who is not able to see a healthcare professional when sick and access health and nutrition is more vulnerable to climate and environmental hazards, shocks, and stresses.
- A child who is poor and lacks access to social protection, such as cash transfers, is more vulnerable to climate and environmental hazards, shocks, and stresses.
- A child who has not benefited from climate change and disaster risk reduction (DRR) education, including school safety programmes is more vulnerable.

### Child vulnerability for LDCs included in CCRI analysis (Pillar 2 of the CCRI)



Source: UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index, 2021*. This map displays only the LDCs included in the CCRI analysis.

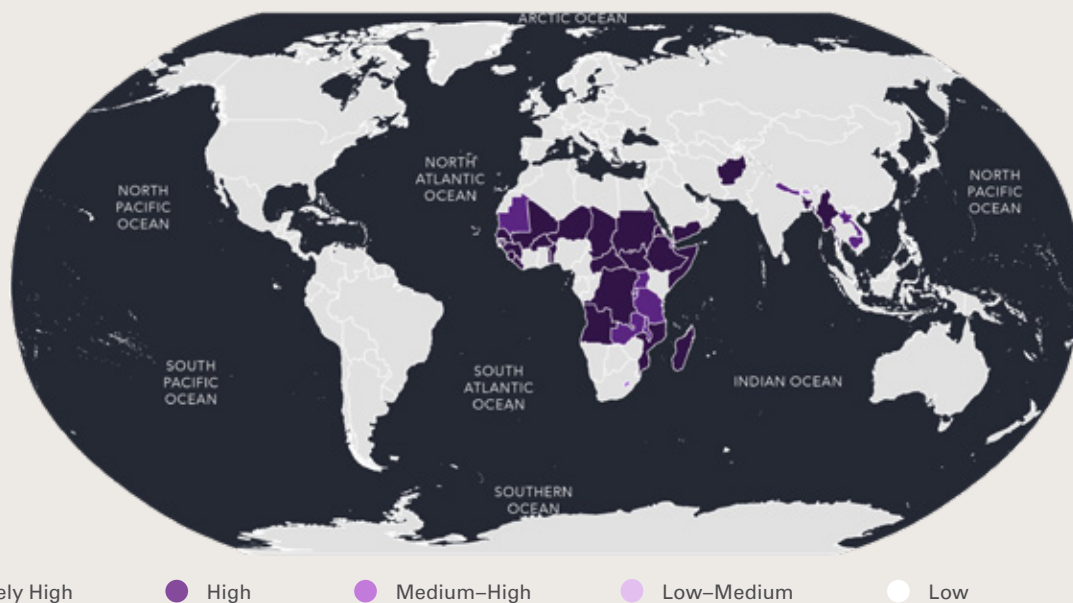
These underlying vulnerabilities, combined with high levels of fragility and displacement in LDCs, contribute to the erosion of development progress, pushing the most vulnerable children deeper into poverty, at the same time as increasing their risk of experiencing the worst and most life-threatening effects of climate change.

Increasing the resilience of essential services including WASH, health, nutrition, education, and social protection is essential to reduce the impact of climate change and prevent millions of children and their families from slipping into extreme poverty by 2030.

This report combines this growing body of new evidence with data on children’s vulnerability to introduce the first comprehensive view of climate risk from a child’s perspective in LDCs. It finds:

- ▶ **Almost 80 percent (26 out of 33) of the “Extremely High Risk” countries identified by the CCRI are Least Developed Countries.**
- ▶ **95 percent (39 out of 41) of Least Developed Countries are either “High Risk” or “Extremely High Risk,” according to the CCRI.**

### The Children’s Climate Risk Index for LDCs included in CCRI analysis



Source: UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index*, 2021. This map displays only the LDCs included in the CCRI analysis.

### The Children’s Climate Risk Index focused on LDCs

This report also highlights that children from LDCs – which globally contribute the least to climate change – will suffer the greatest consequences.

For instance, LDCs have a joint population of 1 billion, yet **contribute less than 1 percent of global emissions (0.98 percent)**.<sup>2</sup> Moreover, the top 10 LDC countries with largest contribution to global emissions (percent of global CO<sub>2</sub> emissions) **only produce 0.71 percent of global CO<sub>2</sub> emissions**.<sup>3</sup>

<sup>2</sup> The sum percentage of global CO<sub>2</sub> emissions of 46 LDCs is 0.98% (rounded 1%). Calculated based on World Bank World Development Indicators (WDI) (2018) and World Population Prospects (WPP) Population data (2020 estimates).

<sup>3</sup> The sum percentage of global CO<sub>2</sub> emissions of the 10 LDCs with largest contributions. Calculated based on World Bank WDI (2018) and WPP Population data (2020 estimates).







To avert the worst impacts of the climate crisis, comprehensive and urgent action is required. According to the Intergovernmental Panel on Climate Change (IPCC), countries must cut their emissions **by at least half by 2030** to keep warming to no more than 1.5°C to avoid the worst impacts.

However, the world is off-track to reduce emissions, and children in LDCs are already suffering from the impacts of climate change – and those impacts will inevitably get worse, even with drastic reductions in global emissions. Climate finance flows are far short of what is needed to limit warming and adapt to 1.5°C, and the gaps are the widest for LDCs.

Adaptation and resilience building offers the most effective way to protect child lives and family livelihoods from the immediate and expected impacts. Unless governments, public and private sectors, and other key stakeholders invest heavily in adaptation and resilience of social services in LDCs now, children and young people will face increasingly high risks to their survival and well-being.

To develop effective adaptation measures, it is necessary to first understand the context-specific climate hazards that children in LDCs face. Adaptation and resilience measures must be based on a careful assessment of both the type, nature, and extent of population exposure to specific climate and environmental hazards, shocks, or stresses, *as well as* the degree to which children are vulnerable. Solutions must be appropriate to social and cultural contexts and must not take away the agency of local populations or overlook the crucial role of nature-based solutions, ecosystem restoration and local knowledge in adaptation.

Protecting children in LDCs from climate change impacts requires a whole-of-society approach, including:

-  **Increase investments in climate adaptation and resilience for key services for children;**
-  **Reduce global emissions;**
-  **Offering and scaling green skills training and capacity building;**
-  **Including children and young people in climate adaptation; and resilience-building plans, policies, and decision-making.**

Urgent and meaningful climate action in LDCs must be enacted now for and with today’s children and young people; and for the future generations who will live in a world marked by our collective decisions.

## **LDC5: From Potential to Prosperity**

UNICEF launched this report at the Fifth United Nations Conference on the Least Developed Countries (LDC5) in Doha, Qatar. The conference has been designed as a once-in-a-decade opportunity to accelerate sustainable development in the places where international assistance is needed the most.

The [2022-2031 Doha Programme of Action](#) reminds us that global resilience depends on LDCs getting the support they need. It is a call for extraordinary measures by all countries and for strengthened international and multilateral cooperation to address the climate challenges affecting LDCs. This Programme affirms commitments to scale up finance for adaptation to climate change, including through comprehensive multi-stakeholder resilience-building measures.

Importantly the Programme recognises the need of investing in children, adolescents, and youth, specifying pledges to expand youth participation mechanisms, to facilitate meaningful engagement of young people — particularly for girls and young people in disadvantaged situations — in policies and activities that support long-term socio-economic development.



# Climate Risk for Children in Least Developed Countries

---

LDCs are defined as low-income countries confronting severe structural impediments to sustainable development.<sup>ii</sup> The LDC identification criteria include countries with low Gross National Income (GNI) per capita, low levels of Human Assets, and high Economic and Environmental Vulnerability.<sup>iii</sup> Each of the three criteria is assessed using key indicators that show long-term structural disadvantages.

Made up of countries across Africa, Asia-Pacific, and the Caribbean, at present, there are 46 countries classified by the United Nations as LDCs<sup>4</sup>. The Committee for Development Policy is mandated by the General Assembly and the Economic and Social Council (ECOSOC) to review the list of LDCs every three years and make recommendations on the inclusion and graduation of eligible countries.

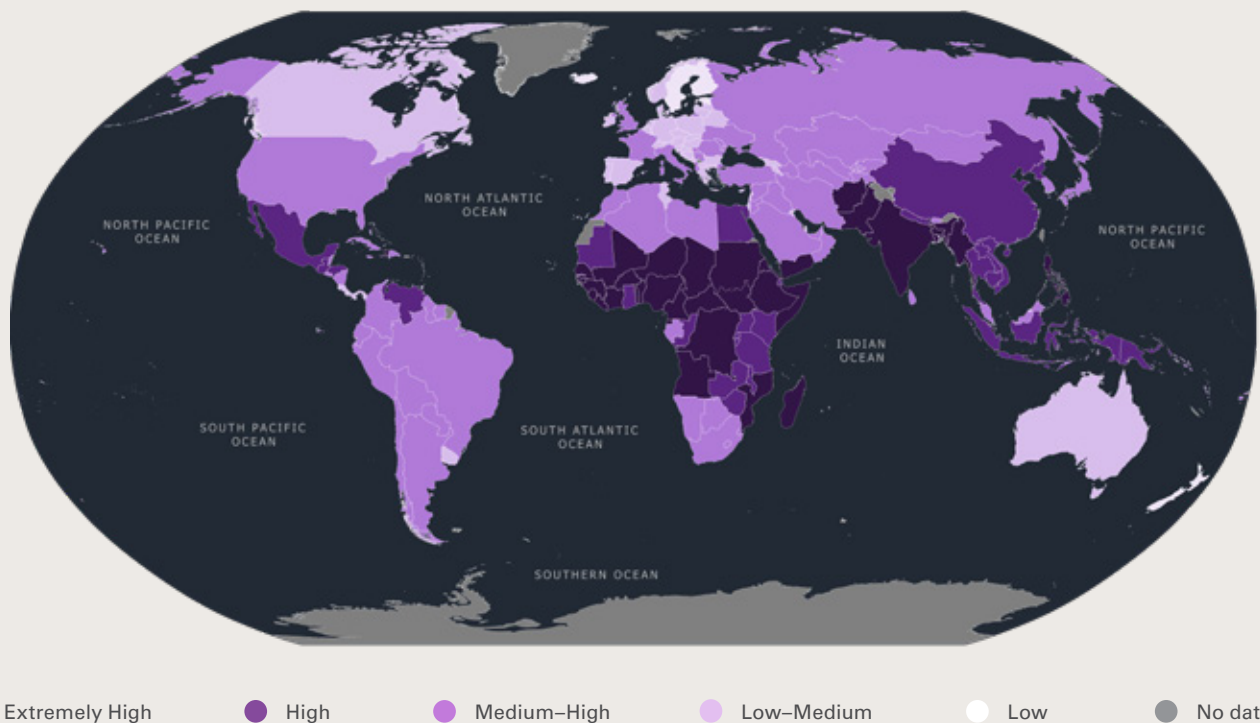
LDCs are considered LDCs, in part, due to variables that are also part of the CCRI. The same factors that drive a lack of development in LDCs also drive vulnerability to climate and environmental shocks.

### LDCs and the Global CCRI

UNICEF’s 2021 report *The Climate Crisis Is a Child Rights Crisis: Introducing the Children’s Climate Risk Index*<sup>v</sup> is the first child-focused climate index that ranks countries based on children’s exposure to climate and environmental shocks, as well as their vulnerability to those shocks based on the availability, quality, equity, and sustainability of key and essential services.

The report reveals that approximately **1 billion children live in one of the 33 countries** that are considered at “Extremely-High Risk” to the impacts of climate change. Children in these countries, like **Central African Republic, Chad, Guinea, and Guinea-Bissau**, face a deadly combination of exposure to multiple climate and environmental shocks with a high vulnerability due to inadequate essential services such as WASH, healthcare, and education.

**Map 1**  
The Children’s Climate Risk Index (Global)



Source: UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children’s Climate Risk Index*, 2021.

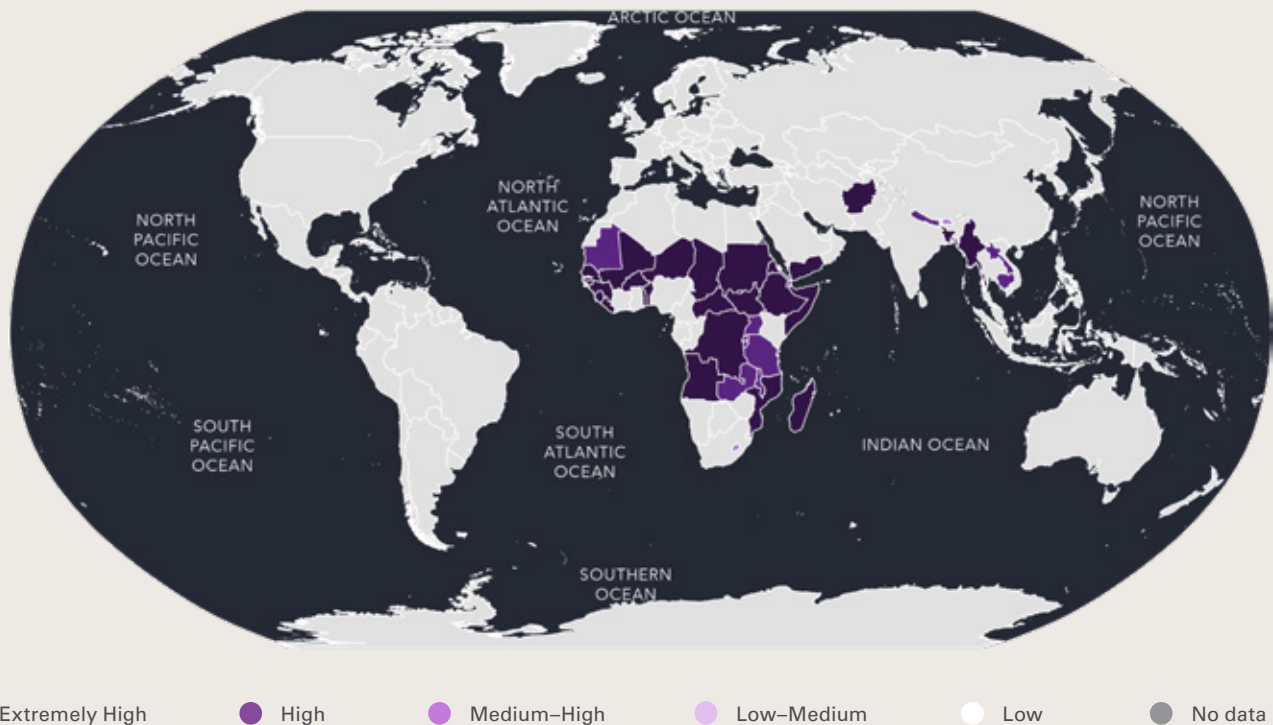
4 Angola, Afghanistan, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Central African Republic, Cambodia, Chad, Comoros, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Kiribati, Lao People’s Democratic Republic, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, São Tomé and Príncipe, Senegal, Sierra Leone, Solomon Islands, Somalia, South Sudan, Sudan, Timor-Leste, Togo, Tuvalu, Uganda, United Republic of Tanzania, Yemen, and Zambia. UNCTAD (2022).

Using the global CCRI data, this report measures the likelihood of climate and environmental hazards, shocks, and stresses affecting children or vulnerable households and groups in LDCs. 41 of the 46 countries classified as LDCs are included in the CCRI analysis.<sup>5</sup> The CCRI highlights that children from these countries that contribute the least to climate change will suffer the greatest consequences. It finds that:

- ▶ **Almost 80 percent (26 out of 33) of the “Extremely High Risk” countries identified by the CCRI are Least Developed Countries.**
- ▶ **95 percent (39 out of 41) of Least Developed Countries are either “High Risk” or “Extremely High Risk,” according to the CCRI.**

## Map 2

The Children’s Climate Risk Index for LDCs included in CCRI analysis



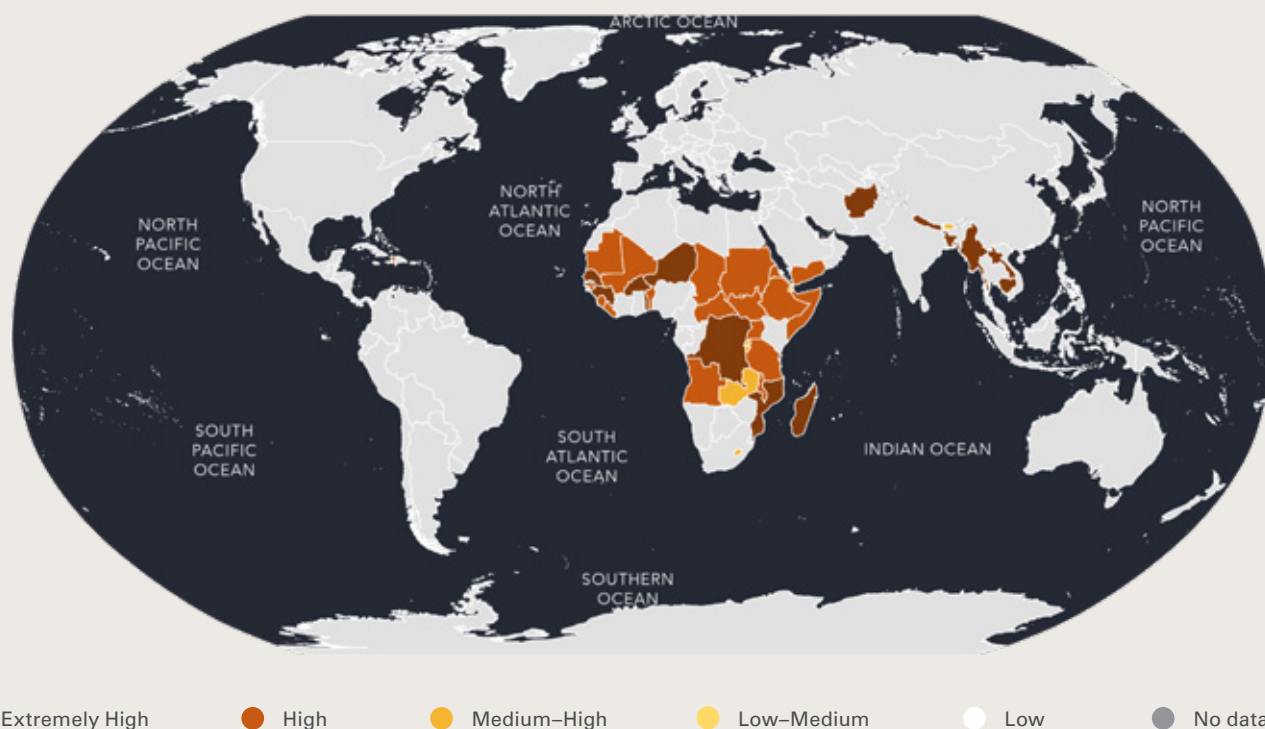
Source: UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children’s Climate Risk Index*, 2021. This map displays only the LDCs included in the CCRI analysis.

<sup>5</sup> 5 Small Island Developing States that have a land area less than 20,000 sq/km were excluded from the CCRI analysis.

## Children residing in LDCs experience high exposure to climate and environmental hazards

### Map 3

Exposure to climate and environmental hazards, shocks, and stresses for LDCs included in CCRI analysis (Pillar 1 of the CCRI)



Source: UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index, 2021*. This map displays only the LDCs included in the CCRI analysis.

According to the CCRI, in LDCs approximately:<sup>6</sup>

- ▶ **153 million children are highly exposed to heatwaves.** This is likely to worsen as global average temperatures increase and weather patterns become more erratic.
- ▶ **50 million children are highly exposed to cyclones.**<sup>7</sup> This is likely to get worse as high-intensity cyclones (i.e., categories 4 and 5) increase in frequency, rainfall intensity grows, and cyclone patterns shift.
- ▶ **79 million children are highly exposed to riverine flooding.** This is expected to intensify as glaciers melt and precipitation increases due to higher water-content in the atmosphere as a result of higher average temperatures.
- ▶ **55 million children are highly exposed to coastal flooding.** This is likely to worsen as sea levels continue to rise, with the effects magnified considerably when combined with storm surges.
- ▶ **125 million children are highly exposed to water scarcity.** This is expected to worsen as climate change increases the frequency and severity of droughts, water stress, seasonal and interannual variability, and contamination – and as demand and competition for water increases, resulting in depletion of available water resources.

<sup>6</sup> The estimates of the number of children exposed to the different types of shocks are based on the 41 LDCs included in the CCRI.

<sup>7</sup> Estimate of children exposed to extensive cyclone winds using a 100 year return period.

- ▶ **462 million children are highly exposed to vector-borne diseases,**<sup>8</sup> such as malaria and dengue among others. This is likely to worsen as temperature suitability and climatic conditions for mosquitos and pathogens that transmit these diseases spreads.
- ▶ **414 million children are highly exposed to air pollution that exceeds international limits of 10µg/m<sup>3</sup>.**<sup>9</sup> This is likely to worsen unless there is a transition to cleaner fuel sources.
- ▶ **249 million children are highly exposed to lead pollution** due to exposures from contaminated air, water, soil, and food. This is expected to worsen in the absence of more responsible lead-containing product manufacturing, consumption, and recycling.

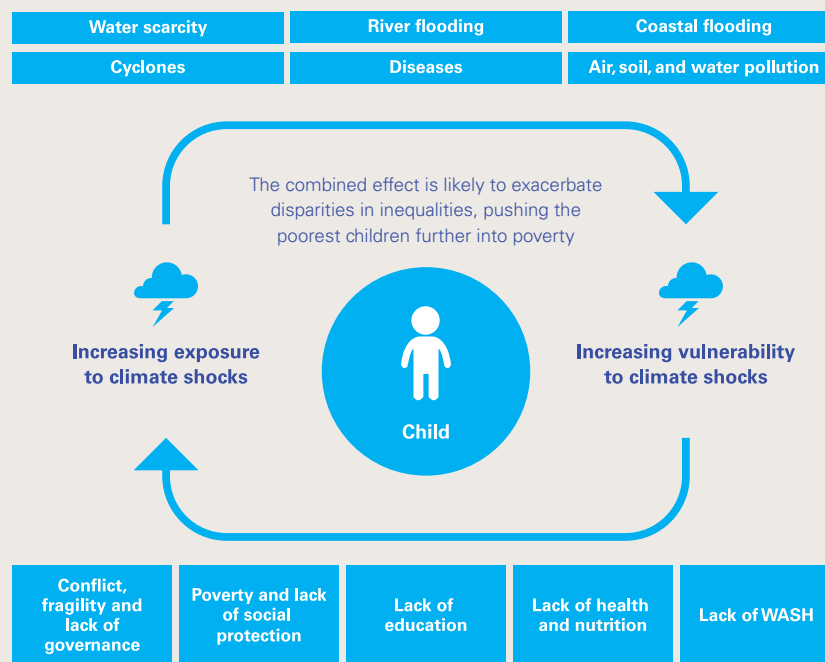
### Children’s vulnerability to climate and environmental hazards, shocks, and stresses

All children face challenges associated with climate change and a degrading natural environment. Some children, however, are more vulnerable to the impacts of climate change than others. This depends largely on the availability, quality, equity, and sustainability of key and essential services for children, including WASH, healthcare, nutrition, education, and social protection, among others. The resilience of services significantly affects the capacity of individuals and communities to manage and recover quickly from the impacts of climate shocks.

Unfortunately, not only does a child’s lack of access to these essential services increase their vulnerability to climate change, but climate change is likely to make it more difficult for children to obtain access to those key essential services. Thus, a vicious cycle is created, pushing the most vulnerable children further into poverty, at the same time as increasing their risk of experiencing the worst effects of climate change. Moreover, vulnerabilities and exposures also interact with each other, potentially magnifying the effects. This vicious cycle is further exacerbated by a lack of recognition of children’s voice and agency, which often undermines any capacity that children have to respond and adapt.

**Figure 1**

Children caught in a vicious cycle of increasing exposures and vulnerabilities face an increase in their overall level of risk.



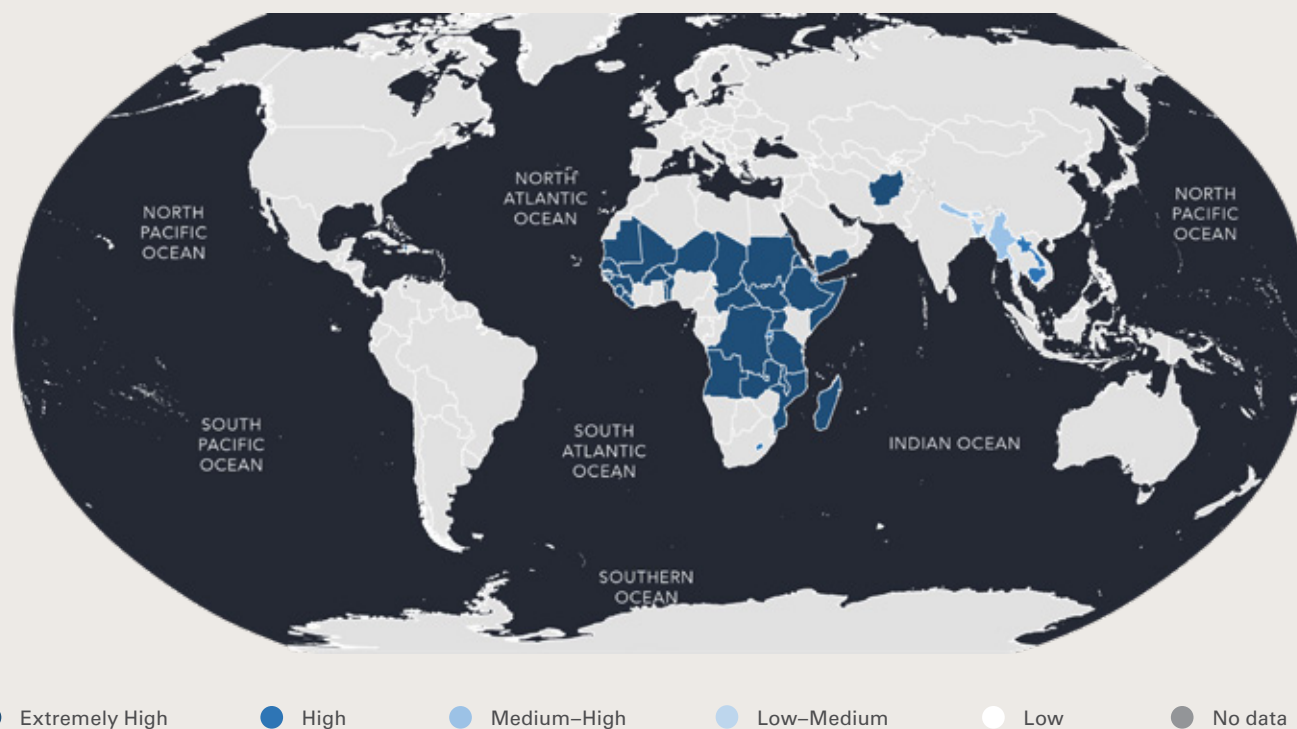
Source: UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children’s Climate Risk Index*, 2021

8 Estimate of children exposed to at least one or more underlying factors (Malaria PV, Malaria PV, Aedes, Dengue, Zika).

9 The Annual Air Quality guideline has changed since this analysis to PM2.5 >= 5 g/m3 (WHO, 2021).

## Map 4

Child vulnerability for LDCs included in CCRI analysis (Pillar 2 of the CCRI)



Source: UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index*, 2021. This map displays only the LDCs included in the CCRI analysis.

There are several other compounding factors which increase vulnerability to climate change impacts in LDCs:

### Resource dependence

Communities in LDCs are often resource dependent and have limited flexibility and diversity of livelihood options. Low economic diversification increases vulnerability, especially if there are no alternatives to rely on when climate and environmental shocks occur. Those with greater opportunities to diversify their incomes, with better access to credit and financial services, and who have more flexibility to apply those resources— such as through insurance — are better able to recover.

In these countries, economies are often highly dependent on climate-sensitive sectors. Furthermore, LDCs frequently face severely constrained capacities to mobilize domestic resources and access capital markets. Whilst an abundance of natural resources can be useful for adaptation measures — such as the protection or restoration of forests and mangroves as part of nature-based solutions — those who depend solely on natural resources, such as for agriculture, often suffer the greatest losses.

### LDCs and fragility

According to the Organization for Economic Co-operation and Development (OECD), approximately **83 percent of LDCs are considered fragile and extremely fragile contexts** (27 LDCs considered Fragile and 11 Extremely Fragile).<sup>10</sup> Benin and Timor-Leste are the most recent LDCs to enter fragile status (2020-2021). In the same period, the formerly fragile country of Eritrea entered extreme fragility.<sup>v</sup> Overall, global fragility rose from 2020 to 2021, most likely as a result of the COVID-19 pandemic.

<sup>10</sup> Calculated using OECD States of Fragility data (2022).

For children living in situations affected by fragility or protracted emergencies, climate change is a threat multiplier that adds another layer of complexity to their lives — exacerbating and disrupting their ability to survive. Poor quality and access to child services, weak economic management, challenges to social cohesion, and gaps in capacities of systems and institutions to deliver shock-responsive services, drive vulnerability for children in fragile settings. For example, compared with non-fragile contexts, children in extremely fragile settings are more than 8 times as likely to lack basic drinking water and almost 4 times as likely to lack basic sanitation.<sup>vi</sup> Further, 95 percent of new conflict-related displacements recorded worldwide in 2020 occurred in countries that are highly vulnerable to the impacts of climate change.<sup>vii viii</sup>

### LDCs and displacement

Millions of children are on the move globally, driven from their homes by the impacts of slow-onset disasters, environmental degradation, and sudden-onset disasters — exacerbated by climate change. According to the Internal Displacement Monitoring Centre’s (IDMC) *2022 Global Report on Internal Displacement*,<sup>ix</sup> 2022 had the largest recorded number of internally displaced people — approximately 60 million, of whom 25.2 million were children. Many of these displacements were induced by climate-related hazards. Where the adverse impacts of climate change – such as water scarcity, crop failure, food insecurity, loss of land, and economic shocks – create challenging environments for children to live, learn, and thrive, migration can be a strategy to cope.



According to the global CCRI, one quarter of countries with “Extremely High” climate risk for children have very high levels of displacement – with more than 5 percent of the population displaced.<sup>x</sup>

Between 2021-2022, the top 5 LDCs with the highest number of uprooted people (as a percentage of total population) were **South Sudan, Somalia, Central African Republic, Yemen, and Afghanistan**.<sup>11</sup> LDCs host over 27 percent of all people displaced across borders worldwide, and the number of refugees in LDCs stood at 7 million at the end of 2021.<sup>xi</sup>

In the context of displacement, children suffer a variety of increased risks, including those related to family separation, exploitation, violence and abuse, loss of education, and often physical and psychological trauma. Such vulnerabilities put displaced children at an increased risk of the future impacts of climate change. Children who are uprooted are also frequently excluded from resilience-building efforts, participatory planning, and youth-led decision-making on climate change. Thus, these children remain unheard, and their potential is overlooked. How governments manage displacement is therefore integral to protect displaced children from the worst impacts of climate change.



### Fragility, displacement, and climate change in LDCs: Lake Chad

In Chad, the Chari and Logone rivers, which flow from the south-east into Lake Chad, provide the only source of natural irrigation.<sup>xii</sup> Livelihoods are dependent on subsistence farming and livestock rearing, so access to water is essential. The Food and Agriculture Organization (FAO) has reported that Lake Chad, has diminished by 90 percent over the past 50 years owing to climate change and population pressures, including droughts and over irrigation.<sup>xiii</sup> Water scarcity has also lowered crop yields and worsened pastures, driving families and young people from their homes in pursuit of more fertile land. As competition for access to Lake Chad and its precious resources has intensified, so too have tensions in the area, eroding social cohesion and resilience of communities and institutions, fuelling conflict and displacement.

11 Calculated indicator: The total number of uprooted people is the sum of refugees and asylum-seekers, returned refugees, people internally displaced by conflict and violence, and people internally displaced by disasters as proportion of the total population. Calculated using UNHCR and IDMC data.



## LDCs and global emissions

Climate change is deeply inequitable. The highest-risk places on Earth contribute least to the causes of climate change. According to the global CCRI, the 33 “Extremely High Risk” countries emit less than **10 percent** of global greenhouse gas emissions and the 10 most “Extremely High Risk” countries emit only **0.5 percent** of global emissions.

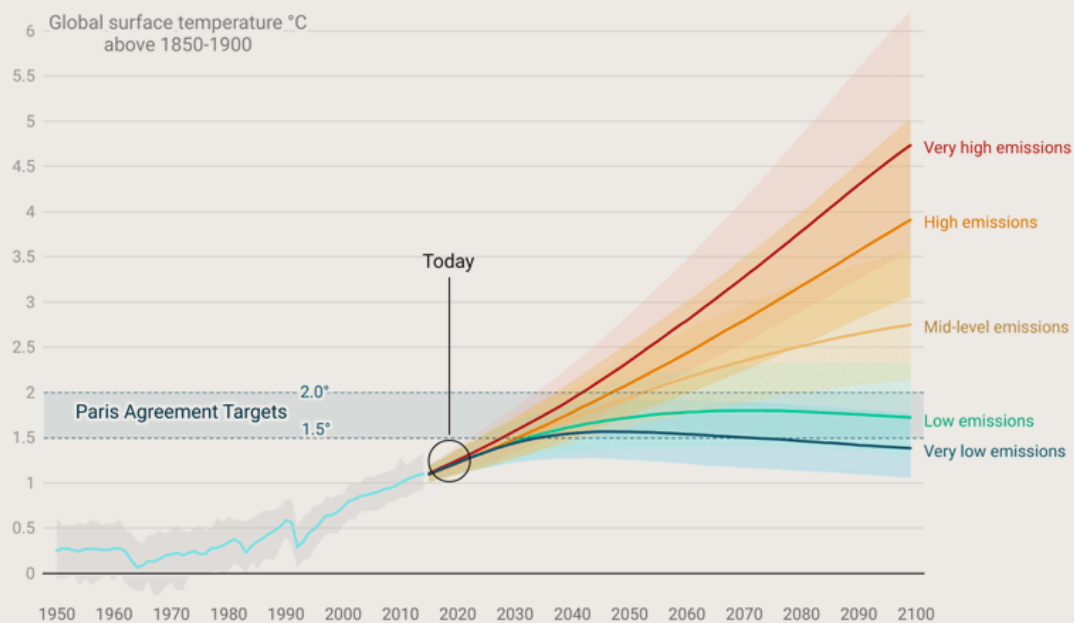
LDCs have a joint population of over one billion people yet contribute less than **1 percent** of global emissions – making them among the least responsible for causing climate change. Even the top 10 LDC countries with largest contribution to global emissions (percent of global CO<sub>2</sub> emissions) only produce **0.71 percent** of global CO<sub>2</sub> emissions.<sup>12</sup>

Conversely, the 10 highest emitting countries collectively account for approximately **two-thirds** of global emissions (**nearly 70 percent**)<sup>xiv</sup>, none of which are LDCs. This underscores the importance of high-emitter countries’ responsibility to adequately support the most vulnerable children, including those in LDCs.

The only long-term solution to the climate crisis is a reduction of emissions to safe levels – reaching net-zero by 2050 to stay on course for warming that does not exceed 1.5°C. However, climate dynamics are such that mitigation efforts will take decades to reverse the impacts of climate change, and for the children on the frontlines in LDCs this will be too late.

Even with ambitious action to reduce emissions, we will be living in a world with higher global average temperatures than currently. This means more droughts, more flooding, and other climate related disasters are inevitable.

**Figure 2**  
IPCC (2021) Global surface temperature change relative to 1850-1900



IPCC, 2021: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

<sup>12</sup> The sum percentage of global emissions of 46 LDC is 0.98% (rounded 1%). Calculated based on World Bank WDI and WPP Population data (2020 estimates).

Adaptation and resilience building offers the most effective way to protect child lives and family livelihoods from the immediate and expected impacts.

While LDCs have demonstrated some progress in the process in climate adaptation and resilience building, such as formulation and implementation of National Adaptation Plans (NAPs) and the implementation of the Sendai Framework for DRR, they frequently lack the capacity and resources to address critical needs. Adaptation and resilience of key social services, including in the sectors of WASH, health, nutrition, education, social protection, and child protection are of prime importance especially of the most vulnerable in society, including children. The rapid projected growth of urban populations presents additional challenges in the provision of services, which must develop and grow at a faster rate in order to keep pace.

Achieving this requires an urgent scaling of adaptation finance delivered to LDCs, to support both projects that improve the resilience of infrastructure and social services, as well as capacity building activities that contribute to long term socio-economic development.

## Climate finance

### Current trends in climate finance

In 2009, at the 15th Conference of Parties (COP) in Copenhagen, developed countries committed to a collective goal to mobilise USD 100 billion per year by 2020 for climate action in developing countries, in the context of meaningful mitigation actions and transparency on implementation.<sup>xv</sup> This goal was formalised at COP16, in the Cancun Agreements<sup>xvi</sup> and at COP21 in Paris, the annual USD 100 billion goal was extended to 2025, and Parties agreed that, prior to 2025, countries should set a new climate finance goal from the floor of USD 100 billion.<sup>xvii</sup> Moreover, the COP 26 [Decision -/CP.26 Glasgow Climate Pact](#) urged developed country parties to at least double their collective provision of climate finance for adaptation to developing country parties from 2019 levels by 2025.

The latest OECD climate finance report shows that total climate finance provided and mobilized by developed countries for developing countries reached **USD 83.3 billion in 2020**<sup>xviii</sup> meaning that developed countries have fallen short of meeting the USD 100 billion goal.

Climate finance flows are far short of what is needed to limit and adapt to warming of 1.5°C. International adaptation finance flows to developing countries are 5-10 times below estimated needs and the gap is widening. Estimated annual adaptation needs are **USD 160-340 billion by 2030** and **USD 315-565 billion by 2050**.<sup>xix</sup> Moreover, without a significant increase in financing, adaptation activities may be outpaced by escalating climate hazards, widening the adaptation implementation gap even further.

Financial flows for mitigation continue to be heavily prioritized over adaptation investments. For example, of the total climate finance mobilised by developed countries in 2020, USD 48.6 billion (58 percent) was for mitigation, USD 28.6 billion (34 percent) for adaptation, and USD 6.0 billion (7 percent) for cross-cutting activities.<sup>xx</sup> Nonetheless, the volume and number of adaptation efforts supported by international climate funds, multilateral funding, and bilateral donor support is growing. Between 2016 and 2020, bilateral and international public finance devoted solely to adaptation more than quadrupled, reaching 36 percent of total public finance in 2020.<sup>xxi</sup>

A limited portion of all private climate financing goes toward adaptation. Most private finance goes towards projects in middle-income countries, which are considered “low-risk.” The nature of existing private finance mechanisms makes mobilizing private finance for adaptation difficult. For example, adaptation projects frequently lack the revenue streams required to garner significant private investment and tend not to focus on activities that increase the resilience of smaller actors, such as small enterprises and farmers.<sup>xxii</sup>

The provision of scaled-up financial resources should aim to strike a balance between adaptation and mitigation, taking into account country-driven strategies. For LDCs, a greater proportion of climate finance must be provided for adaptation and resilience, including increased financing for nature-based solutions and ecosystem-based approaches.

## Climate finance mobilized for LDCs

There is mounting evidence that climate finance providers are not strategically focusing adaptation support to the countries and population groups most vulnerable and in need. Between 2016 and 2020, the 46 LDCs represented just **17 percent** of total climate finance provided and mobilized by developed countries (USD 12.6 billion).<sup>xxiii</sup>

Of the total climate finance that has been mobilized for LDCs, almost half targeted adaptation (45 percent).<sup>xxiv</sup> Agriculture, water, ecosystems, and cross-cutting sectors are the focus of actions and funds are particularly concerned with drought, flooding, and rainfall unpredictability. Adaptation finance remains highly concentrated, with more than 40 percent of total adaptation finance in LDCs directed to only 5 countries.<sup>xxv</sup>

Public finance accounted for the vast majority (93 percent) of total adaptation finance provided and mobilized in LDCs in the 2016-2020 period<sup>xxvi</sup> and the share of bilateral public finance flows for adaptation pledged to LDCs increased from 17 percent in 2019 to 25 percent in 2020.<sup>xxvii</sup> The share of climate finance provided via grants was higher in LDCs than all recipient countries, representing 62 percent of grants and 37 percent of loans of total public climate finance.<sup>xxviii</sup> The provision of climate finance in the form of grants is essential in LDCs, as the true value of adaptation investments is reduced when finance is mobilized in the form of loans, due to loan repayments and interest, which most LDCs do not have the capacity to repay. In contrast, private climate finance mobilized by developed countries for LDCs remained extremely low (2 percent on average).<sup>xxix</sup>

There is an urgent need to scale up and develop innovative finance mechanisms and to better integrate public and private resources and instruments in various country, sector, and risk contexts. Governments and other funders must leverage and increase access to all available traditional, innovative, and alternative climate and risk-reduction finance mechanisms. This includes in domestic budgets; with bilateral, multilateral, private sector, international finance institutions; and through officially supported export credits, grants, or other highly concessional forms of finance to fill funding gaps and finance urgent and essential adaptation action in LDCs.

## Delivering effective and equitable climate finance

To ensure climate finance for adaptation is delivered effectively and has an optimal impact in LDCs, funded adaptation projects must be appropriate to specific contexts and delivered through projects which are accepted by local communities – allowing them to live a life they value.

Investments must also be made into adaptation that are child sensitive, and which protect the rights and well-being of children from climate-related harm. This requires taking into consideration the specific adaptation needs and capacities of children and young people, prioritizing investment in low carbon and climate-resilient social services that reach children most at risk. It also requires that children and young people are meaningfully engaged as stakeholders in the development and implementation of adaptation solutions.

Climate finance should also be accompanied by transparent methods of tracking and reporting on financial flows. There is limited information available on the uses and impact of climate finance received by developing countries, as well as on activities undertaken. This is due in part to the non-mandatory nature of climate finance reporting responsibilities under the United Nations Framework Convention on Climate Change (UNFCCC), as well as developing countries' limited capacity to gather such information.<sup>xxx</sup> Thus, stronger metrics are needed to assess outcomes of adaptation finance and to measure the effectiveness of funds.

Additionally, there is a growing realization that international action must look beyond immediate climate-specific results to promote, enable, and accelerate the transition to low greenhouse gas emissions and climate-resilient development more broadly. In this context, LDCs' integration of climate change policies and targets (such as those outlined in Nationally Determined Contributions (NDCs)) into broader national development plans and procedures is a critical enabler of effective, country-owned climate action.<sup>xxxi</sup> These policies should reference domestic and international sources of finance identified with social sector ministries included in funding allocations. Further, children and young people must be recognized, included and influential in all climate policies and decisions that affect them.

To be **equitable**, investments must be made from high CO<sub>2</sub>-emitting countries to the lowest emitting countries. Adaptation must be prioritized for communities most at risk to protect children and families from experiencing vicious cycles of poverty and to ensure to leave no one behind. Further, a more equal distribution of investments must be provided across LDCs relative to vulnerability, especially in the form of grants or other highly concessional forms of finance, over loans.

LDCs frequently face challenges in accessing financing from multilateral climate funds, often due to the complexities of application process and a lack of adequate capacity to implement and/or manage international climate funding.<sup>xxxii</sup> Thus, there is a need for greater support to ensure that LDCs are not excluded from financing opportunities due to a lack of technical capacity. Moreover, LDCs are also often least able to afford the investment to strengthen resilience due to high debt burdens. Debt-for-climate swaps and debt-for-nature swaps are forms of innovative finance that aim to free up fiscal resources so that governments can build resilience without creating a fiscal crisis or sacrificing investment on other development priorities.<sup>xxxiii</sup>

Additionally, many LDCs have a history of social difference and discrimination where race, caste, gender, and other characteristics privilege some members, while others are marginalized. The burden of climate impacts often falls disproportionately on those who are disadvantages including girls, women, people with disabilities, and children on the move. Climate action can exacerbate existing inequalities and discrimination due to deeply entrenched social norms and reduced access to resources, climate education and technologies, and finance. Thus, adaptation investments and planning must consider how climate-related vulnerability intersects with discrimination, to ensure an equitable share of investments.

Greater investments in climate finance need to be made by developed countries to LDCs. To benefit the most vulnerable children and communities, climate finance needs to be accessible, delivered as grants or other highly concessional forms of finance, and a much greater proportion of it must be dedicated to adaptation action that is focused on increasing the resilience of essential child services, including capacity-building projects for communities.



© UNICEF/JUN0443374/Dejongh

## COP27 progress for LDCs

COP27 in Sharm El-Sheikh, Egypt, was an opportunity to set a new pathway to prioritize adaptation for countries most vulnerable to climate change.

COP27 saw a landmark decision in establishing a fund to address loss and damage. This [decision](#) is a huge success for developing countries and communities on the frontlines, after decades of action taken by the LDC Group in demanding climate justice. However, significant work remains to ensure the established fund has adequate systems and resources to effectively respond to the needs of the most vulnerable people, including people in LDCs, who should be prioritised as beneficiaries and partners for change.

Progress was also made on adaptation, with Parties agreeing to initiate a framework for the Global Goal on Adaptation, to be adopted at COP28. The framework will take into consideration, *inter alia*, the following themes: water; food and agriculture; cities, settlements, and key infrastructure; health; poverty and livelihoods; terrestrial and freshwater ecosystems; and oceans and coastal ecosystems. It will also include cross-cutting considerations: country-driven, gender-responsive, participatory, and fully transparent approaches, human rights approaches, intergenerational equity and social justice, taking into consideration vulnerable groups, communities, and ecosystems, and nature-based solutions. It aims to be based on and guided by the best available science and, *inter alia*, traditional knowledge, knowledge of Indigenous Peoples and local knowledge systems, community-based adaptation, DRR and intersectoral approaches with a view to integrate adaptation into relevant socioeconomic and environmental policies and actions.

Parties “noted with serious concern” the gap between current levels of adaptation finance and needs, calling on countries to “urgently scale up their provision of climate finance.” However, explicit commitments to doubling adaptation finance by 2025, agreed at COP26, was dropped, and is only referred to in the context of requesting the Standing Committee on Finance to “prepare a report on the doubling of adaptation finance” for consideration at COP28. The LDC Group continues to emphasize the need for financial assistance in allowing countries to implement NAPs.

A key decision will be taken in 2024 on the [new collective quantified goal on climate finance](#) (which will replace the USD 100 billion from 2025).

Further, COP27 did not result in an agreement on a more ambitious, accelerated energy transition to meet the 1.5-degree temperature limit. Limiting warming to 1.5°C is the only long-term solution to the climate crisis, therefore countries’ emissions reduction efforts must be drastically increased so that global emissions are cut in half by 2030.



A child takes part in a discussion on "From the Frontlines of the Climate Crisis: Adaption Actions to protect African Children and Youth" at COP27.



# Methodology

---

This report provides a conceptual framework, a tool, and country-level assessments of children’s exposure to climate and environmental hazards, shocks, and stresses and underlying vulnerabilities in LDCs – to help prioritize action including appropriate adaptation and resilience measures for those most at risk.

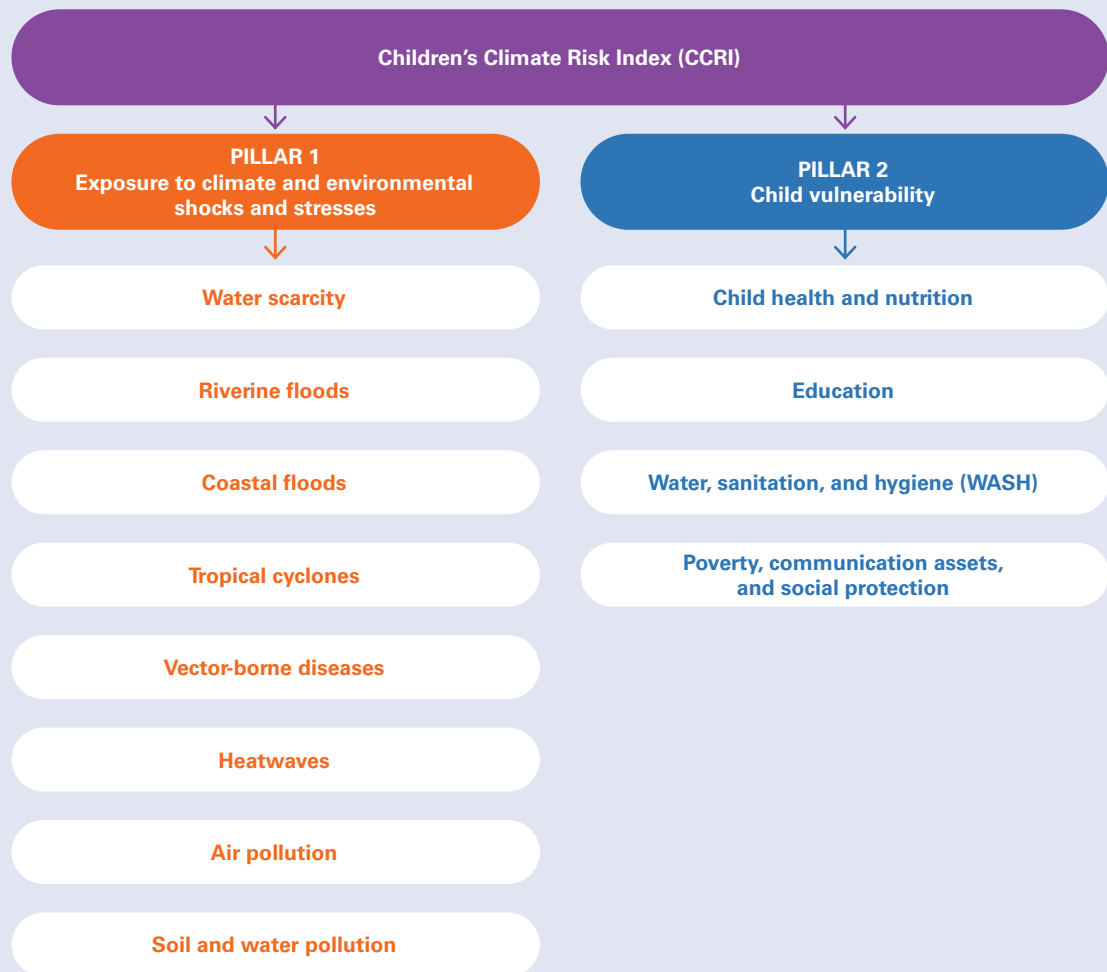
Understanding children’s exposure and vulnerabilities is essential for determining the full extent to which climatic and environmental threats may affect their well-being, if not their very survival. To develop effective adaptation measures, it is necessary to first understand the context-specific climate hazards that children in LDCs face. Adaptation and resilience measures must be based on a careful assessment of both the type, nature, and exposure to specific climate and environmental hazard, shock, or stresses, as well as the degree to which children are vulnerable.

The CCRI is a composite index that aims to capture the exposure of children to multiple climate and environmental shocks, stresses, and hazards, and seeks to represent a balanced view of the different sectors involved in the well-being of children, focusing on aspects that could contribute to, or aggravate, child deprivation in the context of climate-related and environmental shocks and stresses.

The model has a multilayer structure, where the CCRI is built by bringing together a set of indicators across two pillars:

- ▶ **Pillar 1** examines the exposure of children to currently monitored and recorded climate and environmental hazards, shocks, and stresses.
- ▶ **Pillar 2** examines child vulnerability and coping capacity, as reflected in children’s rights outlined in the Convention on the Rights of the Child. It captures child-specific dimensions that make children particularly susceptible to shock or stress (as indicated in Pillar 1). It also includes variables that relate to community, national or institutional abilities (strengths, performance) to manage the impacts of shocks and stresses (including capacity to deliver services).

The CCRI approach adopts and aligns with the IPCC risk framework<sup>xxxiv</sup> and as such considers risk as being composed of the key domains of hazards, exposure to identified hazards, and vulnerability, where vulnerability has the components of both sensitivity (immediate impact of hazard) and adaptive capacity (ability to respond in the longer term). Thus, indicators are selected which reflect these key categorizations and more specifically, reflect them in relation to children’s climate risks. In the CCRI, only components of sensitivity, immediately reflective of a child’s experience, are included. However, the index as a whole is then compared to metrics of adaptive capacity in order to elucidate any potential relationships between them. This approach is adopted to provide a specific policy relevance to the work.



To identify children’s climate risks in LDCs, researchers reviewed the global datasets for the 41 LDCs included in the CCRI and developed country profiles for each individual LDC, which included a breakdown of their CCRI score, Pillar 1 and Pillar 2 scores, and individual component scores. The use of indices made it easier to compare the underlying risk factors (with each area having a score of 0 to 10 on the final index) and the two pillars and all components of the model, where a higher score corresponds to a higher risk level or ‘worse situation’. These scores were then analysed to produce a synopsis of the climate and environmental hazards and underlying vulnerabilities in each LDC. The CCRI data for each country profile was further supplemented using publicly available data obtained from a variety of sources including Governments, UN agencies, research institutes, and global organizations. A lack of reliability and availability of data for Small Island Developing States (SIDS) (<20,000 sq/km) meant that they were excluded from the global CCRI analysis. For the 5 SIDS identified as LDCs, a separate analysis of publicly available datasets, which correspond to the components and indicators used in CCRI methodology, were used.

There are several limitations to the CCRI. For example, there are a variety of hazards, shocks, and stresses not captured in Pillar 1, such as earthquakes, volcanic hazards and other types of pollutants, and toxic exposures. Moreover, there is a lack of subnational data on child vulnerabilities (Pillar 2). In countries where a sub-national data CCRI was conducted, the analysis could examine where specific climate and environmental hazards interact with child vulnerabilities. Another limitation is forward-looking analysis. The current version of the CCRI only examines the current and near-term exposure of children to climate and environmental hazards, shocks, and stresses as well as current child vulnerabilities.

Whilst this report aims to address the data requirements to fully comprehend children’s climate risks in LDCs, including the 5 SIDS internationally classified as LDCs, significant data gaps remain. Such data is required to assist and guide domestic legislation and policies on adaptation. A key challenge in early action is reluctance to expend scarce financial resources on interventions that may prove unnecessary. There is also a lack of disaggregated (notably gender and age) and geo-referenced data including high-resolution hazards maps and gridded population data sets, which are essential for understanding current and future population exposure to climate and environmental hazards, to implement targeted adaptation measures. These data gaps are major barriers for the development of strong climate change rationales for LDC adaptation funding proposals. Therefore, better data collection from trustworthy data sources that are consistent over time and similar across contexts is required in LDCs. This can help to increase the visibility of child-specific climate risks and vulnerabilities and seek dedicated funding to increase the resilience of critical child services.

This is as much an attempt to present a unique and improved perspective on children’s climate and environmental risk, as it is a call for more and better data. Only with stronger data and evidence will we be able to truly understand the risks facing children and respond to their needs accordingly.



For a more detailed description of the methodology, please see [The Climate Crisis is a Child’s Rights Crisis: Introducing the Children’s Climate Risk Index.](#)





© UNICEF/UN0658417/But

## Country Profiles

# East Asia and the Pacific

The East Asia and Pacific region (EAPR) is home to 580 million children, with about 30 million in extreme poverty who are disproportionately impacted by climate change and environmental degradation.<sup>xxxv</sup>

The region has some of the largest number of children highly exposed to multiple climate risks, including more frequent and severe floods, droughts, storms, vector-borne diseases, air pollution, salt-water intrusion and heatwaves. Within EAPR, Myanmar is ranked within the top 33 “Extremely High Risk” CCRI countries. Omitting LDCs, the EAPR region, with fast growing economies, is responsible for an increasing share of global greenhouse gas emissions, making up approximately one-third of global CO<sub>2</sub> emissions.<sup>xxxvi</sup>



**Table 1**  
Estimates of children’s exposure to climate related hazards, shocks, and stresses in LDCs in EAPR

Country	Number of children under 18 years old exposed to / living in areas with					
	Water scarcity	Riverine floods (50 years)	Coastal flood risk	Extensive cyclone wind (100 years)	Intensive cyclone wind (100 years)	Heatwaves
<b>Cambodia</b>	110 thousand	2.9 million	290 thousand	880 thousand	-	220 thousand
<b>Lao People’s Democratic Republic</b>	390 thousand	1 million	170 thousand	2.4 million	180 thousand	2.1 million
<b>Myanmar</b>	610 thousand	4.5 million	5.8 million	4.4 million	-	2.3 million
<b>Solomon Islands</b>	-	-	270 thousand	220 thousand	-	-
<b>UNICEF EAP LDCs (4 countries)</b>	<b>1.1 million</b>	<b>8.4 million</b>	<b>6.5 million</b>	<b>7.9 million</b>	<b>190 thousand</b>	<b>4.7 million</b>

**Table 2**  
Estimates of children’s exposure to environmental hazards, shocks, and stresses in LDCs in EAPR

Country	Number of children under 18 years old exposed to / living in areas with			Number of children under 20 years old exposed to
	Ambient air pollution (PM2.5 >= 10 µg/m3)	Ambient air pollution (PM2.5 >= 25 µg/m3)	High pesticide pollution risk	Lead pollution
<b>Cambodia</b>	6 million	-	4.5 million	3.2 million
<b>Lao People’s Democratic Republic</b>	2.8 million	860 thousand	50 thousand	580 thousand
<b>Myanmar</b>	17.2 million	3.6 million	8.6 million	4.7 million
<b>Solomon Islands</b>	-	-	-	100 thousand
<b>UNICEF EAP LDCs (4 countries)</b>	<b>26 million</b>	<b>4.5 million</b>	<b>13.1 million</b>	<b>8.5 million</b>

**Table 3**  
Estimates of children living in areas exposed to one or more disease vectors in LDCs in EAPR

Country	Number of children under 18 years old living in areas exposed to one or more disease vectors*
<b>Cambodia</b>	6.1 million
<b>Lao People’s Democratic Republic</b>	2.8 million
<b>Myanmar</b>	17.3 million
<b>Solomon Islands</b>	240 thousand
<b>UNICEF EAP LDCs (4 countries)</b>	<b>26.3 million</b>

\*Plasmodium Falciparum Malaria, Plasmodium Vivax Malaria, Aedes, Dengue, Zika

Source: CCRI index (Beta version) (All absolute numbers rounded to the nearest decimal of a million, nearest ten thousand if greater than or equal to 10,000 or nearest five thousand if less than 10,000)

# Cambodia



CCRI ○ ● ○ ○ ○



6.5 | High

## Climate and environment shocks



7.2 | Pillar 1

Water scarcity	3.7	<div style="width: 37%;"></div>
Riverine floods	9.5	<div style="width: 95%;"></div>
Coastal floods	7.1	<div style="width: 71%;"></div>
Tropical cyclones	4.1	<div style="width: 41%;"></div>
Vector borne disease	9.0	<div style="width: 90%;"></div>
Heatwaves	4.6	<div style="width: 46%;"></div>
Air pollution	4.9	<div style="width: 49%;"></div>
Soil and water pollution	9.2	<div style="width: 92%;"></div>

## Child vulnerability



5.6 | Pillar 2

Child health and nutrition	6.3	<div style="width: 63%;"></div>
Education	4.4	<div style="width: 44%;"></div>
Water, sanitation, and hygiene	5.9	<div style="width: 59%;"></div>
Poverty, communication assets and social protection	5.7	<div style="width: 57%;"></div>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Cambodia; 2 out of the 23 indicators included in pillar 2 have no data.

Cambodia has a CCRI score of **6.5** and ranks **46<sup>th</sup>** out of the 163 CCRI countries and regions, placing children in Cambodia at “**High**” risk.

According to the CCRI, the climate and environmental shocks that children in Cambodia are highly exposed to include:



### Riverine flooding

Almost half of the population of children in Cambodia (47 percent) are exposed to riverine flooding. The Mekong River and Tonle Sap River tributaries frequently overflow, inundating Kampong Cham, Kratie, Kandal, Prey Veng, Stung Treng, Svay Rieng, and Takeo. Cambodia is also prone to flash floods, especially during the monsoon season. Riverine flooding has caused significant damage to livelihoods, social infrastructure, and the economy in Cambodia. For example, according to the UNISDR, Cambodia loses approximately USD 250 million per year on average due to floods (just over 1 percent of GDP).<sup>xxxvii</sup> Effective flood risk management is needed to reduce potential losses and damages related to floods in the country. Climate models predict an increase in average annual rainfall, particularly during the wet season, which<sup>xxxviii</sup> is expected to raise peak discharge in rivers and streams, leading to an increased frequency, duration, and severity of flooding. However, upstream hydropower developments along the Mekong and its tributaries, may serve to counteract this, by causing a reduction in rainy season flows.<sup>xxxix</sup>



### Vector-borne diseases

Several arboviruses, including dengue and Japanese encephalitis, are rife in Cambodia and 6.1 million children are living in areas exposed to one or more disease vectors according to the CCRI. For example, Cambodia's entire population of children are exposed to dengue, 96 percent of children are at risk of aedes, and 59 percent are exposed to zika. Research has shown that education facilities in Cambodia are high risk areas for vector-borne disease transmission, thus necessitating vector control methods in schools.<sup>xi</sup>



### Soil and water pollution

The main industries contributing to soil and water pollution in Cambodia include agriculture, garment factories, brick kilns, rice milling, and rubber processing.<sup>xli</sup> Polluted water sources remain a primary concern, especially in rural areas given that limited WASH infrastructure exists outside of urban centres. Almost half of all children and adolescents under the age of 20 are exposed to lead pollution (48 percent), posing significant risks to physical and neurological development, especially in young children. Additionally, 4.5 million children (74 percent) live in areas with high pesticide pollution risk. Pesticide exposure can result in acute or chronic poisoning, with symptoms ranging from skin irritation to delayed development, reproductive abnormalities, cancer, and even death.



### Coastal flooding

Coastal flood risk is high in Cambodia, scoring 7.1 on the CCRI, although riverine and flash flooding are more prominent. The coastal region on the Gulf of Thailand is vulnerable to cyclone and tsunami-induced storm surges, but to a lesser extent than other LDCs. Sea-level rise is expected to pose more serious threats to coastal communities in the future, which already face storm surges, high tides, beach erosion, and seawater intrusion.<sup>xliii</sup> Without adequate resilience measures, the impacts of coastal flooding will undoubtedly worsen, especially in fishing and agricultural communities in the country's south-western region.<sup>xliiii</sup>

## Underlying vulnerabilities



### Health and nutrition

Cambodia's health system has witnessed considerable advances over the past few decades. Preliminary findings of the Cambodia Demographic Health Survey (CDHS 2021-22) show that compared to 2014, overall child mortality and maternal mortality have improved, with substantial reductions in under-5 mortality, infant mortality and neonatal mortality.<sup>xliv</sup> There has also been a decline in childhood stunting from 34 percent in 2014 to 22 percent in 2021, however the prevalence of childhood wasting, or acute malnutrition remains unchanged, at 10 percent over the past years.<sup>xlv</sup> Some provinces have wasting rates that exceed emergency levels over 15 percent.<sup>xlvi</sup> Micronutrient deficiencies also remain persistent, especially for children and women of reproductive age, where an estimated 36.5 percent of Cambodian pregnant women were anaemic in 2019.<sup>xlvii</sup> Key drivers of malnutrition likely include inadequate care and feeding of infants and young children, inadequate WASH, poverty, limited access to quality services and low maternal education. Climate models predict that by 2050, there could be up to 59 climate-related fatalities per million people in Cambodia due to a lack of food, under high emission scenarios (RCP8.5).<sup>xlviii</sup> Greater investments into care for children, the rural poor, and maternal health are crucial to reduce vulnerability to the impacts of climate change.

In comparison to other LDCs, Cambodia has relatively lower scores for other vulnerability components, including poverty assets and social protection, education, and WASH. Nevertheless, there are still areas of improvement to be made to increase the resilience and adaptiveness of essential child services.



### WASH

Despite advancements in WASH systems and practices, children continue to be stunted and die from preventable WASH related causes, as a result of limited access to clean water, toilets and hand-washing facilities. Less than half of households have access to basic drinking water services (44 percent) and just 28 percent of households are drinking water from safely managed services.<sup>xlix</sup> Access to hygiene and sanitation services has seen improvements. In 2020, 69 percent of households had at least basic sanitation and only 14 percent of the population had no handwashing facilities.<sup>i</sup>



### Poverty and social protection

In 2020, around 21 percent of Cambodian children lived in households with income below the national poverty line.<sup>ii</sup> Inadequate infrastructure and access to basic services remain key challenges keeping Cambodian children in poverty. For example, the absence of year-round access to all-weather roads impacts Cambodian food value chains, as well as to health, education, and other public services.<sup>iii</sup> Regarding social protection, only 10 percent of households are receiving child or family benefits and 38 percent of the population above the age of 15 are unable to come up with emergency funds. In the absence of adaptive and shock responsive social protection, poor children and families are likely to be pushed even further into poverty.



### Education

Cambodia has made remarkable progress in education. The adjusted net attendance rate for children of primary school age was approximately 93 percent in 2014.<sup>liii</sup> Youth literacy rates also remain high at 92 percent. Nonetheless, Cambodian children continue to fall short of age-appropriate learning levels. For example, in primary schools, roughly a quarter of students in Grade 3 are unable to write a single word in a dictation exam and only 27 percent of 3 to 5-year-olds are developmentally on track in literacy and numeracy.<sup>liv</sup> Recent national learning assessment results indicate only 55 percent and 26 percent of grade 6 students achieve minimum proficiency in Khmer language and mathematics respectively.<sup>lv</sup> Inadequate learning in early years, poor nutrition, a lack of qualified teachers and insufficient WASH infrastructure in schools are the main drivers of poor educational development. Discrimination towards disabled children still exists and many parents, particularly in rural and impoverished areas, do not see the value of education or cannot afford to send their children to school.

# Lao People's Democratic Republic



CCRI ○ ● ○ ○ ○ 6.7 | High

**Climate and environment shocks** 7.5 | Pillar 1

Water scarcity	5.0	
Riverine floods	9.3	
Coastal floods	7.3	
Tropical cyclones	7.2	
Vector borne disease	8.1	
Heatwaves	8.3	
Air pollution	7.8	
Soil and water pollution	5.4	

**Child vulnerability** 5.8 | Pillar 2

Child health and nutrition	8.0	
Education	4.3	
Water, sanitation, and hygiene	5.1	
Poverty, communication assets and social protection	5.8	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Lao People's Democratic Republic; 3 out of the 23 indicators included in pillar 2 have no data.

The Lao People's Democratic Republic or 'Laos' has a CCRI score of **6.7** and ranks **40<sup>th</sup>** out of the 163 CCRI countries and regions, placing children in Laos at **"High"** risk.

According to the CCRI, the climate and environmental shocks that children in Laos are highly exposed to include:<sup>13</sup>



## Riverine flooding

36 percent of children are exposed to riverine flooding in Laos, with areas along the Mekong River's low-lying plains being particularly vulnerable. Flash flooding and landslides are also frequently experienced hazards. These shocks are dangerous to children because of their quick onset and destructive nature, causing mass damage to critical infrastructure and leaving children and their families with little warning to prepare and respond. Without adaptation measures, the total population expected to be affected by riverine flooding annually is expected to double to over 80,000 people by 2030.<sup>13</sup> However, because the potential for increased loss and damage from flash floods and landslides is poorly known, the number of people impacted could be substantially larger.

<sup>13</sup> The coastal flood risk indicator has been removed from the country profile description for Laos. Laos is a landlocked country which is not exposed to this type of shock. The scoring reflects limitations of the resolution of the coastal flood map used in the CCRI.



### Heatwaves

In Laos, 76 percent children are exposed to heatwaves. Climate projections predict an increase in the probability of future heatwaves, along with a transition towards a chronically heat stressed environment, with up to 110 more days exceeding temperatures above 35°C, annually, under high emission scenarios.<sup>lvii</sup> Heatwaves and extreme heat exacerbate crop failure and food insecurity, with severe impacts on child nutrition, particularly for poorer communities operating subsistence and rain-fed agriculture. Without adaptation, the increased instances of extreme heat during the growing season of staple crops such as rice is expected to result in significant yield reduction in Laos.<sup>lviii</sup>



### Vector-borne diseases

2.8 million children are living in areas exposed to one or more disease vectors in Laos. Around 96 percent of children are exposed to dengue, 74 percent are exposed to zika, and 59 percent are at risk of aedes. The vectoral capacity for dengue fever in Laos is expected to increase in the future under a high emission scenario.<sup>lix</sup> Moreover, by 2070, approximately 1.9 million people are projected to be at risk of malaria annually under a high emissions scenario, this estimate reduces to about 1.6 million annually if there is a rapid reduction in global emissions.<sup>lx</sup> Such high exposure to vectors, which would be exacerbated by climatic risks like flooding, makes it critical to build the resilience of healthcare services and implement vector control measures.



### Air pollution

Every child in Laos is exposed to ambient air pollution, which exceeds (PM2.5 >= 10 g/m<sup>3</sup>) and almost one third of children are exposed to levels of (PM2.5 >= 25 µg/m<sup>3</sup>). Laos primarily relies on small-scale industries, where the primary causes of air quality issues include soil movement, stone, sand, building construction, land development for shelters, construction and road maintenance, and dirty roads.<sup>lxi</sup>



### Tropical cyclones

85 percent of children are exposed to extensive cyclone winds (within a 100-year return period). Five tropical cyclones have affected Laos over the past two decades, impacting over 1.5 million people and costing over USD 400,000 in damage, when combined with the effects of south-west monsoons.<sup>lxii</sup> Cyclones encompass several hazards dangerous to children, including coastal flooding, storm surges, extreme winds, and lightning. As climate change accelerates, warmer ocean temperatures and rising sea levels are expected to increase the frequency of high-intensity cyclones (category 4 or 5).<sup>lxiii</sup> Cyclones that are more severe will cost more in lives lost and infrastructure damage.



### Water scarcity

Laos scores comparably lower for water scarcity than other LDCs. Nonetheless, whilst Laos has an abundance of water – water scarcity is common in remote rural areas and drought is an increasingly pressing issue.

## Underlying vulnerabilities



### WASH

Inadequate WASH services remain a key challenge in Laos, where less than 20 percent of households are using safely managed drinking water services and 34 percent have limited hygiene services.<sup>lxiv</sup> Access to safely managed sanitation services is much higher at 61 percent.<sup>lxv</sup> In rural areas, open defecation is practised by around 26 percent of households, which pollutes surrounding environments and has devastating consequences on community health. Insufficient drinking water supplies, combined with poor sanitation, hygiene, and sewerage contributes to a high prevalence of diarrhoea, dysentery, typhoid, and cholera in Laos. Moreover, just 66 percent of the 8,857 primary schools have access to both a water supply and toilets.<sup>lxvi</sup> Inadequate WASH facilities in schools have a significant impact on enrolment, attendance, retention rates, and learning outcomes, particularly for girls and children living in rural areas, where school WASH facilities are poor.



### Health and nutrition

In the last four decades, eight epidemics have occurred in Laos. Smallpox, malaria, diarrhoea, dysentery, dengue fever, and cholera outbreaks have been reportedly linked to the country's recurring floods and droughts in recent years.<sup>lxvii</sup> The child mortality rate in Laos is approximately 42.5 per 1,000 live births for children under the age of 5.<sup>lxviii</sup> Newborn complications, diarrhoea, and pneumonia are the leading causes of child mortality, and disproportionately affect children from low-income households. The most cost-effective, high-impact strategy for lowering death and morbidity is immunization of both mothers and children. Nonetheless, only 50 percent have access to their second measles vaccination.<sup>lxix</sup> Malnutrition is also prevalent in Laos, where approximately one third of children under the age of 5 are stunted for their age.<sup>lxx</sup>



### Poverty and social protection

Laos has made remarkable progress in reducing poverty in the last 25 years. Between 1993 and 2019, the poverty rate decreased by nearly half, from 46 percent to 18 percent.<sup>lxxi</sup> Rising farm revenues have aided poverty reduction, as agricultural households have transitioned from subsistence rice cultivation to commercial cash crop production. Notwithstanding, climate change is likely to threaten such progression. Families who rely on the agricultural sector are in danger of falling into poverty without sufficient adaptation and resilience measures and access to social safety nets. Further, the impact of the COVID-19 pandemic has made it increasingly difficult for farmers to diversify their livelihoods.<sup>lxxii</sup>

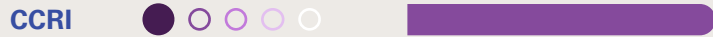


### Education


In comparison to other LDCs, Laos has a lower vulnerability score for education. Laos has been successful in meeting the Millennium Development Goals objective of universal access to basic education with gender parity, with a primary education enrolment rate of almost 99 percent in 2017.<sup>lxxiii</sup> Additionally, youth literacy rates remain high at around 93 percent. Whilst this shows great progress, around 70 percent of 5-year-old children are not enrolled in Early Childhood Education programmes, with those in hard-to-reach locations and from low-income households the most disadvantaged.<sup>lxxiv</sup> Restricted access to early childhood education can have a significant impact on the number of repeated years and dropout rates in primary school. In addition, the learning results of students are poor, leaving youngsters lacking critical knowledge and skills needed to build their adaptive capacity.



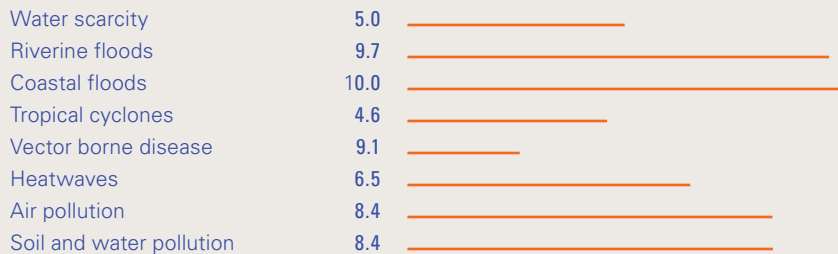
# Myanmar




7.1 | Extremely High

**Climate and environment shocks** 

8.3 | Pillar 1



**Child vulnerability** 

5.4 | Pillar 2



Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Myanmar; all of the 23 indicators included in pillar 2 have data.

Myanmar has a CCRI score of 7.1 and ranks 31<sup>st</sup> out of the 163 CCRI countries and regions, placing Myanmar in the “Extremely High” risk CCRI category.

According to the CCRI, the climate and environmental shocks that children in Myanmar are highly exposed to include:



**Coastal flooding**

Approximately one third of children live in areas of coastal flood risk in Myanmar. Sea-level rise, coastal erosion, and flooding have significant impacts on coastal communities, particularly those reliant on agriculture, as coastal floods damage crops, salinize paddy fields and destroy farmland. Coastal flooding is also be caused by cyclones and storm surges, although levels of exposure to tropical cyclones are comparably lower than in other LDCs. Future sea-level rise will undoubtedly raise the risks of coastal flooding in Myanmar, necessitating investments in coastal flood protection measures.



**Riverine flooding**

Over a quarter of children in Myanmar are exposed to riverine flooding (26 percent), and the prevalence of floods has increased over the past two decades. Rainfall patterns are becoming increasingly variable, with shorter rainy seasons paired with irregular and heavy rainfall, increasing flood episodes. In July 2021, riverine flooding from monsoon rains affected over 125,000 people in the Kachin, Kayin, Mon, Rakhine, and eastern areas of Shan states.<sup>lxxv</sup> Landslides and flash floods are also common, particularly in mining districts. Inadequate shelters and flood protection measures also make refugee camps particularly susceptible to the impacts of flooding. For example, in August 2021, flash floods and a landslide devastated the Maga Yang camp which hosted 1,600 internally displaced people.<sup>lxxvi</sup>



### Vector-borne diseases

17.3 million children are living in areas exposed to one or more disease vectors in Myanmar. 96 percent of children are exposed to dengue, 85 percent are at risk of aedes, and 53 percent are exposed to zika. In 2018, 291 out of 330 of Myanmar's townships were malaria endemic.<sup>lxxxvii</sup> The burden of malaria has declined 82 percent from 2012 to 2017<sup>lxxxviii</sup> and annual malaria death rates dropped from approximately 3,800 a year in 2010 to 170 in 2020.<sup>lxxxix</sup> Notwithstanding, disease outbreaks are likely to increase with more frequent flood events, which create favourable conditions for mosquito breeding grounds.



### Air pollution

In Myanmar, almost all children (99 percent) are exposed to ambient air pollution levels of (PM2.5  $\geq$  10  $\mu\text{g}/\text{m}^3$ ) and 21 percent are exposed to ambient air pollution levels of (PM2.5  $\geq$  25  $\mu\text{g}/\text{m}^3$ ). Smog-forming emissions from old vehicles and the burning of waste (household, industrial, agricultural) deteriorate the air quality in urban areas, especially in Yangon which is Myanmar's most polluted city.<sup>lxxx</sup> Levels of Indoor air pollution (IAP) are also high in Myanmar, where almost all rural households cook with highly polluting biomass. IAP is responsible for 62 percent of infant mortalities from acute lower respiratory infections in the country.<sup>lxxxii</sup>



### Soil and water pollution

Mining and agriculture are leading causes of soil and water pollution in Myanmar. Communities living near mines are frequently exposed to toxic elements including, arsenic and lead, which leach into soil or surface water from mining waste. One quarter of children and adolescents under the age of 20 in Myanmar are exposed to lead pollution. The insufficient disposal of mining waste poses significant health risks, especially when agricultural activity is carried out on mine waste deposited farmland. Additionally, half of Myanmar's child population live in areas with high pesticide pollution risk. Pesticide exposure can result in acute or chronic poisoning, with symptoms ranging from skin irritation to delayed child development, reproductive abnormalities, cancer, and death. The poor management of pesticides also increases risks of harmful exposure. For example, farmers frequently exceed recommended doses and do not use adequate storage or protective equipment.<sup>lxxxiii</sup>

## Underlying vulnerabilities



### WASH

In Myanmar, almost three quarters of households (74.5 percent) have access to basic hygiene services and around 61 percent have safely managed sanitation services.<sup>lxxxiiii</sup> Approximately 9 million people, including 3 million children, remain without access to safe drinking water in the country.<sup>lxxxv</sup> One quarter of schools have a restricted or non-existent basic drinking water supply and 4 out of every 10 schools have inadequate or non-existent basic sanitation and hygiene facilities.<sup>lxxxvi</sup> WASH provision is also a challenge in health facilities, adding to the risk of neonatal deaths. Displaced families and children in camps in Kachin, Rakhine, and northern Shan States are especially vulnerable to inadequate drinking water services, being unable to obtain clean drinking water or utilize banking services to purchase bottled water.<sup>lxxxvii</sup>



### Health and nutrition

Access to adequate health and nutrition is beyond the reach of many children in Myanmar. Conflict has hugely disrupted the health sector, with threats and violence discouraging healthcare workers from delivering services. Child mortality under the age of 5 stands high at 45 per 1,000 live births and around one quarter of children under the age of 5 are stunted for their age. The highest risk factors for poor health in children under the age of 5 include low birth weight, childhood underweight, inadequate breastfeeding, and household air pollution. Further, maternal health outcomes are poor, with 250 maternal deaths per 100,000 live births and only 60 percent of babies are delivered by a qualified healthcare professional.<sup>lxxxviii</sup>



### Poverty and social protection

Following more than a decade of progress, the number of impoverished people is predicted to double in Myanmar, as a result of economic shock, virtual health system collapse, COVID-19 and rising violence following the military takeover in February 2021.<sup>lxxxix</sup> Social protection in the country is limited, at only 6.3 per cent of effective coverage according to the ILO.<sup>lxxxix</sup> Moreover, only one third of the population (over 15 years of age) are able come up with emergency funds when crisis hits and only 0.02 percent of GDP is spent on social safety nets.



## Education

Myanmar has seen significant improvements in the education sector in recent years, achieving a primary school attendance rate of 92 percent<sup>xc</sup> and youth literacy rate of 95 percent.<sup>xci</sup> Nevertheless, access to a safe and consistent learning environment now presents a key challenge. Conflict, the COVID-19 epidemic, and social and political turmoil has displaced over 200,000 adults and children and resulted in 12 million school-aged children and adolescents having their education disrupted. Missed schooling has far-reaching effects for child development, mental health, and reduces an individual's adaptive capacity, making children in Myanmar even more vulnerable to climate change.

# Solomon Islands



CCRI



5.2 | Medium-High

## Climate and environment shocks



4.1 | Pillar 1

Water scarcity	0.0
Riverine floods	0.1
Coastal floods	9.4
Tropical cyclones	5.0
Vector borne disease	5.7
Heatwaves	0.0
Air pollution	0.0
Soil and water pollution	4.4

## Child vulnerability



6.1 | Pillar 2

Child health and nutrition	5.9
Education	2.2
Water, sanitation, and hygiene	8.7
Poverty, communication assets and social protection	7.4

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Solomon Islands; 10 out of the 23 indicators included in pillar 2 have no data.

The Solomon Islands is a sovereign country consisting of 6 major islands and 900 smaller islands in the Pacific region. Whilst considered a SIDS, the total land area for the Solomon Islands exceeds 20,000 sq/km, at 27,990 sq/km,<sup>xcii</sup> warranting the islands' inclusion in the CCRI analysis. The Solomon Islands have a CCRI score of 5.2 and rank 72<sup>nd</sup> out of the 163 CCRI countries and regions, placing children in the Solomon Islands at "Medium-High" risk.<sup>14</sup>

According to the CCRI, the climate and environmental shocks that children in the Solomon Islands are highly exposed to include:



### Coastal flooding

Almost all children (99 percent) live in areas with coastal flood risk in the Solomon Islands. Coastal flooding threatens critical infrastructure, settlements, coastal food stocks, and livelihoods. For example, 72 percent of medical facilities fall within 500 m of the coast in the Solomon Islands.<sup>xciii</sup> Water resources in low lying coastal areas are especially at risk. Typically, coastal communities are dependent on surface water as aquifers, such as ponds and reservoirs, which are expected to become inundated and salinized, as a result of more frequent storm surges. The majority of Solomon Islanders live along the shore at sea level and movement out of coastal zones is limited, due to the upper area of the Solomon Islands being volcanic and rugged, making it unsuitable for human settlement and agricultural development. The western province's Roviana district is especially vulnerable to flood impacts due to its high population density. In addition, the Solomon Islands are in an area

<sup>14</sup> Many SIDS face serious and existential threats due to climate change that are not adequately reflected in the data, and not captured appropriately in a multi-hazard index.

which has experienced above-average rates of sea-level rise in recent decades. Between 1993 and 2010, projections suggest rises in the tropical western Pacific of 8 to 10 millimetres per year on average, compared to a global average rate of about 3.4 mm/year.<sup>xciv</sup>



### Vector-borne diseases

An estimated 240,000 children are living in areas exposed to one or more disease vectors in the Solomon Islands. Regarding vector exposure, 77 percent of children are exposed to dengue, 41 percent are exposed to zika, and 30 percent are at risk of aedes. Children's malaria risk is substantially higher, at 82 percent<sup>15</sup>, with children under the age of 5 being among the most affected groups. Vector-borne disease risk increases during cyclone and flood events, as stagnant water creates ideal breeding grounds for mosquitoes.



### Soil and water pollution

While data gaps related to coastal water quality exist, there is evidence of coastal pollution as a result of logging activities and poor waste management, with sewerage frequently released into the ocean and rivers.<sup>xcv</sup> Water bores are highly susceptible to pollution from human and solid waste, particularly in settlements lacking proper drainage and septic systems. Water pollution worsens during flood events when latrines and wells overflow, and the salination of water supplies presents threats of water scarcity.<sup>xcvi</sup> Logging and mining are key drivers of pollution. For example, sites around the Gold Ridge mine in Guadalcanal have metal and arsenic levels that exceed safe limits.<sup>xcvii</sup> Further, approximately 28 percent of children and adolescents under the age of 20 are exposed to lead pollution, which can have a negative influence on physical and neurological development.



### Tropical cyclones

The tropical cyclone season occurs between November and April and passes through the Solomon Islands' exclusive economic zone at a rate of about 21 per decade.<sup>xcviii</sup> Around 27 percent of all cyclones are Category 3 or higher and cyclones are more frequent in El Nino years (39 per decade).<sup>xcix</sup> Cyclone exposure is highest on the south-eastern islands of Makira, Ulawa, Rennell, and Bellona.<sup>c</sup> Some climate models project that the Solomon Islands may experience a decrease in the frequency of tropical cyclones by 2100.<sup>ci</sup> Nonetheless, there is evidence that the maximum wind speed of cyclones and rainfall intensity may rise, increasing the severity of impacts on children, including an increase in fatalities and the destruction of critical infrastructure.<sup>cii ciii</sup>



### Wider disaster risks in the Solomon Islands

Alongside climatic hazards, the Solomon Islands are highly vulnerable to a variety of geophysical hazards excluded in the CCRI, including volcanos, landslides, tsunamis, and earthquakes. For example, in 2016 a magnitude 7.8 earthquake struck 38 miles south-west of Kirakira, the provincial capital of Makira-Ulwa Province. Around 34,000 people were affected by widespread loss of homes, communal kitchens, food sources, and livelihoods in the provinces of Makira, South Malaita, and Guadalcanal.<sup>civ</sup> Numerous aftershocks, including a severe 6.9 magnitude second earthquake occurred and many communities fled to higher ground in fear of tsunami waves.<sup>cv</sup> Responding to disasters in the Solomon Islands is challenging given the isolation of many of the island populations. As a result, multi-hazard disaster management plans that emphasise community preparedness and resilience are critical.

15 Exposure to both (*Plasmodium falciparum* (PF) and *Plasmodium vivax* (PV)).

## Underlying vulnerabilities



### WASH

Access to clean water, sanitation, and hygiene is a significant challenge in the Solomon Islands. Almost one third of households do not have access to drinking water from an improved source (within 30-minute round trip of their home) and 40 percent of schools have no drinking water service.<sup>cxvi</sup> Moreover, 64 percent of the population do not have access to basic handwashing facilities including soap and water. Significant urban-rural disparities in the practice of safe WASH exists in the Solomon Islands. For example, in rural areas, 58 percent of households practice open defecation, compared to only 4 percent of households in urban areas.<sup>cxvii</sup> Hazards such as flooding, and cyclones pose additional risks to the already limited WASH sector. For example, in 2020 Cyclone Harold destroyed the majority of WASH infrastructure across impacted Pacific Islands, including the Solomon Islands.<sup>cxviii</sup>



### Health and nutrition

In recent years, significant progress has been made in the Solomon Islands' health sector. Neonatal and infant mortality rates are low at 8<sup>cxix</sup> and 16<sup>cx</sup> per 1,000 live births respectively and child mortality rates are significantly lower than in other LDCs (19 per 1,000 live births).<sup>cxvi</sup> Nevertheless, improvements in the healthcare sector can still be made. Inadequate WASH contributes to the prevalence of diarrhoea and other diseases and to high levels of malnutrition in the country. 29 percent of children under the age of 5 in the Solomon Islands are stunted for their age. Large-scale malaria outbreaks continue to occur in the Solomon Islands and access to healthcare services remains a key challenge due to the distribution of the population over several islands.



### Poverty and social protection

The Solomon Islands are one of the poorest countries in the Pacific, where approximately 16 percent of children are living in households with income below the national poverty line.<sup>cxvii</sup> Rural areas, such as Guadalcanal and Makira, are home to more than 80 percent of the poor, with many communities without government assistance to meet their basic living needs.<sup>cxviii</sup> The main economic opportunities include mining, agriculture, fishing, and tourism, which are highly climate sensitive. There is limited data on social protection in the Solomon Islands. In 2005, social safety nets covered 1 percent of the poorest quintile, which was significantly lower than regional and income group averages (45 percent and 39 percent respectively).<sup>cxix</sup> The deployment of shock responsive social protection is critical to protect the most vulnerable children, and to enable an inclusive and sustainable recovery.



### Education

Significant data gaps exist for the education sector in the Solomon Islands, due to limitations of the current Education Management Information System (EMIS), which does not allow education authorities or schools to update information or access their own data. Nonetheless, the Ministry of Education and Human Resources Development is in the process of addressing this, through transitioning to a new open source open EMIS, which will allow for more accurate and efficient data collection and usage.<sup>cxv</sup> In 2015, the net attendance rates for children of primary school age was 66 percent.<sup>cxvi</sup> Inadequate WASH remains a major concern in schools, for example 75 percent of schools lack hygiene services, and 64 percent have no sanitation services, and 40 percent have no drinking water services.<sup>cxvii</sup> This presents a significant disadvantage to girls in the Solomon Islands, as many are forced to miss school due to inadequate menstrual hygiene management (MHM) facilities. In 2021, early childhood education participation the Solomon Islands was the second lowest of the Pacific Islands (59 percent).<sup>cxviii</sup> Moreover, in 2019 there was a significant gap between primary gross enrolment rates and net enrolment rates in the Solomon Islands, indicating that a large proportion of under/overage children are enrolled at primary level, which is likely to be driven by late enrolment and high repetition rates.<sup>cxix</sup>



© UNICEF/UN0574015/Choi

## Country Profiles

# Eastern and Southern Africa

The Eastern and Southern Africa region (ESAR) has some of the greatest number of children highly exposed to multiple climate risks, including severe floods, droughts, vector-borne disease outbreaks, soil and water pollution, and heatwaves.

Several significant climate related crises have recently affected ESAR, including the Tropical Cyclone Idai and Tropical Cyclone Kenneth in 2019, devastating desert locust swarms across East Africa in 2020, and the ongoing Horn of Africa crisis, where at least 10 million children are facing severe drought conditions as a result of four, possibly five consecutive wet seasons failing.<sup>16</sup> There are 14 LDCs in ESAR, half of which are ranked within the CCRI's top 33 "Extremely High Risk" countries.<sup>16</sup> Climate change is anticipated to exacerbate the frequency, severity, and duration of extreme events in the region in the future, necessitating investments in adaptation to protect children from the most severe impacts.

<sup>16</sup> The Extremely High Risk countries in in ESAR include Angola, Eritrea, Ethiopia, Madagascar, Mozambique, Somalia, and South Sudan.



**Table 4**  
Estimates of children’s exposure to climate related hazards, shocks, and stresses in LDCs in ESAR

Country	Number of children under 18 years old exposed to / living in areas with					
	Water scarcity	Riverine floods (50 years)	Coastal flood risk	Extensive cyclone wind (100 years)	Intensive cyclone wind (100 years)	Heatwaves
<b>Angola</b>	7.4 million	1 million	-	-	-	7.5 million
<b>Burundi</b>	-	350 thousand	-	-	-	-
<b>Eritrea</b>	2.3 million	100 thousand	-	-	-	350 thousand
<b>Ethiopia</b>	12.4 million	2.5 million	-	-	-	43.4 million
<b>Lesotho</b>	750 thousand	90 thousand	-	-	-	-
<b>Madagascar</b>	670 thousand	2 million	1.6 million	12.9 million	8.8 million	4.5 million
<b>Malawi</b>	1.2 million	990 thousand	-	-	-	4.3 million
<b>Mozambique</b>	3.6 million	1.6 million	1.9 million	5.6 million	-	6.7 million
<b>Rwanda</b>	-	580 thousand	-	-	-	-
<b>Somalia</b>	3.5 million	1.2 million	60 thousand	-	-	3.5 million
<b>South Sudan</b>	2.9 million	1 million	-	-	-	4.6 million
<b>Uganda</b>	2.3 million	1.6 million	-	-	-	6.5 million
<b>United Republic of Tanzania</b>	5.6 million	1.9 million	320 thousand	-	-	6.1 million
<b>Zambia</b>	3.2 million	670 thousand	-	-	-	2.4 million
<b>UNICEF ESA LDCs (14 countries)</b>	<b>45.8 million</b>	<b>15.7 million</b>	<b>3.9 million</b>	<b>18.5 million</b>	<b>8.8 million</b>	<b>90 million</b>

**Table 5**  
Estimates of children’s exposure to environmental hazards, shocks, and stresses in LDCs in ESAR

Country	Number of children under 18 years old exposed to / living in areas with			Number of children under 20 years old exposed to
	Ambient air pollution (PM2.5 >= 10 µg/m3)	Ambient air pollution (PM2.5 >= 25 µg/m3)	High pesticide pollution risk	
<b>Angola</b>	14.7 million	370 thousand	80 thousand	4.7 million
<b>Burundi</b>	6.5 million	150 thousand	140 thousand	3.1 million
<b>Eritrea</b>	2.8 million	1.1 million	-	500 thousand
<b>Ethiopia</b>	50.5 million	3.2 million	14.6 million	18 million
<b>Lesotho</b>	160 thousand	-	5 thousand	570 thousand
<b>Madagascar</b>	-	-	-	4.9 million
<b>Malawi</b>	2 million	-	4.8 million	3.4 million



<b>Mozambique</b>	2.9 million	-	30 thousand	5.7 million
<b>Rwanda</b>	5.9 million	290 thousand	5.2 million	1.3 million
<b>Somalia</b>	2.6 million	1.1 million	1.7 million	8.1 million
<b>South Sudan</b>	6.8 million	2.1 million	5 thousand	2.3 million
<b>Uganda</b>	24 million	4.2 million	90 thousand	5.2 million
<b>United Republic of Tanzania</b>	15.6 million	-	5 thousand	7.3 million
<b>Zambia</b>	8.9 million	-	90 thousand	1.2 million
<b>UNICEF ESA LDCs (14 countries)</b>	<b>143.3 million</b>	<b>12.5 million</b>	<b>26.7 million</b>	<b>66.4 million</b>

**Table 6**

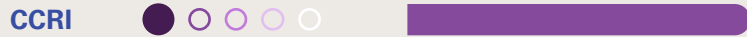
**Estimates of children living in areas exposed to one or more disease vectors in LDCs in ESAR**

Country	Number of children under 18 years old living in areas exposed to one or more disease vectors*
<b>Angola</b>	15.3 million
<b>Burundi</b>	6.6 million
<b>Eritrea</b>	2.8 million
<b>Eritrea</b>	44.7 million
<b>Lesotho</b>	-
<b>Madagascar</b>	12.8 million
<b>Malawi</b>	10 million
<b>Mozambique</b>	16.2 million
<b>Rwanda</b>	5.3 million
<b>Somalia</b>	6.6 million
<b>South Sudan</b>	6.8 million
<b>Uganda</b>	24 million
<b>United Republic of Tanzania</b>	30.8 million
<b>Zambia</b>	9.7 million
<b>UNICEF ESA LDCs (14 countries)</b>	<b>191.6 million</b>

\*Plasmodium Falciparum Malaria, Plasmodium Vivax Malaria, Aedes, Dengue, Zika

Source: CCRI index (Beta version) (All absolute numbers rounded to the nearest decimal of a million, nearest ten thousand if greater than or equal to 10,000 or nearest five thousand if less than 10,000)

# Angola



7.9 | Extremely High



6.5 | Pillar 1

Water scarcity	8.3	
Riverine floods	6.1	
Coastal floods	0.0	
Tropical cyclones	0.0	
Vector borne disease	8.5	
Heatwaves	8.3	
Air pollution	7.3	
Soil and water pollution	6.9	



8.9 | Pillar 2

Child health and nutrition	9.1	
Education	7.5	
Water, sanitation, and hygiene	9.6	
Poverty, communication assets and social protection	9.2	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Angola; 5 out of the 23 indicators included in pillar 2 have no data.

Angola has a CCRI score of 7.9 and ranks 10<sup>th</sup> out of the 163 CCRI countries and regions, classifying children in Angola at “Extremely High” risk.

According to the CCRI, the climate and environmental shocks that children in Angola are highly exposed to include:



## Vector-borne diseases

An estimated 15.3 million children are living in areas exposed to one or more disease vectors in Angola. Almost all children are at risk of PV and PF Malaria (100 and 99 percent respectively), 88 percent of children are at risk of aedes, and 74 percent are exposed to dengue. Insecticide-treated mosquito nets (ITNs) remain one of the most effective ways to prevent disease transmission. However, in 2016, only 31 percent of Angola’s population own ITNs<sup>cxix</sup> As global temperatures rise, the geographical prevalence and transmission rates of vector-borne diseases are expected to increase. Such patterns are already evident in Angola, with recent outbreaks of dengue consistent with local climatic changes.<sup>cxix</sup>



## Water scarcity

Almost half of Angola’s child population (7.4 million children) are exposed to water scarcity, which is frequently experienced in the form of drought. In south-western Angola, an estimated 2.3 million people, nearly half a million of which are children under the age of 5, are suffering from the worst drought in 40 years. The drought has caused mass disruption to education and widespread food insecurity, with an estimated 1.3 million people facing severe hunger.<sup>cxix</sup> While the drought has affected the entire country, it has been especially severe in six provinces, including Cuanza Sul, Benguela, Huambo, Namibe, Hula, and Cunene.



### Heatwaves

In Angola, nearly half of the child population are exposed to heatwaves (49 percent). Heatwaves are most prevalent in the northern coastal regions, which experience an average of 8-10 heatwaves annually.<sup>cxxiv</sup> According to new UNICEF analysis, the percentage of children exposed to high heatwave frequency<sup>17</sup> is expected to rise dramatically from 5 percent in 2020, to all children under both high and low emission scenarios by 2050.<sup>cxxv</sup> Moreover, under low emission scenarios, the proportion of children exposed to high heatwave duration<sup>18</sup> is anticipated to rise by 55 percent from 2020 to 2050, reaching all children in Angola by 2050, under a high emission scenario.<sup>cxxvi</sup>



### Air pollution

In Angola, almost 96 percent of children are exposed to ambient air pollution levels of (PM2.5 >= 10 µg/m3). Air pollution in Angola is largely related to oil and gas exploration, mining, vehicle emissions and agricultural waste burning.<sup>cxxvii</sup> In 2016, approximately 118.5 deaths per 100,000 people were attributed to household and ambient air pollution.<sup>cxxviii</sup>



### Soil and water pollution

Oil and gas exploration and mining are some of the leading causes of soil and water pollution in Angola. Several oil leaks and spills in the provinces of Cabina and Zaire have had significant impacts on community health and livelihoods.<sup>cxxix</sup> For example, in 2021, an Angolan diamond mine discharged massive amounts of toxic water into the Kasai River Basin, resulting in 12 deaths, 4,400 people struck by illness and a total of 1 million people affected.<sup>cxxx</sup> Moreover, over a quarter of young people under the age of 20 are exposed to lead pollution in Angola.

## Underlying vulnerabilities



### WASH

Inadequate WASH is a significant underlying vulnerability in Angola, where WASH infrastructure is highly exposed to threats and lack resilience in both rural and urban areas. Approximately 57 percent of the Angolan population are using at least basic drinking water services.<sup>cxxxi</sup> Most water points in drought-affected communes are non-operational, resulting in a greater need for children to walk longer distances for drinking water, in turn increasing risks of absenteeism from school and gender-based violence (GBV) for girls.<sup>cxxxii</sup> Further, only 52 percent of the population have access to basic sanitation services.<sup>cxxxiii</sup> The inadequacy of WASH provisions in Angola contribute significantly to the high prevalence of WASH related diseases, including diarrhoea, which is a primary cause of child mortality under the age of 5.



### Health and nutrition

Angola's child mortality rate remains high at 69.4 per 1,000 live births.<sup>cxxxiv</sup> Alongside diarrheal disease, the greatest causes of death for children under the age of 5 in Angola include lower respiratory infections, preterm birth complications, asphyxia, and malaria.<sup>cxxxv</sup> Despite significant efforts to reduce child malnutrition over past two decades, approximately half of Angolan children suffer from anaemia<sup>cxxxvi</sup> and around 38 percent of children under the age of 5 remain stunted. Climate change is exacerbating Angola's nutrition crisis. Facing the worst drought in 40 years, 3.8 million people are reported to have insufficient access to food.<sup>cxxxvii</sup> With further climatic variation, lower than normal purchasing power and the coming lean season, poor households in Cunene, Huíla and Namibe provinces will continue to face "crisis" levels of food insecurity in 2023.<sup>cxxxviii</sup>



### Poverty and social protection

Almost one third of the population live below the national poverty line in Angola (32.3 percent). The Republic of Angola is Africa's second largest oil producer, driving the country's economic growth.<sup>cxxxix</sup> To transform the state-led and oil-funded economic model into a sustainable, inclusive, private-sector-led growth model, high-level political commitment, and strong institutions are required. Social protection remains limited in Angola, at 10.5 percent of effective coverage.<sup>cxli</sup> Between 2014-2017, 68 percent of the population above the age of 15 were unable to come up with emergency funds. The ethnic groups of southern Angola must receive priority in social protection programmes, due to their high vulnerability to climate risks and heavy reliance on natural resources.

17 High heatwave frequency is defined as any area where there are on average 4.5 or more heatwaves per year.

18 High heatwave duration is defined as any area where the average heatwave event lasted 4.7 days or longer.



## Education

Education in Angola is frequently disrupted by climate shocks. In 2019, droughts in southern Angola disrupted the education for 70 percent of the Cunene province's students, with many forced to miss school to fetch water for livestock.<sup>cxli</sup> 1.2 million children are currently in need of education support in Angola following the prolonged drought<sup>cxlii</sup>, with many children forced to miss school to fetch water for households and livestock. In particular, there has been an increase in dropouts among boys due to transhumance.<sup>cxliii</sup> The pandemic has further contributed to such issues. After COVID-19-related school closures, an estimated 30,000 children needed educational support.<sup>cxliv</sup>

# Burundi



CCRI



6.1 | High

## Climate and environment shocks



4.3 | Pillar 1

Water scarcity	0.0
Riverine floods	5.2
Coastal floods	0.0
Tropical cyclones	0.0
Vector borne disease	7.3
Heatwaves	0.0
Air pollution	7.0
Soil and water pollution	7.9

## Child vulnerability



7.4 | Pillar 2

Child health and nutrition	8.1
Education	4.0
Water, sanitation, and hygiene	9.3
Poverty, communication assets and social protection	8.3

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Burundi; 3 out of the 23 indicators included in pillar 2 have no data.

Burundi has a CCRI score of **6.1** and ranks **51<sup>st</sup>** out of the 163 CCRI countries and regions, placing children in Burundi at “**High**” risk.

According to the CCRI, the climate and environmental shocks that children in Burundi are highly exposed to include:



### Soil and water pollution

Inadequate WASH infrastructure and sanitation practices, are major drivers of water pollution in Burundi, causing significant health problems. Poor agricultural practices related to coffee and palm oil, are another significant driver. Moreover, high levels of deforestation, land degradation and poor waste management, exacerbates soil and water pollution. For example, in the city of Bujumbura, an insufficient landfill system is threatening human lives, with high amounts of heavy metals pouring out of the garbage, resulting in increased instances of cholera in people who collect food from the site.<sup>cxlv</sup> The landfill contaminates Lake Tanganyika, which provides over 90 percent of the water for Bujumbura.<sup>cxlvi</sup> Lead pollution levels are also high, with almost half of the population under the age of 20 exposed (48 percent).



### Vector-borne diseases

Malaria is one of the major epidemics experienced in Burundi. In 2020, 4.7 million malaria cases were reported, resulting in almost 3000 deaths.<sup>cxlvii</sup> Moreover, Burundi has recorded an 18.2 percent increase in the number of cases from July to September (1,765,742 cases) in comparison with the same period in 2021 (1,494,250 cases).<sup>cxlviii</sup> In addition, 75 percent of children are exposed to Zika. Changing temperatures, poor WASH conditions and stagnant waters during floods, are expected to exacerbate vector-borne disease risk factors in Burundi.



### Air pollution

In Burundi, 97 percent of the total child population are exposed to ambient air pollution (PM<sub>2.5</sub>  $\geq$  10  $\mu\text{g}/\text{m}^3$ ). The main sources of poor air quality include domestic biomass energy, industrial pollutants, and domestic and agricultural waste burning. The city of Bujumbura has been identified as an area of consistently high ambient air pollution risk, which requires extensive air quality monitoring and city-wide planning to limit children's exposure when pollution levels are dangerously high. Poor indoor air quality is also a significant health risk to children. Approximately 55 percent of households cook indoors, most commonly in rural areas, and almost all households in Burundi (98.5 percent) use either wood, vegetable waste or charcoal for cooking.<sup>cxlix</sup>



### Riverine flooding

Floods are common in the larger river basins in Burundi, including the Congo and around the Lake Tanganyika area. Heavy rainfall has resulted in significant flooding in Burundi throughout the twentieth century, particularly in the 1960s when the level of Lake Tanganyika rose by 4 metres, flooding districts of Bujumbura and Gatumba.<sup>cl</sup> More recently, in 2020, flooding in the Bujumbura Province resulted in the first internal displacements in two years.<sup>cli</sup> Heavy rainfall, deforestation and soil erosion in mountainous areas commonly trigger mudslides and landslides, which have devastating consequences for children. Flash floods are also common, across all areas of the country.



### Water scarcity

Whilst the CCRI has not identified water scarcity exposure as a significant hazard to children in Burundi, water scarcity in the form of droughts has been identified as a prominent hazard in the country by various sources. For example, according to the World Bank, droughts account for 67.8 percent of the distribution of natural hazards that occur in the country. The northeast of the country is the most vulnerable to drought, which suffers from water stress and crop failures.<sup>clii</sup> This situation is driving people to migrate to neighbouring countries, a phenomenon that has been occurring since 1998.<sup>cliii</sup>

## Underlying vulnerabilities



### WASH

In Burundi, approximately 62 percent of households have access to at least basic drinking water services. Improvements to adequate sanitation and hygiene services remain key challenges. For example, almost 94 percent of households have limited hygiene services and 39 percent have unimproved sanitation services. Low-quality infrastructure and a lack of upkeep of existing infrastructure, are primary impediments to achieving basic sanitation and hygiene. Frequent flooding puts further pressure on Burundi's WASH services.



### Health and nutrition

The mortality rate for children under the age of 5 in Burundi is 52.6 per 1,000 live births.<sup>cliv</sup> While the country remained free of epidemics for most of 2018, malaria, measles, cholera, Rift Valley fever, COVID-19, and the risk of spill over from the Ebola outbreak in Uganda were identified as epidemic risks in 2022.<sup>clv</sup> Cholera outbreaks are particularly common along the flood prone areas around Lake Tanganyika and the Ruzizi plain.<sup>clvi</sup> Whilst cholera is more prevalent in the dry season, when water supplies are depleted, flooding can lead to the contamination of water sources as well as the destruction of sanitation infrastructure, increasing risks of cholera and other diarrhoeal diseases. Burundi also has one of the highest malnutrition rates worldwide, and 51 percent of children under the age of 5 suffer from stunting.<sup>clvii</sup> The maternal mortality rate is high at 548 deaths per 100,000 live births, necessitating strengthening of both child and maternal healthcare systems.



### Poverty and social protection

Burundi is one of the poorest African countries, where around 66 percent of children are living in households with income below the national poverty line.<sup>clviii</sup> Burundi also has the continent's smallest urban population (11 percent) yet the third greatest urbanisation rate (5.6 percent).<sup>clix</sup> Living conditions remain challenging, with just 7 percent of the population having access to electricity.<sup>clx</sup> Agriculture and livestock in Burundi account for 80 percent of employment, which is a highly climate vulnerable sector.<sup>clxi</sup> Moreover, low incomes in the informal sector and among rural populations make it difficult for individuals to participate in contributory social protection schemes.



## Education

Burundi scores comparably lower for the education vulnerability component than other LDCs (4.0). Youth literacy is one of the highest in the region, (88 percent) and the gross enrolment rate for the 2019–2020 academic year increased to 121.7 percent.<sup>clxii</sup> Despite these advancements, in the same period, 110,000 Burundian students missed school due to natural disasters, including many climate-related events. For example, 78.5 percent of basic schools in Bujumbura’s provinces of Gatumba and Rukaramu had to suspend classes for at least two weeks due to floods in 2019-2020.<sup>clxiii</sup> Moreover, during climate shocks, classrooms frequently serve as shelter for the displaced, disrupting the functioning of the school, in which children (both host community and internationally displaced people suffer.





## Underlying vulnerabilities



### WASH

The CCRI identifies inadequate WASH as the greatest underlying vulnerability contributing to children's climate risk in Eritrea. Just over half the population (52 percent) is using drinking water from basic services, and 30 percent of Eritreans are drinking from unprotected springs, wells, or directly from rivers and streams. In urban areas, access to improved sanitation remains a key challenge and water-borne diseases are rife.



### Health and nutrition

Eritrea's child and maternal mortality rates are 38 per 1,000 live births and 480 deaths per 100,000 live births respectively. Alongside an increase in vector-borne diseases anticipated with climate change, the WHO predicts an increase in the number of children suffering from diarrhoea, schistosomiasis and malnutrition.<sup>clxvii</sup> Malnutrition is already prominent, as evidenced by nearly half (49 percent) of all children under the age of 5 stunted for their age and almost a quarter of all pregnant women experiencing anaemia.<sup>clxviii</sup> The nutritional status for children in Eritrea has further deteriorated, as a result of the impact of COVID-19 on commodity and food prices, desert locust infestations, and droughts.<sup>clxix</sup> Establishing and strengthening climate resilient healthcare systems in Eritrea will help reduce the severity of climate related health impacts on children, as well as the additional burden on healthcare staff and services.



### Poverty and social protection

Several compounding factors have led to high levels of poverty in Eritrea, including decades of conflict, droughts, a high reliance on agriculture, inadequate WASH, low education levels and economic sanctions. Limited data exists on poverty levels in Eritrea. According to the most current accessible survey data, in 1996/1997, the poverty rate was around 70 percent.<sup>clxx</sup> The country remains in a severe macroeconomic state, with an unsustainable debt burden and fragile financial and external sectors. These factors make social protection policies difficult to implement and necessitate adaptation finance in the form of grants rather than loans in the country.



### Education

There is limited data for Eritrea's education sector. According to the most recent data, in 2010, primary and pre-primary age attendance rates both stood at 81 percent.<sup>clxxi</sup> Moreover, in 2018, youth literacy rates were high at 93 percent.<sup>clxxii</sup> COVID-19 and the Horn of Africa drought crisis have curtailed progress, with around 300,000 children and adolescents aged 6 to 17 years reported by the government as being out of school.<sup>clxxiii</sup> Unequal access to digital tools remains a major hurdle for teachers seeking to engage students in distance learning. As climate change accelerates, further disruptions to education are anticipated, which the education sector need to prepare for.





### Air pollution

In Ethiopia, 96 percent of children are exposed to ambient air pollution levels (PM2.5  $\geq$  10  $\mu\text{g}/\text{m}^3$ ). Each year, approximately 70,000 fatalities are related to indoor and outdoor air pollution, which is expected to increase with a hotter, more drought prone environment.<sup>clxxviii</sup> There are significant urban-rural disparities in the exposure to IAP, for example, in Addis Ababa, households use three times more clean energy for cooking when compared to rural areas.<sup>clxxix</sup> Using unclean cooking fuels in the home has a disproportionate impact on women and children.



### Water scarcity

Almost one quarter of children in Ethiopia are exposed to water scarcity (24 percent), which is frequently experienced in the form of drought events. More than 8.1 million people in Ethiopia are currently affected by drought, of which more than 7.2 million people need food assistance and 4.4 million people need water assistance.<sup>clxxx</sup> Further, inadequate roads in drought prone areas is restricting humanitarian access. Water scarcity has also exacerbated conflict, especially in northern Ethiopia, which is expected to threaten displacement for up to 7.8 million people and poses grave threats to the rights and welfare of 3.9 million children.<sup>clxxxi</sup> The deteriorated livelihood situation related to drought has also resulted in an increase in GBV, affecting the lives of millions of women and adolescent girls. In addition, there are increased reports of children fleeing to Kenya, Djibouti, and Somaliland to avoid impacts of the current drought.<sup>clxxxii</sup>



### Vector-borne diseases

A staggering 44.7 million children are estimated to live in areas exposed to one or more disease vectors in Ethiopia. 77 percent of children are at risk of PV Malaria and 73 percent are at risk of PF Malaria. Moreover, over one third of children in Ethiopia are exposed to both dengue and aedes. With increasing temperatures and shifting agroecological zones, the geographic prevalence of vector-borne is changing and are predicted to spread into higher altitudes in Ethiopia, making population groups in hard-to-reach areas particularly vulnerable.

## Underlying vulnerabilities



### WASH

In Ethiopia, only 37 percent of households have access to basic drinking water services<sup>clxxxiii</sup>, a situation which is worsening with accelerating drought conditions. In addition, 65 percent of households have unimproved sanitation and around 54 percent of households have limited hygiene services.<sup>clxxxiv</sup> Inadequate WASH is estimated to be responsible for 60 to 80 percent of communicable illnesses in the country and 50 percent of the consequences of undernutrition.<sup>clxxxv</sup> There is a strong link between sanitation and stunting, and open defecation can lead to faecal-oral infections including diarrhoea, which can exacerbate malnutrition.



### Health and nutrition

Evidence shows that maternal and child deaths have been in decline in Ethiopia since the year 2000. Yet, the maternal mortality rate remains high, at 401 deaths per 100,000 live births. A lack of access to quality antenatal, obstetric, and postnatal health services, especially in rural areas, is hampering further progress in reducing maternal deaths in the country.<sup>clxxxvi</sup> The reduction in mortality rates for children under the age of 5 has been more progressive, declining from 201 per 1,000 live births in 1990 to approximately 47 per 1,000 live births in 2021.<sup>clxxxvii</sup> Diarrhoea is the leading cause of mortality under the age of 5 in Ethiopia, accounting for 23 percent of deaths, or more than 70,000 children every year.<sup>clxxxviii</sup> The country's rapidly deteriorating malnutrition situation resulted in admissions of children with severe acute malnutrition to be 37 percent higher in quarter 1 of 2022, than in the same period for 2021.<sup>clxxxix</sup>



### Poverty and social protection

Vulnerability to climate impacts in Ethiopia, is exacerbated by the country's high levels of poverty and reliance on climate sensitive sectors, including agriculture, water, tourism, and forestry. One quarter of children are living in households with income below the national poverty line.<sup>cx</sup> Such low economic power prevents many from being able to bounce back quickly after climate shocks, with 42 percent of the population unable to come up with emergency funds when hazards strike. Without adequate social protection mechanisms, this vicious cycle will push the most vulnerable children deeper into poverty.



## Education

As children and young people comprise 48 per cent of the population, Ethiopia can lift itself out of poverty by ensuring children have access to quality education.<sup>cxci</sup> Whilst youth literacy is relatively high (around 73 percent), around 61 percent of children remain out of school, including 2.6 million children of primary school age and many do not complete their education.<sup>cxcii</sup> As droughts become more frequent and severe, an increasing number of children are likely to miss and drop out of school. Dropout rates are anticipated to be higher for girls, in times of high-water stress, to allow them to perform water related duties. In addition, Ethiopia is Africa's second-largest refugee host country, placing additional pressure on regions which already face challenges in delivering quality services to their own host populations.<sup>cxciiii</sup>

# Lesotho



CCRI



5.4 | Medium-High

## Climate and environment shocks



4.0 | Pillar 1

Water scarcity	9.0	<div style="width: 90%;"></div>
Riverine floods	5.4	<div style="width: 54%;"></div>
Coastal floods	0.0	<div style="width: 0%;"></div>
Tropical cyclones	0.0	<div style="width: 0%;"></div>
Vector borne disease	0.0	<div style="width: 0%;"></div>
Heatwaves	0.0	<div style="width: 0%;"></div>
Air pollution	2.3	<div style="width: 23%;"></div>
Soil and water pollution	7.0	<div style="width: 70%;"></div>

## Child vulnerability



6.6 | Pillar 2

Child health and nutrition	7.4	<div style="width: 74%;"></div>
Education	2.5	<div style="width: 25%;"></div>
Water, sanitation, and hygiene	8.6	<div style="width: 86%;"></div>
Poverty, communication assets and social protection	7.8	<div style="width: 78%;"></div>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Lesotho; All 23 indicators included in pillar 2 have data.

Lesotho has a CCRI score of **5.4** and ranks **61<sup>st</sup>** out of the 163 CCRI countries and regions, placing children in Lesotho at a **“Medium-High”** risk. Lesotho scores higher for Pillar 2 vulnerabilities (score of 6.6) than Pillar 1 exposure to climate and environmental shocks (score of 4.0).

According to the CCRI, the climate and environmental shocks that children in Lesotho are highly exposed to include:



### Water scarcity

In Lesotho, 88 percent of children are exposed to water scarcity, despite water being a historically abundant resource in the country. Lesotho relies heavily on its water supplies for foreign exchange, yet local communities often lack the infrastructure needed to benefit. Climate change is expected to impact the long-term viability of Lesotho’s water security. The country has a history of drought, low precipitation levels, high aridity and increasing temperatures. Climatic variation is also expected to have a substantial impact on Lesotho’s agricultural sector, causing rangeland degradation, desertification, and the depletion of biological diversity, which in turn increases risks of child malnutrition and food insecurity.



### Soil and water pollution

62 percent of children and adolescents under the age of 20 years of age are exposed to lead pollution in Lesotho. Even at low levels, lead pollution can have devastating impacts on child physical and neurological development, in some cases causing death. Decades of large-scale mining for diamonds in Lesotho is a major driver of environmental pollution. For example, alarmingly high levels of nitrates have been identified in water samples close to tailing sites in Letseng and the Maloraneng village and mining pollution has made several water sources unsuitable for consumption.<sup>CXCIV</sup> Exposure to soil and water pollution is exacerbated by other climate and environmental hazards. During floods, for example, trace elements can leach into previously uncontaminated areas.



### Riverine flooding

Exposure to riverine flooding affects 11 percent of children in Lesotho, albeit levels of exposure are much lower than in other LDCs. Localised flooding from variable rainfall occurs regularly, having a negative influence on the environment, the economy, and society. A staggering 3.2 percent of Lesotho's GDP was lost because of devastating floods between 2010-2011.<sup>cxv</sup> Flash floods are also common in Lesotho. For example, in March 2018, flash flooding caused by heavy rainfall, alongside hailstorms in Quthing, Mafeteng, Mofale's Hoek, and Thaba-Tseka districts impacted 1,418 people, and injured many children.<sup>cxvi</sup>

## Underlying vulnerabilities



### WASH

Just 43 percent of households have access to basic drinking water services in Lesotho, 48 percent have access to safely managed sanitation services and only 6 percent have basic hygiene services.<sup>cxvii</sup> Difficulties eradicating open defecation is a major impediment to achieving basic sanitation in rural areas (practiced by 29 percent of rural households).<sup>cxviii</sup> Education on safe sanitation and hygiene behaviours, are critical to prevent disease transmissions within communities with poor access to adequate WASH provisions.



### Health and nutrition

Child and maternal mortality rates are high in Lesotho (73 per 1,000 live births and 544 per 100,000 live births respectively). Access to healthcare is limited, particularly in rural areas due to restricted transportation links. COVID-19 overburdened Lesotho's health-care system, making it difficult for healthcare professionals to cope with the additional needs of climate related illnesses. In 2021, 766,000 people were in need of health and nutrition services<sup>cxix</sup> and in 2018, over one third of children under the age of 5 were stunted.<sup>cc</sup> Moreover, reductions in agricultural productivity brought on by future droughts are anticipated to cause a decrease in dietary variety and increase vitamin shortages.



### Poverty and social protection

In 2020, 57 percent of children lived in households with income below the national poverty line in Lesotho.<sup>cci</sup> Poverty is highly concentrated in rural areas, where 75 percent of the population reside.<sup>ccii</sup> In rural communities, economic diversification is low, leaving people with little opportunities to adapt to alternative livelihoods in response to climate change. Rural poverty is further stagnated by poor agricultural revenues and a drop in remittances which act as a buffer when shocks occur. Notwithstanding, Lesotho's expansion of social protection programmes in recent years have contributed to a reduction in inequalities and an increase in incomes for poor communities.<sup>cciii</sup> For example, Lesotho's Child Grants Programme is an unconditional cash transfer safety net that serves around 70,000 children from the poorest households.<sup>cciv</sup>



### Education

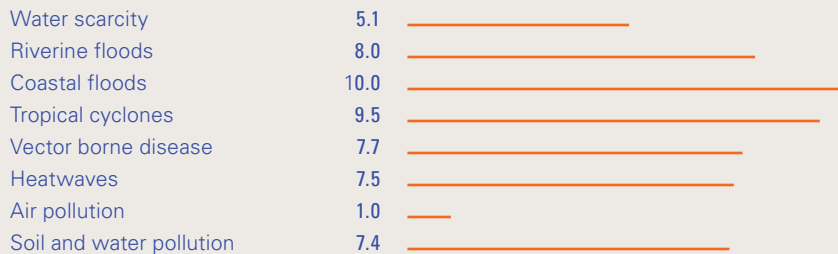
In comparison to other LDCs, Lesotho has substantially better educational outcomes. In 2018, attendance rates for children of primary school age were high, at 97 percent, and 80 percent of children completed primary school.<sup>ccv</sup> Whilst secondary school attendance rates are much lower, (55 percent for lower secondary and 22 percent for upper secondary)<sup>ccvi</sup>, youth literacy rates for adolescents (aged 15-24) are high, around 87 percent. COVID-19 had significant impacts on the education sector, endangering consistent education for nearly 450,000 students enrolled in public schools.<sup>ccvii</sup> Adapting education systems is crucial to prevent children in Lesotho from missing school due to future shocks.

# Madagascar



**CCRI** ● ○ ○ ○ ○ **7.9 | Extremely High**

**Climate and environment shocks** **7.8 | Pillar 1**



**Child vulnerability** **7.9 | Pillar 2**



Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Madagascar; 4 out of the 23 indicators included in pillar 2 have no data.

Madagascar has a CCRI score of **7.9** and ranks **10<sup>th</sup>** out of the 163 CCRI countries and regions, classifying children in Madagascar in the “**Extremely High**” risk category.

Madagascar is the second most exposed country in Africa to multi-disaster risks and has been impacted by 35 cyclones, 8 floods, and 5 severe droughts over the past two decades, affecting more than 5 million children.<sup>ccviii</sup> These environmental shocks and stresses have cost an estimated USD 1 billion in damages and have affected food security, WASH and school infrastructure, public health systems, environmental management, and quality of life.

According to the CCRI, the climate and environmental shocks that children in Madagascar are highly exposed to include:



## Coastal flooding

Coastal flood risk is high in Madagascar, because of rising sea levels, storm surges, and tropical cyclones. Critical infrastructure such as ports and roads are increasingly at risk from flooding and coastal erosion, as are key coastal ecosystems, such as the littoral forests on the sandy coastal plains of eastern Madagascar.<sup>ccix</sup> Between 5.71 and 6.54 metres of coastal erosion were detected in 1997, which is expected to increase exponentially, affecting community livelihoods in coastal settlements.<sup>ccx</sup>



### Tropical cyclones

Madagascar's children are frequently exposed to tropical cyclones due to the country's extensive coastline and location in the Indian Ocean. An average of 1.5 cyclones affects Madagascar annually, which is the highest number in Africa, with the cyclone season lasting from November to March.<sup>ccxi</sup> Crop loss, disease outbreaks, degradation of coastal and marine ecosystems, disruption of critical urban services such as water and electricity, severe flooding, and injury are all frequent impacts of cyclones in Madagascar. Several devastating cyclones have struck the nation in recent decades, including tropical Cyclone Enawo, which inflicted significant destruction to infrastructure and triggered widespread flooding, impacting a total of 52,000 people, and displacing 10,000 individuals.<sup>ccxii</sup>



### Riverine flooding

Over the last 3 decades, Madagascar has seen around 30 floods and periods of excessive rainfall, which have impacted thousands of children.<sup>ccxiii</sup> The Socia, Betsiboka, Manambao, Mangoro, Tsiribihina, Mangoky, Manannara, and Onilahy rivers commonly overflow in times of high precipitation. Rivers provide most of the country's water demands for agricultural and human use, hence flooding has far-reaching consequences. Fianarantsoa has been identified as having a particularly high risk of flood loss, with an average annual loss of USD 4.9 million.<sup>ccxiv</sup>



### Vector-borne diseases

12.8 million children are estimated to live in areas exposed to one or more disease vectors in Madagascar. 99 percent of children are at risk of PV malaria and 94 percent are at risk of PF malaria. Children in Madagascar also have a 70 percent risk of aedes, a 58 percent risk of exposure to dengue, and 26 percent exposure to zika. A simple way to reduce children's exposure to disease transmission is using ITNs, which only 62 percent of children under the age of 5 were sleeping under in 2018.<sup>ccxv</sup>



### Heatwaves

Approximately 35 percent of children in Madagascar are exposed to heatwaves. Young children and infants are particularly vulnerable to heat stress, due to their inability or lack of agency to regulate their body temperature and control their surrounding environment. Exposure to abnormal or prolonged heat also affects education, since high temperatures can make the classroom uncomfortable, causing children to become fatigued and lowering educational outcomes.



### Soil and water pollution

According to estimates, pollution exposure accounts for more than one in five deaths in Madagascar.<sup>ccxvi</sup> Major sources of soil and water pollution include deforestation and the mining industry. 35 percent of children and adolescents under the age of 20 in Madagascar are exposed to lead pollution, which significantly hampers children's health and development. Children's health risks associated with pollution can include conditions like cancer, starvation, preterm births, growth retardation, and respiratory illnesses. Exposure to pollution can also affect a child's development by causing them to miss school. More broadly, high levels of pollution can exacerbate poverty and undermine socio-economic development.

## Underlying vulnerabilities



### WASH

Madagascar ranks third lowest in the world in the use of unimproved water sources and basic sanitation.<sup>ccxvii</sup> 44 percent of households have limited hygiene services and 42 percent of the population continue to practice open defecation,<sup>ccxviii</sup> which pollutes surrounding environments and has devastating consequences on community health. Limited access to improved WASH has been linked to high levels of malnutrition and diarrhoea in children in the country.



### Health and nutrition

Despite recent progress in Madagascar's health sector, child and maternal mortality rates remain high (66 per 1,000 live births and 335 per 100,000 live births respectively). Over one third of child mortalities under the age of 5 in Madagascar are caused by climate related diseases including respiratory infections, diarrhoea, and malaria.<sup>ccxix</sup> Additionally, only 41 percent of children aged 12 to 23 months have basic immunization coverage.<sup>ccxx</sup> Approximately, half of all children under the age of 5 are stunted in Madagascar, and nearly one fifth suffer from severe acute malnutrition, with rates of malnutrition peaking during climate shocks.<sup>ccxxi</sup>





### Poverty and social protection

Despite an abundance of natural resources, Madagascar is one of the world's poorest countries, with just over three quarters of the population living in extreme poverty.<sup>ccxxii</sup> High rates of malnutrition significantly contribute to vicious poverty cycles. Living conditions remain challenging in the country, for example, less than a quarter of the population have access to electricity. Climate change impacts in Madagascar are expected to destabilise livelihood systems supporting vulnerable children, increasing the need for shock responsive social protection measures to be rapidly implemented.



### Education

Inadequate access to education is another factor increasing Madagascan children's vulnerability to climate change impacts. Whilst youth literacy rates are higher than other LDCs (80 percent), only 27 and 13 percent of young people are attending lower and upper secondary school.<sup>ccxxiii</sup> Primary education attendance is much higher (76 percent), however, only 56 percent of students complete primary education.<sup>ccxxiv</sup> Quality of education also remains a key issue, for instance, 97 percent of teachers lack a professional teaching diploma.<sup>ccxxv</sup> Access to high-quality education and climate smart education can significantly increase a child's future prospects, as well as improve their adaptive capacity.

# Malawi



CCRI



6.7 | High

## Climate and environment shocks



5.7 | Pillar 1

Water scarcity	5.8	<div style="width: 58%;"></div>
Riverine floods	6.6	<div style="width: 66%;"></div>
Coastal floods	0.0	<div style="width: 0%;"></div>
Tropical cyclones	0.0	<div style="width: 0%;"></div>
Vector borne disease	7.5	<div style="width: 75%;"></div>
Heatwaves	7.7	<div style="width: 77%;"></div>
Air pollution	2.9	<div style="width: 29%;"></div>
Soil and water pollution	8.8	<div style="width: 88%;"></div>

## Child vulnerability



7.5 | Pillar 2

Child health and nutrition	7.3	<div style="width: 73%;"></div>
Education	5.5	<div style="width: 55%;"></div>
Water, sanitation, and hygiene	7.9	<div style="width: 79%;"></div>
Poverty, communication assets and social protection	9.1	<div style="width: 91%;"></div>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Malawi; 1 out of the 23 indicators included in pillar 2 has no data.

Malawi has a CCRI score of **6.7** and ranks **40<sup>th</sup>** out of the 163 CCRI countries and regions, placing children in Malawi at **“High”** risk.

According to the CCRI, the climate and environmental shocks that children in Malawi are highly exposed to include:



### Soil and water pollution

34 percent of children and adolescents (under the age of 20) are exposed to lead pollution, which can threaten children’s health and cognitive development. Pollution from industry and agriculture frequently contaminate waterways, disrupting aquatic ecosystems and the fishing industry, which are vital for livelihood and food security.<sup>ccxxvi</sup> Additionally, nearly half of the population of children live in areas with high pesticide pollution risks, which can be exacerbated by other climate and environmental hazards. During storms and floods, for example, pesticides can leach into previously uncontaminated areas. Exposure to soil and water pollution can be significantly reduced with sound environmental management.



### Heatwaves

43 percent of children are exposed to heatwaves in Malawi. Heatwaves impact children’s health directly through heat stress and the influx of heat related disease, and indirectly, through the impact of extreme temperatures on crop yields and livestock, which in turn affects nutrition. Climate projections show that exposure to high heatwave frequency<sup>21</sup> is estimated to increase to all children in Malawi by 2050, under both low and high emission scenarios.<sup>ccxxvii</sup>

<sup>21</sup> High heatwave frequency is defined as any area where there are on average 4.5 or more heatwaves per year.



### Vector-borne diseases

Approximately two thirds of the population are at risk of vector-borne diseases in Malawi.<sup>ccxxviii</sup> Risks of malaria are particularly high, where the entire child population is at risk of both PV (unstable) and PF (stable) malaria. Children’s risk of aedes is also particularly high (86 percent), whilst exposure to dengue and zika vectors are much lower (45 percent and 15 percent exposure). Nonetheless, as climate change alters transmission periods and geographic vector range, diseases like Dengue Fever and Zika Virus may become more common in Malawi in the future.



### Riverine flooding

Whilst exposure levels are lower than in other LDCs, approximately 990,000 children are exposed to riverine flooding in Malawi.<sup>22</sup> Areas along the Shire River basin have been identified as the most vulnerable to flooding.<sup>ccxxix</sup> 18 major floods were recorded between 1967 and 2011, and the number of floods is expected to increase with a rise in inter-annual rainfall variability.<sup>ccxxx</sup> Additionally, landslides are a common secondary hazard to flooding, which typically occur in Malawi’s southern region.

## Underlying vulnerabilities



### WASH

Children’s vulnerability to climate change is often exacerbated by inadequate access to safe drinking water and sanitation facilities in Malawi. Whilst around 87 percent of households have basic access to drinking water, less than half the population have access to improved sanitation services and 76 percent have limited access to hygiene services.<sup>ccxxxi</sup> Inadequate WASH significantly impedes children’s health in Malawi. Approximately 6 million children are at risk of diarrhoea, cholera, and pneumonia, a figure which is expected to increase according to climate change projections.<sup>ccxxxii</sup>



### Health and nutrition

Child and maternal mortality rates stand at 41.8 per 1,000 live births and 349 maternal deaths per 100,000 live births respectively. Malawi facing its biggest cholera outbreak in decades, with 38,566 cases and 1,254 deaths documented since the first case was reported a year ago (February 5, 2022). At the time, the country was still reeling from the effects of tropical storms Anna and Gombe, which devastated WASH infrastructure, forcing communities to rely on contaminated water and increasing their risk of developing this water-borne disease. In addition, Malawi continues to have one of Africa’s highest rates of stunting, which affects over one third of children. Climate change is expected to impede advances in future food access and availability, with the great majority of Malawi’s rural population dependent on rain-fed agriculture. Droughts also have a significant impact on child health and nutrition. For example, in 2015 a drought affecting 25 of Malawi’s districts resulting in food insecurity for 2.8 million people.<sup>ccxxxiii</sup>



### Poverty and social protection

Just over half of Malawi’s population (51.5 percent) remain below the national poverty line. Although multi-dimensional child poverty has declined from 63 percent in 2012 to 60.5 percent in 2017, most children in Malawi still suffer from multiple and overlapping deprivations.<sup>ccxxxiv</sup> Low agricultural productivity, limited livelihood opportunities in non-agricultural occupations, uncertain economic development, fast population expansion, and inadequate coverage of social safety net programmes all contribute to high levels of poverty and make children particularly vulnerable to climate change in Malawi. For example, less than 10 percent of households in Malawi receive family and/or child cash benefits as part of social protection schemes.

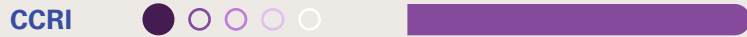


### Education

Malawi has one of the highest primary school attendance rates in ESAR (94 percent). However, secondary school attendance is extremely low (28 percent for lower secondary and 17 percent for upper secondary level).<sup>ccxxxv</sup> For the most deprived children, tuition fees and associated education expenses, are key barriers to secondary school access. In addition, inadequate infrastructure, limited teacher training and insufficient learning materials, all contribute to low quality learning in Malawi. Climate and environmental shocks are expected to further impede children’s access to good quality education in the country.

22 50 years return period.

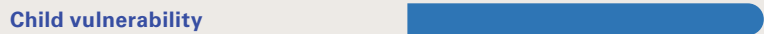
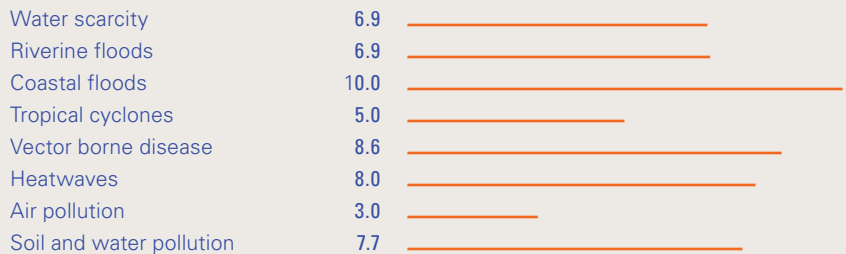
# Mozambique



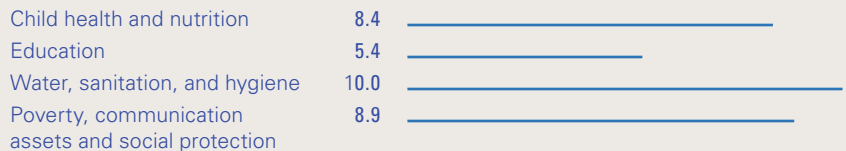
7.9 | Extremely High



7.5 | Pillar 1



8.2 | Pillar 2



Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Mozambique; 1 out of the 23 indicators included in pillar 2 has no data.

Mozambique has a CCRI score of 7.9 and ranks 10<sup>th</sup> out of the 163 CCRI countries and regions, placing children in Mozambique at “Extremely High” risk. Natural shocks continue to drive needs in Mozambique, highlighting the country’s position as one of Africa’s most vulnerable countries to disasters and climate change.

According to the CCRI, the climate and environmental shocks that children in Mozambique are highly exposed to include:



## Coastal flooding

Rising sea levels are a major driver of flooding in low-lying coastal areas of Mozambique, including the urban centre of Beira which lies only 4.9 meters above sea level.<sup>ccxxxvi</sup> The positioning of Mozambique’s extensive 2,300 km coastline facing the Indian Ocean also puts many children at moderate risk of storms and cyclones, which are a major cause of flooding. For example, in January 2021, Tropical Cyclone Eloise caused widespread flooding in central Mozambique, damaging 17,000 homes, displacing 16,000 people, and causing over a dozen deaths.<sup>ccxxxvii</sup>



## Vector-borne diseases

16.2 million children are estimated to live in areas exposed to one or more disease vectors in Mozambique. 96 percent of children are at risk of aedes, 83 percent are exposed to dengue and 49 percent are at risk of zika. Malaria is also widespread in the country, with seasonal fluctuations and a peak season between December to April. Between 2011-2015 malaria accounted 42 percent of mortalities for children under the age of 5.<sup>ccxxxviii</sup> Vector disease risk increases during cyclone and flood events in Mozambique, as stagnant water creates suitable breeding grounds for mosquitoes. Increased risks of floods with climate change, makes adapting the healthcare sector in Mozambique critical, to protect children from illness and death related to vector-borne diseases.



### Heatwaves

41 percent of children are exposed to heatwaves in Mozambique. According to new UNICEF analysis, it is anticipated that the percentage of children exposed to high heatwave frequency<sup>23</sup> will rise dramatically from 1 percent in 2020, to all children in Mozambique under both high and low emission scenarios by 2050.<sup>ccxxxix</sup> Moreover, the proportion of children exposed to high heatwave duration<sup>24</sup> is expected to increase by 82 percent from 2020 to 2050 under a high emission scenario.<sup>ccxi</sup>



### Soil and water pollution

In Mozambique, immediate action is required to prevent soil pollution and its consequences for the country's food and nutritional security. Human action and climate change are the primary factors threatening the condition of soils in the country. The improper use of agrochemicals, solid waste, and untreated wastewater are other sources of contamination, especially in waterways, which pose serious health concerns to children.<sup>ccxii</sup> Moreover, over one third of children and adolescents under the age of 20 are exposed to lead pollution in Mozambique (34 percent), which can cause long lasting neurological, cognitive, and physical impairment depending on levels of exposure.



### Water scarcity

Water scarcity is increasing in Mozambique, with droughts particularly frequent in the central and southern regions. Water scarcity frequently has negative effects on Mozambique's agriculture, coastal zone productivity, grazing areas, food imports, and livestock, in turn greatly affecting national food security. For example, food insecurity is still a major issue in southern and central Mozambique following droughts in 2022. Further, droughts and floods frequently occur within the same year in the country, giving agricultural land and communities little time to recover.<sup>ccxliii</sup>



### Riverine flooding

Mozambique's positioning at the mouth of several international river basins renders the country highly susceptible to riverine flooding. Flood risks pose a constant threat to agriculture and the deliverance of essential child services, particularly when combined with cyclones or storm surges.<sup>ccxliv</sup> Riverine flooding occurs almost annually in Mozambique during the rainy season and is strongly influenced by the Inter Tropical Convergence Zone and La Niña effects. Seasonal level projections indicate an increase in rainfall in the wet season between July to September in Mozambique, which may increase future flood risks.<sup>ccxlv</sup>

## Underlying vulnerabilities



### WASH

The CCRI identifies inadequate WASH as the greatest underlying vulnerability contributing to children's climate risk in Mozambique. 37 percent of households continue to use unimproved sanitation in the country and over 6 million people (21 percent of households) continue to practice open defecation, which has a direct impact on community health and safety.<sup>ccxlv</sup> Moreover, 63 percent of households have access to basic drinking water services<sup>ccxlii</sup> and data on hygiene is limited. Children and families affected by displacement and conflict confront the most severe WASH issues. Geographic disparities also exist. For example, in the northern provinces, such as Zambézia, just 30 percent of the population has access to safe water, and only 13 percent uses improved sanitation. In contrast, nearly 87 percent of the population in the southern province of Maputo has access to safe water, and 70 percent has access to and utilises improved sanitation.<sup>ccxlvii</sup>



### Health and nutrition

Mozambique's child mortality rate is high (70 per 1,000 live births). Despite efforts to reduce preventable diseases, diarrhoea remains a primary cause of death among children. Maternal mortality rates are also high (289 per 100,000 live births) Nearly 40 percent of children under the age of 5 are stunted for their age, with areas Palma, Macomia, and Quissanga facing severe hunger.<sup>ccxlviii</sup> Recent conflict and other shocks have led to increased food insecurity, with approximately 545,100 children in need of nutrition assistance in 2022.<sup>ccxlix25</sup>

23 High heatwave frequency is defined as any area where there are on average 4.5 or more heatwaves per year.

24 High heatwave duration is defined as any area where the average heatwave event lasted 4.7 days or longer.

25 UNICEF Nutrition sector estimate based on number of people displaced and host families.

<http://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1154889/?iso3=MOZ>



### Poverty and social protection

Mozambique is one of the poorest countries in the globe, facing multiple development challenges including high poverty rates, low life expectancy and significant gaps in education levels. Mozambique's high exposure to frequent hazards including drought, cyclones, and disease outbreaks, exacerbates poverty. In 2014, the poverty headcount ratio at national poverty lines was 46.1 percent and in 2020, an estimated 46.3 percent of children experience multidimensional poverty.<sup>cc1</sup> Further, poverty levels have been exacerbated by instability and conflict. In the conflict zone of Cabo Delgado, 517,986 children were displaced, as of June 2022,<sup>cc2</sup> one third of health facilities had been destroyed, and multiple water systems had come under attack, preventing children from access to essential services. The conflict has also created a protection crisis. Girls and boys are increasingly exposed to child rights violations, GBV and other protection risks related to displacement and in situations of children in armed conflict.<sup>cc3</sup>



### Education

Mozambique has demonstrated significant progress in the education sector in recent years, including eliminating school fees, offering direct funding to schools, and supplying free textbooks at the elementary level and the education sector receives the largest portion of the state budget (over 15 percent).<sup>cc4</sup> These advancements have seen substantial increases in school attendance over the past decade. However, access to consistent, quality education remains a struggle, largely due to hazards and conflict. Following the return of many children to school after the COVID-19 pandemic, an escalation in violence in Cabo Delgado has continued the disruption of education for thousands of children. For example, in 2022, an estimated 522,000 children in Mozambique needed access to school.<sup>cc5</sup>

# Rwanda



CCRI



5.7 | High

## Climate and environment shocks



4.5 | Pillar 1

Water scarcity	0.0
Riverine floods	6.2
Coastal floods	0.0
Tropical cyclones	0.0
Vector borne disease	6.6
Heatwaves	0.0
Air pollution	7.1
Soil and water pollution	8.3

## Child vulnerability



6.7 | Pillar 2

Child health and nutrition	5.6
Education	3.9
Water, sanitation, and hygiene	9.4
Poverty, communication assets and social protection	7.9

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Rwanda; 1 out of the 23 indicators included in pillar 2 has no data.

Rwanda has a CCRI score of **5.7** and ranks **57<sup>th</sup>** out of the 163 CCRI countries and regions, placing children in Rwanda at “**High**” risk.

According to the CCRI, the climate and environmental shocks that children in Rwanda are highly exposed to include:



### Soil and water pollution

Soil and water pollution levels are dangerously high in Rwanda. The agricultural sector is a leading driver, with 87 percent of children living in areas with high pesticide pollution risks. Agriculture also contributes to the high levels of toxic Cadmium found in Rwanda’s soils.<sup>cclv</sup> Moreover, 21 percent of young people (under the age of 20) are exposed to lead pollution, which can have severe impacts on physical and neurological health. Climate change is expected to increase pollutant levels in Rwanda, especially with increased rainfall and floods, which allow pollutants to be more easily transported.<sup>cclvi</sup>



### Air pollution

97 of percent of children exposed to ambient air pollution levels (PM2.5  $\geq$  10  $\mu\text{g}/\text{m}^3$ ). The greatest contributors of poor air quality in the country include the industrial sector, transport emissions and agricultural waste burning, and the city of Kigali has consistently high levels of air pollution.



### Vector-borne diseases

5.3 million children are estimated to live in areas exposed to one or more disease vectors in Rwanda.

87 percent of children are at risk to PV malaria (unstable transmission) and 71 percent are at risk of PF Malaria (stable transmission). 61 percent of children are exposed to zika and just less than half of children are at risk of aedes (46 percent). Malaria is second highest driver of mortality in the country (behind AIDS), responsible for 23 percent of all deaths.<sup>cclvii</sup> As a result of climate change, malaria, tick bite fever, and schistosomiasis are all expected to have a greater influence on human health in Rwanda.<sup>cclviii</sup>



### Riverine flooding

Riverine flooding is another frequent climate hazard impacting children in Rwanda, albeit exposure levels are lower than other LDCs (just 10 percent of children exposed)<sup>26</sup>. Regions in northern Rwanda (provinces of Gisenyi, Ruhengeri, and Byumba), south-western Rwanda (Gikongoro and Butare), western Rwanda (Kibuye, and Gikongoro), and northern part of Kigali, are the most vulnerable flooding.<sup>cclix</sup> The impacts of flooding in Rwanda have increased in severity in recent years, as a result of population growth and land scarcity, which has forced more people to dwell in flood-prone locations. In addition, heavy rainfall events in the northern and western provinces are causing flash flooding, landslides, and mudslides, resulting in significant infrastructure damage and fatalities.<sup>cclx cclxi</sup>

## Underlying vulnerabilities



### WASH

Inadequate WASH makes children in Rwanda especially vulnerable to climate change. Only 12 percent of households have access to a safely managed drinking water service.<sup>cclxii</sup> Access to safe sanitation and hygiene are also limited. Around 86 percent of households have no handwashing facilities<sup>cclxiii</sup> and 32 percent of schools have no hygiene services.<sup>cclxiv</sup> Children without access to adequate WASH provisions have a reduced capacity to respond to, and treat, climate-related diseases, and girls frequently miss school due to a lack of adequate MHM services.



### Health and nutrition

Rwanda has seen significant advancements in its health sector in recent years, including a two-thirds drop in child mortality<sup>cclxv</sup> and success combating tuberculosis and malaria. An increase in both vector and water-borne disease outbreaks are expected with climate change in Rwanda. Without sufficient resilience measures, these outbreaks are predicted to have a major impact on children's health outcomes. A household survey in 2020 found that only 56 percent of children under the age of 5 were sleeping under ITNs,<sup>cclxvi</sup> which is a simple preventative measure to reduce vector-borne disease exposure. Child malnutrition is also expected to increase, due to the projected reductions in food insecurity anticipated with climate change. In 2020, around one third of Rwandan children under the age of 5 were stunted for their age.



### Poverty and social protection

Rwanda has made substantial economic and structural reforms and sustained its steady economic growth rates for over a decade, until the COVID-19 pandemic hit.<sup>cclxvii</sup> Rwanda aspires to be a Middle-Income Country by 2035 and a High-Income Country by 2050.<sup>cclxviii</sup> Advances in poverty reduction have been assisted by political stability in Rwanda which has been maintained since the end of the genocide in 1994.<sup>cclxix</sup> The country's poverty reduction efforts were weakened by the COVID-19 pandemic due to a combination of poor nutrition, limited health services, educational losses from school closures, and school dropouts. Moreover, social protection remains limited at 10.5 percent of effective coverage according to the ILO.<sup>cclxx</sup>



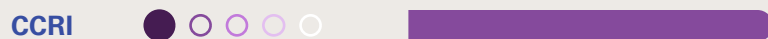
### Education

Rwanda is one of the top performing countries in the education sector in Sub-Saharan Africa. Youth literacy rate is high at 86.5 percent, as are attendance rates in primary schools (94 percent in 2015).<sup>cclxxi</sup> Nevertheless, further improvements can be made. Just 30 percent of adolescents attended lower secondary school and 15 percent of youth attended upper secondary school in 2015.<sup>cclxxii</sup> Improvements to quality of education also requires significant attention. Further, various inequities exist in the education system, where 30 percent of disabled children are not enrolled in primary school and girls are more likely to drop out of schools than boys.<sup>cclxxiii</sup>

26 Estimated using a 50-year return period.



# Somalia



8.4 | Extremely High

## Climate and environment shocks

7.0 | Pillar 1

Water scarcity	7.9	
Riverine floods	8.1	
Coastal floods	4.6	
Tropical cyclones	0.0	
Vector borne disease	7.6	
Heatwaves	7.8	
Air pollution	6.6	
Soil and water pollution	8.8	

## Child vulnerability

9.3 | Pillar 2

Child health and nutrition	9.3	
Education	0.0	
Water, sanitation, and hygiene	9.4	
Poverty, communication assets and social protection	9.2	

Version 3.1 (11 August 2021). 1 out of 4 components of pillar 2 has no data value for Somalia; 11 out of the 23 indicators included in pillar 2 have no data.

Somalia has a CCRI score of **8.4**, ranking **4<sup>th</sup>** out of the 163 CCRI countries and regions, placing children in Somalia at “**Extremely High**” risk. Vulnerability to climate hazards is also exacerbated by, and a driver of, the longstanding humanitarian crisis in Somalia, in which conflict, insecurity, drought, floods and famine have impacted children for more than two decades.

According to the CCRI, the climate and environmental shocks that children in Somalia are highly exposed to include:



### Soil and water pollution

Water contamination is a persistent hazard in Somalia, especially in displacement camps and conflict zones, where WASH infrastructure is often compromised. A staggering 91 percent of children and adolescents under the age of 20 are exposed to lead pollution, which can have severe impacts on physical and neurological health. One quarter of children also reside in areas with high pesticide pollution risk. Pollution from pesticides leaches into water systems and has been linked with cancer including childhood leukaemia. It can also cause developmental delays and impact brain and behaviour development.



### Riverine flooding

18 percent of Somali children are exposed to riverine flooding. In 2021, river flooding in Jowhar, in the Middle Shabelle region displaced an estimated 66,000 people.<sup>cclxxiv</sup> Flash floods are also common, which are especially dangerous to children due to their fast-flowing nature and quick onset. In May 2021, heavy Gu’ season rainfall triggered flash flooding in Banadir, causing 25 fatalities, including 9 children.<sup>cclxxv</sup> Alongside death and injury, flooding in Somalia is detrimental to child nutrition and food security. For example, Somalia’s cereal output in the Gu’ season was estimated to be 40 percent below average in 2021 due to crop damage from flooding.<sup>cclxxvi</sup>



### Water scarcity

Over half the population of children in Somalia are exposed to water scarcity (54 percent). The regional drought situation in the Horn of Africa is threatening child survival and development. The drought was caused by below-average rainfall and has caused mass disruption to education and widespread food insecurity in Somalia, with approximately 7.1 million people facing food insecurity and 1.8 million children under the age of 5 expected to experience wasting by July 2023.<sup>cclxxvii</sup> The water shortages are affecting an estimated 6.4 million people. The limited access to safe water has triggered a spike in cholera, with 10,440 cholera cases, including 59 deaths.<sup>cclxxviii</sup>



### Heatwaves

Over half of all children in Somalia are exposed to heatwaves. Children are more impacted by heatwaves than adults because they react more slowly to changes in ambient temperature and are more prone to health-related heat problems. Projections show that the percentage of extreme temperature days<sup>27</sup> could impact up to 75 percent of children in Somalia by 2050 under a high emission scenario.<sup>cclxxix</sup> Moreover, the city of Mogadishu is expected to be in a permanent state of heatwave throughout the duration of the warm season.<sup>cclxxx</sup> An increase in heatwaves will negatively impact critical sectors of the Somali economy including agriculture and livestock, making it even more difficult for communities to recover when climate hazards occur.



### Vector-borne diseases

6.6 million children are estimated to live in areas exposed to one or more disease vectors in Somalia. 94 percent are at risk of PV malaria (unstable transmission), 73 percent of children are at risk of aedes, and 63 percent of children are exposed to dengue. Frequent flood events in Somalia are expected to increase children's exposure risks to vector-borne diseases, as stagnant flood water creates favourable conditions for mosquito breeding grounds.

## Underlying vulnerabilities



### WASH

Inadequate WASH remains a key challenge in the country, where 28 percent of households continue to have limited access to drinking water services.<sup>cclxxxi</sup> Due to a lack of regulation of private water suppliers and extortionate fees, poorer households are often forced to source water from dangerous open wells. Moreover, 21 percent of households have no handwashing facilities and 23 percent of the population practice open defecation.<sup>cclxxxii</sup> Risks of contracting preventable diseases such as diarrhoea, cholera, and respiratory infections increase without access to clean water, toilets, and adequate hygiene. According to the WASH Cluster, 6.4 million people endure severe water shortages.<sup>cclxxxiii</sup> The scarcity of safe water has resulted in an increase in acute watery diarrhoea and cholera cases. Since January 2022, 25 of the country's 74 drought-affected districts have registered 10,440 cholera cases and 59 deaths, resulting in a 0.6 per cent case fatality rate.<sup>cclxxxiv</sup>



### Health and nutrition

An estimated 6.5 million people lack access to healthcare services in Somalia.<sup>cclxxxv</sup> Child and maternal mortality rates are staggeringly high at 111.8 (per 1,000 live births) and 829 (per 100,000 live births) respectively. 4 out of every 100 Somali children die in the first month of life, 8 out of every 100 before their first birthday, and 1 out of every 8 before they reach the age of five.<sup>cclxxxvi</sup> Prematurity, hypoxia, delivery difficulties, or infections such as pneumonia, diarrhoea, measles, and neonatal diseases account for more than 80 percent of newborn deaths.<sup>cclxxxvii</sup> The risk of contracting preventable illnesses such as diarrhoea, acute watery diarrhoea, cholera, and respiratory infections is significant without adequate WASH. Moreover, Somalia is facing a severe food security crisis, exacerbated by the ongoing drought and frequent desert locust infestations. For example, admissions of children with severe acute malnutrition were 48 percent higher in quarter one of 2022 than in the same period for 2021.<sup>cclxxxviii</sup>

<sup>27</sup> Extreme high temperatures are defined as any area where, on average, 83.54 or more days a year exceed 35°C.



### Poverty and social protection

20 years of violence has exacerbated extreme poverty in Somalia, where approximately 71 percent of the population lives below the poverty line.<sup>ccclxxxix</sup> The government fell apart in 1991, splintering the country. Despite the installation of a new administration, conflict in southern Somalia persists, with the revival of armed conflict between the federal government, the armed group Al-Shabaab and clan militias. Conflict, displacement, COVID-19, and prolonged drought have led to 5.1 million children in need of humanitarian assistance in 2023.<sup>ccxc</sup> Inadequate social protection mechanisms make it difficult for Somali families to cope with the ongoing humanitarian crisis. Just 0.18 percent of Somalia's GDP is spent on social safety net spending and only half of Somalia's population (above the age of 15) can come up with emergency funds. Multi-sectoral life-saving assistance, including the provision of social protection, including humanitarian cash transfers are imperative for Somali communities to cope with the current crisis and increase their resilience to future shocks.



### Education

Limited data sources are available for the education sector in Somalia. Drought, insecurity, and conflict have degraded children's access to education and their protective environment. More than 3.1 million children are out of school, and 900,000 are at risk of dropping out.<sup>ccxcj ccxcii</sup> Without consistent, high-quality learning, Somali children are less likely to be adaptive and empowered in their preparation, response, and recovery to future climate change.

# South Sudan



CCRI



8.2 | Extremely High

## Climate and environment shocks



6.8 | Pillar 1

Water scarcity	7.4	<div style="width: 74%;"></div>
Riverine floods	7.5	<div style="width: 75%;"></div>
Coastal floods	0.0	<div style="width: 0%;"></div>
Tropical cyclones	0.0	<div style="width: 0%;"></div>
Vector borne disease	8.4	<div style="width: 84%;"></div>
Heatwaves	8.4	<div style="width: 84%;"></div>
Air pollution	8.3	<div style="width: 83%;"></div>
Soil and water pollution	7.4	<div style="width: 74%;"></div>

## Child vulnerability



9.2 | Pillar 2

Child health and nutrition	9.4	<div style="width: 94%;"></div>
Education	9.1	<div style="width: 91%;"></div>
Water, sanitation, and hygiene	10.0	<div style="width: 100%;"></div>
Poverty, communication assets and social protection	8.3	<div style="width: 83%;"></div>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for South Sudan; 7 out of the 23 indicators included in pillar 2 have no data.

South Sudan has a CCRI score of **8.2** and ranks **7<sup>th</sup>** out of the 163 CCRI countries and regions, classifying children in South Sudan as at **“Extremely High”** risk.

According to the CCRI, the climate and environmental shocks that children in South Sudan are highly exposed to include:



### Vector-borne diseases

Children in South Sudan experience significant exposure to disease vectors, including PF malaria (stable) (99 percent), aedes (99 percent), dengue (72 percent), and zika (24 percent) (percent of the total population of children under the age of 18). Increased instances of disease outbreaks are expected with climate change, which will place an additional burden on South Sudan’s health sector. A simple way to reduce children’s exposure to disease vectors is the use of ITNs, which only 42 percent of children under the age of 5 were sleeping under according to a health survey in 2017.<sup>ccxciii</sup>



### Heatwaves

68 percent of children in South Sudan are exposed to heatwaves and prolonged exposure to extreme heat is resulting in significant heat stress in the region. According to recent UNICEF analysis, it is anticipated that the percentage of children exposed to high heatwave frequency<sup>28</sup> will rise dramatically from 14 percent in 2020, to all children in South Sudan under both high and low emission scenarios by 2050.<sup>ccxciv</sup> Moreover, 99 percent of South Sudanese children are expected to be exposed to extreme high temperatures<sup>29</sup> by 2050 under high emission scenarios.<sup>ccxcv</sup> During heatwaves, infants and small children are more likely to die or suffer from heat stress because they are unable or lack agency to regulate their body temperature and control their surrounding environment.

<sup>28</sup> High heatwave frequency is defined as any area where there are on average 4.5 or more heatwaves per year.

<sup>29</sup> Extreme high temperatures are defined as any area where, on average, 83.54 or more days a year exceed 35°C.



### Air pollution

All children are exposed to ambient air pollution levels of (PM2.5  $\geq$  10  $\mu\text{g}/\text{m}^3$ ) in South Sudan and almost one third of children (32 per cent) are exposed to ambient air pollution levels of (PM2.5  $\geq$  25  $\mu\text{g}/\text{m}^3$ ). Waste burning, forest fires, and the widespread usage of small gasoline-powered generators all contribute to South Sudan's poor air quality, and the city of Juba experiences persistently high air pollution levels.



### Water scarcity

43 percent of children are exposed to water scarcity in South Sudan. A major contributor to the present water crisis is the civil war that began in 2013. During the war, most of the country's water systems and infrastructure were abandoned or destroyed.<sup>ccxcvi</sup> The 2011 East African drought further aggravated South Sudan's water scarcity situation. During times of high water scarcity, resource conflict frequently arises between countries surrounding the Nile basin, which serves as South Sudan's primary water supply and is shared by ten other nations.



### Riverine flooding

Flooding most frequently occurs between the months of July and September in South Sudan, when heavy rains cause the Nile River's tributaries to overflow. Areas of Jonglei, Unity State, Upper Nile, Warrap, northern Bahr el Ghazal, and parts of western and eastern Equatoria are often permanently under water during the flood season.<sup>ccxcvii</sup> In 2021, South Sudan experienced some of the worst flood events in decades, which resulted in food insecurity, displacement, disruption to education and increased risks of infection to water-borne diseases.<sup>ccxcviii</sup> As flood risk increases with rising global temperatures, strengthening the resilience of critical services such as healthcare, education and WASH is essential to protect children in South Sudan from the worst effects of flooding.



### Soil and water pollution

The health of children in South Sudan is endangered by the exploration and production of the country's oil activities. Children are frequently exposed to open waste pits, waterways and soils contaminated by toxic chemicals and heavy metals. Exposure to these toxins can have severe consequences on child and maternal health and development. For example, research around the Paloch oil fields has found that pollution from the oil industries is linked to various health difficulties including female infertility, miscarriages, birth defects, and eye and skins irritations.<sup>ccxcix</sup>

## Underlying vulnerabilities



### WASH

WASH services are severely limited in South Sudan, where 37 percent of households continue to have limited drinking water services.<sup>ccc</sup> Children are often forced to drink contaminated water to survive, placing them at danger of water-borne illnesses, such as cholera and diarrhoea, which continue to be primary causes of mortality among South Sudanese children. Further, sanitation and hygiene services in households, schools and healthcare facilities remain limited and 60 percent of households practice open defecation.<sup>ccci</sup> The impact of serious food insecurity and floods, linked to climate change, continue to put stress on WASH services. This is further aggravated by high levels of displacement due to of intercommunal violence.



### Health and nutrition

Child and maternal mortality rates are staggering in South Sudan, at 99 per 1,000 live births and 1,150 per 100,000 live births respectively. Preventable infections such as diarrhoea, malaria, and pneumonia account for around 75 percent of total child mortality.<sup>cccii</sup> Climate shocks, coupled with years of conflict have contributed to an increase in food insecurity, and high levels of malnutrition in South Sudan. In 2021, 1.4 million children under the age of five were acutely malnourished, and only 7 percent of children received an adequate diet.<sup>ccciii</sup> A further constraint to improvements in South Sudan's health sector is a lack of qualified healthcare professionals, making expenditures in health education and training essential to cope with climate-related diseases.



### Poverty and social protection

Poverty levels are critically high in South Sudan, where 82.3 percent of people were living below the national poverty line in 2016. Several compounding factors contribute to such high levels of poverty, including food and nutrition instability, flooding, sub-national conflict, and disease outbreaks.

When climate shocks strike, approximately 76 percent of South Sudan's population (above 15 years of age) are unable to come up with emergency funds, necessitating an increase in social safety net investments to safeguard children and their families.



## Education

Insufficient access to quality education remains a key challenge in South Sudan. The number of out-of-school children has increased dramatically following COVID-19, reaching 2.8 million in 2021.<sup>ccciiv</sup> Girls make up the majority of out-of-school children in the country, due to several factors including poverty, child marriage, and cultural and religious beliefs. Moreover, a lack of skilled teachers, and poor quality of education materials can have detrimental effects on children's learning results. Further, the voluntary return of refugees from neighbouring countries, such as Uganda due to protracted closure of schools, has exacerbated pressures on the education sector.

# Uganda



CCRI



6.8 | High

## Climate and environment shocks



6.3 | Pillar 1

Water scarcity	6.2	<div style="width: 62%;"></div>
Riverine floods	6.4	<div style="width: 64%;"></div>
Coastal floods	0.0	<div style="width: 0%;"></div>
Tropical cyclones	0.0	<div style="width: 0%;"></div>
Vector borne disease	8.8	<div style="width: 88%;"></div>
Heatwaves	7.7	<div style="width: 77%;"></div>
Air pollution	8.4	<div style="width: 84%;"></div>
Soil and water pollution	6.5	<div style="width: 65%;"></div>

## Child vulnerability



7.3 | Pillar 2

Child health and nutrition	6.8	<div style="width: 68%;"></div>
Education	5.0	<div style="width: 50%;"></div>
Water, sanitation, and hygiene	9.6	<div style="width: 96%;"></div>
Poverty, communication assets and social protection	7.6	<div style="width: 76%;"></div>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Uganda; 5 out of the 23 indicators included in pillar 2 have no data.

Uganda has a CCRI score of **6.8** and ranks **37<sup>th</sup>** out of the 163 CCRI countries, placing children in Uganda at **“High”** risk.

According to the CCRI, the climate and environmental shocks that children in Uganda are highly exposed to include:



### Vector-borne diseases

24 million children are estimated to live in areas exposed to one or more disease vectors in Uganda. 60 percent of children are exposed to dengue, 82 percent are at risk of aedes, and 85 percent are exposed to zika. In 2019 Uganda had the largest number of malaria cases in ESAR, the third highest global burden of malaria cases globally and the eighth highest incidence of mortality.<sup>cccv</sup>



### Air pollution

98 percent of Ugandan children are exposed to ambient air pollution levels (PM2.5  $\geq$  10  $\mu\text{g}/\text{m}^3$ ). The main sources of poor air quality include manufacturing, vehicle emissions and waste burning, and the cities of Kampala has been identified as a highly polluted city, where around 28,000 people die each year in the country as a result of air pollution.<sup>cccv</sup>



### Heatwaves

Almost half the population of children are exposed to heatwaves in Uganda (47 percent). Heatwaves have a significant impact on the beef and dairy cattle industry, as well as on crop yield and production quality in the country. In addition, exposure to abnormal or prolonged heat can affect education in Uganda, since high temperatures make the classroom uncomfortable, causing children to become fatigued, lowering educational outcomes.



### Soil and water pollution

Water pollution is one of the most detrimental environmental hazards in Uganda. Lake Victoria, which is the primary source of fresh water for Uganda, Kenya, and Tanzania has become highly polluted, as a result of poor land management and agricultural practices, untreated wastewater and industrial waste. The pollution has resulted in significant hyacinth growth, depleting fish stocks, reducing biodiversity and increasing costs of water treatment, which in turn increases children's exposure to harmful pathogens.<sup>cccvii</sup> Climate-induced displacement is expected to increase competition for Lake Victoria's water resources, further putting livelihoods, and food security in jeopardy. Moreover, deforestation and mining are significant drivers of soil pollution, and 20 percent of children and adolescents under the age of 20 are exposed to lead pollution.



### Riverine flooding

Exposure to riverine flooding affects 1.5 million children in Uganda. Nearly 50,000 individuals and more than USD 62 million in GDP are affected annually by floods.<sup>cccviii</sup> Both flash floods and slow-onset floods, are frequent, especially in cities, low-lying areas, areas along riverbanks, and swamplands. The nation's capital, Kampala, as well as the northern and eastern regions are the places most vulnerable to flooding.<sup>cccix</sup>



### Water scarcity

Over 2 million children are exposed to water scarcity in Uganda. The "livestock corridor," which runs from western and central Uganda to mid-northern and eastern Uganda, are the most susceptible to drought.<sup>ccc</sup> A heavy dependence on rain-fed agriculture and natural resources make communities particularly vulnerable to periods of drought. For example, 80 percent of Uganda's rural population are dependent on subsistence agriculture.<sup>cccxi</sup> Children's risks to drought and water scarcity are expected to increase in future years, because of environmental degradation, inadequate irrigation infrastructure, and a lack of community-level disaster preparedness in the country.

## Underlying vulnerabilities



### WASH

Access to adequate WASH is limited in Uganda, where only 39 percent of households have access to basic drinking water services, 45 percent of households have no handwashing facilities and 58 percent of households have unimproved sanitation services.<sup>cccxii</sup> Water-borne diseases are rife in Uganda, where diarrheal disease is one of the top three killers of children, killing approximately 33 children each day.<sup>cccxiii</sup> Climate related hazards such as floods, exacerbate the spread of water-borne and vector-borne diseases. Improving access to climate resilient WASH services and infrastructure can considerably reduce Ugandan children's health risks related to climate change.



### Health and nutrition

The mortality rate for children under the age of 5 is high in Uganda at 42.1 per 1,000 live births. Children living in rural areas, areas of high poverty and with uneducated mothers are the most likely to die before reaching the age of 5. Maternal mortality rates are also high in the country, at 375 deaths per 100,000 live births. The majority of child and maternal fatalities are caused by preventable diseases and conditions, such as poor quality of treatment during delivery, unsafe abortions, hypertensive disorders, infections, postpartum haemorrhage, malaria, pneumonia, diarrhoea, and HIV.<sup>cccxiv</sup> Child malnutrition rates are also high in the country, more than one third of young children – 2.4 million – are stunted, and half of children under the age of five and are anaemic.<sup>cccxv</sup>



### Poverty and social protection

Uganda is one of the youngest countries globally, where over half of the population is under the age of 15 and 41 percent of the population lives in poverty.<sup>cccxvi</sup> Economic growth has slowed significantly in recent years, following exogenous shocks including droughts and COVID-19, with growth since 2011 barely surpassing the country's high population growth rate of 3 percent.<sup>cccxvii</sup> Additionally, Uganda has Africa's highest refugee population, with over 1.6 million people seeking sanctuary in the country<sup>cccxviii</sup>, putting strain on already limited resources.





## Education

Delivering basic education remains a key challenge in Uganda. The lack of pre-schools and early childhood education centres, as well as qualified teachers, jeopardises children's learning and development. Pre-primary education is only attended by one out of every ten children aged 3-5.<sup>cccxi</sup> 8 out of 10 children aged 6 to 12 years attend primary school and more than 1 in 4 attend secondary school.<sup>cccxx</sup> Gender disparities exist in relation to education access. Early marriage, adolescent pregnancy, school maltreatment, and costly high school fees prevent many girls from attending secondary education.<sup>cccxxi</sup> During times of high water stress, even more children are likely to miss school and the high refugee population is putting an increasing strain on Uganda's education system.

# United Republic of Tanzania



CCRI



6.7 | High

## Climate and environment shocks



6.2 | Pillar 1

Water scarcity	7.3	
Riverine floods	6.5	
Coastal floods	6.3	
Tropical cyclones	0.0	
Vector borne disease	8.3	
Heatwaves	7.4	
Air pollution	3.9	
Soil and water pollution	6.0	

## Child vulnerability



7.2 | Pillar 2

Child health and nutrition	7.1	
Education	5.6	
Water, sanitation, and hygiene	8.3	
Poverty, communication assets and social protection	7.7	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for United Republic of Tanzania; 1 out of the 23 indicators included in pillar 2 has no data.

The United Republic of Tanzania or “Tanzania” has a CCRI score of **6.7** and is ranked **40<sup>th</sup>** out of the 163 countries and regions, placing children in Tanzania at “**High**” risk.

According to the CCRI, the climate and environmental shocks that children in Tanzania are highly exposed to include:



### Vector-borne diseases

30.8 million children are estimated to live in areas exposed to one or more disease vectors in Tanzania. 86 percent of children are exposed to aedes, 60 percent to dengue, and 45 percent to zika. Moreover, 99 percent of children are at risk of PV malaria (unstable) and 97 percent are at risk of PF malaria (stable). Climate change is expected to spread of vector-borne diseases, into previously unaffected areas. For example, Tanzania has already seen the spread of malaria into Tanga, Kilimanjaro, and Arusha Highlands.<sup>cccxxii</sup> Moreover, increased periods of rainfall during El Nino events, has been linked to an increase in disease vectors, including malaria in the country.<sup>cccxxiii</sup>



### Heatwaves

Approximately, 20 percent of children are exposed to heatwaves in Tanzania. According to recent UNICEF analysis, it is anticipated that the percentage of children exposed to high heatwave frequency<sup>30</sup> will rise dramatically from 17 percent in 2020, to 100 percent of children under both high and low emission scenarios by 2050. <sup>cccxxiv</sup> During heatwaves, infants and small children are more likely to die or suffer from heat stress because they are unable or lack agency to regulate their body temperature and control their surrounding environment. A greater frequency of heatwaves is also expected to have a substantial impact on children’s education, as extreme temperatures cause many children to miss school or become fatigued, worsening their learning outcomes.

<sup>30</sup> High heatwave frequency is defined as any area where there are on average 4.5 or more heatwaves per year.



### Water scarcity

Approximately 5.6 million children are exposed to water scarcity in Tanzania. Tanzania has a water intensive economy, where agriculture, agro-processing, mining, tourism, and energy generation are the primary industries. Agriculture consumes the majority of available water resources, accounting for around 89 percent of overall consumption in Tanzania (against a global average of 70 percent).<sup>cccxxv</sup> Droughts have a significant influence on Tanzania's water dependent economy, for example, weather-related disasters, notably drought, generate an estimated USD 200 million in yearly losses in the agricultural sector.<sup>cccxxvi</sup> Moreover, poor crop yields because of drought significantly undermine efforts to alleviate poverty and food insecurity in the country. Tanzania urgently needs to enhance the management of its water resources, especially as, levels of water scarcity are anticipated to worsen with climate change.



### Soil and water pollution

In Tanzania's major towns and cities, solid and liquid wastes are frequently left untreated. Soil and water are frequently polluted as a result, which poses a serious health risk to people who live in poorer areas. Moreover, marine pollution is significant due to a lack of sewage systems in areas like Dar es Salaam, affecting marine ecosystems and coastal communities. Further, nearly one quarter of children and adolescents under the age of 20 are exposed to lead pollution in the country, which can have lifelong impacts on development and well-being.



### Riverine flooding

Almost 2 million children are exposed to riverine flooding in Tanzania. Flooding can have disastrous effects on agriculture, food security, health, groundwater supplies, hydropower generation, and the economy. For example, in 2020, approximately 20,000 people were affected by floods and landslides, as a result of the "Vuli" and "Masika" rains, many of which required food and WASH assistance.<sup>cccxxvii</sup>



### Coastal flooding

Whilst the country's overall coastal flood risk scores lower on the CCRI than in other LDCs, the impacts are significant for children and families living in coastal areas. The low-lying metropolis of Dar-es-Salaam, which houses approximately 5 million residents has been identified as an areas of high flood risk. The country's mangroves, groundwater resources, coastal infrastructure, and livelihoods are all at risk from coastal flooding, erosion and rising sea levels.

## Underlying vulnerabilities



### WASH

Inadequate WASH is a significant vulnerability in Tanzania, where 39 percent of households have unimproved sanitation and 35 percent have limited hygiene services.<sup>cccxxviii</sup> Inadequate access to WASH comes at a high cost, squandering resources which can be put into the resilience of other key services. For example, Tanzania is predicted to spend 70 percent of its health expenditure on preventable WASH-related illnesses.<sup>cccxxix</sup> Homes, schools, and health centres that lack proper WASH facilities create breeding grounds for infections that kill children and impair their capacity to thrive. The most vulnerable are girls, disabled children, and children living in rural areas.



### Health and nutrition

Recent advances in the health sector, such as regular vaccination, Vitamin A supplementation, HIV prevention, and improved management of common childhood diseases has saved the lives of thousands of Tanzanian children.<sup>cccxxx</sup> Preventable illnesses including malaria, pneumonia, diarrhoea, and newborn disorders continue to take the lives of Tanzanian children daily. In addition, malnutrition remains a significant barrier to child development, with almost one third of children under the age of 5 stunted for their age, which can have irreversible, life-long implications.



### Poverty and social protection

Tanzania's poverty rate has seen a steady decline over the past decade from 34.4 in 2007 to 26.4 in 2017.<sup>cccxxxi</sup> Nevertheless, living conditions remain inadequate for many. For example, just below one third of the population have access to electricity, with rural areas and poorer households disproportionately affected. In addition, coverage of social safety net programmes remains limited, with annual social safety net spending accounting for only 0.38 percent of the country's GDP. In addition, around 61 percent of the population over the age of 15 are unable to come up with emergency funds.



## Education

Tanzania attained virtually universal access to primary education in 2007. However, enrolment of primary school-aged children has since declined. In 2016, 81 percent children attended primary school, 28 percent of adolescents attended lower secondary school and just 3 percent of youth attended upper secondary education.<sup>cccxixii</sup> Primary school-aged children from low-income households are 3 times less likely to attend school than those from higher-income families.<sup>cccxixiii</sup> Poor gender parity is also a key issue, with school dropout rates significantly higher for girls in Tanzania, largely due to early marriage and teenage pregnancy. Whilst youth literacy rates are moderately high, (85.8 percent), poor quality education remains a significant problem and many Tanzanian children fail to acquire core learning goals including literacy, numeracy, and life skills.

# Zambia



CCRI

6.6 | High

**Climate and environment shocks**

5.3 | Pillar 1

Water scarcity	7.2	<span style="display: inline-block; width: 100%; height: 2px; background-color: orange;"></span>
Riverine floods	5.8	<span style="display: inline-block; width: 90%; height: 2px; background-color: orange;"></span>
Coastal floods	0.0	<span style="display: inline-block; width: 0%; height: 2px; background-color: orange;"></span>
Tropical cyclones	0.0	<span style="display: inline-block; width: 0%; height: 2px; background-color: orange;"></span>
Vector borne disease	7.8	<span style="display: inline-block; width: 100%; height: 2px; background-color: orange;"></span>
Heatwaves	6.8	<span style="display: inline-block; width: 95%; height: 2px; background-color: orange;"></span>
Air pollution	4.8	<span style="display: inline-block; width: 50%; height: 2px; background-color: orange;"></span>
Soil and water pollution	5.4	<span style="display: inline-block; width: 60%; height: 2px; background-color: orange;"></span>

**Child vulnerability**

7.6 | Pillar 2

Child health and nutrition	7.2	<span style="display: inline-block; width: 100%; height: 2px; background-color: blue;"></span>
Education	4.1	<span style="display: inline-block; width: 40%; height: 2px; background-color: blue;"></span>
Water, sanitation, and hygiene	10.0	<span style="display: inline-block; width: 100%; height: 2px; background-color: blue;"></span>
Poverty, communication assets and social protection	9.1	<span style="display: inline-block; width: 90%; height: 2px; background-color: blue;"></span>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Zambia; 1 out of the 23 indicators included in pillar 2 has no data.

Zambia has a CCRI score of **6.6** and ranks **45<sup>th</sup>** out of the 163 CCRI countries and regions, placing children in Zambia at **“High”** risk.

According to the CCRI, the climate and environmental shocks that children in Zambia are highly exposed to include:



## Vector-borne diseases

Zambian children experience various exposure to disease vectors, including aedes (91 percent), dengue (49 percent) and zika (32 percent). Additionally, malaria is a major public health issue, which is endemic throughout the country. Such high risks to vector-borne diseases make the need to adapt healthcare systems imperative in Zambia, especially as climatic variations can bring longer transmission seasons and increase exposure across a larger geographic range.



## Water scarcity

In Zambia, one third of children are exposed to water scarcity. Meteorological droughts have had significant impacts on Lake Kariba, which experiences dangerously low water levels.<sup>cccxxxiv</sup> Such impacts have resulted in critical reductions in power generation, given that 95 percent of Zambia’s power supply comes from hydroelectricity.<sup>cccxxxv</sup> These energy reductions have negatively affected socioeconomic activities in both Zambia and neighbouring Zimbabwe.<sup>cccxxxvi</sup> The water scarcity situation in Zambia is projected to worsen with future climate change, as maximum and minimum temperatures increase, levels of rainfall decrease, and as heatwaves increase in duration and frequency.<sup>cccxxxvii cccxxxviii</sup>



### Heatwaves

Almost one quarter of children in Zambia are exposed to heatwaves (24 percent), resulting in significant heat stress in the country. New UNICEF analysis has revealed that the percentage of children exposed to high heatwave frequency<sup>31</sup> will rise dramatically from 14 percent in 2020, to 100 percent of children in Zambia, under both high and low emission scenarios by 2050.<sup>cccxxxix</sup> Moreover, the proportion of children exposed to high heatwave duration<sup>32</sup> is expected to increase from 4 percent in 2020 to between 86-100 percent by 2050 under various emission scenarios <sup>cccxi</sup>



### Riverine flooding

Approximately, 600,000 children are exposed to riverine flooding in Zambia. Both slow-onset and flash flooding are common in Zambia. For example, in January 2022, an estimated 15,000 individuals were affected by flash flooding in Zambia’s southern province. The flooding significantly affected agriculture, inundating 8,000 hectares of crops and carried animals like goats and poultry away.<sup>cccxi</sup> In Namwala, 500 households were displaced and forced to live in schools, where their access to basic needs including safe WASH, and food were limited.<sup>cccxlii</sup> Whilst this hazard score is lower than comparable LDCs (5.8), an increase in the frequency and intensity of flood events are expected with climate change.

## Underlying vulnerabilities



### WASH

Despite significant WASH improvements in recent years, around 22 percent of households in Zambia continue to use drinking water from unimproved sources, over half the population have no access to handwashing facilities (51 percent) and 37 percent have unimproved sanitation services.<sup>cccxliv</sup> Without access to adequate WASH provisions, healthcare professionals have a reduced capacity to treat an increased burden of climate-related diseases. Inadequate access to WASH also affects dropout rates in schools in Zambia, especially for girls who have specific MHM needs.



### Health and nutrition

In Zambia, child and maternal mortality are rates high at 57.7 per 1,000 live births and 213 per 100,000 live births, respectively. The leading causes of child mortality include vaccine-preventable illnesses (e.g., tuberculosis [TB], polio, measles, diphtheria, whooping cough, and tetanus), HIV, malaria, pneumonia, diarrhoea, and malnutrition.<sup>cccxliv</sup> Over one third of Zambian children under the age of 5 are stunted for their age, which has been linked to poor sanitation in the country. Food insecurity mostly affects disadvantaged rural communities and intensifies rises following heatwaves and droughts.



### Poverty and social protection

Recent economic progress saw Zambia meeting the criteria for LDC graduation for the first time in 2021. Nonetheless, significant socio-economic challenges remain and Zambia’s growing youthful population is expected to put significant pressure on the growing demand for social services. In 2020, 58 percent of Zambian children were living in households with income below the national poverty line.<sup>cccxlv</sup> Moreover, according to the ILO, one quarter of the country is covered by effective social protection.<sup>cccxlv</sup> Approximately 86 percent of the population (over the age of 15) are unable to conjure up emergency funds and only 0.8 percent of public expenditure is spent on social protection.<sup>cccxlvii</sup>



### Education

Zambia’s CCRI score for education is considerably lower than other LDCs. Youth literacy rates stand high, at 92 percent. Zambia has almost achieved universal primary education completion levels, with government figures indicating a 91.8 percent completion rate at Grade 7.<sup>cccxlviii</sup> Nonetheless, significant regional disparities exist, with the northern area recording 81 percent and the southern capital city Lusaka, approximately 79 percent.<sup>cccxlix</sup> Improvements to equity and quality of education are key areas for Zambia to focus on. For example, girls continue to be at a disadvantage, with higher of dropout rates than boys, as well as lower levels of transition into secondary levels.

31 High heatwave frequency is defined as any area where there are on average 4.5 or more heatwaves per year.

32 High heatwave duration is defined as any area where the average heatwave event lasted 4.7 days or longer.



© UNICEF/UN0766839/Joseph

## Country Profiles

# Latin America and the Caribbean

---

Children in Latin America and the Caribbean (LAC) are at the forefront of a rapidly changing climate. Extreme temperatures, and shifting precipitation patterns are already having a negative impact on hydrological systems, biodiversity, and livelihoods particularly in the Andean mountains, Amazon rainforest and Caribbean islands. Among the most vulnerable are the children of Haiti, the regions' only LDC.

**Table 7****Estimates of children's exposure to climate related hazards, shocks, and stresses in LDCs in LACR**

Country	Number of children under 18 years old exposed to / living in areas with					
	Water scarcity	Riverine floods (50 years)	Coastal flood risk	Extensive cyclone wind (100 years)	Intensive cyclone wind (100 years)	Heatwaves
<b>Haiti</b>	100 thousand	230 thousand	-	4.2 million	4.2 million	2.5 million
<b>UNICEF LAC LDCs (1 country)</b>	<b>100 thousand</b>	<b>230 thousand</b>	<b>-</b>	<b>4.2 million</b>	<b>4.2 million</b>	<b>2.5 million</b>

**Table 8****Estimates of children's exposure to environmental hazards, shocks, and stresses in LDCs in LACR**

Country	Number of children under 18 years old exposed to / living in areas with			Number of children under 20 years old exposed to
	Ambient air pollution (PM2.5 >= 10 µg/m3)	Ambient air pollution (PM2.5 >= 25 µg/m3)	High pesticide pollution risk	Lead pollution
<b>Haiti</b>	1.4 million	-	30 thousand	4.6 million
<b>UNICEF LAC LDCs (1 country)</b>	<b>1.4 million</b>	<b>-</b>	<b>30 thousand</b>	<b>4.6 million</b>

**Table 9****Estimates of children living in areas exposed to one or more disease vectors in LDCs in LACR**

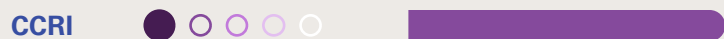
Country	Number of children under 18 years old living in areas exposed to one or more disease vectors*
<b>Haiti</b>	4.2 million
<b>UNICEF LAC LDCs (1 country)</b>	<b>4.2 million</b>

\*Plasmodium Falciparum Malaria, Plasmodium Vivax Malaria, Aedes, Dengue, Zika

Source: CCRI index (Beta version) (All absolute numbers rounded to the nearest decimal of a million, nearest ten thousand if greater than or equal to 10,000 or nearest five thousand if less than 10,000)



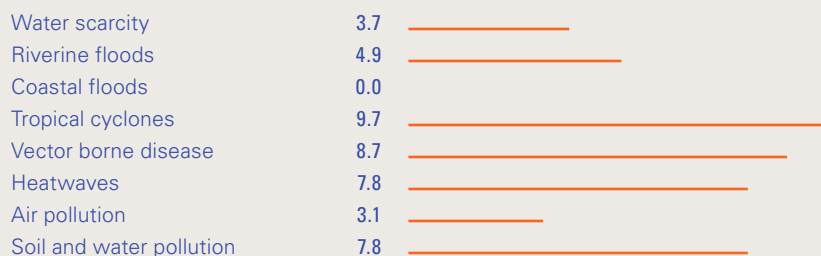
# Haiti



7.3 | Extremely High

**Climate and environment shocks**

6.7 | Pillar 1



**Child vulnerability**

7.8 | Pillar 2



Version 3.1 (11 August 2021). The stated 0 for coastal floods for Pillar 1 refers to no data. All four components of pillar 2 have a data value for Haiti; 7 out of the 23 indicators included in pillar 2 have no data.

Haiti has a CCRI score of **7.3** and is ranked **29<sup>th</sup>** out of the 163 countries and regions, placing children in Haiti at “**Extremely High**” risk. Whilst considered a SIDS, the total land area for Haiti exceeds 20,000 sq/km, at 27,560 sq/km<sup>cccl</sup>, warranting the country’s inclusion in the CCRI analysis.

According to the CCRI, the climate and environmental shocks that children in Haiti are highly exposed to include:



**Tropical cyclones**

Haiti’s tropical positioning and exposure to high levels of moisture carried by trade winds makes this country highly susceptible to cyclones. From 1988-2018, 37 tropical storms have made landfall or passed by Haiti, 26 of which caused loss and damage and 13 of which were classified as tropical cyclones. Over the last 30 years, tropical storms and cyclones caused at least 73 child casualties annually and affected further 70,000 children (aged 0-14 years) per year on average, with annual damages totalling approximately USD 100 million, primarily in communities on the southern peninsula.<sup>cccli</sup>



**Vector-borne diseases**

Haitian children are exposed to a number of vector-borne diseases, including aedes (95 percent), dengue (94 percent), Zika (88 percent) and PF malaria (60 percent stable and 38 percent unstable transmission). Malaria incidence in Haiti fell 64 percent between 2010 and 2017, owing mostly to the usage of ITNS. As global temperatures rise, the prevalence of vector-borne illnesses is expected to grow into the Haitian highlands impacting the 50,000 people living in communities over 1,000 meters above sea level who have previously been unaffected.<sup>ccclii</sup>



### Heatwaves

Almost 60 percent of children under the age of 18 are exposed to heatwaves in Haiti. Heatwaves affect the children in urban areas most severely, where 2.5 million children currently live in urban slums with poor building quality, lacking access to WASH and little green spaces, all of which limit children's capacity to cope with heat stress.<sup>cccliii</sup> An increase in the frequency and severity of marine heatwaves is expected to disrupt coastal fisheries, a main source of livelihood for families in Haiti. Such disruptions will affect food security and may, result in school dropout and an increase in child labour to guarantee the family's survival.



### Soil and water pollution

Lead pollution is a serious threat to children's health and development in Haiti, where 94 percent of children and adolescents under the age of 20 are exposed to unsafe lead pollution levels. For example, research in Port-au-Prince has found dangerous lead concentration levels ranging from 40 µg/L to 90 µg/L and high Chromium (III) risks have also been measured in groundwater and drinking water.<sup>cccliv</sup>

## Underlying vulnerabilities



### WASH

Access to WASH services in Haiti are limited. 1.9 million people lack access to safe water and around 23 percent of the population lack access to basic handwashing facilities.<sup>ccclv</sup> Open defecation remains prevalent, particularly in rural areas, which 31.5 percent of the population practise.<sup>ccclvi</sup> The threat of acute respiratory infections, diarrhoeal illnesses, cholera, and malaria is growing in southern Haiti, where over 500,000 children lack access to adequate WASH and shelter.<sup>ccclvii</sup> Children with poor access to adequate WASH provisions have a reduced capacity to respond to, and treat, climate-related injuries and diseases.



### Health and nutrition

Maternal and child mortality rates are staggering in Haiti, at 480 per 100,000 live births and 58.6 per 1,000 live births respectively.<sup>ccclviii</sup> While diarrhoeal infections already accounted for 8 percent of all mortalities among children under the age of five globally in 2019, they accounted for up to 10.7 percent of deaths among Haitian children.<sup>ccclix</sup> In 2022, Haiti experienced a resurgence of cholera after over 3 years of no reported cases. This resurgence has spread to all parts of the county affecting over 13,000 people, including 283 deaths (December 2022).<sup>ccclx</sup> The outbreak has taken place amid a complicated humanitarian crisis, which is increasing the disease burden and impeding response efforts. In addition, an estimated 168,000 children suffer from acute malnutrition, particularly in Port-au-Prince, which experiences the highest prevalence of acute malnutrition globally at 6.5 percent.<sup>ccclxi</sup> Health risk is increased by the scarcity of doctors in the nation, with only one available for every 1,400 people.<sup>ccclxii</sup>



### Poverty and social protection

Children in Haiti are among the poorest children in the world, suffering from multiple deprivations which are exacerbated by climatic changes. Haiti is also the poorest country in the LAC region, with one of the lowest GDP per capita, at USD 2,925 (2020), less than a sixth of the regional average of USD 15,092.<sup>ccclxiii</sup> COVID-19, political instability, rising gang violence, and fragility are stagnating Haiti's economic growth and social development. Institutional weaknesses and sheer rates of impoverishment make social protection schemes difficult to implement in Haiti. Moreover, climate change and environmental degradation, such as deforestation and soil erosion, are major drivers of migration, especially from rural areas, where people can no longer sustain livelihoods<sup>ccclxiv</sup>, and remittances are increasingly becoming an adaptive strategy.



## Education

Access to education remains a key challenge in Haiti. Whilst attendance rates for primary level remain high at 86 percent, only 28 and 21 percent of youth attend lower and upper secondary school. In addition, over the past 2 years, over 3 million students have been unable to attend school owing to political and security issues, as well as COVID-19 lockdowns. Moreover, without adequate DRR infrastructure, earthquakes significantly affect 'children's rights to education.



## Earthquakes

Alongside climatic hazards, Haiti is highly vulnerable to natural/geophysical hazards, including earthquakes. For example, in August 2021, a 7.2 magnitude earthquake, struck south-western Haiti, causing hospitals, schools and homes to collapse, claiming hundreds of lives, and leaving communities in crisis. Approximately 82 health facilities and 56 water supply systems were severely damaged or destroyed, and an estimated 260,000 children, were estimated to need humanitarian assistance. The devastation also set back significant advancements made in social protection and highlights a greater need for building community preparedness and resilience.



© UNICEF/JUN0610701/A-H-Basha

## Country Profiles

# Middle East and North Africa

Middle East and North Africa (MENA) is the hottest and driest region across the globe, which is warming at a rate twice the global average and is experiencing increased aridification. By 2050, the region could be as much as 4°C warmer, which significantly exceeds the 1.5°C target set by the Paris Agreement.<sup>ccclxv</sup>

Climate aggravated water scarcity is one of the greatest threats to child survival and development in MENA. The region contains 14 out of 17 of the most water stressed countries worldwide according to SDG 6.4.2 and almost 90 percent of children live in areas of high or extremely high-water stress.<sup>ccclxvi</sup> Increasing water scarcity and devastating sandstorms, threaten the lives and well-being of the most vulnerable children in the region, particularly those living in LDCs.



**Table 10**

**Estimates of children’s exposure to climate related hazards, shocks, and stresses in LDCs in MENA**

Country	Number of children under 18 years old exposed to / living in areas with					
	Water scarcity	Riverine floods (50 years)	Coastal flood risk	Extensive cyclone wind (100 years)	Intensive cyclone wind (100 years)	Heatwaves
<b>Djibouti</b>	30 thousand	10 thousand	-	-	-	140 thousand
<b>Sudan</b>	11.2 million	20 thousand	20 thousand	-	-	1.2 million
<b>Yemen</b>	9.4 million	310 thousand	20 thousand	-	-	530 thousand
<b>UNICEF MENA LDCs (3 countries)</b>	<b>20.6 million</b>	<b>340 thousand</b>	<b>40 thousand</b>	-	-	<b>1.9 million</b>

**Table 11**

**Estimates of children’s exposure to environmental hazards, shocks, and stresses in LDCs in MENA**

Country	Number of children under 18 years old exposed to / living in areas with			Number of children under 20 years old exposed to
	Ambient air pollution (PM2.5 >= 10 µg/m3)	Ambient air pollution (PM2.5 >= 25 µg/m3)	High pesticide pollution risk	Lead pollution
<b>Djibouti</b>	250 thousand	240 thousand	5 thousand	60 thousand
<b>Sudan</b>	21 million	20.8 million	-	12.5 million
<b>Yemen</b>	13.3 million	13.3 million	140 thousand	13.8 million
<b>UNICEF MENA LDCs (3 countries)</b>	<b>34.5 million</b>	<b>34.3 million</b>	<b>140 thousand</b>	<b>26.4 million</b>

**Table 12**

**Estimates of children living in areas exposed to one or more disease vectors in LDCs in MENA**

Country	Number of children under 18 years old living in areas exposed to one or more disease vectors*
<b>Djibouti</b>	320 thousand
<b>Sudan</b>	21 million
<b>Yemen</b>	12.2 million
<b>UNICEF MENA LDCs (3 countries)</b>	<b>33.6 million</b>

\*Plasmodium Falciparum Malaria, Plasmodium Vivax Malaria, Aedes, Dengue, Zika

Source: CCRI index (Beta version) (All absolute numbers rounded to the nearest decimal of a million, nearest ten thousand if greater than or equal to 10,000 or nearest five thousand if less than 10,000)

# Djibouti



CCRI



5.8 | High

## Climate and environment shocks



4.3 | Pillar 1

Water scarcity	3.2	<div style="width: 32%;"></div>
Riverine floods	2.8	<div style="width: 28%;"></div>
Coastal floods	0.0	<div style="width: 0%;"></div>
Tropical cyclones	0.0	<div style="width: 0%;"></div>
Vector borne disease	6.8	<div style="width: 68%;"></div>
Heatwaves	5.8	<div style="width: 58%;"></div>
Air pollution	7.5	<div style="width: 75%;"></div>
Soil and water pollution	3.8	<div style="width: 38%;"></div>

## Child vulnerability



6.9 | Pillar 2

Child health and nutrition	7.7	<div style="width: 77%;"></div>
Education	7.0	<div style="width: 70%;"></div>
Water, sanitation, and hygiene	5.0	<div style="width: 50%;"></div>
Poverty, communication assets and social protection	7.9	<div style="width: 79%;"></div>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Djibouti; 5 out of the 23 indicators included in pillar 2 have no data.

Djibouti has a CCRI score of **5.8** and ranks **56<sup>th</sup>** out of the 163 CCRI countries and regions, placing children in Djibouti at **“High”** risk.

According to the CCRI, the climate and environmental shocks that children in Djibouti are highly exposed to include:



### Air pollution

In Djibouti, 76 percent of children are exposed to ambient air pollution (PM2.5  $\geq$  25  $\mu\text{g}/\text{m}^3$ ), exceeding the WHO recommended maximum limits (PM2.5  $\geq$  5  $\mu\text{g}/\text{m}^3$ ). The construction sector, agricultural outputs, and vehicle pollution are the greatest contributors to poor air quality in Djibouti.<sup>ccclxvii</sup>



### Vector-borne diseases

Children in Djibouti also experience high exposure to several vector-borne diseases. For example, 91 percent of children are exposed to dengue and 88 percent of children are at risk of aedes, which causes several debilitating illnesses. Conversely, children’s exposure to zika is significantly lower than other LDCs, at just 6 percent, however this may increase in the future as temperature suitability and climatic conditions for various disease vectors shift. Research suggests that an additional 1.3 billion new people could be exposed to zika virus risk by 2050.<sup>ccclxviii</sup> Djibouti’s health-care systems must be prepared for, and made resilient to, the additional burden of climate-related diseases.



### Heatwaves

Heatwaves are another environmental risk to children in Djibouti, albeit this risk level is significantly lower than in other LDCs (44 percent of children are exposed). Children in urban areas have been identified as particularly vulnerable to heat stress due to the urban heat island effect. For example, the capital, Djibouti City, is one of the world's hottest inhabited cities, with a hot desert marine climate, and temperatures ranging from 35°C to 45°C from May to September. <sup>ccclxix ccllxx</sup>

## Underlying vulnerabilities



### WASH

Djibouti has made remarkable progress in the provision of safe drinking water services in recent years. Approximately 76 percent of households have basic water service delivery. <sup>ccclxxi</sup> However, access to adequate sanitation and hygiene services remain a key challenge. Only 37 percent of households have access to a safely managed sanitation service. <sup>ccclxxii</sup> Moreover, 64 percent of Djibouti's rural population continue to practice open defecation <sup>ccclxxiii</sup> which pollutes surrounding environments and has devastating consequences on child health. Improving access to adequate WASH should remain a key priority in Djibouti to reduce children's vulnerability to climate change, including the ongoing drought.



### Health and nutrition

Over the past 20 years, Djibouti has made considerable improvements in children's health, with child mortality rates falling from 91.3 in 2004 to 54.1 in 2021. <sup>ccclxxiv</sup> Nonetheless, the maternal mortality rate remains high, at 248 per 100,000 live births. One of the primary causes for the insufficiency of maternal healthcare is the lack of healthcare providers, with only 7.3 midwives and nurses per 10,000 inhabitants. Across the country, overall acute malnutrition rates exceed the WHO emergency threshold of 10 percent. The peak is reached in the Obock region, where 25.7 percent of children under five suffer from acute malnutrition. <sup>ccclxxv</sup> Areas of the world with weak health infrastructure, that already struggle to provide adequate health-care services, will experience even greater strains on resources with climate change.



### Poverty and social protection

Poverty levels are high in Djibouti and have not reduced much since 2013, with an absolute poverty rate of 21 percent (2017) compared to 23 percent in 2013. <sup>ccclxxvi</sup> Additionally, whilst the percentage of uprooted people in Djibouti remains low at just 3 percent, the country receives an enormous number of refugees from Yemen, Ethiopia, Somalia and Eritrea and is a favourable transit country for Gulf states, putting strain on already limited services and resources. <sup>ccclxxvii</sup> COVID-19 was hard hitting to Djibouti's economy, which saw a decline in economic growth from 7.1 to 1 percent, pushing many families into further poverty. <sup>ccclxxviii</sup> Resilience to shocks including pandemics and climate hazards remains low in the region due to a lack of social protection and financial inclusion.



### Education

Out of school rates for children of primary and secondary school age Djibouti remain high at 33 percent and around 48 percent respectively, and are particularly high in the Obock and Tadjourah districts. <sup>ccclxxix</sup> The main barriers to school attendance include: absence of birth certificates, limited class sizes and community beliefs, such as that children are 'too young' 'not interested' or are required to help their families. <sup>ccclxxx</sup> Alongside, high dropout rates, quality of education remains a key challenge. Nonetheless, remarkably during COVID-19, distance learning, transmitted on radio and television from Djibouti, was able to reach more than 94,000 out of the 130,000 students enrolled in basic education, which may be a useful technology to continue education for children forced to miss school as a result of heatwaves or other shocks in the future. <sup>ccclxxxi</sup>







### Vector-borne diseases

Vector disease risk is high in Sudan, where 99 percent are at risk of PV malaria (unstable transmission), 93 percent are at risk of aedes, and 27 percent of children are exposed to dengue. In 2019, Sudan experienced an increase in outbreaks of malaria, dengue fever, Rift Valley fever and chikungunya, owing to increase in heavy rainfall. The rise of the outbreaks can be linked to the recent heavy rainfall in the country that have left significant pools of stagnant water, which are breeding sites for a variety of vectors such as mosquitoes and houseflies.<sup>cccxxxvii</sup> Exposure to these vectors, and increased risks of compounding climatic factors, makes adapting the healthcare sector in Sudan critical to protect children from the deadly impacts of vector-borne diseases.



### Soil and water pollution

Waterways and soils in Sudan are extremely contaminated. The oil industry is a major contributor to pollution, exposing children to various toxic chemicals and heavy metals. For many local governments, a lack of funding and resources poses a major barrier to effective water treatment. In addition, 57 percent of children and adolescents under the age of 20 are exposed to lead pollution, which can have significant consequences for children’s health and well-being.

## Underlying vulnerabilities



### WASH

In Sudan, 60 percent of households have access to basic drinking water services, and 37 percent have access to at least basic sanitation.<sup>cccxxxviii</sup> Inadequate WASH is the primary cause of child mortality and contributes significantly to acute malnutrition. In addition, Sudan has the highest prevalence of open defecation in MENA, which nearly a quarter of households (over 10 million people) practise.<sup>cccxxxix</sup> Open defecation poses significant public health risks, including cholera, diarrhoea, dysentery, typhoid, and polio.



### Health and nutrition

Poor health and nutrition cause significant vulnerability in Sudan. Child mortality rates are high at 54.9 percent per 1,000 live births and diarrhoea, pneumonia, and malaria account for more than 30 percent of under-five mortality. Cases of chikungunya and dengue are increasing, and the recent measles epidemic provided a major setback to Sudan’s goal of eliminating measles by 2020. Maternal health is also poor in the region, where only 27 percent of mothers receive postnatal care and maternal mortality rates are high at 295 per 100,000 live births. Additionally, Sudan is one of 14 nations that account for 80 percent of the world’s stunted children, where over one-third of children under the age of 5 (2.3 million) are stunted for their age.<sup>cccxc</sup>



### Poverty and social protection

In Sudan, nearly half of the population — around 20 million people live in poverty, with limited access to basic necessities, such as food and clean water.<sup>cccxcxi</sup> The country is endowed with fertile land, natural resources, a young labour force; nonetheless, decades of conflict and the oil-rich south’s secession in 2011 has resulted in a downward economic trend. According to IMF data, GDP declined by half between 2011 and 2019.<sup>cccxcii</sup> In addition, Sudan is one of the biggest host countries for refugees globally. In 2022, 4 million people were uprooted people in Sudan, including 3 million internally displaced by conflict and violence and 85,000 internally displaced by disasters.<sup>33</sup> In the context of displacement, children suffer a variety of increased risks, including those related to family separation, exploitation, violence and abuse, loss of education, increased vulnerability to physical and psychological trauma, all of which, place displaced children at an increased vulnerability to the impacts of climate change.

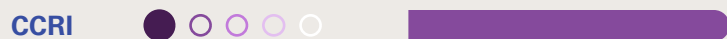


### Education

Nearly 3 million Sudanese children, aged 5 to 13, are not in school. Only 68 percent of students attend primary school, and by lower secondary, this halves to 31 percent.<sup>cccxciii</sup> Conflict, societal values on the importance of education, and poverty all contribute to low attendance rates. In addition, inadequate WASH services for MHM and socio-cultural norms around the traditional roles of women prevent many girls from attending school. Moreover, quality of education is a significant concern given a lack of teacher training. For example, in 2016 out of a total of 7,315 engaged instructors in south and east Darfur, the Ministry of Education recognised 3,692 unqualified teachers.<sup>cccxciv</sup>

33 Calculated indicator: The total number of uprooted people is the sum of refugees and asylum-seekers, returned refugees, people internally displaced by conflict and violence, and people internally displaced by disasters as proportion of the total population. Calculated using UNHCR and IDMC data.

# Yemen

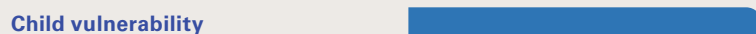


7.4 | Extremely High



7.0 | Pillar 1

Water scarcity	9.1	
Riverine floods	4.7	
Coastal floods	3.4	
Tropical cyclones	0.0	
Vector borne disease	7.3	
Heatwaves	5.2	
Air pollution	10.0	
Soil and water pollution	8.4	



7.8 | Pillar 2

Child health and nutrition	8.6	
Education	8.0	
Water, sanitation, and hygiene	6.9	
Poverty, communication assets and social protection	7.5	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Yemen; 5 out of the 23 indicators included in pillar 2 have no data.

Yemen has a CCRI score of 7.4 and ranks 26<sup>th</sup> out of the 163 CCRI countries and regions, placing children in Yemen at “Extremely High” risk. Children’s vulnerability to climate hazards is also exacerbated by the ongoing humanitarian crisis in Yemen, where approximately 13 million children require humanitarian assistance as a result of catastrophic conflict.

According to the CCRI, the climate and environmental shocks that children in Yemen are highly exposed to include:



## Air pollution

In Yemen, 99 percent of the child population is exposed to ambient air pollution levels (PM2.5  $\geq$  25  $\mu\text{g}/\text{m}^3$ ), exceeding the recommended maximum ambient air pollution of (PM2.5  $\geq$  5  $\mu\text{g}/\text{m}^3$ ). Children residing in the largest city, Sana’a are consistently exposed to high pollution risks.



## Water scarcity

Even before the current conflict broke out, Yemen was one of the world’s most water-scarce countries. 70 percent of children at risk of water scarcity, as a result of high aridity, rapid groundwater depletion and inadequate water infrastructure. Groundwater supplies are expected to be drained in the next two decades, lowering agricultural productivity up to 40 percent.<sup>cccxcv</sup> Heavy rains are regularly followed by protracted dry spells, resulting in severe drought, desertification, and land degradation. Climate change is expected to prolong Yemen’s drought periods, as a result of greater rainfall variability and temperature rise.<sup>cccxcvi</sup> Water resource management has been a priority for Yemen’s adaptation planning over the past decade. For example, some water conservation has been achieved by reusing treated wastewater and grey water from mosques, as well as by employing irrigation-saving strategies.<sup>cccxcvii</sup> Nevertheless, as climate change accelerates, further investments to adapt children’s services to increased levels of water scarcity are needed to protect vulnerable children.



### Soil and water pollution

Major causes of water pollution in Yemen include poor sanitation, a lack of sewage treatment plants, overuse of fertilisers and pesticides and manufacturing emissions. Activities related to crude oil production and petroleum refining are also significant sources of pollutants. For example, the possibility of an oil spill from the FSO Safer tanker, which stores 1.1 million barrels of crude oil just off the coast of Yemen, poses a huge risk to children.<sup>cccxcviii</sup> In addition, nearly all children and adolescents under the age of 20 (95 percent) are exposed to lead pollution. Lead pollution can cause serious health problems, including irreparable damage to brain development, neurological systems, and vital organs, even resulting in death.



### Vector-borne diseases

Malaria risk is present throughout the year in Yemen, and 91 percent of children at risk of PV malaria (unstable transmission). Other vectors of concern include Aedes (46 percent risk) and dengue (42 percent child exposure). Dengue is endemic in urban and semi-urban settings along Yemen's Red Sea and Arabian Sea coasts and was recorded in 204 districts, including rural areas, between 2019-2020.<sup>cccxcix</sup> Children's exposure to zika is much lower than other LDCs (4 percent), however the conjunction of increasing Aedes aegypti infestation with large, impoverished/displaced populations and inadequate public health infrastructure is expected to put some countries in MENA at an increasingly higher risk.<sup>cd</sup>

## Underlying vulnerabilities



### WASH

More than 17.8 million people lacked access to safe WASH services in 2022, including 9.2 million children.<sup>cdi</sup> The country continues to experience regular outbreaks of cholera, measles, diphtheria and other vaccine-preventable diseases. Poor access to adequate WASH is linked to the inadequate living conditions in Yemen. In September 2021, 4 million people were internally displaced, including 2 million children.<sup>cdii</sup> Implementing WASH interventions in displacement camps and conflict zones proves difficult given the insecurity, a lack of WASH funding and inadequate infrastructure. Climate change is expected to worsen the WASH situation for vulnerable children in Yemen. For example, for two consecutive years in August (2021 and 2022), periods of heavy rainfall have destroyed shelters of internally displaced people and flooded WASH infrastructures.<sup>cdiii</sup> Consequently, there is a critical need to increase the resilience of WASH systems to protect vulnerable children.



### Health and nutrition

Yemen's healthcare system is on the brink of collapse after 8 years of conflict, large scale displacement and climate shocks which have left almost 21.9 million people, half of whom are children, in desperate need of basic healthcare.<sup>cdiv</sup> Child and maternal mortality rates are high at 61.9 per 1,000 live births and 164 per 100,000 live births respectively. Many healthcare institutions are closed or only provide rudimentary services. In 2022, 2.2 million children under the age of 5 were facing acute malnutrition,<sup>cdv</sup> and 37 percent have stunted growth for their age. Without adequate funding for healthcare, hospital support will cease, resulting in a widespread disruption in fundamental life-saving healthcare for children and mothers. Moreover, in 2021, millions of doses of over ten types of lifesaving vaccinations, including those for polio, measles, and COVID-19, were expected to expire due to a break in the cold chain.<sup>cdvi</sup>



### Poverty and social protection

Yemen is facing several development challenges including high poverty rates, low life expectancy and significant malnutrition. The national poverty rate stands at 48.6 percent and poverty levels have been greatly affected by instability and conflict, which prevent children from accessing critical services needed to survive. Conflict has slowed economic development, plummeted household income, and driven millions into poverty. According to the UNDP, if the conflict continues, Yemen will have the world's deepest poverty, second-worst gender development imbalance, lowest calories per capita, and second-worst decline in economic activity relative to 2014.<sup>cdvii</sup> Improved access to cash based social safety nets is essential to reduce extreme poverty and vulnerability and increase individual, household and community resilience in response to the ongoing humanitarian crisis in Yemen.



### Education

Access to education remains a key challenge in Yemen. Attacks on schools since conflict began in 2015 has had a devastating impact on millions of children's access to learning. In 2013, school attendance rates were low, especially for children of lower and upper secondary school age, at 39 percent and 29 percent respectively.<sup>cdviii</sup> In addition, only 63 percent of children complete primary education.<sup>cdix</sup> The double threat of conflict and climate shocks have worsened educational outcomes for children in recent years. For example, in September 2021, a combination of conflict and heatwaves resulted in the closure of schools in Aden, Abyan, Hadramout and Shabwa in the southern region.<sup>cdx</sup>



© UNICEF/UN0743133/Griplotis

## Country Profiles

# South Asia

Children in South Asia are in constant danger, facing high levels of exposure to multiple climate and environmental shocks, including riverine flooding, air pollution, soil and water pollution and coastal flooding. The South Asian region (SAR) consists of 4 LDCs.<sup>34</sup> Afghanistan and Bangladesh are among four South Asian countries where children are at “Extremely High” climate and environmental risk, while children in Bhutan and Nepal experience relatively lower risks.

---

<sup>34</sup> The LDCs in the SAR include Afghanistan, Bangladesh, Bhutan and Nepal.



**Table 13**

**Estimates of children’s exposure to climate related hazards, shocks, and stresses in LDCs in SAR**

Country	Number of children under 18 years old exposed to / living in areas with					
	Water scarcity	Riverine floods (50 years)	Coastal flood risk	Extensive cyclone wind (100 years)	Intensive cyclone wind (100 years)	Heatwaves
<b>Afghanistan</b>	12.2 million	1.7 million	-	-	-	4.5 million
<b>Bangladesh</b>	4.4 million	36 million	38.5 million	19.5 million	-	12.5 million
<b>Bhutan</b>	-	20 thousand	-	-	-	200 thousand
<b>Nepal</b>	8 million	1.8 million	-	-	-	3.8 million
<b>UNICEF SA LDCs (4 countries)</b>	<b>24.7 million</b>	<b>39.5 million</b>	<b>38.5 million</b>	<b>19.5 million</b>	<b>-</b>	<b>20.9 million</b>

**Table 14**

**Estimates of children’s exposure to environmental hazards, shocks, and stresses in LDCs in SAR**

Country	Number of children under 18 years old exposed to / living in areas with			Number of children under 20 years old exposed to
	Ambient air pollution (PM2.5 >= 10 µg/m3)	Ambient air pollution (PM2.5 >= 25 µg/m3)	High pesticide pollution risk	Lead pollution
<b>Afghanistan</b>	17.9 million	17.9 million	10.4 million	19.5 million
<b>Bangladesh</b>	52.3 million	52.3 million	27.6 million	35.5 million
<b>Bhutan</b>	270 thousand	250 thousand	-	20 thousand
<b>Nepal</b>	10.7 million	10.6 million	-	6.7 million
<b>UNICEF SA LDCs (4 countries)</b>	<b>81.2 million</b>	<b>81.1 million</b>	<b>38 million</b>	<b>61.7 million</b>

**Table 15**

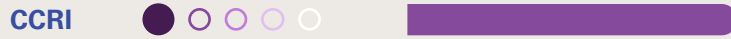
**Estimates of children living in areas exposed to one or more disease vectors in LDCs in SAR**

Country	Number of children under 18 years old living in areas exposed to one or more disease vectors*
<b>Afghanistan</b>	14.9 million
<b>Bangladesh</b>	53 million
<b>Bhutan</b>	170 thousand
<b>Nepal</b>	10.1 million
<b>UNICEF SA LDCs (4 countries)</b>	<b>78.2 million</b>

\*Plasmodium Falciparum Malaria, Plasmodium Vivax Malaria, Aedes, Dengue, Zika

Source: CCRI index (Beta version) (All absolute numbers rounded to the nearest decimal of a million, nearest ten thousand if greater than or equal to 10,000 or nearest five thousand if less than 10,000)

# Afghanistan

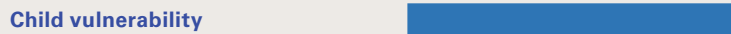


7.6 | Extremely High



7.3 | Pillar 1

Water scarcity	9.1	
Riverine floods	6.8	
Coastal floods	0.0	
Tropical cyclones	0.0	
Vector borne disease	5.6	
Heatwaves	7.3	
Air pollution	10.0	
Soil and water pollution	9.5	



7.9 | Pillar 2

Child health and nutrition	9.4	
Education	6.6	
Water, sanitation, and hygiene	8.0	
Poverty, communication assets and social protection	7.5	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Afghanistan; 6 out of the 23 indicators included in pillar 2 have no data.

Children in Afghanistan are considered at “Extremely High” risk. The country has a CCRI score of 7.6 and ranks 15<sup>th</sup> out of the 163 CCRI countries and regions. Afghanistan’s climate and environmental risks are heavily compounded by the ongoing severe humanitarian crisis.

According to the CCRI, the climate and environmental shocks that children in Afghanistan are highly exposed to include:



## Air pollution

In Afghanistan, all children are exposed to ambient air pollution (PM<sub>2.5</sub>  $\geq$  25  $\mu\text{g}/\text{m}^3$ ), exceeding the WHO recommended maximum ambient air pollution limit. Mortality attributed to ambient air pollution is estimated at 11,000 deaths annually.<sup>cdxi</sup> Household air pollution is responsible for an estimated 27,000 deaths per year, with children and women being especially vulnerable due to their domestic responsibilities.<sup>cdxii</sup> During the winter months pollution often rises, owing to increased use of polluting fuels (e.g., wood, coal, kerosene) and inefficient heating technologies.



## Soil and water pollution

Water quality mapping research has found high levels of nitrates, fluoride, and arsenic in groundwater supplies in many areas of Afghanistan.<sup>cdxiii</sup> <sup>cdxiv</sup> The primary source of pollution is agriculture, which contributes pesticides, nitrates and microbial contamination into soil and water systems. At present, 58 percent of children are living in areas with high pesticide pollution risks. Other major pollution sources include insufficient infrastructure, septic tanks, and leachate from informal waste dumping.<sup>cdxv</sup> Additionally, children’s risks of lead poisoning are amongst the highest globally. 94 percent of children and adolescents under the age of 20 are exposed to lead pollution, which can seriously harm physical and neurological development.



### Water scarcity

Afghanistan is highly water scarce, suffering from regular droughts which greatly impact livelihoods and the economy. 68 percent of Afghan children are exposed to water scarcity. Despite significant water supplies from mountain runoff, water resources are not adequately distributed and the continued loss of glacial mass, is leading to reduced runoff, which will increase future drought frequency.<sup>cdxxvi</sup> The south-eastern region is especially drought prone and areas such as the Western Heart Province are experiencing water resource conflicts, affecting children's safety.<sup>cdxxvii</sup> Agriculture provides a significant level of livelihood and sustenance in Afghanistan, employing approximately half of the working population.<sup>cdxxviii</sup> Droughts and other climate related hazards are, therefore, a constant danger to community livelihoods and food security.



### Heatwaves

One quarter of all children in Afghanistan are exposed to heatwaves. The national average monthly maximum temperature is approximately 20°C, with maximum temperatures in July averaging 33°C.<sup>cdxxix</sup> These national averages conceal significant subnational variances, including in the cities of Kandahar and Herat, which have typical July maximum temperatures of 40°C and 37°C respectively.<sup>cdxxx</sup> Recent projections under high emission scenarios show that extreme heatwaves in Afghanistan might occur as frequently as every 1-2 years, affecting the health and well-being of children, who are more susceptible to heat stress than adults.<sup>cdxxxi cdxxii</sup>

## Underlying vulnerabilities



### WASH

Despite substantial WASH progress over the last 10 years, only 28 percent of households have access to a safely managed drinking water service.<sup>cdxxiii</sup> Poor access to safe water sources contributes to significant health risks for Afghan children, where diarrhoeal illnesses are the second most common cause of death for children under the age of 5, after acute respiratory infections.<sup>cdxxiv</sup> Women and children are disproportionately affected by the lack of safe piped water due to their water related responsibilities. In addition, sanitation and hygiene remain poor in the country with just 38 percent of households having access to basic handwashing facilities and 28 percent have unimproved sanitation services.<sup>cdxxv</sup>



### Health and nutrition

Inadequate access to health and nutrition makes children in Afghanistan more vulnerable to climate change. Afghanistan has high child and infant mortality rates at 45 deaths per 1,000 births and 58 per 1,000 live births respectively and in 2018, 40 percent of Afghan children died before their first birthday.<sup>cdxxvi</sup> Maternal mortality rates are also high at 638 per 100,000 live births. Thousands of Afghan women die every year from pregnancy-related causes, the majority of which are preventable. Afghanistan has one of the world's highest rates of stunting in children under the age of 5, at 41 percent.<sup>cdxxvii</sup> More than half of the population are estimated to face crisis or emergency levels of acute food insecurity and 7.2 million people are estimated to need nutrition assistance.<sup>cdxxviii</sup>



### Poverty and social protection

The economic crisis in Afghanistan is expected to continue, where 64 percent of households are unable to meet their basic needs. This is coupled with a historic third La Niña drought, harsh winters, and other climate-related risks. According to OCHA, between April and September 2022, over 32,000 people have been displaced by conflict, 57 percent of which were children.<sup>cdxxix</sup> In the context of displacement, children suffer a variety of increased risks, including those related to family separation, exploitation, violence, and loss of education, which make children increasingly vulnerable to climate impacts. A greater coverage of social protection mechanisms is essential for Afghan children to better respond and recover to future shocks, including extreme winters and sudden onset-disasters.



### Education

More than three decades of continuous conflict have wreaked havoc on Afghanistan's education system. Despite recent progress in increased enrolment, primary school completion remains a frequent problem for girls, who often miss school due to security risks, a lack of adequate sanitation facilities and traditional gender norms. Moreover, attendance rates are lowest in the poorest and most distant parts of the country, especially in mountainous areas. Those who do attend school often obtain a low-quality education, since just 48 percent of teachers possess the required academic teaching requirements.<sup>cdxxx</sup> Attempts to strengthen Afghanistan's education system are severely hampered by the ongoing humanitarian crisis and accelerating impacts of climate change.

# Bangladesh



CCRI ● ○ ○ ○ ○



7.6 | Extremely High

## Climate and environment shocks



9.1 | Pillar 1

Water scarcity	6.8	
Riverine floods	10.0	
Coastal floods	10.0	
Tropical cyclones	5.5	
Vector borne disease	9.4	
Heatwaves	8.0	
Air pollution	10.0	
Soil and water pollution	9.4	

## Child vulnerability



5.1 | Pillar 2

Child health and nutrition	6.4	
Education	4.8	
Water, sanitation, and hygiene	4.4	
Poverty, communication assets and social protection	4.9	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Bangladesh; 2 out of the 23 indicators included in pillar 2 have no data.

Bangladesh has a CCRI score of 7.6 and ranks 15<sup>th</sup> out of the 163 CCRI countries and regions, placing children in Bangladesh at “Extremely High” risk. According to the IDMC, Bangladesh recorded over 4 million internal displacements as a result of disasters in 2020.<sup>cdxxxii</sup>

According to the CCRI, the climate and environmental shocks that children in Bangladesh are highly exposed to include:



### Coastal flooding

73 percent of children are living in areas of coastal flood risk in Bangladesh. Coastal flood risk occurs largely because of sea-level rise and monsoons, with two thirds of Bangladesh’s land sitting below 5 meters above sea level.<sup>cdxxxii</sup> Communities around the Bay of Bengal face particularly high flood risk, where homes are becoming increasingly inhabitable, forcing many people to permanently move.



### Riverine flooding

68 percent of Bangladeshi children are exposed to riverine flooding. Bangladesh is located on the Brahmaputra River Delta, which has several distributaries that are prone to flooding. Floods are most prevalent during the monsoon season (June to October), which brings enormous volumes of precipitation. Himalayan meltwater is also a substantial contributor to flooding. Flood events are extremely dangerous for children, who often face increased risks of injuries and drowning. Every year, more than 19,000 children lose their lives due to drowning in Bangladesh, with an average of 53 child mortalities daily, according to Bangladesh Health and Injury Survey 2016.<sup>cdxxxiii</sup> Beyond the immediate risks of death and injury, floods also increase instances of diarrhoea outbreaks and frequently disrupt children’s education and learning.





### Air pollution

Bangladesh has one of the highest levels of air pollution worldwide. 99 percent of children are exposed to ambient air pollution (PM<sub>2.5</sub> >= 25 µg/m<sup>3</sup>), which exceeds recommended maximum ambient air pollution limits. Moreover, Bangladesh has one of highest burdens of child mortality associated with IAP. 89 percent of Bangladeshi families utilize solid fuels, including wood, agricultural waste, and cow dung for cooking and heating, which are major sources of household air pollution, resulting in the deaths of approximately 8,500 children each year.<sup>cdxxxiv</sup>



### Soil and water pollution

Rivers and groundwater are frequently polluted in Bangladesh, as a result of growing urbanisation, industrialization, and poor infrastructure. High levels of arsenic, chloride and manganese degrade water quality in Bangladesh. High levels of exposure to arsenic has been linked to cardiovascular disease, cancer, and infectious diseases. Moreover, an estimated 1 million people are at risk of lead poisoning, including a staggering 35 million children, which is largely the unsafe disposal of lead-acid batteries. Pregnant women exposed to high amounts of lead risk miscarriage, stillbirth, early birth, and low birth weight and young children are more sensitive to lead's toxicity, which can result in long term development problems as well as death.



### Vector-borne diseases

In Bangladesh almost all children (99 percent) are exposed to dengue, the same percentage are at risk of aedes, and 84 percent are exposed to zika. As temperatures rise and the frequency of intense rainfall, drought, and flooding increases, so will the prevalence of vector-borne illnesses in Bangladesh, placing a growing number of children at danger.<sup>cdxxxv</sup>



### Heatwaves

Over 12 million children are exposed to heatwaves in Bangladesh. The country experiences some of the highest maximum temperatures in Asia, with an average monthly maximum of 30°C.<sup>cdxxxvi</sup> Bangladesh now sees approximately 70 days per year with a Heat Index of more than 35°C, indicating a high frequently heat-stressed environment.<sup>cdxxxvii</sup> Dhaka has been identified as a city which faces some of the greatest heat-related health impacts worldwide and is rapidly approaching a permanent state of heatwave.<sup>cdxxxviii cdxxxix</sup> Exposure to abnormal or prolonged heat and humidity without relief or adequate fluids often causes children to miss out on schooling.

## Underlying vulnerabilities



### Health and nutrition

Bangladesh has one of the highest rates of newborn mortalities worldwide, at 62,000 every year.<sup>cdxli</sup> The main causes of newborn deaths include prematurity, sepsis and conditions arising from delivery complications, like asphyxia. Maternal mortality is high at 241 per 100,000 live births, which could easily be preventable with improved antenatal healthcare systems. Improving education for mothers is also essential, as newborns with less educated mothers are 2.3 times more likely to die within the first month.<sup>cdxlii</sup> Bangladeshi children are also highly vulnerable to water-borne diseases. Approximately, 7 percent of child deaths under the age of five are caused by diarrheal disease in Bangladesh, with the highest transmission rates observed during flooding.<sup>cdxliii</sup> Floods, droughts and heatwaves are all environmental drivers of vector and water-borne diseases. As hazards increase with intensity and frequency, Bangladeshi children will be increasingly exposed to climate related diseases, necessitating the development of resilient healthcare systems.

Inadequate nutrition is also significant in Bangladesh, where 30 percent of children under the age of 5 are stunted and around 28 percent of babies are born with low birth weight. Progression on the alleviation of malnutrition has been slow. For example, the FAO has calculated that Bangladesh's national undernourishment rate only declined from 16.6 to 15.5 percent between 2004 and 2016.<sup>cdxliv</sup> According to climate models, Bangladesh could experience 67 climate-related fatalities per million inhabitants, each year, by mid-century due to a lack of food supply.<sup>cdxlv</sup>

In comparison to other "Extremely High Risk" countries, Bangladesh has a relatively lower scores for other vulnerability indices. However, improvements to strengthen the climate resilience of Bangladesh's sectors can still be made.



## WASH

Most households in Bangladesh have access to drinking water in Bangladesh (59 percent of access safely managed drinking water services and 39 percent access basic drinking water services).<sup>cdxlv</sup> However, the quality of water is compromised with bacteriological contamination resulting from poor sanitary practices, availability of undesirable chemical contamination such as arsenic – with over 10 per cent of sources contaminated<sup>cdxlvii</sup> – and seawater intrusion, resulting from climate hazards, such as floods, landslides, and cyclones. Bangladesh has been successful in significantly reducing open defecation; nevertheless, more work is required to obtain safely managed sanitation, as well as to guarantee the safety and privacy of girls and women. Environmental pollution in the form of unregulated sewage endangers the availability of the country's scarce freshwater resources and contributes to disease transmission.



## Poverty and social protection

Bangladesh has achieved significant progress in poverty reduction, thanks to the country's strong economic growth. Bangladesh has reduced severe poverty by half and attained a lower middle-income status in 2015. The country is on track to graduate from its LDC status in 2026. The poverty head count ratio at national poverty levels is currently 24.3 percent, substantially lower than other comparable LDCs. Social protection coverage has also improved, with over 130 social protection programmes installed, however the system remains highly fragmented with overlapping objectives, low budgets, and disparities in access.<sup>cdxlviii</sup> Therefore, continuing to strengthen social protection services in Bangladesh is critical to keep children out of extreme poverty.



## Education

Bangladesh has seen significant progress in improving primary education access and equity in recent years. Primary school attendance stands high, at 86 percent, as do primary school completion rates at 83 percent.<sup>cdxlviii</sup> However, issues with higher education levels remain. Only 58 percent of adolescents attend lower secondary, and 48 percent of youth attend upper secondary education.<sup>cdxlix</sup> Drop-outs rates are largely related to child marriage for girls and child labour for boys. Moreover, children living in disaster-affected areas, children with disabilities, and the poorest children are most at danger of being kept out of school. For example, children with disabilities are seven times more likely to be out of school than other children, while married girls are over four times more likely to be out of school than their unmarried friends.<sup>cdli</sup> Nearly 20 million children in Bangladesh are seriously exposed to climate hazards, with floods, cyclones, extreme heat, and droughts frequently disrupting their education.<sup>cdlii</sup> Moreover, a lack of qualified teachers, inadequate facilities, poor nutrition, and food security all obstruct high-quality education.

# Bhutan



CCRI



3.8 | Medium-High

## Climate and environment shocks



4.3 | Pillar 1

Water scarcity	0.0	
Riverine floods	3.6	<div style="width: 36%;"></div>
Coastal floods	0.0	
Tropical cyclones	0.0	
Vector borne disease	5.4	<div style="width: 54%;"></div>
Heatwaves	7.3	<div style="width: 73%;"></div>
Air pollution	8.8	<div style="width: 88%;"></div>
Soil and water pollution	2.4	<div style="width: 24%;"></div>

## Child vulnerability



3.3 | Pillar 2

Child health and nutrition	5.3	<div style="width: 53%;"></div>
Education	1.6	<div style="width: 16%;"></div>
Water, sanitation, and hygiene	1.5	<div style="width: 15%;"></div>
Poverty, communication assets and social protection	4.7	<div style="width: 47%;"></div>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Bhutan; 2 out of the 23 indicators included in pillar 2 have no data.

Bhutan has a CCRI score of **3.8** and ranks **111<sup>th</sup>** out of the 163 CCRI countries and regions, placing children in Bhutan at “**Medium-High**” risk.

According to the CCRI, the climate and environmental shocks that children in Bhutan are highly exposed to include:



### Air pollution

In Bhutan, 94 percent of the total child population are exposed to ambient air pollution ( $PM_{2.5} \geq 25 \mu g/m^3$ ), exceeding the WHO recommended maximum ambient air pollution ( $PM_{2.5} \geq 5 \mu g/m^3$ ). The main sources of poor air quality include the construction industry, vehicle emissions, wood burning stoves, and burning of household and farm waste. Pollution levels are highest from November to March, due to the need to heat individual homes and air pollution levels in the areas of Thimpu and Phuentsholing have been reported as continuously high. Indoor and outdoor air pollution are also considerable drivers of pneumonia in Bhutan, which is the leading cause of mortality for children under the age of 5.<sup>cdlxviii</sup>



### Heatwaves

73 percent of children are exposed to heatwaves in Bhutan. The country's tropical and lower altitude experiences the greatest danger of extended exposure to excessive heat, at least once every five years.<sup>cdlxix</sup> Recent projection analysis, estimates that the percentage of children exposed to high heatwave frequency<sup>37</sup> and high heatwave duration<sup>38</sup> will reach all children in Nepal under both high and low emission scenarios by 2050.<sup>cdlxxx</sup> These projections demonstrate the need for greater adaptation measures to shield children from the worst effects of heat stress, including heat rash, heat-related cramps, exhaustion and stroke.

<sup>37</sup> High heatwave duration is defined as any area where the average heatwave event lasted 4.7 days or longer.

<sup>38</sup> High heatwave frequency is defined as any area where there are on average 4.5 or more heatwaves per year.

Dehydration can also occur because of extreme heat stress, which is a prevalent cause of hyperthermia and mortality in babies and small children. Children are also more likely to miss school due to heat exhaustion or to help in the workforce, due to a decrease in labour productivity during heatwaves



### Vector-borne diseases

Children in Bhutan are also vulnerable to vector-borne diseases, with exposure to dengue and the aedes mosquito the most significant risks (99 and 95 percent of children under the age of 18 at risk, respectively). For example, in 2019, Bhutan experienced its first nationwide dengue epidemic, with almost 6000 cases, and children especially vulnerable.<sup>cdlxxxix</sup> With rising temperatures and altering agroecological zones, zika and malaria are anticipated to migrate into Bhutan's higher altitude regions as their geographic ranges change.<sup>cdlxxxii cdlxxxiii</sup>



### Glacial Lake Outburst Floods (GLOFs)

Whilst not captured in the CCRI, Global Lake Outburst Floods (GLOFs) are a significant concern in Bhutan, given their sudden onset and potential to cause substantial damage to communities in river valleys. The northern part of the nation is particularly at risk to these hazards, where 25 glacial lakes at dangerous risk of rupture are located.<sup>cdlxxxiv</sup> Rising average temperatures accelerates glacial retreat and melt, increasing the volume of water in glacial lakes, which in turn increases risks of a GLOF.<sup>cdlxxxv</sup> Bhutan's disaster preparedness and climate adaptation plans must address the real potential of a GLOF hazard occurring.

## Underlying vulnerabilities



### WASH

Vulnerabilities related to WASH in Bhutan are considerably lower than in other LDCs. Significant improvements in WASH have been made in recent years. 92 percent of households have access to basic hygiene services and 65 percent of households have a safely managed sanitation service.<sup>cdlxxxvi</sup> Nonetheless, WASH challenges are particularly prominent in schools and monastic institutions. Water for handwashing with soap and functional toilets are unavailable in one out of every five schools and almost one third of schools do not have separate restrooms for females, resulting in major concerns for MHM for adolescent girls.<sup>cdlxxxvii</sup> According to a recent needs assessment survey, around 44 percent of teenage schoolgirls miss school due to menstruation.<sup>cdlxxxviii</sup>



### Health and nutrition

Despite the country's relatively high levels of food sufficiency, malnutrition remains a prevalent problem for children in Bhutan, where approximately, 22 percent of children under the age of 5 are stunted, and almost 12 percent of babies are born with a low birthweight.<sup>cdlxxxix</sup> Child and maternal mortality rates are considerably lower than other LDCs, at 26.7 per 1,000 live births and 183 per 100,000 live births respectively. Nonetheless, almost two out of every five women still give birth outside of a hospital, with women in rural areas especially excluded from inadequate birth and postoperative care. Moreover, routine immunization coverage is high in Bhutan, improving from 86.7 per cent (2020) to 95 per cent (2021), which protect children from falling serious ill from preventable diseases.<sup>cdxc</sup> In monastic schools, severe skin diseases, worm infestations, and diarrhoea, are frequent challenges associated with a lack of adequate sanitation infrastructure and poor personal hygiene.



### Poverty and social protection

Bhutan's poverty headcount ratio at the national level is relatively low (8.2 percent), and the country is on track to graduate from its LDC status in 2023. Despite these advances, Bhutan's high reliance on agriculture and forestry makes families highly vulnerable to climate shocks. In times of crisis, the poorest are often forced to sell their livelihood assets such as land, livestock, and farming tools to access basic services or resources, such as food or shelter. Some social protection schemes pre-exist in the country, including statutory programmes for old age, disability, and employment injury. However, only 13.5 percent of effective social protection coverage is focused on children.<sup>cdxci</sup>



## Education

Bhutan has seen tremendous success in improving education outcomes, achieving almost universal education in the past decade. Net attendance rates are high for primary school children (95 percent). Nonetheless, net attendance rates for lower and upper secondary school children are significantly lower at 53 and 24 percent respectively.<sup>cdxcii</sup> Access to early childhood education for children aged 3 to 5 remains a key challenge, with most centres inaccessible for rural and hard to reach communities. Children with disabilities continue to face stigma and exclusion from school. Although in 2018, the opening of 2 new inclusive schools has served 650 children with disabilities.<sup>cdxciii</sup> Children and young people frequently move internally, hoping to have better access to education and employment.

# Nepal



CCRI



6.1 | High

## Climate and environment shocks



7.5 | Pillar 1

Water scarcity	9.2	<div style="width: 92%;"></div>
Riverine floods	8.0	<div style="width: 80%;"></div>
Coastal floods	0.0	<div style="width: 0%;"></div>
Tropical cyclones	0.0	<div style="width: 0%;"></div>
Vector borne disease	8.3	<div style="width: 83%;"></div>
Heatwaves	7.4	<div style="width: 74%;"></div>
Air pollution	10.0	<div style="width: 100%;"></div>
Soil and water pollution	7.8	<div style="width: 78%;"></div>

## Child vulnerability



4.2 | Pillar 2

Child health and nutrition	6.6	<div style="width: 66%;"></div>
Education	1.8	<div style="width: 18%;"></div>
Water, sanitation, and hygiene	4.5	<div style="width: 45%;"></div>
Poverty, communication assets and social protection	3.8	<div style="width: 38%;"></div>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Nepal; 2 out of the 23 indicators included in pillar 2 have no data.

Nepal has a CCRI score of **6.1** and ranks **51<sup>st</sup>** out of the 163 CCRI countries and regions, placing children in Nepal at “**High**” risk.

According to the CCRI, the climate and environmental shocks that children in Nepal are highly exposed to include:



### Air pollution

Air pollution in Nepal is a serious public health risk. All Nepalese children are exposed to ambient air pollution (PM<sub>2.5</sub>  $\geq$  25  $\mu\text{g}/\text{m}^3$ ), exceeding the WHO recommended maximum ambient air pollution (PM<sub>2.5</sub>  $\leq$  5  $\mu\text{g}/\text{m}^3$ ). According to the WHO, the annual average air pollution concentration in Nepal is 4.9 times higher than safe air quality limits and is a leading risk factor for death and disability, responsible for 133 fatalities out of 1,000,000 annually.<sup>cdliii cdliiii</sup> Manufacturing, construction, transport, and waste are the leading sectors contributing to Nepal’s poor air quality. Pollution levels vary seasonally, with the greatest levels occurring during the dry season (December to April). Air pollution levels also differ at various altitudes, with the highest levels recorded in the morning and evening in plain and valley locations, and in the afternoon in higher altitudes. The cities of Kathmandu, Lumbini, Nepalgunj, Bhairahawa, and Chitwan are particularly dangerous for children, given their persistently high air pollution levels.



### Water scarcity

Despite vast river basins flowing from glaciers in the Himalayan range, water scarcity affects three quarters of all children in Nepal. The lowland plateaus frequently experience water stress, as a result of long dry spells. Droughts are increasing in frequency, especially in the winter and along the western Terai plains, which are already relatively dry due to the late monsoons. Droughts have a variety of consequences for poor families and communities, including crop failure, livestock loss, income drops, food insecurity as well as rising food prices. In the northern region, mountain dwellers are increasingly forced

to build new settlements at lower altitudes.<sup>cdliv</sup> Water scarcity is also accelerating mobility. According to recent projections, under all emission scenarios, the likelihood of droughts is expected to increase in Nepal, with the median annual drought probability expected to rise by least 10 percent between 2080-2099.<sup>cdlv</sup>



### Vector-borne diseases

According to the CCRI, 10.1 million children are estimated to live in areas exposed to one or more disease vectors in Nepal. 90 percent of children are exposed to dengue, 75 percent are at risk of PV malaria and 71 percent are at risk of aedes. Whilst not included in the CCRI, Japanese encephalitis, visceral leishmaniasis, and lymphatic filariasis are also common vector-borne diseases in Nepal. Most are native to Nepal's lowland Terai and hills; however, population exposure is anticipated to grow as climate change permits vectors to spread to higher altitudes.<sup>cdlvi</sup>



### Riverine flooding

The bulk of Nepal's agricultural land and infrastructure is situated along drainage basins that are vulnerable to flooding. The major causes of flooding are periods of intense rainfall and glacier melt and flood risk is highest in the country's southern lower altitude region. Climate change is expected to increase the frequency of extreme river flows in Nepal.<sup>cdlvii</sup> For example, according to climate models, a once-in-a-century flood event in Nepal is expected to become a once-every-50-year or once-every-25-year occurrence.<sup>cdlviii</sup> GLOFs are also a major concern.



### Glacial Lake Outburst Floods (GLOF)

Whilst not captured in the CCRI, Nepal faces an increasing threat from GLOFs. Approximately 1,000 glacial lakes are known to exist in the country, the number of which is growing due to glacial melt in the Himalayas. Glacial lakes categorised as catastrophic in their GLOF risks include Phoksundo Tal, Tsho Rolpa, Chamlang North Tsho, Chamlang South Tsho, and Lumding Tsho.<sup>cdlix</sup> GLOFs frequently occur when a moraine that holds back meltwater is broken, inflicting significant damage downstream.<sup>cdlx</sup> These outbreaks are often triggered by climatic or geographical processes. For example, GLOFs are linked to both earthquakes and rising temperatures.<sup>cdlxi</sup> Existing DRR measures are in place in Nepal to mitigate the risks of GLOFs, which also require consideration in climate plans and policies.



### Soil and water pollution

Nepalese children face serious health risks related to water and soil pollution. Arsenic pollution of groundwater is common in the 20 Terai districts, where underground water is utilised as drinking water, without purification — placing an estimated 0.5 million people at risk of arsenic poisoning.<sup>cdlxii</sup> Additionally, over half of the Nepalese population under the age of 20 are exposed to lead pollution (57 percent). Exposure to arsenic and lead can have devastating impacts on children's physical and neurological development, in some cases causing death.



### Heatwaves

35 percent of Nepalese children are exposed to heatwaves. Children are affected by heatwaves more than adults, as they adjust more slowly to changes in environmental temperatures and are more vulnerable to heat-related health risks. Alongside health implications, heatwaves significantly affect children's educational outcomes. New UNICEF analysis, has estimated that the percentage of children exposed to high heatwave frequency<sup>35</sup> will almost double from 56 percent in 2020, to all children under both high and low emission scenarios by 2050.<sup>cdlxiii</sup> Moreover, the proportion of children exposed to high heatwave duration<sup>36</sup> is expected to increase by 68 percent from 2020 to 2050 under low emission scenarios, reaching all children in Nepal by 2050 under high emission scenarios.<sup>cdlxiv</sup> These projections demonstrate the need for greater adaptation measures to shield children from the worst effects of heat stress.

35 High heatwave frequency is defined as any area where there are on average 4.5 or more heatwaves per year.

36 High heatwave duration is defined as any area where the average heatwave event lasted 4.7 days or longer.



## Earthquakes

Nepal is a high-risk country for natural hazards including earthquakes. While earthquake exposure is not directly related to climate change, it is significant in the context of a changing climate. Increased precipitation and higher temperatures alter the stability of the landscape, making children more vulnerable to mudflows, avalanches, GLOFs, and landslides which can be triggered by earthquakes.<sup>cdlxv</sup> Earthquakes and their secondary hazards, often have devastating consequences for children, including fatalities, injuries, and damage to critical infrastructure. For example, in 2015 two successive 7.8 and 7.3 magnitude earthquakes struck Nepal, resulting in 9,000 fatalities, one third of which were children.<sup>cdlxvi</sup> Critical child services, suffered severe damage during these events, including considerable harm to safe water supplies, damage to 70 percent of birthing facilities, and caused the displacement of nearly one million students from their schools.<sup>cdlxvii cdlxviii</sup>

## Underlying vulnerabilities

In comparison to other LDCs, Nepal has a lower vulnerability score (4.2), which can be attributed to the enormous development efforts made in recent years. Nonetheless, improvements to increase the climate resiliency of key social services can be made.



### WASH

Whilst vulnerabilities related to WASH in Nepal are far less severe than in other LDCs, further advances to ensure universal access to improved and equitable water, sanitation and hygiene services needs to be made. 73 percent of households in Nepal have access to a basic drinking water service, yet less than half the population have access to basic sanitation.<sup>cdlxix</sup> In addition, 10 percent of the population continue to practice open defecation<sup>cdlxx</sup> and 30 percent of schools have a limited drinking water service.<sup>cdlxxi</sup> The risk of contracting easily preventable illnesses such as diarrhoea and cholera in Nepal is significant without adequate WASH.



### Health and nutrition

Nepal has made great progress in the health sector over the past two decades. For example, since 2010, the country has been proclaimed polio-free.<sup>cdlxxii</sup> Child and maternal mortality rates are far lower than other LDCs, at 27.3 per 1,000 births and 186 per 100,000 live births respectively. Inadequate nutrition remains a prominent health problem, as indicated by 30 percent of children under the age of 5 being stunted, and around 22 percent of babies are born at a low birth weight. Climate change is also projected to increase the risks of water-borne illness transmission in the country. For example, higher temperatures have already been linked to an increase in diarrhoea incidence in Nepal.<sup>cdlxxiii</sup>



### Poverty and social protection

Nepal's CCRI component score for poverty and social protection is much lower than comparable LDCs. Nevertheless, climate change will disproportionately harm Nepal's poorest communities. For example, employment in heavy manual labour, is frequently among the lowest paid occupations, while simultaneously being the most vulnerable to productivity losses owing to heat stress.<sup>cdlxxiv</sup> Further, impoverished communities usually have the least assets and resources to adapt to climate change. For example, poor farmers are often less able to pay for local water storage and irrigation facilities in Nepal.<sup>cdlxxv</sup> Moreover, the relationship between food price increases and a rise severe poverty is well established in Nepal.<sup>cdlxxvi</sup> Despite higher government expenditure than other LDCs, (2.06 per percent of GDP spent on Social Safety Nets), social protection coverage is low and fragmented, with many eligible populations excluded from receiving entitled benefits. Around one quarter of the population (aged 15 years+) are unable to come up with emergency funds. Thus, social protection programmes are critical to protect poor children in Nepal, from experiencing the worst impacts of climate change.



### Education

Nepal has achieved substantial educational development in recent years. Youth literacy rates are considerably high for an LDC, at 92.4 percent and just over 5 percent of the country's GDP expenditure is put into the education sector. Nonetheless, the country still faces many challenges. There are significant inequities, with poverty, social marginalization, disability, migration, child labour, societal norms, and gender prejudice all major hurdles to school enrolment and attendance. In addition, only 11 percent of school buildings are earthquake resistant.<sup>cdlxxvii</sup> Safe learning facilities and DRR education can make the difference between life and death for millions of children in Nepal. Nepal's Comprehensive School Safety Master Plan, supported by UNICEF, will ensure that all school buildings are safe and earthquake resistant and that school management bodies, and local communities are equipped to strengthen the resilience of schools and the capacity of their students.





© UNICEF/JUN0594601/DeJongh

## Country Profiles

# West and Central Africa

13 out of the 15 LDCs in the West and Central Africa region (WCAR) are among the 33 “Extremely High Risk” countries identified by the CCRI. Children from 6 of these LDCs are in the top 10 of the most climate change affected countries worldwide, with Central African Republic, Chad, Nigeria, Guinea, and Guinea-Bissau occupying the top spots.

WCAR hosts several climate change hotspots, where strong physical and ecological effects of climate change intersect with large populations of poor and vulnerable communities. The region has experienced several serious climate-related crises, including the ongoing crisis in the Sahel region of West Africa, in which floods and droughts lead to a protracted food and refugee crisis and perpetuates multi-dimensional poverty, which continues to affect people in Burkina Faso, Chad, Guinea, Mali, Mauritania, and Niger.<sup>cdxciv</sup> The burden of other shocks and stresses including wide-spread governance issues, armed violence, and epidemics adds to overall child vulnerability, perpetuates multi-dimensional poverty and protracted humanitarian crises.

Children in WCAR represent only 11 percent of the world's child population. Yet, the region also represents one third of global deaths of children under the age of 5, one third of out-of-school children (primary and lower secondary school age), and one fifth of stunted children worldwide (29 million).<sup>cdxcv</sup> These development deficits are further jeopardized by climate change impacts. Despite these challenges, the region has incredible assets to overcome foreseen disasters. More than 230 million people under the age of 24 make up WCAR's young, active population, who must be empowered and supported, to be the driving force behind climate action.



**Table 16**

**Estimates of children's exposure to climate related hazards, shocks, and stresses in LDCs in WCAR**

Country	Number of children under 18 years old exposed to / living in areas with					
	Water scarcity	Riverine floods (50 years)	Coastal flood risk	Extensive cyclone wind (100 years)	Intensive cyclone wind (100 years)	Heatwaves
<b>Benin</b>	200 thousand	890 thousand	-	-	-	2.6 million
<b>Burkina Faso</b>	9.1 million	540 thousand	-	-	-	950 thousand
<b>Central African Republic</b>	20 thousand	350 thousand	-	-	-	2.3 million
<b>Chad</b>	2.7 million	1.9 million	-	-	-	100 thousand
<b>Democratic Republic of the Congo</b>	140 thousand	4.9 million	-	-	-	13.8 million
<b>Gambia</b>	5 thousand	100 thousand	760 thousand	-	-	-
<b>Guinea</b>	180 thousand	560 thousand	2.2 million	-	-	2.1 million
<b>Guinea-Bissau</b>	-	70 thousand	470 thousand	-	-	40 thousand
<b>Liberia</b>	10 thousand	590 thousand	-	-	-	1.5 million
<b>Mali</b>	2.9 million	2 million	-	-	-	180 thousand
<b>Mauritania</b>	770 thousand	360 thousand	5 thousand	-	-	820 thousand
<b>Niger</b>	11.1 million	1.6 million	-	-	-	50 thousand
<b>Senegal</b>	5.5 million	390 thousand	1.1 million	-	-	4 million
<b>Sierra Leone</b>	-	240 thousand	130 thousand	-	-	2.8 million
<b>Togo</b>	20 thousand	480 thousand	1.7 million	-	-	2.2 million
<b>UNICEF WCA LDCs (15 countries)</b>	<b>32.7 million</b>	<b>15 million</b>	<b>6.4 million</b>	-	-	<b>33.4 million</b>

**Table 17****Estimates of children's exposure to environmental hazards, shocks, and stresses in LDCs in WCAR**

Country	Number of children under 18 years old exposed to / living in areas with			Number of children under 20 years old exposed to
	Ambient air pollution (PM2.5 >= 10 µg/m3)	Ambient air pollution (PM2.5 >= 25 µg/m3)	High pesticide pollution risk	Lead pollution
<b>Benin</b>	5.6 million	5.6 million	4.6 million	3.1 million
<b>Burkina Faso</b>	10.7 million	10.7 million	20 thousand	9.1 million
<b>Central African Republic</b>	2.7 million	2.7 million	5 thousand	1.7 million
<b>Chad</b>	8.7 million	8.7 million	-	7.9 million
<b>Democratic Republic of the Congo</b>	47.1 million	32.4 million	26.5 million	23.9 million
<b>Ghana</b>	1 million	1 million	400 thousand	540 thousand
<b>Guinea</b>	6.9 million	6.9 million	20 thousand	4.5 million
<b>Guinea-Bissau</b>	960 thousand	960 thousand	-	550 thousand
<b>Liberia</b>	2.2 million	2.2 million	1.2 million	1.5 million
<b>Mali</b>	11.1 million	11.1 million	-	9.7 million
<b>Mauritania</b>	2 million	2 million	-	480 thousand
<b>Niger</b>	13.7 million	13.7 million	110 thousand	12.5 million
<b>Senegal</b>	7.9 million	7.9 million	270 thousand	1.9 million
<b>Sierra Leone</b>	3 million	3 million	2.2 million	2.3 million
<b>Togo</b>	3.8 million	3.8 million	1.7 million	1.5 million
<b>UNICEF WCA LDCs (15 countries)</b>	<b>127.3 million</b>	<b>112.5 million</b>	<b>37 million</b>	<b>81.3 million</b>

Source: CCRI index (Beta version) (All absolute numbers rounded to the nearest decimal of a million, nearest ten thousand if greater than or equal to 10,000 or nearest five thousand if less than 10,000)

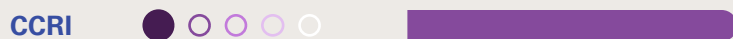
**Table 18****Estimates of children living in areas exposed to one or more disease vectors in LDCs in WCAR**

Country	Number of children under 18 years old living in areas exposed to one or more disease vectors*
<b>Benin</b>	5.9 million
<b>Burkina Faso</b>	10.7 million
<b>Central African Republic</b>	2.7 million
<b>Chad</b>	8.7 million
<b>Democratic Republic of the Congo</b>	46.7 million
<b>Gambia</b>	1.1 million
<b>Guinea</b>	7 million
<b>Guinea-Bissau</b>	990 thousand
<b>Liberia</b>	2.4 million
<b>Mali</b>	11.1 million
<b>Mauritania</b>	2 million
<b>Niger</b>	13.7 million
<b>Senegal</b>	8.5 million
<b>Sierra Leone</b>	3.3 million
<b>Togo</b>	3.9 million
<b>UNICEFWCA LDCs (15 countries)</b>	<b>128.4 million</b>

\*Plasmodium Falciparum Malaria, Plasmodium Vivax Malaria, Aedes, Dengue, Zika

Source: CCRI index (Beta version) (All absolute numbers rounded to the nearest decimal of a million, nearest ten thousand if greater than or equal to 10,000 or nearest five thousand if less than 10,000)

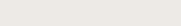
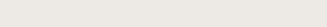

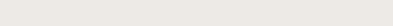
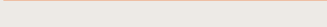
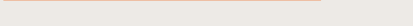

# Benin

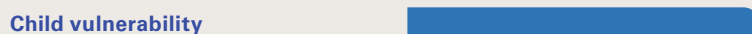


7.6 | Extremely High

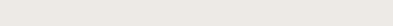
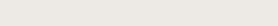


7.1 | Pillar 1

Water scarcity	4.2	
Riverine floods	7.4	
Coastal floods	1.6	
Tropical cyclones	0.0	
Vector borne disease	8.8	
Heatwaves	7.3	
Air pollution	9.6	
Soil and water pollution	9.2	



8.1 | Pillar 2

Child health and nutrition	9.0	
Education	6.1	
Water, sanitation, and hygiene	9.5	
Poverty, communication assets and social protection	7.7	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Benin; 3 out of the 23 indicators included in pillar 2 have no data.

Benin has a CCRI score of 7.6 and ranks 15<sup>th</sup> out of the 163 CCRI countries and regions, placing children in Benin at “Extremely High” risk.

According to the CCRI, the climate and environmental shocks that children in Benin are highly exposed to include:



## Air pollution

Air pollution is a significant environmental hazard for children in Benin. The most recent data shows that 95 percent of children are exposed to ambient air pollution (PM<sub>2.5</sub> ≥ 25 µg/m<sup>3</sup>), which substantially exceeds the recommended maximum ambient air pollution limits (PM<sub>2.5</sub> ≥ 5 µg/m<sup>3</sup>). The bulk of the sectors contributing to Benin’s poor air quality operate in Cotonou, the country’s largest city, which has chronically high levels of air pollution. These industries include palm oil processing, textile manufacture, and food processing.<sup>cdxcvi</sup>



## Soil and water pollution

Soil and water pollution significantly hinder children’s health and well-being in Benin. Approximately half of children and youth under the age of 20 are exposed to lead pollution. Depending on levels of exposure, lead exposure can cause severe health problems including irreversible damage to brain development, nervous systems, and various organs. Children under the age of 5 years, are at the greatest risk of suffering lifelong neurological, cognitive, and physical damage and even death.<sup>cdxcvii</sup> 77 percent of children also reside in areas with high pesticide pollution risk. Pollution from pesticides leaches into water systems and has been linked with cancer, including childhood leukaemia. It can also cause developmental delays and can impact brain and behaviour development.



### Vector-borne diseases

5.9 million children are estimated to live in areas exposed to one or more disease vectors in Benin. 99 percent of children are exposed to dengue, 95 percent are at risk of aedes, and 75 percent are exposed to zika. Such high risks to vector-borne diseases, necessitates vector control measures in Benin, especially as the frequency of flooding increases, which can create favourable environments for mosquito breeding grounds.



### Riverine floods

Over 800,000 children are exposed to riverine flooding in Benin. In 2010, when heavy rains caused the Ouémé River to burst its banks, Benin saw its worst floods since 1963, killing 40 people and displacing 100,000 more.<sup>cdxcviii</sup> More recently, in October 2021, 38 out of 77 communes were struck by riverine flooding as a result of torrential rainfall, damaging 50 primary schools and causing least 9 fatalities.<sup>cdxcix</sup> Agricultural losses anticipated from riverine flooding are expected to push the poorest families into further poverty, without adequate social protection systems in place. Climate projections show that flooding is likely to become more frequent and destructive in Benin, with particular concern for reoccurring flooding in urban areas, including Cotonou, Portio Novo, and Parakou.<sup>d</sup>



### Heatwaves

Benin has been identified as a country with a high extreme heat hazard classification,<sup>di</sup> where 44 percent of children are exposed to heatwaves. During heatwaves, children are especially susceptible, with newborns and small children being the most likely to die or suffer from heatstroke, due to their inability or lack of agency to regulate their body temperature. Heatwaves also make the classroom unpleasant, reducing educational outcomes for children and can lead to school absenteeism of pupils and teachers.

## Underlying vulnerabilities



### WASH

Despite significant improvements to drinking water provisions, around 44 percent of households in Benin have no access to handwashing facilities and over half of households continue to practice open defecation.<sup>dii</sup> Inadequate access to sanitation and hygiene increases children's risks to water-borne diseases, including diarrhoea, which was responsible for 11 percent of infant mortalities in 2016.<sup>diii</sup> Climate-related shocks like flooding, further exacerbate health risks, through compromising safe water supplies, increasing the likelihood of diarrhoea outbreaks. Thus, improving WASH services is essential to protect children in Benin from disease outbreaks, especially, as flooding becomes more frequent and severe.



### Health and nutrition

Child mortality rates are staggering in Benin, at 84 per 1,000 live births in 2021. Malaria is the leading cause of mortality in children under the age of 5, although figures are improving, with the large-scale implementation of ITNs and other malaria prevention measures.<sup>div</sup> Other significant causes of death in children under the age of 5, include pneumonia, diarrhoea, and sepsis.<sup>dv</sup> Maternal mortality rates are also high, at 397 per 100,000 live births. In 2017, research revealed that approximately 10 percent of Benin's population was food insecure and chronic malnutrition affects 32 percent of children.<sup>dvi</sup> Dietary habits, malaria, diarrhoea, respiratory infections, and mothers' health are among the main factors driving child malnutrition in the country. Food insecurity mostly affects disadvantaged rural communities and intensifies following shocks, such as the country's annual floods.



### Poverty and social protection:

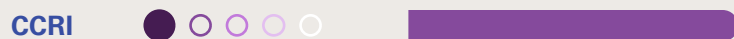
Poverty levels are high in Benin, where approximately 38.5 percent of the population are living below the national poverty line. Some of the major development problems stem from Benin's high reliance on agriculture, which employs 70 percent of the working population and accounts for 32 percent of Benin's GDP.<sup>dvii</sup> The limited economic diversity and poor flexibility of livelihood options makes Benin highly vulnerable to external shocks, including climate and environmental hazards. At present, 57 percent of the population (aged 15 years and older) struggle to come up with emergency funds when in need. Government authorities in Benin need to build their capacity to better manage climate change and disaster risks.



## Education

Even today, nearly 1.6 million school-aged children in Benin do not have access to education.<sup>dviii</sup> Geographic distance from schools, the economic costs of education, and gender-related socio-cultural norms all affect children's access to education. Whilst progress in gender parity in education has been demonstrated, traditional gender norms for women and girls, including early marriage, often results in girls attending school on a part-time basis or to drop out entirely. For example, in cycle one of secondary school, girls enrol at a 20 percent lower rate than males.<sup>dix</sup> Moreover, girls' transportation, safety from assault and sexual harassment by teachers and peers are all lacking in schools, as are adequate sanitation facilities for MHM. Children from low-income families are believed to have a 30 percent lower access rate to schools than children from wealthy families.<sup>dx</sup> In addition, just 61 percent of the population between 15-24 years of age are literate in Benin, restricting livelihood options, especially for poorer and rural communities leaving them more vulnerable to climate change.

# Burkina Faso

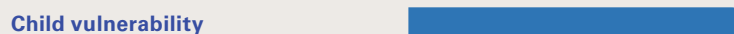


7.6 | Extremely High



7.3 | Pillar 1

Water scarcity	9.7	
Riverine floods	5.5	
Coastal floods	0.0	
Tropical cyclones	0.0	
Vector borne disease	8.6	
Heatwaves	5.8	
Air pollution	10.0	
Soil and water pollution	8.2	



7.8 | Pillar 2

Child health and nutrition	7.4	
Education	7.0	
Water, sanitation, and hygiene	10.0	
Poverty, communication assets and social protection	6.7	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Burkina Faso; 1 out of the 23 indicators included in pillar 2 has no data.

Burkina Faso has a CCRI score of **7.6**, ranking **15<sup>th</sup>** out of the 163 CCRI countries and regions. Children in Burkina Faso are considered at **“Extremely High”** risk. Burkina Faso is situated at the epicentre of a multidimensional humanitarian crisis affecting the Sahel region, which is driven by a combination of factors including armed violence and insecurity, demographic pressures, climate change, and governance issues.

According to the CCRI, the climate and environmental shocks that children in Burkina Faso are highly exposed to include:



## Air pollution

Ambient air pollution is a significant environmental risk for children in Burkina Faso. Recent data shows that the country’s entire child population is exposed to ambient air pollution (PM<sub>2.5</sub> >= 25 µg/m<sup>3</sup>). Like all countries of the Sahel, Burkina Faso is subject to dust storms and dusty winds (“Harmattan”), which is a significant driver of poor air quality. Pollution levels vary by season, with greater levels occurring during the dry season (November to March) and air pollution in Ouagadougou is reported as consistently high.<sup>dx1</sup>



## Water scarcity

Burkina Faso has been in ‘quasi-drought’ conditions since the early 1970s, due to erratic precipitation and low water retention in soils. Droughts conditions occur most frequently in November and December, when humidity levels average 10 percent, especially in the north, where rain falls just twice a year.<sup>dxii</sup> Water scarcity is expected to increase in variability and incidence with climate change, which will negatively impact crop yields and pastoralist activities.<sup>dxiiidxiv</sup> Droughts have also resulted in migration from the central plateau to east and western areas, which is causing overcrowding and environmental deterioration in receiving areas.<sup>dxv</sup>





### Vector-borne diseases

10.7 million children are estimated to live in areas exposed to one or more disease vectors in Burkina Faso. All children are at risk of PF and PV malaria transmission and 93 percent of children are exposed to dengue. The poor WASH conditions in the country, with significant standing water and inadequate sanitation increases risks of disease outbreaks, especially for malaria.<sup>dxvi</sup>



### Soil and water pollution

Artisanal gold mining is a large source of soil pollution in the country, where the use of cyanide to recover gold presents a danger to human health. Cyanide is a rapidly acting, potentially fatal chemical that even at small levels poses significant health risks, which children are considered more vulnerable to.<sup>dxvii dxviii</sup> In the Zougnazamiline settlement, 20 percent of people are exposed to soil polluted with cyanide.<sup>dxix</sup> Alongside cyanide, the CCRI identifies lead pollution as a significant hazard in Burkina Faso where 80 percent of children and adolescents under the age of 20 are exposed to dangerous levels. Children under the age of 5, are at the greatest risk of suffering lifelong neurological, cognitive, and physical damage and even death from lead poisoning.<sup>dx</sup>



### Riverine flooding

Whilst scoring much lower on the CCRI than other Pillar 1 components (5.5), riverine flooding is increasingly impacting children in Burkina Faso. Severe flood events have occurred repeatedly over the last 30 years, particularly in the north and centre of the country. In 2020, Burkina Faso experienced the worst flooding in a decade, which affected over 100,000 people and caused one of the world's food security challenges of the decade.<sup>dxxi</sup>

## Underlying vulnerabilities



### WASH

Inadequate WASH remains a significant challenge in Burkina Faso, where an estimated 3 million people require access to WASH services in the country.<sup>dxxii</sup> 31 percent of households have limited drinking water services, 64 percent of households have no access to handwashing facilities, and around 40 percent of households continue to practice open defecation.<sup>dxxiii</sup> Children with poor access to adequate WASH provisions have a reduced capacity to treat climate related diseases.



### Health and nutrition

Underlying vulnerabilities related to child health and nutrition make children particularly vulnerable to climate change in Burkina Faso. Approximately 2.9 million people require life-saving health care services in the country, yet an estimated 1 million people are completely isolated and unable to access essential services. Burkina Faso's hot and dry environment is conducive to meningitis outbreaks and cholera epidemics.<sup>dxxiv</sup> Moreover, children's nutritional outcomes are poor; over 180,000 children are suffering from severe wasting, and one-quarter of children under the age of five are stunted. Climate variability and hazards are already placing a major constraint on child nutrition. This was demonstrated by the floods in 2020 which forced 15 percent of the population into famine-level food insecurity.<sup>dxv</sup>



### Poverty and social protection

The economy in Burkina Faso is mostly reliant on agriculture, which employs 80 percent of the population – and is a highly climate sensitive sector.<sup>dxvii</sup> The country faces several development challenges that contribute to high levels of poverty, including inadequate access to healthcare, education, WASH, and social protection mechanisms, resulting in 41 percent of people living below the national poverty line. Ongoing conflict is preventing children's access to vital services and impedes relief delivery to the most vulnerable communities. Moreover, growing insecurity, conflict, and violence, especially in bordering areas, has led to the internal displacement of more than 1.7 million people in Burkina Faso, 60 percent of which are children.<sup>dxviii</sup>



### Education

School attendance has become increasingly challenging with the ongoing humanitarian crises. Since the escalation of unrest and conflict in Burkina Faso, schools have become favoured targets of non-state armed groups, resulting, large-scale displacements of populations, school evacuations, and psychological trauma in many children. Fortunately, digital learning modalities including the radio education programme established by UNICEF and Ministry of National Education, Literacy, and Promotion of National Languages and its partners have contributed to continuity of learning for affected children.<sup>dxviii</sup> Similar contingency plans are essential, as climate shocks increase in frequency and severity, to ensure that children's education needs are met, even in times of climate induced displacement or school closure.

# Central African Republic



CCRI



8.7 | Extremely High

## Climate and environment shocks



6.7 | Pillar 1

Water scarcity	2.5	
Riverine floods	6.5	
Coastal floods	0.0	
Tropical cyclones	0.0	
Vector borne disease	8.9	
Heatwaves	8.6	
Air pollution	9.6	
Soil and water pollution	7.3	

## Child vulnerability



9.8 | Pillar 2

Child health and nutrition	9.8	
Education	10.0	
Water, sanitation, and hygiene	10.0	
Poverty, communication assets and social protection	9.2	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Central African Republic; 6 out of the 23 indicators included in pillar 2 have no data.

The Central African Republic (CAR) has a CCRI score of **8.7** and ranks **1<sup>st</sup>** out of the 163 CCRI countries and regions, placing children in the CAR at “**Extremely High**” risk.

According to the CCRI, the climate and environmental shocks that children in the CAR are highly exposed to include:



### Air pollution

100 per cent of children are exposed to ambient air pollution (PM<sub>2.5</sub>  $\geq$  25  $\mu\text{g}/\text{m}^3$ ) in the CAR. Air pollution poses threats to health, particularly in urban centres such as the capital of Bangui<sup>dxix</sup>, as well as the large rural population that predominantly relies on solid biomass energy such as wood for cooking fuel. Short-lived climate pollutants (SLCPs) in the country are derived from sectors such as the energy, waste, agriculture, bushfire, and land-use sectors, and pose health risks which include breathing problems, chronic diseases and premature mortality.



### Vector-borne diseases

According to the CCRI, 2.7 million children are estimated to live in areas exposed to one or more disease vectors in CAR. All children are at risk of malaria (PV unstable and PF stable transmission), 99 percent are at risk of aedes, and 98 percent are exposed to both zika and dengue. Such high levels of exposure, increase the need for vector control measures, including the provision of ITNs for children, which were only used by half of children-under 5 in 2019.<sup>dxix</sup>



### Heatwaves

83 percent of children are exposed to heatwaves in the CAR. Children are affected by heatwaves more than adults, as they adjust more slowly to changes in environmental temperature and are more vulnerable to heat-related health risks. A rise in the frequency of hot days, high temperatures, and the duration of heatwaves is expected in the CAR, especially in the northern region. By 2085, the estimated increase in the duration of long-lasting heatwaves is expected to rise 7 to 81 days.<sup>dxxxix</sup> The impact of rising temperatures will undoubtedly impact vital sectors of the CAR's economy, such as forestry, agriculture, and livestock, thus impacting nutrition and food security.



### Soil and water pollution

Soil and water contamination are persistent issues affecting children in the CAR. Approximately 65 percent of children and adolescents under the age of 20 are exposed to lead pollution, posing significant risks to physical and neurological development, especially in infants and young children. Moreover, mining in the CAR is causing serious damage to the environment, including soil erosion and pollution of waterways due to the use of chemicals and heavy metals, including mercury which is used in gold mining.<sup>dxxxii</sup>



### Riverine flooding

Riverine flooding is responsible for the greatest share of economic and human losses caused by natural disasters in the CAR. Several major flood disasters have occurred over the past decade, with the most regularly recorded flood incidents occurring in and around the capital of Bangui. For example, floods in Bangui in 2021 harmed 2,589 children, with considerable damage to vital infrastructure including the destruction of 94 water wells and 107 latrines, hindering access to safe water and sanitation.<sup>dxxxiii</sup>

## Underlying vulnerabilities



### WASH

Inadequate WASH remains a key factor increasing children's vulnerability to the impacts of climate change. Just 17 percent of the population have access to basic handwashing facilities including soap and water and approximately 34 percent of households continue to use drinking water from unimproved water sources.<sup>dxxxiv</sup> WASH conditions are particularly poor for internally displaced communities in the CAR, due to limited infrastructure and services. In 2022, 664,000 people were internally displaced due to conflict and disasters, the majority of which were women and children.<sup>dxxxv</sup> Implementing WASH interventions in highly vulnerable areas proves difficult given the insecurity induced by armed groups', as well as physical obstacles such as poor road conditions.



### Health and nutrition

The poor health situation in the CAR is a product of the multiple crises affecting the region, including extreme fragility, poor governance, and climate impacts. Common health problems include HIV/AIDS, communicable diseases including measles, malaria, and diarrhoea, as well as noncommunicable diseases like diabetes, with favourable conditions developing for many of these diseases during the dry season.<sup>dxxxvi</sup> Many of these illnesses contribute to the CAR's extremely high maternal mortality and child mortality rates (829 per 100,000 live births and 100 per 1,000 respectively). Food instability, malnutrition, and undernutrition are also major concerns for children. Approximately 40 percent of children under the age of 5 are stunted and the number of children who require treatment for severe wasting is anticipated to increase by 10 percent in 2023.<sup>dxxxvii</sup>



### Poverty and social protection

Despite great agricultural potential, extensive mineral and forest resources, the CAR remains one of the poorest countries globally. In 2020, it was estimated that nearly 71 percent of the population lived below the international poverty line (USD 1.90 per day).<sup>dxxxviii</sup> Over 40 years of conflict has led to weak institutions, limited access to basic services and high levels of violence. Almost 70 percent of the population above the age of 15 are unable to come up with emergency funds and just 1 percent of households receive child/family cash benefits. Due to the combined effects of conflict-related violence, price increases linked to the war in Ukraine and the consequences of climate change, 3.1 million people, including 1.4 million children, are estimated to require humanitarian assistance in the CAR in 2023.<sup>dxxxix</sup>



## Education

Children in the CAR have some of the lowest levels of education worldwide. In 2019, 73 percent of children primary school age attended education and lower and upper secondary attendance rates were notably low, at 13 and 5 percent respectively.<sup>dxl</sup> Girls are disproportionately affected by poor access to education, with many females lacking access to secondary education. In 2018, only 38 percent of young people between 15 to 24 was literate, limiting their capacity to access job markets and seek a diversity of livelihood opportunities. Moreover, school closures are common in the CAR due to natural disasters and conflict. Children with lower levels of educational attainment are more vulnerable to climate and environmental shocks, as they often lack the knowledge and skills to manage risks.

# Chad



CCRI  8.5 | Extremely High

**Climate and environment shocks**  7.0 | Pillar 1

Water scarcity	7.0	<div style="width: 70%;"></div>
Riverine floods	9.3	<div style="width: 93%;"></div>
Coastal floods	0.0	<div style="width: 0%;"></div>
Tropical cyclones	0.0	<div style="width: 0%;"></div>
Vector borne disease	8.2	<div style="width: 82%;"></div>
Heatwaves	4.1	<div style="width: 41%;"></div>
Air pollution	10.0	<div style="width: 100%;"></div>
Soil and water pollution	7.4	<div style="width: 74%;"></div>

**Child vulnerability**  9.4 | Pillar 2

Child health and nutrition	9.9	<div style="width: 99%;"></div>
Education	8.6	<div style="width: 86%;"></div>
Water, sanitation, and hygiene	10.0	<div style="width: 100%;"></div>
Poverty, communication assets and social protection	9.0	<div style="width: 90%;"></div>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Chad; 5 out of the 23 indicators included in pillar 2 have no data.

Children in Chad are considered at “Extremely High” risk, ranking 2<sup>nd</sup> out of the 163 CCRI countries and regions and scoring 8.5 on the CCRI.

According to the CCRI, the climate and environmental shocks that children in Chad are highly exposed to include:



## Air pollution

In Chad, the entire child population is exposed to ambient air pollution levels of (PM2.5  $\geq$  25  $\mu\text{g}/\text{m}^3$ ), exceeding WHO international pollution limits (PM2.5  $\geq$  5  $\mu\text{g}/\text{m}^3$ ). In 2017, air pollution was the third leading risk factor for premature death, accounting for 10 percent of all deaths.<sup>dxli</sup> In the same year, exposure to household air pollution caused an average loss of over 2 years of life expectancy, while exposure to ambient air pollution caused a loss of nearly 1 year and 6 months.<sup>dxliii</sup> Chad’s oil, textile industries, as well as vehicle emissions and waste burning, all contribute to the dangerous air pollution levels.



## Riverine flooding

1.8 million children are exposed to riverine flooding in Chad, with areas along the Lake Chad Basin particularly vulnerable. The 2021 rainy season saw record rainfall in the country, resulting in flooding in 20 out of 23 provinces, affecting 388,000 people mostly in the central, eastern, and southern regions.<sup>dxliiii</sup> Flash flooding is also common, for example, in 2020, nearly 120,000 people were displaced by flash floods caused by heavy rainfall in Chad.<sup>dxliv</sup> Children are especially vulnerable to flash floods because of their quick onset and destructive nature; leaving little time to prepare and respond.



### Vector-borne diseases

According to the CCRI, 8.7 million children are estimated to live in areas exposed to one or more disease vectors in Chad. 71 percent of children are exposed to dengue and the entire child population is at risk of PV malaria. Between July- September 2020, 27,540 cases of the Chikungunya virus, transmitted by the Aedes mosquito, were reported across 3 provinces in Chad.<sup>dxiv</sup> As the transmission potential of vectors increase with climate change, larger outbreaks of vector-borne diseases, are expected in the country.



### Soil and water pollution

As the third largest oil exporter in Sub-Saharan Africa, large-scale oil extraction is a substantial source of water and soil contamination in Chad. Research along the Chari River has found high levels of heavy metal concentrations in Chad's water systems, which can lead to severe health implications for children.<sup>dxvi</sup> For example, 85 percent of children and adolescents under the age of 20 are exposed to lead pollution in Chad, which can have devastating impacts on human health.



### Water scarcity

Approximately 31 percent of children are exposed to water scarcity in Chad. Lake Chad, which is the main source of food security and livelihoods has depleted by 90 percent since the 1960s.<sup>dxvii</sup> Northern Chad, which stretches into the Sahara Desert, is another area which experiences high water scarcity; here, the dry season lasts from November to March, with little to no rain.<sup>dxlviii</sup> Water shortages have a significant impact on the region's farmers and pastoralists, as a result of desertification and soil degradation. The depletion of water resources has also forced women and girls to travel longer distances to fetch water, disrupting girls' education.

## Underlying vulnerabilities



### WASH

In Chad, 32 percent of households are using drinking water from unimproved sources and 44 percent of households have no handwashing facilities.<sup>dxlix</sup> The lack of access to adequate WASH leads to frequent diarrhoea and malabsorption, which contribute to malnutrition, particularly in young children. In addition, Chad has the highest prevalence of open defecation in WACR, which is practiced by 64 percent of households.<sup>di</sup> Open defecation poses significant public health risks, including cholera, diarrhoea, dysentery, typhoid, and polio. Children who suffer from existing WASH-related illnesses are less able to respond to climate shocks and hazards.



### Health and nutrition

Climate change and ongoing conflict are deteriorating Chad's already fragile healthcare system. The mortality rate for children under the age of 5, is persistently high, at 107 per 1,000 live births in 2021. Pneumonia is one of the largest drivers of child mortality, causing the deaths of 17,800 children in 2018.<sup>dii</sup> Moreover, vaccination coverage is low; according to the 2017 vaccination coverage survey only 22 percent of children aged 12-23 months were fully vaccinated.<sup>diii</sup> Low vaccination coverage, combined with the precarious situation of the health system exposes Chad to recurrent disease outbreaks, such as the measles epidemic in 2018. In addition, Chad has one of the highest maternal mortality rates globally, at 1,140 per 100,000 live births and many mothers die in delivery without receiving any medical assistance. Climate shocks greatly impact children's nutritional status in Chad, where 35 percent of children under the age of 5 are stunted. Insufficient precipitation in the rainy seasons in recent years have led to a decrease in agricultural productivity and deficits in grazing areas, leading to food insecurity. The cost of staple food remains high in the region, meaning that the most impoverished communities cannot afford to eat and trade flows around the Lake Chad basin have been largely disrupted by armed conflict.<sup>diiii</sup> Countries with weak health infrastructure, that already struggle to provide adequate health-care services, like Chad, will experience even greater strains on resources with climate change.



### Poverty and social protection

Poverty levels are high in Chad, where 42 percent of the population live below the national poverty line. There is a high reliance on climate sensitive sectors, including agriculture and livestock, which are frequently impacted by shifting weather patterns and frequent droughts. In the poorest areas, where economic diversification is low, opportunities to adapt to alternative livelihoods are limited, pushing people further into poverty. Additionally, limited government capacity and low social protection coverage, mean that 60 percent of the population (aged 15 years+) unable to come up with emergency funds. Government support is urgently needed for the poorest and most vulnerable children, who will be disproportionately affected by climate change in Chad.



### Education

Chad's education sector is characterized by a low level of schooling. Less than half of primary aged children attend school (43 percent) and just 14 percent of adolescents of lower secondary age.<sup>d1iv</sup> Youth literacy rates are staggeringly low, at less than 31 percent for ages 15 to 24, meaning that over 2 million youth are unable to read or write. Moreover, there is little access to higher education, and professional training, limiting opportunities for youth to participate in both formal and green economies. Humanitarian crises in neighbouring countries have added significant pressure, with more than 600,000 refugee children in need of education.<sup>d1v</sup> Climate change is expected to cause more frequent disasters, and repeated disruptions, increasing the need to strengthen the resilience of the education sector, to ensure that school for Chad's children is not stopped for good.

# Democratic Republic of the Congo



CCRI 8.0 | Extremely High

**Climate and environment shocks** 7.2 | Pillar 1

Water scarcity	3.8	
Riverine floods	7.8	
Coastal floods	0.0	
Tropical cyclones	0.0	
Vector borne disease	9.0	
Heatwaves	8.1	
Air pollution	9.4	
Soil and water pollution	9.4	

**Child vulnerability** 8.6 | Pillar 2

Child health and nutrition	8.5	
Education	6.3	
Water, sanitation, and hygiene	10.0	
Poverty, communication assets and social protection	9.5	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Democratic Republic of the Congo; 5 out of the 23 indicators included in pillar 2 have no data.

The Democratic Republic of the Congo (DRC) has a CCRI score of **8.0** and ranks **9<sup>th</sup>** out of the 163 CCRI countries and regions. Children in the DRC are considered at “**Extremely High**” risk.

According to the CCRI, the climate and environmental shocks that children in the DRC are highly exposed to include:



## Soil and water pollution

Mining for diamonds, gold, and coltan are significant drivers of soil and water pollution in the DRC, due to the use of chemicals and heavy metals. Exposure to chemicals can significantly hinder children’s cognitive and physical development. Children in DRC are especially vulnerable to the impacts of lead poisoning, with almost half of all children and adolescents under the age of 20 exposed to lead pollution (49%). Additionally, 56 percent of children live in areas with high pesticide pollution risks, which could be significantly reduced with sound environmental management.



## Air pollution

All children in DRC are exposed to ambient air pollution levels higher than the WHO recommended maximum ambient air pollution of (PM2.5  $\geq$  5  $\mu\text{g}/\text{m}^3$ ). The key causes of air pollution include waste burning, mining, mineral processes, forestry and the cement industry and DRC has been identified as one of the countries with the most widespread use of solid fuels globally. Indoor air pollution levels are also high. Cooking with wood and coal, as widely practiced in the DRC, can harm children’s developing lungs, causing acute respiratory infections and exposure in utero can lead to lower birthweight and contribute to stillbirth.<sup>d1vi</sup>





### Heatwaves

Almost 30 percent of children are exposed to heatwaves in the DRC. Children in urban areas have been identified as particularly sensitive to the impacts of heat stress, as a result of the urban heat island effect.<sup>dlvii</sup> Annual temperatures are anticipated to rise between 1.7°C to 4.5°C by the end of the century in the country and heatwaves are projected to become more frequent and longer in duration.<sup>dlviii</sup> According to the Ministry of Foreign Affairs, by the end of the century, the number of hot days and nights is expected to rise by 58 percent and 86 percent, respectively.<sup>dlvix</sup>



### Vector-borne diseases

Children in the DRC experience high exposure to vector-borne diseases, with 88 percent of children exposed to zika, 86 percent at risk of aedes and 85 percent exposed to dengue. The DRC is also one of the world's most malaria affected countries, where malaria was responsible for 38 percent of total morbidity and 36 percent of mortality in the DRC, in 2018.<sup>dlx</sup> Disease risk is exacerbated by other climate hazards, including flooding, which compromises safe drinking water and creates favourable sites for mosquito breeding grounds.



### Riverine flooding

4.9 million children are exposed to riverine flooding in the DRC. Flood risk is greatest along the river Congo, which frequently floods during periods of heavy equatorial rainfall. For example, in December 2022, flooding induced by heavy rainfall affected nearly 39,000 households in the capital city of Kinshasa, resulting in 120 fatalities and 282 homes destroyed, leaving many families homeless.<sup>dlxi</sup> Low-income communities tend to live in the most flood prone areas, pushing the most vulnerable into further poverty. Mudslides and landslides are frequent secondary hazards to flooding, especially in the country's mountainous regions. In addition, soil erosion and waterlogging of fields as a result of flooding, frequently lowers agricultural yields, increasing risks of food insecurity.

## Underlying vulnerabilities



### WASH

The DRC has tremendous water potential, holding over half of the African continent's water reserves. Nonetheless, access to water remains a key challenge. Around one third of households continue to use unimproved drinking water services.<sup>dlxii</sup> Moreover, access to adequate sanitation and hygiene services remains limited, where 42 percent of households have no handwashing facilities.<sup>dlxiii</sup> The increasing frequency and intensity of flooding is expected to exacerbate WASH challenges in the DRC, including damage to sanitation infrastructure and potential increases in water-borne diseases, including cholera.<sup>dlxiv</sup>



### Health and nutrition

Inadequate access to healthcare services is a key challenge for children in the DRC. Maternal and child mortality rates are high (473 per 100,000 live births and 79 per 1000 live births respectively). Diseases such as Ebola and Zika virus are expected to become more prevalent with climate change in DRC, exploiting the already overburdened health system, which struggles to address present health needs. Chronic malnutrition affects 43 percent of children aged 0 to 5 in the country, resulting in 41 percent of children under the age of 5 considered stunted for their age.<sup>dlxv</sup> The additional burden of WASH related diseases including diarrhoea, dysentery and cholera from climate change undermines the ability of children to utilize food, further driving adverse nutritional and health outcomes of children.



### Poverty and social protection

The DRC is among the five poorest countries in the world and is home to one in every six people living in extreme poverty.<sup>dlxvi</sup> Nearly 64 percent of the population, or just under 60 million people, lived on less than USD 2.15 per day in 2021.<sup>dlxvii</sup> The DRC's rapid urbanization rate and mass movements of people due to chronic conflict in several provinces, is exacerbating poverty. Children in the poorest families have low resilience to climate shocks. For example, only 1.3 percent of households with children receive child or family cash benefits and just 0.68 percent of DRC's GDP is spent on social safety nets.



### Education

Over the last few decades, the DRC has made great progress toward universal primary education. The net primary school attendance rate has grown from 52 percent in 2001 to 78 percent in 2018.<sup>dlxviii</sup> Nonetheless, 7.6 million children aged 5 to 17 years old remain out of school and only 5 percent of children aged 3 to 5 years old attend preschool, affecting their early cognitive and social development.<sup>dlxix</sup> Furthermore, repetition and dropout rates at the primary school level are high. Despite the DRC government's promise of free primary education, direct and indirect expenditures related to schooling including, registration fees, school materials, and uniforms remain key barriers to enrolment in schools.

# The Gambia



CCRI

6.8 | High

**Climate and environment shocks**

6.5 | Pillar 1

Water scarcity	2.0	<span style="display: inline-block; width: 100px; height: 5px; background-color: orange;"></span>
Riverine floods	5.1	<span style="display: inline-block; width: 200px; height: 5px; background-color: orange;"></span>
Coastal floods	9.9	<span style="display: inline-block; width: 450px; height: 5px; background-color: orange;"></span>
Tropical cyclones	0.0	<span style="display: inline-block; width: 0px; height: 5px; background-color: orange;"></span>
Vector borne disease	7.6	<span style="display: inline-block; width: 300px; height: 5px; background-color: orange;"></span>
Heatwaves	0.0	<span style="display: inline-block; width: 0px; height: 5px; background-color: orange;"></span>
Air pollution	8.9	<span style="display: inline-block; width: 350px; height: 5px; background-color: orange;"></span>
Soil and water pollution	7.9	<span style="display: inline-block; width: 300px; height: 5px; background-color: orange;"></span>

**Child vulnerability**

7.1 | Pillar 2

Child health and nutrition	7.2	<span style="display: inline-block; width: 300px; height: 5px; background-color: blue;"></span>
Education	7.8	<span style="display: inline-block; width: 350px; height: 5px; background-color: blue;"></span>
Water, sanitation, and hygiene	7.1	<span style="display: inline-block; width: 300px; height: 5px; background-color: blue;"></span>
Poverty, communication assets and social protection	6.4	<span style="display: inline-block; width: 250px; height: 5px; background-color: blue;"></span>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Gambia; 5 out of the 23 indicators included in pillar 2 have no data.

The Gambia has a CCRI score of **6.8** and ranks **37<sup>th</sup>** out of the 163 countries and regions, placing children at “**High**” risk.

According to the CCRI, the climate and environmental shocks that children in The Gambia are highly exposed to include:



## Coastal floods

67 percent of children reside in coastal flood risk areas in The Gambia. The capital city of Banjul is particularly exposed, sitting less than 1 metre above sea level. Coastal flooding and subsequent erosion, has various impacts on coastal livelihoods, including, infrastructure damage, harm to fisheries, and a loss of freshwater resources due to salination and mangrove migration. The implementation of coastal protection measures is essential to prevent significant loss and damages from the devastating impacts of coastal floods. For example, in Banjul, youth activists, as part of the Clean Green Gambia initiative, with funding from an EU partnership with the Belgian city of Ostende, have planted over 7,000 coconut trees along Banjul beach, to act as a natural flood barrier.<sup>dlxxi</sup>



## Air pollution

93 of percent of children are exposed to ambient air pollution (PM2.5  $\geq$  25  $\mu\text{g}/\text{m}^3$ ) in The Gambia. The agricultural industry, vehicle emissions, and waste burning all contribute to poor air quality in Gambia. There are also seasonal fluctuations in air pollution levels, with significant levels of pollution occurring during the dry season (May to September).



### Soil and water pollution

Soil and water pollution are a major hazard in The Gambia, where 42 percent of children and adolescents under the age of 20 years are exposed to lead pollution and 35 percent of children are living in areas with high pesticide pollution risk. Water pollution in coastal areas is also seriously threatening marine biodiversity, including contributing to the depletion of mangrove forests, a natural barrier against flooding.<sup>dlxxii</sup>



### Vector-borne diseases

1.1 million children are estimated to live in areas exposed to one or more disease vectors in The Gambia. The entire child population in are at risk of PV malaria and PF malaria. In addition, 98 percent of children are exposed to both dengue and aedes. Disease risk is exacerbated during periods of flooding, which creates favourable sites for mosquito breeding grounds. Such high exposure to these vectors, makes strengthening healthcare services and implementing vector control measures critical.

## Underlying vulnerabilities



### Health and nutrition

There has been a steady decline child mortality in The Gambia from 58 per 1,000 live births in 2016 to 48 per 1,000 live births in 2021.<sup>dlxxiii</sup> Nonetheless, Gambian children continue to suffer from preventable health complications and diseases. The most common causes of child mortality and morbidity in the Gambia include malaria, diarrhoeal disease, malnutrition and respiratory infections. Moreover, the country has one of the highest maternal mortality rates in the world, at 597 deaths per 100,000 live births in 2017. Families with poor health status are more vulnerable to the impacts of climate change. Moreover, outbreaks of water-borne diseases have been linked to flooding in some parts of the country and drought conditions in others.



### WASH

In recent years, progression in access to safe drinking water has been made and only 0.1 percent of households are practising open defecation. Nonetheless, 74 percent of Gambian households have limited hygiene services and 40 percent have unimproved sanitation services.<sup>dlxxiv</sup> Moreover, in spite of 84 percent of primary schools gaining access to basic handwashing facilities that meet national standards, significant disparities exist between the urban and rural schools. Water quality is also a major concern, with around 73 percent of families at risk of E. coli faecal contamination.<sup>dlxxv</sup>



### Poverty and social protection

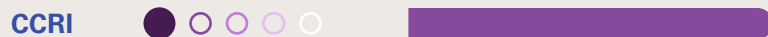
Vulnerability to climate change is exacerbated by the country's high levels of poverty, where there is a high reliance on the agrarian sector, which is highly sensitive to climate change. 48.6 percent of the population live below the national poverty line and public expenditure as a proportion of GDP lags behind international commitments (health 8 percent against 15 percent, child protection under 1 percent against 3 percent and education 14 percent against 20 percent).<sup>dlxxvi</sup> A lack of available data made measuring indicators related The Gambia's social protection and economic empowerment difficult in the CCRI analysis.



### Education

Low school attendance remains a key problem in the Gambia. Whilst attendance rates for primary school aged children is moderate, at 78 percent, lower and upper secondary attendance rates are far lower, at 44 and 31 percent respectively.<sup>dlxxvii</sup> Completion rates for children are also low, with only 62 percent of children finishing primary education.<sup>dlxxviii</sup> Children who experience consistent learning and complete their education are more likely to be adaptive and empowered in their climate change response. Improving equity in access to learning is also important in The Gambia. At present, many girls leave school earlier than boys due to social norms, such as child marriage.

# Guinea



8.4 | Extremely High

**Climate and environment shocks**

7.7 | Pillar 1



**Child vulnerability**

8.9 | Pillar 2



Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Guinea; 5 out of the 23 indicators included in pillar 2 have no data.

Guinea has a CCRI score of **8.4**, ranking **4<sup>th</sup>** out of the 163 CCRI countries and regions. Children in Guinea are considered at **“Extremely High”** risk.

According to the CCRI, the climate and environmental shocks that children in Guinea are highly exposed to include:



**Coastal flooding**

Coastal flooding is a major hazard in Guinea, where almost one third (32 percent) of the child population live in areas with coastal flood risk. Sea level rise is occurring along Guinea’s coastline, causing increased salinization, and flooding, affecting agriculture, drinking water quality, loss of infrastructure, and devastation of mangrove ecosystems. Coastal floods have particularly devastating impacts on food security in Guinea, through damage to fisheries, loss of freshwater supplies and the salination of rice fields.<sup>dlxxix</sup> Coastal flooding also furthers the spread of water-borne and vector-borne diseases, through providing larger vector habitats and by dispersing pathogens from wastewater and sewage, especially in urban areas.<sup>dlxxx</sup> To protect children from these impacts, the development of coastal protection measures, are critical in Guinea’s coastal zones.



**Air pollution**

In Guinea, 98 of percent of children are exposed to ambient air pollution level (PM2.5  $\geq$  25  $\mu\text{g}/\text{m}^3$ ), exceeding the WHO recommended maximum ambient air pollution limit. Such high levels of air pollution pose significant health risks to children in Guinea including respiratory illnesses, chronic diseases, and premature mortality. Deforestation, the agricultural industry, transport, aluminium refining, and mining are the greatest contributors to poor air quality in Guinea.



### Vector-borne diseases

7 million children are estimated to live in areas exposed to one or more disease vectors in Guinea. All children are at risk of PV malaria and PF malaria, 99 percent of children are exposed to dengue, 92 percent are at risk of aedes, and 75 percent are exposed to zika. Disease risk is exacerbated during periods of coastal flooding, which creates an additional burden of vector-borne diseases. A cost effective method to reduce children's exposure to vector-borne diseases is through the provision of ITNs, which were only used by 38 percent of children under the age of 5 in Guinea, in 2021.<sup>dlxxxii</sup>



### Soil and water pollution

Soil and water pollution are widespread environmental hazards threatening children in Guinea. 64 percent of young people under the age of 20, are exposed to lead pollution in the country. The main sources of pollution include the accumulation of solid and liquid waste decanted into rivers and the sea, faecal pollution which is rife in urban areas, and the spillage of toxic substances associated with oil and mining activities. Pollutants have disproportionate impacts on child health, as children breathe faster than adults and take in more air per unit of body weight.<sup>dlxxxiii</sup>

## Underlying vulnerabilities



### WASH

Inadequate WASH increases children's vulnerability to climate change impacts in Guinea. 36 per cent of households lack access to basic water services, while 70 per cent lack access to basic sanitation.<sup>dlxxxiii</sup> Access to safe drinking water is also a key challenge, with Guinea's rural villages disproportionately underserved, with too few sources of potable water in places that are far apart.

The 2014 and 2021 Ebola outbreaks highlight the importance of strengthening WASH services and health-related preventive measures at all levels in Guinea. Moreover, flash flooding in the Kankan Region has worsened the WASH situation, by destroying more than 300 water points and over 400 latrines, impacting nearly 30,000 people.<sup>dlxxxiv</sup>



### Health and nutrition

Child mortality rates are high in Guinea, at 98.7 per 1,000 live births. Several epidemics have impacted Guinea in recent years, including haemorrhagic fevers (Ebola, Lassa, and Marburg), measles, polio, and malaria. Notably, the resurgence of the Ebola virus disease in 2021 put significant strain on Guinea's healthcare system. In 2023, more than 2.7 million children under 5 years of age will require polio vaccinations, while 735,610 will need measles vaccinations, following the underutilization of health services during COVID-19 and the 2021 Ebola outbreak.<sup>dlxxxv</sup> Moreover, Guinea has a global acute malnutrition incidence of 9 percent, and a national severe wasting rate of around 4 percent, signifying an emergency nutrition situation.<sup>dlxxxvi</sup>



### Poverty and social protection

Poverty is widespread in Guinea, where approximately 57 percent of children lived in households with income below the poverty line in 2020.<sup>dlxxxvii</sup> Vulnerability to climate change occurs against a fragile political situation, weak essential social services delivery and a high risk of spill over of the central Sahel conflict, amplified by the porous border with Mali. Around 57 percent of the population (aged 15+) are unable to come up with emergency funds and an estimated 1.7 million people are in need social protection services in 2023.<sup>dlxxxviii</sup> When floods and other disasters strike, rural areas are often the hardest hit, due to a high reliance on agriculture and lack of access to national safety net programmes.



### Education

In Guinea, approximately, half of youth (56.9 percent) aged 15 to 24 are literate, which reduces opportunities for youth to escape poverty and enter the green economy. School attendance rates are low in the country (66 percent for primary years, 32 percent for lower secondary and 13 percent for upper secondary) and just 45 per cent of children complete primary school.<sup>dlxxxix</sup> Further, an estimated 4 million children are at risk of dropping out of school in the event of another epidemic resurgence.<sup>dlxc</sup>





### Air pollution

Guinea-Bissau's air pollution poses a significant threat to child health. 97 percent of children are exposed to ambient air pollution (PM2.5  $\geq$  25 g/m<sup>3</sup>), which is much higher than the WHO's recommended limit (PM2.5  $\geq$  5 g/m<sup>3</sup>). Poor air quality in Guinea-Bissau is driven by agricultural processing, vehicle emissions and waste burning. Associated health risks for children include respiratory infections, chronic illnesses, and early mortality.



### Vector-borne diseases

Around 990,000 children are estimated to live in areas exposed to one or more disease vectors in Guinea Bissau. 99 percent of children are at risk of PF Malaria., 94 percent of children are exposed to dengue, 96 percent are at risk of aedes, and 75 percent are exposed to zika. Whilst risks of exposure are high, the widespread use of ITNs by 97 per cent of households in Guinea-Bissau helps reduce infection rates.<sup>dxci</sup> Moreover, during periods of flooding, transmission rates increase because stagnant flood water creates favourable mosquito breeding grounds.



### Soil and water pollution

The leading drivers of soil and water pollution in Guinea-Bissau, include the use of chemical fertilisers, pesticides in agriculture, as well as the release of hazardous industrial waste into the environment.<sup>dxci</sup> According to the CCRI, over half of the country's population under the age of 20 are exposed to lead pollution (54 percent), which can have devastating impacts on physical and neurological development.

## Underlying vulnerabilities



### WASH

In Guinea-Bissau less than a quarter of households have access to a safely managed drinking water service (24 percent), just 12 percent are using safely managed sanitation services and 69 percent have no handwashing facilities.<sup>dxci</sup> Moreover, faecal coliform contamination frequently makes protected open wells, unsuitable for human consumption. Despite these challenges, significant advancements have been made in the eradication of open defecation. During 2016-2018, a total of 611 communities were certified Open Defecation Free, putting the country on course to fulfil the 2030 sanitation goals.<sup>dxci</sup> The integration of WASH service delivery in education and health facilities has supported this progress, creating synergies between community WASH systems strengthening and social and behaviour change efforts.



### Health and nutrition

Both child and maternal mortality rates are high in Guinea-Bissau (74.3 per 1,000 live births and 667 per 100,000 live births respectively). Some of the most prevalent illnesses affecting children, include malnutrition, malaria, TB, and cholera.<sup>dxci</sup> Chronic food insecurity sweeps the nation, which is exacerbated by irregular rainfall and fluctuating food prices, for both local cashew production and rice importation.<sup>dxci</sup> Poor nutrition has been linked to stunting in 28 percent of children under the age of 5 and low birth weight in 21 percent of babies.



### Poverty and social protection

Since its independence in 1974, Guinea-Bissau has been plagued by political instability, resulting in a lack of growth and high levels of poverty. In 2021, an estimated 52 per cent of children were experiencing at least three deprivations simultaneously.<sup>dxci</sup> Major drivers of poverty include, dependence on cashew nuts as the main export commodity, reduced tax revenues, a GNI per capita of USD 760 in 2020, high public debt (79 per cent of GDP), limited fiscal space, and limited public sector investments.<sup>dxci</sup> High unemployment rates, rising prices of basic commodities, limited social safety nets and weakened informal solidarity mechanisms have led to increased hardship for families, including children. Moreover, approximately 85 percent of the population are dependent on agriculture, which is a highly climate sensitive sector.<sup>dc</sup>



### Education

Guinea-Bissau has some of the lowest school attendance rates for adolescents and youth globally. In 2019, only 10 percent of pupils of lower secondary age attended school and 7 percent of upper secondary students.<sup>dc</sup> Whilst primary school attendance rates are much higher (69 percent), only 27 percent of children complete primary education.<sup>dc</sup> The risks of children dropping out of education indefinitely has heightened over the past few years, largely because of COVID-19, which saw increases in early marriage and pregnancies, particularly in rural areas.

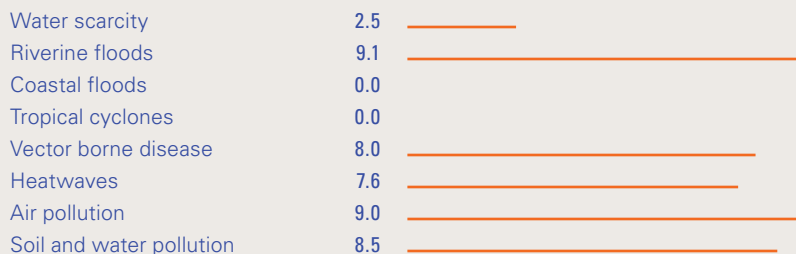
# Liberia



7.5 | Extremely High

**Climate and environment shocks**

6.8 | Pillar 1



**Child vulnerability**

8.1 | Pillar 2



Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Liberia; 3 out of the 23 indicators included in pillar 2 have no data.

Children in Liberia are considered at “Extremely High” risk. The country has a CCRI score of 7.5 and ranks 22<sup>nd</sup> out of the 163 CCRI countries and regions.

According to the CCRI, the climate and environmental shocks that children in Liberia are highly exposed to include:



**Riverine flooding**

Riverine flood risk is widespread in Liberia, where one quarter of children are exposed, owed to the vast number of rivers, aquifers and catchments and periods of high rainfall. Many of the country’s urban centres have been built on critical flood zones including the capital city of Monrovia. Beyond the immediate risks of death and injury, flooding in Liberia’s urban centres, causes overflow of sewerage, damage to urban infrastructure and leaching from hazardous waste landfills. In rural areas, agricultural losses from floods impacts local food security and child nutrition, pushing the poorest families into further poverty.



**Coastal flooding**

Whilst data limitations prevented the identification of coastal flooding as a significant risk factor in the CCRI, coastal flood risk is high in the country. Monrovia is particularly vulnerable to flooding, as a result of sea-level rise and an increase in the frequency of high-intensity storms. These climate change-related impacts contribute to coastal erosion, waterlogging and coastline retreat, endangering coastal communities. Compounding these challenges further, sea-level rise and urban encroachment into the Mesurado Wetland in Monrovia’s centre endangers the region’s ecological services and fisheries.<sup>d.ciii</sup>





### Air pollution

Air pollution levels are a threat to child health and wellbeing in Liberia, where 90 percent of children are exposed to ambient air pollution level (PM<sub>2.5</sub> >= 25 µg/m<sup>3</sup>), which substantially exceeds the WHO recommended maximum ambient air pollution limit (PM<sub>2.5</sub> >= 5 µg/m<sup>3</sup>). Large contributors to poor air quality include the mining and timber industry, palm oil processing, waste burning, transport emissions and inefficient fuel burning.



### Soil and water pollution

In Liberia, iron ore pollution from mining, pesticide runoff from agriculture, and industrial operations are the main contributors to poor soil and water quality.<sup>dciv</sup> Approximately 60 percent of children and adolescents under the age of 20 are exposed to lead pollution, which can have a negative influence on a child's physical and neurological development, including mortality in some cases. In times of flooding, water pollution risks increase, as latrines and wells overflow, causing water contamination. Moreover, standing water creates favourable conditions for water and vector-borne diseases.



### Vector-borne diseases

According to the CCRI, 2.4 million children are estimated to live in areas exposed to one or more disease vectors in Liberia. 96 percent of children are exposed to dengue, 85 percent are exposed to zika, and 65 percent are at risk of Aedes. Malaria is endemic to Liberia and is a leading cause of mortality, with pregnant women and children under the age of 5 years old among the most affected groups. In 2020, there were an estimated 1.8 million cases and over 4,500 deaths attributed to malaria in the country.<sup>dcv</sup> Such a high exposure to these vectors, and increased risks of compounding factors such as floods, makes strengthening the resilience of Liberia's healthcare sector critical to protect children from morbidity and mortality related to vector-borne diseases.



### Heatwaves

An estimated 62 percent of children in Liberia are exposed to heatwaves. A rise in the frequency of hot days, high temperatures, and hot evenings, especially in the northern interior regions is expected with climate change. Under a high-emission scenario, 'hot' days are expected to occur 24 to 65 percent of the time by mid-century, and 29 to 90 percent of the time by the end of the century.<sup>dcvi</sup> The fastest rise will occur in July, August, and September, although the 'hot season' will begin earlier and remain longer.<sup>dcvii</sup> The impact of extreme heat is expected to impact vital sectors of Liberia's economy, including forestry, agriculture, and livestock.

## Underlying vulnerabilities



### WASH

Despite substantial progress in the provision of safe drinking water, advancements in sanitation and hygiene are falling short. For example, whilst 75 percent of households are using drinking water from at least basic sources, only 18 percent of households have at least basic sanitation services.<sup>dcviii</sup> Over one third (38 percent) of the population still practice open defecation, which can have severe consequences for community health and safety.<sup>dcix</sup> Moreover, there is a 34 percent difference in basic hygiene coverage between urban and rural schools.<sup>dcx</sup> Climate change is projected to increase flood risk in Liberia, which is expected to increase outbreaks of water-borne and vector-borne diseases, such as malaria, cholera, and diarrheal infections.<sup>dcxi</sup>



### Health and nutrition

Liberia's child mortality rate is high, at 76 per 1,000 live births. The main causes of death include neonatal causes, malaria, pneumonia, diarrhoea, and measles, many of which are easily preventable diseases. Achieving progress in the eradication of these preventable diseases has been severely hampered by high levels of malnutrition, the 2014 Ebola outbreak from neighbouring Guinea, and COVID-19. In addition, access to medical services remains a key challenge in the country, where nearly one-third of children and adults live more than 5 km from a health centre.<sup>dcxii</sup>



### Poverty and social protection

Approximately, 52.7 percent of children live in households with income below the national poverty line in Liberia.<sup>dcxiii</sup> Around 68 percent of the country's poor live in rural areas where the poverty rate stands at 71.6 percent, more than twice as high as in urban areas (31.5 percent).<sup>dcxiv</sup> Moreover, in 2021, 2.3 million Liberians were unable to achieve their basic needs.<sup>dcxv</sup> Poverty in Liberia is expected to rise in the short-term, owing to rising food prices, reduced mineral commodity prices, and the impacts of climate change.<sup>dcxvi</sup> Government authorities must increase their capacity to manage climate and disaster related risks in Liberia, to prevent children falling into deeper poverty, as a result of climate change.



## Education

Access to high quality, consistent education has been a constant struggle for children in Liberia. The education system has been severely impacted by the long-term repercussions of the 14-year civil war, where just a few schools remained open during the conflict and 60 percent of school buildings were damaged or destroyed.<sup>dcxvii</sup> Additionally, children have experienced major disruptions to learning following the 2014 Ebola outbreak and COVID-19. Attendance rates are low in the country, at 43 percent for primary aged children and 14 and 12 percent for lower and upper secondary age. To prevent further disruptions to education, contingency plans including the implementation of hybrid learning approaches and remote learning modalities should be put in place in Liberia.

# Mali



CCRI



7.3 | Extremely High

## Climate and environment shocks



7.0 | Pillar 1

Water scarcity	6.9	
Riverine floods	8.5	
Coastal floods	0.0	
Tropical cyclones	0.0	
Vector borne disease	8.7	
Heatwaves	4.5	
Air pollution	10.0	
Soil and water pollution	7.8	

## Child vulnerability



7.5 | Pillar 2

Child health and nutrition	8.6	
Education	7.9	
Water, sanitation, and hygiene	5.3	
Poverty, communication assets and social protection	8.1	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Mali; 3 out of the 23 indicators included in pillar 2 have no data.

Mali has a CCRI score of 7.3 and ranks 29<sup>th</sup> out of the 163 CCRI countries and regions, which classifies children in Mali at “Extremely High” risk.

According to the CCRI, the climate and environmental shocks that children in Mali are highly exposed to include:



### Air pollution

Air pollution is a significant hazard to children in Mali, where the entire child population is exposed to ambient air pollution (PM<sub>2.5</sub>  $\geq$  25  $\mu\text{g}/\text{m}^3$ ). Dust storms and transport emissions are two of the greatest contributors to Mali’s poor air quality. Pollution levels vary seasonally, with the peak levels occurring during “Harmattan”, which spans from November to March and impacts all the Sahelian countries.



### Vector-borne diseases

Approximately 11 million children are living in areas exposed to one or more disease vectors in Mali. According to the CCRI, 99 percent of children are at risk of aedes, 84 percent are exposed to dengue and all children are at risk of PV malaria vectors. According to a household survey, only 79 percent of children under the age of 5 slept under a ITN in 2018.<sup>dcxviii</sup> ITNs are one of the most simple and cost-effective measures to reduce children’s risks of infection to vector-borne diseases.



### Riverine floods

Over 3 million people have been affected by major flooding disasters in Mali over the past 30 years, resulting in significant loss of life, damage to infrastructure and economic losses.<sup>dcxix</sup> An estimated 2 million children are exposed to riverine floods (using a 50-year return period). Flood risk is particularly high in the Niger river delta, which can be flooded for up to 5 months of the year.<sup>dcxx</sup> Agricultural expansion and inadequate land management practices, have significantly increased the likelihood of flooding, erosion, and sedimentation in Mali.<sup>dcxxi</sup> Flood protection measures are essential to mitigate against the impacts of flooding in Mali. Government authorities should also provide community education on how to best prepare and build resilience to future flood events.



### Soil and water pollution

High levels of sodium, chloride, sulphate, and nitrates have been detected in urban areas in Mali, caused by poor sanitation, residential waste, and industrial activity.<sup>dcxxii</sup> In addition, 85 percent of children and adolescents under the age of 20 are exposed to unsafe levels of lead in the country. Even at low levels, lead pollution can have devastating impacts on a child's health, in some cases causing death. Increased flood occurrences in Mali as a result of climate change are predicted to increase water pollution threats.



### Water scarcity

27 percent of children are exposed to water scarcity in Mali. Droughts caused by unpredictable rainfall are conducive of Mali's local climate, and various traditional strategies are used by communities to adapt to drought conditions throughout the country. Poor water management, overuse and contamination of fresh water supplies in Mali's neighbouring countries can also impact levels of water scarcity, given that the region is highly dependent on transboundary water resources, where 50 percent of Mali's water supply comes from outside the country's boundaries.<sup>dcxxiii</sup>

## Underlying vulnerabilities



### WASH

Children in Mali have been identified as especially vulnerable to inadequate WASH. While approximately 83 percent of households have access to basic drinking water services<sup>dcxxiv</sup>, improvements to sanitation and hygiene services have been slow-moving. 53 percent of households continue to have a limited hygiene service and 32 per cent have unimproved sanitation.<sup>dcxxv</sup> Outside of households, only half of Mali's schools have improved water sources, and fewer than 20 percent have separate functioning, bathrooms for boys and girls.<sup>dcxxvi</sup>



### Health and nutrition

In Mali, one out of every ten children die before the age of five, and one out of every 30 infant dies during the first month of life, often from preventable diseases.<sup>dcxxvii</sup> Only 45 percent of Mali's children have received all their essential vaccines, and 14 percent have received none.<sup>dcxxviii</sup> HIV is a significant health challenge in Mali, where more than half of HIV-positive infants do not survive their first two years of life.<sup>dcxxix</sup> Maternal outcomes are also poor in the region. Per 100,000 live births 562 mothers die in Mali, owing to several factors, including a lack of adequate antenatal, obstetric, and postnatal health services. Malnutrition is also common in Mali, where 22 percent of children under the age of 5 are stunted for their age.<sup>dcxxx</sup>



### Poverty and social protection

Mali is characterised by a low-income economy that remains undiversified and highly reliant on agriculture, making the country highly vulnerable to climate shocks and fluctuations in commodity prices. The national poverty rate stands at 41.9 percent and 90 per cent of the country's poverty is concentrated in the south's highly populated rural areas, including Sikasso, Mopti, and Segou.<sup>dcxxxi dcxxxii</sup> Mali's development has been greatly affected by instability and conflict since the military coup of 2012.<sup>dcxxxiii</sup>



### Education

Mali's education has significantly improved over the past decade. Nonetheless, an estimated 2 million children aged 5 to 17 remain out of school<sup>dcxxxiv</sup>, and over half of the country's young people aged 15 to 24 remain illiterate. High out-of-school rates in Mali are largely a result of household poverty, child labour, child marriage, fragility, and a shortage of schools close to children's homes. Females and children from the poorest families have the greatest danger of not enrolling or dropping out of school. For example, just 74 percent of girls are engaged in primary basic education, compared to 86 percent of boys.<sup>dcxxxv</sup> In addition, the lack of trained teachers, text materials, and a low-quality schooling contribute to poor learning outcomes for many children in Mali.

# Mauritania



CCRI

6.7 | High

**Climate and environment shocks**

6.1 | Pillar 1

Water scarcity	6.3	<span style="display: inline-block; width: 100%; height: 10px; background-color: orange; border-radius: 5px;"></span>
Riverine floods	7.5	<span style="display: inline-block; width: 100%; height: 10px; background-color: orange; border-radius: 5px;"></span>
Coastal floods	2.2	<span style="display: inline-block; width: 100%; height: 10px; background-color: orange; border-radius: 5px;"></span>
Tropical cyclones	0.0	<span style="display: inline-block; width: 100%; height: 10px; background-color: orange; border-radius: 5px;"></span>
Vector borne disease	7.2	<span style="display: inline-block; width: 100%; height: 10px; background-color: orange; border-radius: 5px;"></span>
Heatwaves	6.5	<span style="display: inline-block; width: 100%; height: 10px; background-color: orange; border-radius: 5px;"></span>
Air pollution	9.3	<span style="display: inline-block; width: 100%; height: 10px; background-color: orange; border-radius: 5px;"></span>
Soil and water pollution	4.2	<span style="display: inline-block; width: 100%; height: 10px; background-color: orange; border-radius: 5px;"></span>

**Child vulnerability**

7.2 | Pillar 2

Child health and nutrition	7.8	<span style="display: inline-block; width: 100%; height: 10px; background-color: blue; border-radius: 5px;"></span>
Education	8.6	<span style="display: inline-block; width: 100%; height: 10px; background-color: blue; border-radius: 5px;"></span>
Water, sanitation, and hygiene	6.7	<span style="display: inline-block; width: 100%; height: 10px; background-color: blue; border-radius: 5px;"></span>
Poverty, communication assets and social protection	5.6	<span style="display: inline-block; width: 100%; height: 10px; background-color: blue; border-radius: 5px;"></span>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Mauritania; 3 out of the 23 indicators included in pillar 2 have no data.

Mauritania has a CCRI score of **6.7** and ranks **40<sup>th</sup>** out of the 163 CCRI countries and regions, placing children in Mauritania at **“High”** risk.

According to the CCRI, the climate and environmental shocks that children in Mauritania are highly exposed to include:



## Air pollution

Air pollution is a significant hazard experienced by children in Mauritania. In this country, 97 percent of children are exposed to ambient air pollution (PM<sub>2.5</sub> >= 25 µg/m<sup>3</sup>), which is exceeding the WHO recommended maximum ambient air pollution limit (PM<sub>2.5</sub> >= 5 µg/m<sup>3</sup>). Food processing, oil production, mining, and vehicle emissions all contribute to poor air quality in Mauritania.



## Vector-borne diseases

An estimated 1.9 million children are living in areas exposed to one or more disease vectors in Mauritania, where 92 percent of children are at risk of aedes, 48 percent are exposed to dengue and 93 percent are at risk of PV malaria. Despite high levels of exposure, only 50 percent of households had access to at least one ITN in 2015.<sup>dcxxxvi</sup> In 2018, the WHO reported 174,000 cases of malaria in Mauritania.<sup>dcxxxvii</sup> Climate change is anticipated to affect malaria transmission periods, as well as the geographic range of vector-borne diseases. The general malaria risk in Mauritania is expected to decrease as temperatures rise.<sup>dcxxxviii</sup> However, some areas are predicted to become more vulnerable to malaria, for example, especially as flooding becomes more common.<sup>dcxxxix</sup>



### Riverine floods

Approximately, 360,000 children are exposed to riverine flooding in Mauritania. Flood risk in the south and east regions and along the Senegal River valley are particularly high. For example, in 2020, 10,000 people in Bassiknou, Adel Begrou, Amourj, and Néma were affected by flooding induced by heavy rainfall.<sup>dcxli</sup> Flash flooding is also common, which children are especially vulnerable to because of their quick onset and destructive nature; leaving children with little warning to prepare and respond.



### Heatwaves

39 percent of children are exposed to heatwaves in the country. Heatwaves and extreme temperatures are most prevalent in the North, which has an arid climate that extends into the Sahara Desert. Climate models show that the air temperature over Mauritania is projected to rise between 2.0 and 4.5°C by 2080 and the annual number of very hot days (daily maximum above 35°C) is projected to rise substantially.<sup>dcxlii</sup> The percentage of children exposed to high heatwave frequency<sup>39</sup> is expected to rise dramatically from zero percent of exposure in 2020, to 100 percent children under both high and low emission scenarios by 2050.<sup>dcxliii</sup> Moreover, the proportion of children exposed to high heatwave duration<sup>40</sup> is anticipated to rise from 5 percent in 2020, to 97 percent of children in by 2050, under a high emission scenario.<sup>dcxliiii</sup>

## Underlying vulnerabilities



### WASH

Inadequate WASH is a key vulnerability in Mauritania. In 2020, 72 percent of households had access to basic drinking water services and almost half of households (49.8) had at least basic sanitation.<sup>dcxliv</sup> Open defecation remains prevalent especially in rural communities, where it is practised by 58 percent of households.<sup>dcxlv</sup> Water availability per capita is expected to fall by 2080, owing primarily to population expansion and modelling predicts indicate that water conservation measures will be essential across Mauritania after 2030.<sup>dcxlvi</sup>



### Health and nutrition

Climate change adds a significant burden to the health sector in Mauritania. Morbidity and mortality from vector-borne illnesses (such as malaria), water-borne diseases associated with extreme weather events including floods (such as diarrhoea and cholera), and respiratory disorders, are among the top health issues in Mauritania.<sup>dcxlvii</sup> In 2019, one quarter of the population in Mauritania experienced severe food insecurity<sup>dcxlviii</sup> and in 2021, 17.4 percent of children under the age of 5 were stunted.<sup>dcxlix</sup> Furthermore, the accelerated influx of refugees has put significant strain on social services, including health and nutrition systems. Approximately, 80,600 refugees were registered in 2022, including nearly 9,200 new arrivals and 5,570 Mauritians returning from Mali.<sup>dc</sup> Many had lost assets, properties, and livestock as they escaped violence. Returning pastoralist herds are estimated at 800,000 herd of livestock, putting further pressure on already scarce resources, and sparking fears of tensions with the host population over water resources.<sup>dccli</sup>



### Poverty and social protection

Despite the country's vast natural resources, in 2014, 31 percent of the population lived below the national poverty line<sup>dccli</sup> and an estimated 16.6 percent of the population lives below the extreme poverty line.<sup>dccli</sup> The deterioration of resources, recurring climate shocks, incoherent policies, weak governance, and limited adaptive capacity in the agricultural sector are some of the main factors contributing to poverty, especially in rural areas. Access to social protection is higher than other LDCs, for example almost 62 per cent of the population (aged 15 years and older) can produce emergency funds in times of crisis and annual social safety net spending accounts for 3.43 percent of GDP. Nonetheless, children in the poorest families experience low self-sufficiency and exclusion from social protection mechanisms, thus reducing their resilience to climate and environmental shocks.



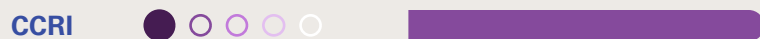
### Education

Attendance rates for primary and lower secondary aged children remain low in Mauritania, at 59 and 29 respectively.<sup>dccliv</sup> There is little access to higher education, technical education, and professional training. The refugee crisis has added further pressure on the educational system. For example, in 2020, only 6,800 children out of 29,000 in the M'Berra refugee camp were accessing formal education.<sup>dcclv</sup> As climate change causes more frequent disruptions, this greatly increases chances that education for many children in Mauritania could be stopped for good.

39 High heatwave frequency is defined as any area where there are on average 4.5 or more heatwaves per year.

40 High heatwave duration is defined as any area where the average heatwave event lasted 4.7 days or longer.

# Niger



8.2 | Extremely High

**Climate and environment shocks**

7.3 | Pillar 1

Water scarcity	9.6	
Riverine floods	7.2	
Coastal floods	0.0	
Tropical cyclones	0.0	
Vector borne disease	8.3	
Heatwaves	3.6	
Air pollution	10.0	
Soil and water pollution	8.3	

**Child vulnerability**

8.9 | Pillar 2

Child health and nutrition	9.1	
Education	8.0	
Water, sanitation, and hygiene	10.0	
Poverty, communication assets and social protection	8.4	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Niger; 2 out of the 23 indicators included in pillar 2 have no data.

Niger has a CCRI score of **8.2** and ranks **7<sup>th</sup>** out of the 163 CCRI countries and regions, indicating that children in this country are considered at **“Extremely High”** risk.

According to the CCRI, the climate and environmental shocks that children in Niger are highly exposed to include:



### Air pollution

Air pollution levels are considered unsafe in Niger, where the entire population of children are exposed to ambient air pollution (PM2.5  $\geq 25 \mu\text{g}/\text{m}^3$ ), which substantially exceeds the WHO recommended maximum ambient air pollution limit (PM2.5  $\geq 5 \mu\text{g}/\text{m}^3$ ). Mining, petroleum, cement and brick industries, Sahara Desert dust, and transport emissions are the largest contributors to Niger’s poor air quality.



### Water scarcity

Niger is located in the Sahel region, which is prone to high levels of water scarcity. Surface water in the Sahel is scarce, meaning that groundwater is the major source of water for many communities. Water supply in the Sahel region is also unevenly distributed, difficult to reach owing to underdeveloped infrastructure, and crosses national boundaries, posing significant water management issues. For example, 90 percent of water in Niger comes from water sources beyond the country’s borders<sup>dclvi</sup>, which in times of high scarcity often results in resource conflict or forced migration. Approximately 81 percent of children in Niger are exposed to water scarcity, a figure which is expected to rise as rainfall declines, temperature rises, and more frequent droughts associated with climate change, reduce surface and groundwater supplies and accessibility.<sup>dclvii</sup>



### Soil and water pollution

Waterways and soils in Niger are highly contaminated. Oil extraction and artisanal mining are the leading drivers of pollution in the country, which frequently pollute soils and waterways with heavy metals and trace elements. A staggering 88 percent of children in Niger are exposed to lead pollution, which even at low levels, can have devastating impacts on child physical and neurological development.



### Vector-borne diseases

13 million children in Niger are living in areas exposed to one or more disease vectors. 97 percent of children are at risk of aedes, and 67 percent are exposed to dengue, both of which cause debilitating illness in children. Malaria is endemic throughout the country, although malaria cases have decreased significantly in recent years, owing mostly to the usage of ITNs, which 95 percent of children under the age of 5 slept under in 2015.<sup>dclviii</sup>



### Riverine flooding

Flood risk is greatest along the flood plains of the Niger River which runs across south-west Niger and is the country's sole permanent river. From January to August 2021, flooding affected over 158,000 people across all eight of Niger's regions causing 60 fatalities and increased cholera outbreaks in several of these regions.<sup>dclix</sup> Flooding in Niger has also a significant impact on levels of food insecurity. In the 2021 rainy season, torrential rains destroyed 6,000 hectares of cultivable land and caused the death of over 10,000 cattle, forcing many children and families to be displaced.<sup>dclx</sup> In September 2022, the country registered 28,885 households affected by floods, along with 179 deaths.<sup>dclxi</sup>

## Underlying vulnerabilities



### WASH

Access to safe drinking water and sanitation remains low in Niger, with significant disparities between rural and urban areas. For example, 86 percent of households in urban areas have access to basic drinking water services, compared to 39 percent of rural households.<sup>dclxii</sup> Moreover, 68 percent of the population practices open defecation, which has major ramifications for community health and safety.<sup>dclxiii</sup> Outside of households, 63 percent of schools have no sanitation services<sup>dclxiv</sup> and 74 percent of healthcare centres have limited sanitation.<sup>dclxv</sup> Children without access to adequate WASH provisions have a reduced capacity to respond to, and treat, climate-related diseases.



### Health and nutrition

Child mortality has reduced significantly in recent decades, from 326 per 1,000 children under the age of 5 in 1990 to 80 in 2021. Nonetheless, the majority of child fatalities remain preventable. Water-borne diseases are among the top causes of mortality among children under the age of five in the country. Meningitis, cholera, and other epidemics are widespread and recent conflict and flooding have both interfered with essential services. Maternal mortality rates remain high, where approximately one in every 188 women die during pregnancy, childbirth, or after delivery.<sup>dclxvi</sup> Malnutrition is widespread across Niger, where approximately 1.6 million children are estimated to require nutrition assistance in 2023.<sup>dclxvii</sup> Poor nutrition is a leading cause of stunting which affects 44 per cent of children under the age of 5 in the country.<sup>dclxviii</sup> Pockets of high-risk food insecurity and wasting are expected to remain throughout 2023, particularly in areas facing insecurity, drought and flooding.



### Poverty and social protection

High levels of poverty in Niger make children even more vulnerable to climate change. The national poverty rate stands at 42 percent and Niger's economy is highly undiversified, with agriculture accounting for 40 percent of GDP.<sup>dclxix</sup> In times of crisis, the poorest communities are often forced to sell their livelihood assets such as land, livestock, and farming tools in order to access basic services or resources. Poverty levels have also been greatly affected by high fragility and conflict. Niger is experiencing a security crisis in areas bordering Nigeria, Burkina Faso, and Mali, where armed groups have repeatedly attacked security personnel and civilians.<sup>dclxx</sup> In some areas of Niger climate change is responsible, in situations where conflict arises over the fight for water resources which are becoming scarcer. In addition, the large influx of refugees entering Niger, particularly from Nigeria and Mali are putting further strain on already limited resources.





## Education

The education sector continues to face significant challenges, related to conflict and insecurity. Insecurity-related closures of 890 schools were reported as of September 2022, affecting about 78,000 students.<sup>dclxxi</sup> 60 percent of children are out of school at the primary and lower secondary levels, making children and adolescents particularly vulnerable to the effects of conflict. Moreover, less than half of youth aged 15-24 are literate, impacting their opportunities to enter both the formal and green economies. Poor gender parity is also significant with parents being hesitant to enrol girls in school due to safety concerns, long distances to school, and social norms around child marriage.

# Senegal



CCRI 7.5 | Extremely High

**Climate and environment shocks** 7.9 | Pillar 1

Water scarcity	8.6	
Riverine floods	5.2	
Coastal floods	10.0	
Tropical cyclones	0.0	
Vector borne disease	8.3	
Heatwaves	7.7	
Air pollution	9.6	
Soil and water pollution	6.4	

**Child vulnerability** 7.1 | Pillar 2

Child health and nutrition	7.2	
Education	7.3	
Water, sanitation, and hygiene	6.8	
Poverty, communication assets and social protection	7.0	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Senegal; 3 out of the 23 indicators included in pillar 2 have no data.

Senegal has a CCRI score of 7.5 and ranks 22<sup>nd</sup> out of the 163 CCRI countries and regions, indicating that children in Senegal are considered at “Extremely High” risk.

According to the CCRI, the climate and environmental shocks that children in Senegal are highly exposed to include:



## Coastal flooding

Over 1 million children live in coastal flood risk areas in Senegal. Sea-level rise, storm surges, coastal erosion, and flooding all have significant impacts on coastal communities, particularly those reliant on fishing, agriculture, and tourism. The measured decline rate of Senegal’s shoreline from coastal erosion is estimated between 1-2 metres per year, with the most severely affected coastal regions being those between Joal and Djiffer and between Saint-Louis and the Mbao-Bargny.<sup>dclxxii</sup>



## Air pollution

93 percent of children are exposed to ambient air pollution levels (PM2.5  $\geq$  25  $\mu\text{g}/\text{m}^3$ ), which exceeds the recommended maximum ambient air pollution limits (PM2.5  $\geq$  5  $\mu\text{g}/\text{m}^3$ ). The main sources of poor air quality include agriculture, vehicle emissions, waste burning and the mining industry. Pollution levels vary seasonally, with the maximum levels occurring during the Harmattan season (November to March) and the capital city, Dakar has persistently high levels of air pollution.



### Vector-borne diseases

An estimated 8.4 million children are living in areas exposed to one or more disease vectors in Senegal. Malaria is both endemic and epidemic to the country. In addition, 96 percent of children are at risk of aedes which is linked to several diseases including yellow fever and the chikungunya virus. Disease risk increases during times of flooding, and a reduction in the use of ITNs by children under the age of 5 (from 65 percent in 2019 to 46 percent in 2021) is continuing the high burden of vector-borne diseases.<sup>dclxxiii</sup>



### Water scarcity

Water scarcity is high in Senegal, which 65 percent of children are exposed to. Climatic variability, including a late rainy season, an uneven geographical distribution of rainfall, and premature ends to the rainy season, are common causes of drought in the region. Drought is most common in the northern and central arid and semi-arid Sahelian regions.<sup>dclxxiv</sup> Water scarcity has a significant impact on food security and child nutrition in Senegal, as water stress and droughts can significantly reduce crop yields, especially when coupled with locust invasions.<sup>dclxxv</sup>



### Heatwaves

Almost half of the child population are exposed to heatwaves in Senegal (47 percent). The highest temperatures experienced in May and June.<sup>dclxxvi</sup> Research has found a significant increase in seasonal average temperatures in north and north-eastern Senegal, where thresholds exceeding the 90th percentiles (42°C maxima and 27°C minima). Heatwaves and extreme temperatures are a significant cause of heat-related morbidity, especially in women and children.

## Underlying vulnerabilities



### WASH

Access to adequate WASH remains poor in Senegal, with a nearly two-fold gap between urban and rural communities. For example, 43 percent of urban households have no handwashing facilities compared to 69 percent of rural households.<sup>dclxxvii</sup> Moreover, 72 percent of schools in Senegal have no access to hygiene services and 82 percent of hospitals have basic water services.<sup>dclxxviii dclxxix</sup> Inadequate WASH in schools and healthcare centres especially pose challenges for girls who often miss or drop out of school due to a lack of adequate MHM.



### Health and nutrition

Child and maternal health outcomes are poor in Senegal. Maternal and child mortality rates remain high (315 per 100,000 live births, and 38.6 per 1,000 live births respectively).<sup>dclxxx dclxxxi</sup> Senegal has been a leader in WCAR, reducing child stunting prevalence by 17.9 percent from 1992 to 2017.<sup>dclxxxii</sup> Nonetheless, 66 percent of children between the ages of 6 and 59 months are anaemic, and paediatric HIV and acute respiratory infections remain serious health challenges.<sup>dclxxxiii</sup> Cost, distance, a lack of information and care-seeking behaviours in crucial areas, including treating common children infections, maternal health, and child nutrition make it challenging for families to access and use services.



### Poverty and social protection

Senegal is a youthful country, where children account for 48 percent of the overall population, including one-third of all children under the age of five.<sup>dclxxxiv</sup> In Senegal, one in every second family with children is poor, with one-third facing both monetary and multidimensional deprivation in essential social services.<sup>dclxxxv</sup> These difficulties have been exacerbated by population increase, the COVID-19 pandemic and the increase in frequency and severity of hazards. Additionally, just 42 percent of the population (aged 15+) are unable to come up with emergency funds and only 1 percent of households receive child/family cash benefits. When floods and other hazards strike, rural areas are often the hardest hit, due to a high reliance on agriculture and lack of access to national safety net programmes.



### Education

Access to education remains a key challenge in Senegal. Only 31 percent of adolescents attend lower secondary school and 17 percent of youth attend upper secondary school.<sup>dclxxxvi</sup> Primary education attendance is much higher (61 percent), however, less than half of children enrolled in primary education complete their schooling.<sup>dclxxxvii</sup> A staggering 70 percent of youth aged 15-24 are illiterate, significantly reducing opportunities for youth to escape poverty and enter the green economy. Children with lower educational attainments are also more vulnerable to climate and environmental shocks and stresses.

# Sierra Leone



CCRI



7.4 | Extremely High

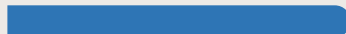
## Climate and environment shocks



6.9 | Pillar 1

Water scarcity	0.0	
Riverine floods	5.3	<div style="width: 53%;"></div>
Coastal floods	6.3	<div style="width: 63%;"></div>
Tropical cyclones	0.0	
Vector borne disease	8.2	<div style="width: 82%;"></div>
Heatwaves	8.9	<div style="width: 89%;"></div>
Air pollution	9.1	<div style="width: 91%;"></div>
Soil and water pollution	8.9	<div style="width: 89%;"></div>

## Child vulnerability



7.9 | Pillar 2

Child health and nutrition	8.4	<div style="width: 84%;"></div>
Education	5.1	<div style="width: 51%;"></div>
Water, sanitation, and hygiene	10.0	<div style="width: 100%;"></div>
Poverty, communication assets and social protection	8.1	<div style="width: 81%;"></div>

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Sierra Leone; 1 out of the 23 indicators included in pillar 2 have no data.

Sierra Leone has a CCRI score of **7.4** and ranks **26<sup>th</sup>** out of the 163 CCRI countries and regions, indicating that children in Sierra Leone are considered at “**Extremely High**” risk.

According to the CCRI, the climate and environmental shocks that children in Sierra Leone are highly exposed to include:



### Air pollution

91 percent of children are exposed to levels ambient air pollution of (PM2.5  $\geq$  25  $\mu\text{g}/\text{m}^3$ ). The main contributors to air pollution in the country include mining, manufacturing, transport emissions and the refining industry. Such high levels of air pollution significantly hamper children’s health and development in Sierra Leone.



### Soil and water pollution

Sierra Leone is rich in natural resources, including mineral reserves and agricultural land. Artisanal and small-scale gold mining is a major driver of soil and water pollution, especially in rural areas.<sup>dclxxxviii</sup> Mercury and cyanide are the two principal pollutants linked with gold mining, both of which pose dangerous risks to human health. Further, over half of children and adolescents under the age of 20 in Sierra Leone are exposed to lead pollution (57 percent) and 66 percent of children are living in areas with high pesticide pollution risk.



### Heatwaves

86 percent of children are exposed to heatwaves in Sierra Leone. According to UNICEF analysis, under high emission scenarios, the entire child population in Senegal is estimated to be exposed to high heatwave frequency<sup>41</sup> and 93 per cent of children are projected to be exposed to high heatwave duration<sup>42</sup>.<sup>dclxxxix</sup> The agricultural sector is highly vulnerable, posing significant risks to food security and agriculture, which is the largest sector of Sierra Leone's economy.



### Vector-borne diseases

An estimated 3.2 million children are living in areas exposed to one or more disease vectors in Senegal. 98 percent of children are exposed to dengue, 71 percent are at risk of aedes, and 83 percent are exposed to zika. In addition, 99 percent of children are at risk of both PV and PF malaria. In 2016, malaria was the cause of almost 4 in 10 hospital consultations in Sierra Leone, with children under the age of 5 are most vulnerable to morbidity and mortality attributed to the disease.<sup>dcxc</sup>

## Underlying vulnerabilities



### WASH

Inadequate access to basic sanitation and hygiene are major challenges in Sierra Leone. Only 2.5 percent of households have access to basic sanitation facilities, while 53 percent and 64 percent, respectively, do not have access to basic water services or handwashing facilities.<sup>dcxci</sup> Diarrhoea, acute respiratory infections, malnutrition, and worm infestations are all exacerbated by a lack of access to WASH services. Boys and girls frequently miss school owing to illness and diminished cognitive function brought on by worm infestations.



### Health and nutrition

Sierra Leone has one of the highest maternal death rates in the world at 1,120 per 100,000 live births.<sup>dcxcii</sup> Maternal fatalities account for 36 percent of all deaths among women aged 15 to 49, the major direct causes of which are obstetric haemorrhage, hypertension, obstructed labour and sepsis.<sup>dcxciii</sup> Mortality rates for children under the age of 5 years are also among the highest in the world (104.6 fatalities per 1,000 live births).<sup>dcxciv</sup> More than 70 percent of under-five mortalities are caused by preventable newborn conditions, malaria, acute respiratory infection and diarrhoeal illnesses.<sup>dcxcv</sup> Nutritional outcomes are also poor, over a quarter of children under the age of 5 stunted for their age.<sup>dcxcvi</sup> Climate change is expected to worsen malnutrition in children in Sierra Leone, especially as droughts become more frequent. Undernutrition, weak health-care infrastructure and poor child and maternal health are key indicators of child's climate vulnerability.



### Poverty and social protection

Sierra Leone's poverty headcount ratio at national poverty line stands at 56.8 percent. Whilst a significant amount of people has access to mobile phones (86 mobile cellular subscriptions per 100 people), only 23 percent of the population have access to electricity. Unemployment rates are high, particularly among youth (60 per cent) and approximately 67 per cent of youth are illiterate, making it incredibly difficult for young people to compete for the few opportunities.<sup>dcxcvii</sup> Just 0.9 percent of the country's GDP is spent on social safety nets and 58 percent of the population (above the age of 15) are unable to come up with emergency funds. Alongside social protection services, government authorities need to build their capacity to manage climate change and disaster risks.



### Education

Access to quality education and completion of school remain key challenges for children in Sierra Leone. Whilst primary school attendance has seen vast improvements (82 percent) attendance rates for lower and upper secondary school are significantly lower (36 and 29 percent respectively).<sup>dcxcviii</sup> Significant barriers to school attendance include poverty, gender discrimination, long distances to schools, social norms, and practices such as, early marriage, teenage pregnancy, and an unsafe learning environment. Children with lower educational attainments are more vulnerable to environmental shocks and stresses.

41 High heatwave frequency is defined as any area where there are on average 4.5 or more heatwaves per year.

42 High heatwave duration is defined as any area where the average heatwave event lasted 4.7 days or longer.

# Togo



CCRI



7.6 | Extremely High

## Climate and environment shocks



7.8 | Pillar 1

Water scarcity	2.6	
Riverine floods	6.6	
Coastal floods	10.0	
Tropical cyclones	0.0	
Vector borne disease	8.6	
Heatwaves	7.7	
Air pollution	9.6	
Soil and water pollution	8.5	

## Child vulnerability



7.3 | Pillar 2

Child health and nutrition	7.7	
Education	3.4	
Water, sanitation, and hygiene	9.9	
Poverty, communication assets and social protection	8.1	

Version 3.1 (11 August 2021). All four components of pillar 2 have a data value for Togo; 1 out of the 23 indicators included in pillar 2 has no data.

Togo has a CCRI score of **7.6** and ranks **15<sup>th</sup>** out of the 163 CCRI countries and regions. Children in Togo are considered at **“Extremely High”** risk.

According to the CCRI, the climate and environmental shocks that children in Togo are highly exposed to include:



### Coastal flooding

Togo has a 56-kilometer coastline, and almost half of the child population are living in areas with coastal flood risk (45 percent). Coastal flooding poses significant threats to the country’s economy, with the coastal zone accounting for 70 percent of all economic activity.<sup>dxcix</sup> The sectors most affected by coastal flooding include fishing, agriculture, and tourism. Coastal floods also pose risks to safe drinking water services, which are frequently damaged or compromised by salinization. Coastal flood measures are imperative to protect children and future generations in Sierra Leone, where climate projections estimate sea-level rise of up to 0.16m in 2025, 0.34m in 2050, and 0.74m by the end of the century.<sup>43 dcc</sup>



### Air pollution

Air pollution is a major challenge in Togo, where 98 percent of children are exposed to ambient air pollution (PM2.5  $\geq$  25  $\mu\text{g}/\text{m}^3$ ), which significantly exceeds the recommended maximum ambient air pollution limit (PM2.5  $\geq$  5  $\mu\text{g}/\text{m}^3$ ). The largest contributors to poor air quality in Togo include the mining and cement industries, vehicle emissions, and waste burning. Additionally, a relationship between increased dust during the harmattan, rising temperatures, and higher evaporation has been linked to poor air quality in Togo, with cross-border health repercussions across the Sahara.<sup>dcci</sup>

43 Based on an RCP2.6 emissions scenarios.



### Vector-borne diseases

3.8 million children are living in areas exposed to one or more disease vectors in Togo. The entire child population is exposed to malaria, 99 percent of children are at risk of dengue, 96 are at risk of aedes and 62 percent are exposed to zika. Disease risk increases during flooding, as stagnant water creates breeding grounds for mosquitoes. Nonetheless, areas of endemic and seasonal malaria risk, are likely to decline across Togo and other parts of Western Africa, as temperatures surpass mosquito heat tolerance, particularly in Sahelian nations where warming is expected to be quicker.<sup>dccii</sup>



### Soil and water pollution

A primary cause of pollution in Togo is Phosphate mining, which presents significant health risks to children, especially in the coastal region.<sup>dcciii</sup> 36 percent of children and adolescents under the age of 20 are exposed to lead pollution in the country and 44 percent live in areas of high pesticide pollution risk. Unsafe levels of cadmium in soils have also been identified in parts of Togo, the main sources of which include agriculture, industrial facilities, and waste sites.<sup>dcciv</sup> Surface and groundwater pollution are a leading cause of cholera outbreaks in the country, which are linked to heavy rainfall and flooding.<sup>dccv</sup>



### Heatwaves

In Togo, 57 percent of children are exposed to heatwaves, which have significant impacts on child health, and wellbeing. Heat stress and the related risks of cardiovascular and respiratory illness are major risks associated with heatwaves and extreme heat. Heat stress is most severe in Togo's northern locations, where children and the elderly are the most affected.<sup>dccvi</sup>



### Riverine flooding

An estimated 480,000 children are exposed to riverine flooding in Togo<sup>44</sup>. Although there is some flooding in Togo virtually every year, there were ten significant floods between 1983 and 2010, and the past four years have seen especially widespread and destructive floods that have devastated infrastructure and farmland.<sup>dccvii</sup> The repeated floods have eroded arable land and leached vital nutrients from topsoils, significantly affecting agriculture. Land management practices such as deforestation may increase local flood risks in Togo in future years.

## Underlying vulnerabilities



### WASH

Access to clean water, sanitation and hygiene is a significant challenge in Togo. Just under half of Togolese households have access to basic drinking water services (49 percent) and approximately 74 percent have no handwashing facility.<sup>dccviii</sup> Moreover, 45 percent of households open defecation, which is largely practised in rural areas (70 percent of households).<sup>dccix</sup> Water-borne diseases are rife in the country, with communities frequently experiencing cholera outbreaks. Improving sanitation and hygiene services is essential to protect children in Togo from further disease burdens, especially as flooding becomes more frequent and severe.



### Health and nutrition

Togo has a decentralised healthcare system, and the country's health status is marked by high mortality rates (63 per 1,000 live births for children under the age of 5 and 396 per 100,000 live births for mothers).<sup>dccx dccxi</sup> HIV/AIDS, diarrhoea, TB, pneumonia, and malaria remain the top causes of mortality across all age groups. Nutritional outcomes are also poor, almost a quarter of children under the age of 5 are stunted for their age (24 percent).<sup>dccxii</sup> The ebola virus disease pandemic in WCAR, as well as the meningitis and lassa fever epidemics in the country's central and northern areas in 2016, exposed significant flaws in Togo's healthcare sector. The most severe climate related health risks in Togo include increased risk of food insecurity, flood and drought-related mortality and displacement, heat stress, and a rise in infectious illnesses.



### Poverty and social protection

Togo remains one of Sub-Saharan Africa's poorest countries. More than half of the population lives below the national poverty line (55.1 percent of the population).<sup>dccxiii</sup> Poverty is strongly connected to malnutrition; food insecurity at the household level and is widespread across the country, but especially in the northern regions. The surge in armed conflict across the central Sahel has also spread to Togo, a previously unaffected area. As of 29 July 2022, 1,868 people from Burkina have been displaced in the spill over zones and 1,562 internally displaced people are placing additional strain on an already fragile network of basic social services.<sup>dccxiv</sup>

## Education

44 Calculated using a 50 year return period.



Access to education remains a challenge in Togo, particularly for adolescents and girls. Whilst 91 percent of children of primary school age are attending school, just 53 per cent of adolescents are attending lower secondary and only 24 percent of youth attend upper secondary school.<sup>dccxv</sup> Gender disparities exist in Togo's education sector. For example, in each level of schooling except pre-primary, there are 10 percent fewer girls enrolled than boys.<sup>dccxvi</sup> Disparities in education also exist between urban and rural areas, with secondary schools particularly sparse in rural areas. Despite this, youth literacy rates in Togo are higher than in other LDCs (84 percent) and 5.4 percent of the country's GDP is spent on the education sector.





© UNICEF/UN04.181.199/Tremeau

## Country Profiles

# Small Island Developing States

---

Out of the 46 LDCs, 41 are included within the initial CCRI dataset. The remaining 5 are Small Island Developing States (SIDS) that have a land area less than 20,000 sq/km and were not part of the 2021 CCRI dataset due to data availability limitations. While many SIDS face serious and existential threats due to climate change, the data did not adequately reflect this reality well enough to be captured appropriately in a multi-hazard index.

The 5 SIDS that are classified as LDCs include:

- ▶ **Kiribati**
- ▶ **São Tomé and Príncipe**
- ▶ **Timor-Leste**
- ▶ **Tuvalu**
- ▶ **Union of the Comoros**

Children living in SIDS are on the front lines of climate change, despite contributing relatively little to the greenhouse gas emissions that are fuelling the climate crisis. These nations confront a variety of threats, including severe climatic events like floods, droughts, and cyclones, increasing average temperatures, rising sea levels and a high burden of climate-sensitive diseases. SIDS' high climate vulnerability also relates to their distance from global markets, limited and fragile resource bases, difficulty to attain economies of scale, and vulnerability to economic shocks. The impacts of climate change in SIDS are multifaceted, including salination, bleached reefs, eroded coastlines, degraded ecosystems, disrupted economies, infrastructure damage, poverty traps, lost lives, and endangered livelihoods.

In recent years, the leaders of SIDS have been a powerful force in calling for immediate global action to protect populations all around the world, including children and future generations whose basic survival is threatened.

This report aims to address the data requirements for the contexts of the 5 SIDS that are also LDCs through a separate analysis offered here.



© UNICEF/JUN07/17/24/Chudeau

# Kiribati

Kiribati is a SIDS located in the central Pacific Ocean, which consists of 32 coral atolls and one raised limestone island. The country is divided into three primary island groups: the Gilbert group in the west, the Phoenix group in the centre, and the Line group to the east.<sup>dccxlii</sup> These islands cover an area of 811 km<sup>2</sup> and the population was approximately 119,446 in 2020, 51 percent of which lived on the island of South Tarawa, where the capital of Tarawa is situated.<sup>dccxlili</sup> As an extremely isolated and low-lying island nation, Kiribati is one of the most vulnerable to climate variability and sea-level rise and its large maritime area represents significant challenges, including in the provision of supplies.

The climate and environmental hazards children in Kiribati are exposed to include:



## Coastal flooding

The coral atolls of Kiribati are narrow, barely a few hundred metres wide, and have a maximum elevation of 2 metres above sea level in several places,<sup>dccxliv</sup> putting children and families at significant risks of coastal flooding. Several communities on the outlying islands, such as Tebunginako and Abaiang, have already been forced to relocate as a result of coastal flooding.

Kiribati's major urban centre, Tarawa has also been identified to have high coastal flood risk, threatening Kiribati's economy. In addition, the population of Kiribati are frequently exposed to coastal erosion and inundation during spring tides, storm surges, and severe winds. By 2050, 18 to 80 percent of Buariki, north Tarawa, and up to 50 percent of Bikenibeu, south Tarawa, are anticipated to be inundated.<sup>dccxlv</sup> Furthermore, a reduced return period of exceptionally high sea-levels, driven by climate circulations, is expected to put Kiribati at risk of wave-driven flooding, emphasising the necessity of coral protection adaptation measures.<sup>dccxlvii</sup> Some estimates suggest that without adequate adaptation, wave-driven flooding will render several of Kiribati's island groupings uninhabitable by the mid-twentieth century.<sup>dccxlviii</sup>



## Tropical cyclones

Kiribati's islands are frequently exposed to storm surges that occur on a 14-year cycle.<sup>dccxlviii</sup> Whilst climatic patterns often protect Kiribati's islands from direct cyclone path, consequences can still be felt when storms pass within a few hundred km. For example, in March 2015 Cyclone Pam brought widespread flooding and destruction to Kiribati's coastal infrastructure and sea walls.<sup>dccxlix</sup> Warmer ocean temperatures and rising sea levels are likely to increase the frequency of high-intensity cyclones (category 4 or 5)<sup>dccli</sup>, which could be more costly in terms of deaths and damages in low lying areas of Kiribati. There is also a high risk of loss of livelihoods for fishermen, with entire communities economically dependent on fisheries in Kiribati. In addition, there are concerns that cyclones will strip Kiribati's low-lying islands of their vegetation and soils, posing significant threats to food security.



## Extreme Heat

Kiribati's location on the equator, brings average yearly temperatures of 27.5°C and regularly experiences high maximum temperatures, with an average monthly maximum of 30.8°C.<sup>dccli</sup> Families in Kiribati are generally well adapted to these high yet stable temperatures. Yet, as climate change brings fluctuations in Kiribati's temperature regimes, an increase in heat-related illness and mortalities may occur, without adequate adaptation and resilience measures. For example, research in the Australasian region has found that annual health-related mortalities could rise by 211 percent by 2030.<sup>dcclii</sup> Moreover, marine heatwaves in the western tropical Pacific region are expected to pose an additional threat to Kiribati's children.<sup>dccliii</sup>



## Water scarcity

Rainwater collection and groundwater are the primary sources of water on Kiribati's islands, both of which rely heavily on rainfall for replenishment. Saline intrusion poses significant threats to water security and human health due to the salinization of ground water and drinking water sources. For example, the salinization of drinking water has been linked to an increase in the incidence of hypertension during pregnancy in the Pacific region.<sup>dccliv</sup> In May 2022, the Kiribati Government declared a State of Disaster due to drought which has affected the entire country (approximately 120,000 people).<sup>dcclv</sup> The drought has brought increasing challenges and threats in terms of water contamination, brackish water, water accessibility and water

availability. Climate models predict that hydrological events including heavy rainfall, droughts, and storms will become more intense and frequent in Kiribati over time.<sup>dcclvi</sup> These changes are expected to increase risks of bacterial and pollutant contamination in water sources and affect subsistence agriculture, posing additional threats to child nutrition and food security.<sup>dcclvii</sup> In Kiribati, challenges with legislation and regulation enforcement of water supplies exacerbate the vulnerabilities to water scarcity in the face of climate change.<sup>dcclviii</sup>



### Vector-borne diseases

Disease burdens for dengue fever and the chikungunya virus are particularly high in Kiribati. In 2015, over 12,000 people on South Tarawa and Betio were infected with chikungunya virus and dengue fever, according to Kiribati's Ministry of Health and Medical Services.<sup>dcclix</sup> Malaria and zika risks are significantly lower in Kiribati than in other LDCs.

## Underlying vulnerabilities



### WASH

Only 15 percent of the population in Kiribati are using safely managed water services, just 27 percent have access to safely managed sanitation services, and around 31 percent have limited hygiene services.<sup>dcclx dcclxi</sup> In addition, almost 30 percent of the population are still practicing open defecation,<sup>dcclxii</sup> which can pollute surrounding environments perpetuating a vicious cycle of disease and poverty. Improving WASH services is essential to protect children in Kiribati from malnutrition and disease burdens, especially as coastal flooding becomes more severe with projected sea-level rise.



### Health and nutrition

Kiribati's health sector has seen remarkable progress in recent years. Average life expectancy at birth has risen from 60 years in 1990 to 66 years in 2015.<sup>dcclxiii</sup> Communicable illnesses, such as diarrhoea and respiratory tract infections, have also decreased in prevalence. However, Kiribati is one of only three Pacific Island countries that failed to meet any of the Millennium Development Goals for Health.<sup>dcclxiv</sup> Child and maternal mortality rates remain moderately high, at 48.2 per 1,000 live births<sup>dcclxv</sup> and 92 per 100,000 live births respectively.<sup>dcclxvi</sup> The main health concerns include TB and leprosy, levels of which are among the highest in the Pacific.<sup>dcclxvii</sup> In addition, an estimated 15 percent of children stunted for their age.<sup>dcclxviii</sup> Ciguatera poisoning is another health concern in Kiribati, caused by the consumption of reef fish contaminated with ciguatoxins.<sup>dcclxix</sup> Climate change is anticipated to increase the incidence of ciguatera poisoning, alongside water-borne and vector-borne illnesses in Kiribati, including dengue fever, diarrhoea, and cholera, where densely populated urban areas, such as Tarawa's capital city expected to be particularly hard hit.<sup>dcclxx</sup>



### Poverty and social protection

In Kiribati, primary economic activities are subsistence farming and fishing, which are highly sensitive to climate change. Kiribati is also highly dependent on imported food, fuel, and external aid.<sup>dcclxxi</sup> In 2020, the overall unemployment rate was 30.6 percent, while the youth unemployment rate was 54 percent, with female youth unemployment 14.2 percent higher than male young unemployment.<sup>dcclxxii</sup> Rates of poverty are highest in South Tarawa, which is home to around 47 percent of the population and serves as a hotspot for internal migration from the outlying islands.<sup>dcclxxiii</sup> Whilst South Tarawa offers employment, higher education and social services, which are not accessible elsewhere in Kiribati, it also has the greatest prevalence of basic needs poverty (24.2 percent of the population).<sup>dcclxxiv</sup> These factors, along with the country's low food and water security, increases children's vulnerability to climate change.



### Education

Kiribati has made remarkable progress in delivering access to education for children over the last decade. In 2019, 96 percent of children attended pre-primary and primary school education and 81 percent of children attended lower secondary school education.<sup>dcclxxv</sup> In addition to attendance, 94 percent of children have gone on to complete their primary school learning.<sup>dcclxxvi</sup> Nonetheless, improvements in higher education access for children on the outer islands are needed. Future climate change could threaten the progress made in the education sector, if flooding and storm surges damage school infrastructure and leads to climate induced displacement. Consequently, investing in climate resilient infrastructure and remote learning methods is critical in Pacific Island states, to ensure minimal disruption to education in times of shock.

# São Tomé and Príncipe

São Tomé and Príncipe (STP) is an island country in the Gulf of Guinea, off the western equatorial coast of Central Africa. STP is the second smallest and second-least populated African sovereign state, consisting of two main archipelagos and four islets. STP is among the least responsible for climate change, as a state that acts as an absolute sink of greenhouse gases, contributing to the sequestration of CO<sub>2</sub>, yet the islands remain highly sensitive to climate change and STP's population have a limited potential to absorb and adapt without significant investments.<sup>dcclxxvii</sup>

The climate and environmental hazards children in STP are highly exposed to include:



## Coastal flooding

Flooding is common for coastal communities across the islands of São Tomé and Príncipe, which are frequently inundated by sea water, as a result of sea-level rise and storms. Coastal flooding and erosion have a significant impact on fisheries, which comprise 20 percent of the nation's workforce.<sup>dcclxxviii</sup> In the upper regions, flash floods, mudslides and landslides, are common along the mountainous slopes during heavy rains. Between 2014-2016, extensive floods were experienced in the villages of Praia Gamboa, Santa Catarina, Ribeira Afonso, Malanza, and Io Grande, destroying houses and resulting in significant fatalities.<sup>dcclxxix</sup>



## Extreme Heat

Rising temperatures are anticipated to pose serious threats to the population's health in STP including an increase in the prevalence of heat stress. Climate models predict that 85 to 100 percent of days could be classified as 'hot'<sup>45</sup> in STP by the end of the century under various emission scenarios.<sup>dcclxxx</sup> This increase is expected to result in a greater number of children at risk of heat-related illnesses including dehydration, heat exhaustion, heat rash, and heat-related deaths.<sup>dcclxxxi</sup> Infants and small children are especially vulnerable during high heat conditions because they are incapable or lack agency to regulate their body temperature. Without adaptation measures, an increase in the number of hot days is also expected to affect livelihoods, socioeconomic output, and reduce labour productivity.



## Vector-borne diseases

Malaria is a significant risk all year around throughout the islands, which is transmitted by female Anopheles mosquitos, mostly during night-time hours. Whilst there has been a decrease in the overall disease burden for Malaria between 1990-2019, the mortality in children under 5 years of age climbed during this period and was higher than in all other age groups and remained the group with the highest disease burden of malaria in the country.<sup>dcclxxxii</sup> Disease risk increases during flood events, as stagnant water creates breeding grounds for mosquitoes, increasing the likelihood of malaria epidemics. A lack of adequate disease protection measures, including ITNs, which only 62.6 percent of children under the age of 5 slept under in 2019, according to a health survey, will continue the high rates of malaria transmission in the islands.<sup>dcclxxxiii</sup> Additionally, research has revealed that dengue vectors are prevalent in STP,<sup>dcclxxxiv</sup> whereas no previous or present zika transmissions are known to have occurred on the islands.<sup>dcclxxxv</sup>



## Water scarcity

The availability of groundwater is affected by several climatic factors in STP, including increasing temperatures, decreasing precipitation and river flows, a longer dry season "gravana", as well as the salination of water supplies because of sea-level rise.<sup>dcclxxxvi</sup> Water scarcity presents risks of crop failure, livestock death, and income losses, which can result in food insecurity and rising food costs. A reduction in the availability of fresh water for drinking and hygiene also places children at an increased exposure to diseases such as cholera, typhoid, acute respiratory infections, and diarrhoea.

45 A 'hot day' is a day when maximum temperature exceeds the 90<sup>th</sup> percentile threshold for that time of the year.



### Soil and water pollution

Water quality is poor across the islands of STP, due to a lack of suitable water treatment systems, and poor sewage treatment. Deforestation for construction and charcoal are major drivers of marine pollution, as a result of shipping and illegal waste dumping at sea.<sup>dccclxxxvii</sup> Land pollution and upstream activities such as dam building is also contributing to the pollution in marine environments.<sup>dccclxxxviii</sup> Further, pollution in coastal zones is degrading habitats critical to health, well-being, and livelihoods including estuaries and wetlands. The preservation of coastal trees, mangrove forests, and coral reefs in STP are particularly important because they operate as natural coastal flood barriers.

## Underlying vulnerabilities



### WASH

In STP, only 36 percent of households have a safely managed drinking water service and 28 percent of the population have no access to handwashing facilities.<sup>dccclxxxix</sup> Poor drainage and inadequate wastewater treatment are two serious problems which the islands are confronted with. Inadequate drainage often results in urban flooding during periods of heavy rainfall, particularly in the capital city of São Tomé.<sup>dccxc</sup> Open defecation is practised by approximately 43 percent of the population, having significant impacts on community health and water quality.<sup>dccxcii</sup> Furthermore, poor sanitation and polluted water sources increase risks of water-borne illnesses, including cholera and typhoid in children.



### Health and nutrition

Inadequate access to healthcare services makes children in STP especially vulnerable to climate change. Child and maternal mortality rates are significantly lower than in other LDCs at 15.4 (per 1,000 live births) and 130 (per 100,000)<sup>dccxciii dccxciii</sup> Nonetheless, children and mothers still suffer from significant health problems, including TB, malaria and HIV. Malnutrition is also prevalent across the islands, where around 12 percent of children under the age of 5 are stunted for their age<sup>dccxciv</sup> and almost half the population of women of reproductive age were iron deficient in 2016.<sup>dccxcv</sup> Climate related hazards, such as flooding have the potential to damage healthcare infrastructure and disrupt service delivery. An increase in climate-sensitive illnesses will also put significant strain on already overburdened health facilities.



### Poverty and social protection

High poverty rates and low economic growth makes the population especially sensitive to the impacts of climate change in STP. According to World Bank estimates, around one-third of the population lives on less than USD 1.90 per day in STP.<sup>dccxcvi</sup> Poverty is most prevalent in urban areas and in the southern districts including Caué and Lembá.<sup>dccxcvii</sup> Agriculture (especially cocoa) accounts for a major portion of the country's economy, and the country remains heavily reliant on imports for commodities. In addition, the country's youthful population, with 79 percent of the population below the age of 35 places significant strain on key services and often requires that children enter the workforce at a younger age.<sup>dccxcviii</sup> COVID-19 worsened the situation for many families on the islands, pushing 8,000 new households into poverty in 2020.<sup>dccxcix</sup> Strengthening shock responsive social protection in STP is essential to protect the most vulnerable children from falling into deeper poverty.



### Education

Access to adequate education remains a key challenge for children in STP. While primary school attendance rates are high (94 percent), lower and upper secondary school attendance rates are much lower (52 percent and 20 percent, respectively).<sup>dccc</sup> COVID-19 has disrupted children's learning in STP, with all 209 schools closed in March 2020, resulting in 30,000 children and adolescents absent from school.<sup>dccci</sup> Fortunately, digital learning modalities were accessible to 70 percent of pre-school, basic and secondary school students and back to school packages were established to meet the needs of 6000 vulnerable children.<sup>dcccii</sup> Similar contingency plans are essential as climate shocks increase in frequency and severity in STP, to ensure that children's rights to education are met even in times of climate induced displacement or school closure.

# Timor-Leste

Timor-Leste is a SIDS in Southeast Asia which consists of the eastern side of Timor, the surrounding islands of Atauro and Jaco, and Oecusse, an exclave on the island's north-eastern side bordered by Indonesian West Timor. The land area for Timor-Leste is approximately 15,007 km<sup>2</sup> and the typical climate is tropical, humid with distinct rainy and dry seasons.<sup>dccciii</sup>

The climate and environmental hazards children in Timor-Leste are exposed to include:



## Water scarcity

Water scarcity is a leading stressor threatening children's well-being in Timor-Leste. Recent El Nino events have increased drought risks in the east and south of the country (particularly in Lautem and Viqueque).<sup>dccciv</sup> Moreover, environmental degradation in upland water catchments significantly impairs the natural water collecting capacity of ecosystems that serve rural communities. Water supply to rural communities is projected to deteriorate in the future without a solid adaptation strategies and funding, with negative implications for children's health.<sup>dcccv</sup>



## Heatwaves/Extreme heat

The Global Facility for Disaster Reduction and Recovery (GFDRR) classifies Timor-Leste's heat hazard as 'medium,' implying that there is a greater than 25 percent chance that the country will experience at least one period of prolonged exposure to extreme heat, resulting in heat stress, in the next five years.<sup>dccvii</sup> Heatwaves events are projected to increase in duration and with higher temperature extremes in Timor-Leste.<sup>dccviii</sup> These temperature changes are anticipated to reduce the reliability of food and cash crop production, impacting household food and nutrition security and income, particularly during the lean season.<sup>dccix</sup> Longer heatwave events will pose significant health challenges, especially for newborns and infants who are more sensitive to heat related illnesses such as dehydration.



## Riverine flooding

High inter-annual rainfall variability across Timor-Leste, with a 40 percent difference year-to-year, makes the predictability of high rainfall events and flooding difficult.<sup>dcccix</sup> Nonetheless, various flood events have been recorded in recent years. For example, in April 2021, 33,835 households were affected by flooding across all 13 municipalities, which resulted in 44 recorded fatalities.<sup>dcccxi</sup> Flash floods and landslides are also common hazards associated with high rainfall. Children are especially vulnerable to these hazards because of their quick onset and destructive nature, which leaves children and their caregivers little warning to prepare and respond.



## Coastal flooding

Coastal flooding is a significant threat in Timor-Leste which contains a 706 km coastal zone. Climate projections show that sea-level rise could increase by ~10cm in Timor-Leste by 2030, and up to 60cm by 2090.<sup>dcccxi</sup> Coastal flooding poses risks of, disruption to infrastructure, groundwater salinization, lowered agricultural yields, and harm to coral reef health, all of which affect child nutrition and livelihoods, especially in fishing communities.<sup>dcccxi</sup> Unsustainable fishing techniques on coral reefs, mangrove harvesting, and sand, plant, and coral exploitation along the north coast are leaving Timor-Leste's coastal zones increasingly vulnerable to coastal erosion and flooding.<sup>dcccxiv</sup> Nature based solutions and adaptive costal management techniques are essential to protect children from the impacts of future floods in Timor-Leste as sea levels rise.



## Air pollution

In 2020, Timor-Leste's annual mean concentration of CO<sub>2</sub> PM<sub>2.5</sub> was approximately 19 g/m<sup>3</sup>, which exceeds the WHO recommended guideline level of 5 g/m<sup>3</sup>.<sup>dcccxv</sup> Outdoor air pollution can have direct and often severe consequences for children's health. Women and children are also at great risks for disease related to IAP in the country, where approximately 93 percent of the population primarily use solid fuels for cooking.<sup>dcccxvi</sup> In 2012, 62 per cent of an estimated 500 child deaths due to acute lower respiratory infections were attributed to household air pollution in Timor-Leste.<sup>dcccxvii</sup> Tackling IAP requires sustained, nationwide efforts to raise awareness of the risks associated with open wood fires as well as the dissemination of both cost-effective and culturally acceptable clean fuel alternatives.



### Vector-borne diseases

Children in Timor-Leste also experience high risks of exposure to vector-borne diseases. Dengue fever is a major public health concern, with cases increasing from 975 in 2019 to 1,450 in 2021, of which children under the age of 5 are most vulnerable.<sup>dcccxxviii</sup> Climate change is expected to increase the disease burden of a range of diseases including, dengue and Japanese encephalitis, as a result of expanding transmission sites and altering mosquito breeding grounds. Such risks are of concern given that areas of good progress are vulnerable to reversal such as, for example, the elimination of malaria, which has been a landmark achievement for Timor-Leste.<sup>dcccxxix</sup>



### Soil and water pollution

Inadequate sanitation and wastewater infrastructure, as well as industrial and domestic pollution are leading causes of water contamination in Timor-Leste, which pose significant risks to children's health. Poor water-waste management and frequent pools of stagnant water contribute to various water and vector-borne disease outbreaks, especially during periods of flooding. Land management practices including slash and burn, tree felling for fuel and open grazing have significantly reduced soil quality in many areas, leading to deforestation and soil erosion. These practices reduce soil quality, increase soil pollution levels, and heighten risks of landslides.<sup>dcccxxx</sup>

## Underlying vulnerabilities



### WASH

Whilst access to basic levels of drinking water services is generally quite high in Timor-Leste (around 85 percent of the population),<sup>dcccxxxi</sup> water is largely obtained from rain-fed water sources such as springs and wells, which can easily be compromised, including by hazards like floods. Water management in rural areas remain inadequate, especially during periods of droughts, when water resources that animals use dry-up. Approximately 15.5 percent of households still have unimproved sanitation services and one quarter of households practice open defecation in rural areas (26.5 percent).<sup>dcccxxii</sup> Moreover, 34 percent of schools in Timor-Leste have no sanitation services,<sup>dcccxxiii</sup> which can impede children attending school, especially girls who have specific MHM requirements. In addition, one quarter of all hospitals have limited water services, preventing proper sanitation and hygiene to keep patients safe and well.<sup>dcccxxiv</sup> Climate change is predicted to make access to safe water more difficult and less predictable in Timor-Leste, particularly during periods of drought linked to El Nino occurrences. As a result, improving water access for households, schools, and health centres is critical, especially in rural areas.



### Health and nutrition

The WHO has identified infectious, and vector-borne diseases, exposure to IAP, heat related deaths and under-nutrition as the main health issues for Timor-Leste related to a changing climate.<sup>dcccxxv</sup> Child mortality rates remain high (50.5 per 1,000 live births).<sup>dcccxxvi</sup> In addition, child morbidity remains high, with climate related illnesses such as dengue and Japanese encephalitis placing significant burdens on healthcare services. Maternal mortality rates are also high, at 142 deaths per 100,000 live births.<sup>dcccxxvii</sup> Regarding nutrition, over 100,000 families are estimated to have insufficient food for a substantial period of the year in Timor-Leste, with food shortages most severe during the periods of October to March and especially in upland areas.<sup>dcccxxviii</sup> Subsistence farmers and female-headed households have been identified as among the most food insecure groups.<sup>dcccxxix</sup> Further, 46.7 percent of the population of children under the age of five were stunted for their age in 2020.<sup>dcccxxx</sup>



### Poverty and social protection

42.6 percent of Timor-Leste's child population are living in households with income below the national poverty line<sup>dcccxxxi</sup>, with rural areas disproportionately poor. Most rural households are subsistence farmers, relying heavily on favourable climatic conditions for food and nutrition. Such limited livelihood diversity makes it increasingly difficult for farmers to recover from shocks. Unemployment is high, employment opportunities in the formal sector are generally limited and the majority of the population does not have a steady source of income.<sup>dcccxxxii</sup> Moreover, electricity centres, such as those in Dili, frequently struggle to reach rural settlements.<sup>dcccxxxiii</sup>



### Education

Timor-Leste has made tremendous progress in the education sector since regaining independence in 2002. Attendance rates for primary school aged children are high at 90 percent, although school attendance rates decrease for lower and upper secondary levels (54 and 38 percent respectively).<sup>dcccxxxiv</sup> Disparities in levels of education between urban and rural communities exist. For example, illiteracy affects 37 percent of adolescents in rural areas aged 15-24, compared to 6 percent in urban areas.<sup>dcccxxxv</sup> Approximately 50 percent of schools in the country lack access to electricity, with even fewer having consistent access.<sup>dcccxxxvi</sup> Access to improved water sources is also approximately 50 percent in schools, while basic sanitary facilities are lacking in 35 percent of primary schools.<sup>dcccxxxvii</sup>



# Tuvalu

Tuvalu is a SIDS located in the south Pacific Ocean, which consists of 9 atolls that stretch 579 km in length and is internationally recognised as one of the most climate vulnerable states globally. Tuvalu has a surface area of approximately 26 km<sup>2</sup> and a population of roughly 11,800 inhabitants as of 2020.<sup>dcccxxviii</sup>

The climate and environmental hazards children in Tuvalu are exposed to include:



## Coastal flooding

Tuvalu has an average elevation of 3 metres above sea level, which have been rising at a rate of about 5 mm per year since 1993 and are projected to rise another 0.4-0.9 metres by 2090.<sup>dcccxxix dcccxi</sup> Sea-level rise has contributed significantly to coastal erosion and the salinization of freshwater supplies in Tuvalu, having negative influence on agriculture, fisheries, water resources, human health, and ecosystems. Key national infrastructure including government buildings, utility infrastructure, and the airport lie in an area exposed to storm surge and coastal flooding. Coral reefs play an important role in Tuvalu's coastal defences and economic output by contributing to local fish stocks. Climate change has increased reef exposure to bleaching events, exacerbating the damage already done by humans. Moreover, sand mining in coastal areas, has eroded coastal defences and made coastal areas increasingly vulnerable.<sup>dcccxi</sup>



## Tropical cyclones

Between 2000-2016, 13 tropical cyclones were recorded in Tuvalu.<sup>dcccxlii</sup> Cyclone events have significant impacts on livelihoods and the Tuvalu economy. For example, in 2015, Cyclone Pam impacted several of Tuvalu's islands including Nui, Nukufetau and Nanumaga. In Nui, widespread destruction left 71 families (40 percent of the population) displaced and in Nukufetau, large areas of the island's seawall were damaged from storm surges and wave action.<sup>dcccxliii</sup> The cyclone also resulted in increased incidences of diarrhoea and minor skin infections in children under 12, and many sanitation facilities in temporary shelters were non-functional.<sup>dcccxliv</sup> Local food security was also compromised, for example, in Nui, 100 percent of vegetable, banana, and pulaka crops were affected.<sup>dcccxlv</sup> Projected sea-level rise is expected to enhance damages and impacts caused by future cyclone induced storm surges, as is the prospect of increased wind speed and precipitation severity.<sup>dcccxlvii</sup>



## Extreme heat/Heatwaves

Tuvalu experiences high maximum temperatures on a frequent basis, but, typically has a highly consistent temperature regime, with an average monthly maximum of 31°C.<sup>dcccxlviii</sup> The western tropical Pacific has been identified as a global hotspot for climate induced marine heatwaves, which are expected to negatively impact marine ecosystems and livelihoods, which are adapted to exist under highly stable temperature regimes.<sup>dcccxlviii</sup> Further research is required to fully comprehend the implications of climate change, as well as its connection with the El Niño–Southern Oscillation (ENSO) phenomena, for Tuvalu's future temperature regime and potential heatwaves.



## Water scarcity

Tuvalu's fresh water supply is nearly completely dependent on rainfall. The groundwater reserves which are currently accessible are frequently brackish and unfit for human consumption. Sea-level rise is anticipated to exacerbate risks of salt intrusion into groundwater and soils and the salinization of water-supply infrastructure.<sup>dcccxlix</sup> Model predictions on future precipitation trends are highly uncertain for Tuvalu and there is disagreement among models covering the Polynesia region, with some predicting declining annual precipitation and others increases.<sup>dccccl</sup> The connection between climate change and ENSO, which is currently poorly understood, is expected to have a significant impact on future rainfall patterns. Deficits in rainfall may produce an increase in meteorological droughts in the region, although modelling is limited due to projection issues related to the nation's small land mass, sensitivity to El Niño, the remote pacific location and a lack of historical data.<sup>dccccli</sup>



## Vector-borne diseases

There are two main vector-borne diseases of concern in Tuvalu: dengue fever and lymphatic filariasis.<sup>dccccli</sup> In 2019, Tuvalu experienced a significant dengue outbreak, where the majority of the 210 confirmed cases were experienced by children aged 5-9 years of age.<sup>dccccli</sup>

## Underlying vulnerabilities



### WASH

Tuvalu has seen significant success in the WASH sector, improving its water coverage to 98 percent, which is much higher than the 14 Pacific Island Countries and Territories' average.<sup>dcccliv</sup> Nonetheless, access to improved sanitary facilities is more limited, at 83 percent of coverage, with lower sanitation coverage in rural areas.<sup>dccclv</sup> Inadequate access to sanitation is linked to the transmission of cholera and dysentery, which are exacerbated by climate hazards such as floods and cyclones. Around 4 percent of the population still practices open defecation,<sup>dccclvi</sup> which is comparably lower than other LDCs.



### Health and nutrition

Access to adequate healthcare is a challenge in Tuvalu, which has only one hospital located on the main island of Funafuti and 11 healthcare centres on the outer islands, which are staffed by nurses providing primary care and preventative treatments.<sup>dccclvii</sup> Patients who require advanced clinical treatment must be sent to overseas facilities, which can be difficult during extreme weather events. Sexual health and reproductive health services are also limited, with 24 percent of married women without access to family planning and Tuvalu has one of the highest HIV/AIDS rates in the Pacific.<sup>dccclviii</sup> Child and maternal nutritional challenges are also prevalent, where 37 percent of children have stunted growth and around 6 percent experience wasting.<sup>dccclix</sup> There is also a high proportion of obesity among children (21 percent considered obese).<sup>dccclx</sup> Many health vulnerabilities in Tuvalu are related to climate change including extreme weather-related trauma, heat-related illnesses, impaired water and food safety and security, vector-borne diseases, zoonoses, respiratory illnesses and noncommunicable diseases.<sup>dccclxi</sup> Despite these challenges, Tuvalu's child mortality rates have progressively declined in recent years, reaching 21.3 per 1,000 live births in 2021 and immunization coverage is mostly adequate.<sup>dccclxii</sup>



### Poverty and social protection

In 2020, 27 percent of children were living in households with income below the poverty line in Tuvalu.<sup>dccclxiii</sup> A lack of opportunity for young people reinforces poverty cycles and has resulted in harmful behaviours such as drug and alcohol misuse, as well as mental health difficulties.<sup>dccclxiv</sup> Geographical disparities exist across Tuvalu's islands, where the likelihood of a household being poor is over 30 percent higher in the outer Islands than in the main island of Funafuti.<sup>dccclxv</sup> Poverty alleviation is severely hampered by a lack of comprehensive social protection in Tuvalu. Traditional community safety nets such as churches play a vital role, but their capacity to respond to shocks is limited. In addition, Tuvalu's Government lacks the financial resources required to meet adaptation needs necessitating external finance contributions.



### Education

Enrolment in early childhood and primary education remains a key challenge in Tuvalu.<sup>dccclxvi</sup> For example, the net enrolment rate for primary education fell from almost universal 97.4 percent in 2013 to 82 percent in 2020.<sup>dccclxvii dccclxviii</sup> Indirect and direct costs of schooling prevent children from socioeconomically disadvantaged households from accessing education. Furthermore, a lack of school transportation presents a significant barrier to disabled children and students in remote areas. Moreover, climate hazards often result in disruptions to child education, as a result of infrastructure damage or the use of schools as refuge points. For example, during Cyclone Pam, Nui's primary school was used as an evacuation centre, resulting in the suspension of learning programmes.<sup>dccclxix</sup>

# Union of the Comoros

The Union of the Comoros or 'Comoros' is an island nation located in the Indian Ocean, north-east of Madagascar and consists of 4 major islands: Grande Comore (Ngazidja), Mohéli (Mwali), Mayotte (Maore) and Anjouan (Ndzواني) and several smaller islands. Comoros is one of the most climate-sensitive nations in the world due to its location and geography.

The climate and environmental hazards children in Comoros are exposed to include:



## Coastal flooding

Most of the Comoros' population and cities are situated in the coastal zone, where coastal flooding poses serious dangers to well-being and livelihoods. Climate models predict a 4 mm/year increase in sea level annually in Comoros, and a total increase of 20 cm by 2050.<sup>dccxvii</sup> The anticipated impacts of sea level rise include the infiltration of salted water into coastal aquifers; an increase in the occurrence of malaria and a decrease in crop yields, agricultural production, and fisheries. Moreover, 10 percent of the country's coastal inhabitants are expected to be displaced because of inundation.<sup>dccxviii</sup> Sea-level rise and resultant flooding will also destroy significant coastal infrastructure, valued at USD 400 million, including critical infrastructure such as WASH facilities and healthcare centres.<sup>dccxix</sup>



## Tropical cyclones

Cyclones threaten Comoros annually and have increased in frequency in recent years. In 2019, Cyclone Kenneth, centred west of Ngazidja, brought torrential rain and 70 km/h winds which swept throughout Comoros. The cyclone caused widespread coastal flooding and significant water contamination of community water tanks due to debris and salinization. 345,130 people were affected, and 3 million people displaced.<sup>dccxx</sup> The cyclone also impacted food security, with 63 percent of food crops damaged, and caused a loss of 2,055 animals.<sup>dccxxi</sup> The cyclone severely disrupted education, damaging 465 classrooms, half of which were entirely destroyed.<sup>dccxxii</sup> As the intensity of tropical cyclones increases with climate change, investments to help communities on the islands of Comoros to better prepare for and increase their resilience to the impacts of tropical storms will be essential to protect children in Comoros.



## Water scarcity

On the islands of Comoros, water resources are limited, and often unable to fulfil population demands. This situation is projected to worsen as demands increase. For instance, in 2002, the daily average water consumption was around 28,600 m<sup>3</sup>, which is anticipated to increase to 46,498 m<sup>3</sup> by 2025, and 79 200 m<sup>3</sup> by 2050.<sup>dccxxiii</sup> The main drivers of water scarcity in the Comoros islands include deforestation, the fragile equilibrium between fresh and salt water in Grande Comore and Moheli, buried septic tanks contaminating groundwater, inadequate WASH infrastructure, and a decline in the quantity of rivers and quality of ground water, especially in Anjouan and Moheli.<sup>dccxxiv</sup> Sea-level rise is expected to contribute to the salination of fresh water supplies and the impact of tides on underground water results in change in water salt content.<sup>dccxxv</sup> Further, agricultural productivity and food supply in the Comoros have recently been affected by a prolonged drought that has delayed fruit ripening, dried out grasses, and reduced pasture area.<sup>dccxxvi</sup> To ensure that children's right to water is upheld, Comoros' water supply networks must be better managed and maintained.



## Vector-borne diseases

Malaria is endemic in the Comoros and is one of the leading causes of child mortality. Whilst malaria outbreaks have largely been confined to lowland areas, climate change is predicted to extend the geographic range of the disease into the highland communities of Comoros.<sup>dccxxvii</sup> Improved mosquito survival with changing climatic conditions may also allow the normally seasonal pattern of breakouts to be extended to year-round infection. In addition, children in Comoros are also at risk to dengue and Chikungunya transmission.



## Volcanos

In addition to risks to climate related hazards, volcanic hazards are also prevalent in the Comoros. The Karthala Volcano, located near Grand Comore's southern edge is particularly active, having erupted more than 20 times since the 19th century.<sup>dccxxviii</sup> Volcanic eruptions and related hazards, such as floods, landslides, and toxic gas exposure, can have serious effects on children's lives. Whilst the islands have largely escaped mass disruption, two eruptions in 2005, displaced 10,000 people and left approximately 120,000 people without clean drinking water due to ash contamination in water cisterns.<sup>dccxxix</sup>

Disaster Management efforts which incorporate both DRR and climate change adaptation measures, are essential to reduce the vulnerabilities of populations at risk of compounding hazards. Working with communities to build their capacity to prepare for, respond to, and recover from shocks, is essential to enhance overall community resilience.

## Underlying vulnerabilities



### WASH

Communities in Comoros continue to have limited access to potable water, as well as inadequate sanitation and hygiene provisions. For example, almost two out of every three families (61 percent) do not have access to upgraded toilets and must rely on uncovered latrines.<sup>dccxxx</sup> Inadequate WASH systems remains a prominent issue in education and healthcare facilities. For instance, 88 percent of schools have no drinking water service.<sup>dccxxxi</sup> Regions of the islands that receive the most precipitation and inundation are also more susceptible to outbreaks in water-borne diseases. The water industry in Comoros has chronic governance issues, with data not effectively maintained to provide for a thorough grasp of Comoros islands' WASH profile, to ensure that the most vulnerable families receive WASH assistance. Thus, improved monitoring and child-centred risk assessments are essential to identify where children are in the greatest need for climate resilient WASH services.



### Health and nutrition

Child and maternal mortality rates remain high in Comoros, 61.3 (per 1,000 live births) and 273 (per 100,000) respectively.<sup>dccxxxii</sup> Diarrhoeal disorders linked to climate shocks, drinking untreated water and poor food quality, are major causes of morbidity and death, particularly among young children. Other significant health concerns include malaria and acute respiratory infections. Malnutrition remains prominent, with almost one quarter of the population unable to meet the daily minimal nutritional requirements, approximately 23 percent of children under the age of five are stunted for their age.<sup>dccxxxiii</sup> Significant disparities in health outcomes and access to health services exist between Comoros' islands, urban and rural populations, and sexes.<sup>dccxxxiv</sup>



### Poverty and social protection

The Comoros' economy is still recovering from the successive shocks of Cyclone Kenneth which saw a decline of GDP from 3.6 percent (2018) to 1.8 percent (2019).<sup>dccxxxv</sup> The COVID-19 pandemic significantly impacted Comoros' post-cyclone rebuilding efforts and further declined GDP to 0.3 percent in 2020.<sup>dccxxxvi</sup> A quarter of the country's residents live just below the national poverty line and a further 10 percent of the population is at danger of falling below the national poverty threshold if met by further shocks.<sup>dccxxxvii</sup> In 2018, over half of children aged 0 to 4 years of age were affected by more than one deprivation and 9 percent of these children were affected by multiple deprivations in the areas of health, nutrition, and hygiene.<sup>dccxxxviii</sup> Resilience to shocks remains low in the region due to the inadequate coverage of social protection and low financial inclusion.



### Education

Access to quality education remains a key challenge for children in Comoros. In 2012, attendance rates for primary school aged children were relatively good (84 percent), however lower and upper secondary attendance rates were lower (49 and 27 percent respectively).<sup>dccxxxix</sup> Furthermore, by the age of 18, children in the Comoros have finished only 8.4 years of schooling on average.<sup>dcxli</sup> Girls generally receive fewer years of education than boys, and the prevalence of adolescent pregnancy is two to three times that of similar LDCs.<sup>dcxlii</sup> Preschool education still remains experimental, and many families favour non-traditional learning environments like Koranic institutions. Schools typically lack qualified teachers, adequate infrastructure and sanitation facilities, and regional disparities in education access are prevalent.



© UNICEF/JUN0771723/Chudeau

## Recommendations

### → **Community-based approaches**

Localization of climate action, including support for local governments and building resilient communities, is extremely important because community members understand local needs and are on the front line of climate change adaptation action. A community-based approach to adaptation is one where those who are affected by decision-making are included as key partners in the development of adaptation plans and strategies. Placing children and local communities at the centre of climate action, ensures that children will be better protected; their adaptive capacity to identify, develop, and sustain climate change solutions will be strengthened; and their representation and participation is prioritized in decision-making. Child-centred risk assessments are an important participatory technique to ensure that consideration is given to how the risks associated with various shocks and stresses can affect children, their caregivers, and their communities. These risk assessments should inform wider community-based disaster risk management policies and action plans which involve the inclusion of local people's values and knowledge in formulating and implementing DRR and climate adaptation measures.

### → **Nature-based solutions**

Nature-based solutions involve collaborating with nature to address societal issues, benefiting both human well-being and biodiversity. Nature-based solutions include actions involving the protection, restoration, or management of natural and semi-natural ecosystems; the sustainable management of aquatic systems and working lands; or the creation of novel ecosystems in and around cities. These solutions are created and implemented with the full participation and permission of local communities and Indigenous Peoples.<sup>docclxx</sup> Whilst an important method in all LDCs, nature-based solutions are particularly important in SIDS given that protecting or restoring coastal ecosystems (mangroves, reefs, and salt marshes) can shelter communities and infrastructure from cyclones, storm surges, and coastal erosion. Moreover, coastal habitats — especially mangroves — sequester carbon, so restoration also contributes to climate change mitigation.

Photo: young people plant mangroves in Kiribati to lower cyclone risk in their community from coastal flooding.

## → 'The whole-of-island' or 'whole-of-ecosystem approach'

Responding to the complex needs of LDCs requires developing approaches that are customized to local economies, cultures, contexts, capacities, and building holistically modelled systems that incorporate ecosystems, reefs, weather, climate, and people. Typically implemented in SIDS, the whole-of-island approach entails strengthening resilience to climate change and its associated hazards across all sectors of social and economic life, as well as developing more robust ecosystem-based approaches that employ cutting-edge techniques, technologies, and know-how to protect the environment and promote a healthier planet.<sup>dcccclxxi</sup> In the Pacific SIDS, Ridge-to-Reef methods provide an example of a whole-of-ecosystem approach to coastal protection. The Ridge-to-Reef approach aims to provide a holistic intervention for protecting coastal areas by focusing on environmental degradation in the uplands that affect coastal ecosystems through sedimentation, by restoring the shoreline and protecting marine ecosystems, and by reducing people's exposure and vulnerability to these hazards.<sup>dcccclxxii</sup> At the same time, Ridge-to-Reef approaches directly engage and provide benefits to local communities.

## Hazard-specific recommendations



### Air pollution

- ▶ **Develop regulations for the open burning of waste.**
- ▶ **Switch to cleaner fuels and energy, install quality filters on smokestacks, apply low carbon strategies in industry, improve stoves, and adopt cleaner cooking and heating fuels to reduce household air pollution.**
- ▶ **Install air ventilation systems in schools, healthcare centres, and homes.**
- ▶ **Reduce polluting traffic and industries around schools and play areas.**
- ▶ **Monitor air quality systematically and limit child exposure to air pollution when levels are high.**
- ▶ **Encourage citizens to become "air aware" – through the provision of information on air quality in their communities so that they can make informed decisions to take action.**



### Riverine and coastal flooding control measures

- ▶ **Apply nature-based solutions, including coral reef restoration, strengthening natural embankments and mangrove replanting.**
- ▶ **Where appropriate, install hard protection measures such as sea walls and groins (requires significant finance and community consultation).**
- ▶ **Implement nature-based riverine flood control measures, including protecting and expanding wetlands and widening natural flood plains.**
- ▶ **Construct and/or retrofit flood-resistant infrastructure.**



---

### Tropical cyclones

- ▶ Strengthen integrated risk surveillance, monitoring, and early warning systems.
- ▶ Take early action and implement anticipatory action measures i.e., established evacuation plans and teaching children how to respond during cyclone events, especially in schools.
- ▶ Strengthen natural embankments and mangrove replanting.
- ▶ Install cyclone-related coastal flood defense measures – e.g., sea walls.
- ▶ Retrofit critical infrastructure to avoid exposure and damage.
- ▶ Maintain and construct cyclone shelters.



---

### Vector control measures

- ▶ Provision of ITNs for children and indoor residual spraying.
- ▶ Clear stagnant water and drain blockages to reduce favourable conditions for mosquito breeding grounds.
- ▶ Implement community-based vector surveillance.
- ▶ Provide community education on methods to reduce vector exposure.



---

### Heatwave adaptation measures

- ▶ Retrofit critical infrastructure such as schools and health centres using heat-tolerant materials – e.g., cool roofs.
  - ▶ Train healthcare workers on the management of heat-related illnesses.
  - ▶ Use climate-smart agriculture to increase crop resilience to extreme temperatures and heatwaves, to reduce risks to food security.
  - ▶ Support the growth of urban green spaces and safe public water supplies.
  - ▶ Limit exposure through early identification through monitoring systems and increased education and awareness.
-



---

### Water scarcity adaptation measures

- ▶ **Support rainwater harvesting, diversifying water supply sources, and expanding current sources.**
- ▶ **Increase water storage capacity, greywater recycling, conjunctive use of surface and groundwater, and watershed management.**
- ▶ **Develop regulatory systems that address water scarcity, including over-extraction of groundwater, water accounting, and data monitoring and analysis.**
- ▶ **Rehabilitate urban water distribution networks and treatment systems to reduce water leakage and contamination.**
- ▶ **Develop climate-resilient water sources, including the use of deeper groundwater reserves through solar-powered water networks.**
- ▶ **Implement climate-smart agriculture to increase crop resilience and reduce risks to food security.**



---

### Soil and water pollution management

- ▶ **Implement soil pollution management: including natural attenuation, in situ impermeable barriers, phytomanagement, exclusion zones, and change of land use in contaminated areas.**
- ▶ **Implement water pollution management: including investing in adequate sewage piping and water treatment systems, household and industrial waste disposal, and building and maintaining flood and storm water drains.**
- ▶ **Support community education on safe water management and waste practices to reduce contamination.**

### Climate-smart services for children

Adaptation and resilience building offers the most effective way to protect family livelihoods and children's lives from the immediate and expected impacts in climate change. Specifically, this will require:

#### Climate-smart WASH infrastructure and services

**Ensure that WASH infrastructure and services are sustainable, safe, and resilient to climate and disaster risks** through WASH-sector specific climate and hazard vulnerability assessment and adaptation planning and enhancing WASH-related knowledge, aptitude, and practices at institutional, community and individual levels, considering impacts of climate change. Expand access to renewable and off-grid energy sources, such as solar, to ensure resilience of systems, as well as clean and low carbon approaches to safely managed water supplies.

**Integrate climate-risk screening for rural and urban water supply systems**, ensuring that the quality of water resources from urban and rural service providers is monitored, and that watershed zones are protected, including during disasters. Synergies can be developed in intervention areas with conservation programmes to strengthen ecosystem services, such as water, nutrients, and through implementing erosion control. Governments are supported to integrate the climate rationale into key national climate, environment, DRR, sustainable energy documents, strategies, commitments, and plans to ensure it is integrated as a national climate priority in NAPs and NDCs.



**Improve reliability and durability of services** by focusing on demand-side water management strategies, to guarantee water availability year-round, including during meteorological, hydrological, and agricultural droughts, as well as integrated water management. This can empower water user groups that include marginalized users. As well preventing evaporative and spillage losses, this will help guarantee an adequate provision of freshwater resources. This also includes improving water resource assessments, sustainable water withdrawal, efficient use, early warning, and action to prevent situations where there is a depletion of water supplies and disaster-proofing water supply in areas exposed to hazards and climate-related shocks. This may also involve expanding partnerships with business actors to build stronger markets, with a focus on accelerating resilient and safe WASH services and products and frontier technologies.

### Climate-smart health services

**Develop climate smart strategies for health system infrastructures** by supporting the health sectors to develop climate resilience and adaptive strategies for new and existing health system infrastructure. This includes equipping health systems with new infrastructures, including the provision of renewable energy for health clinics and the reduction of healthcare waste. This contributes both to low-carbon development as well as resilience to climate and disaster shocks.

### Ensure environmental determinants of children’s health are reflected in prevention and treatment strategies.

This includes improved monitoring of environmental threats such as air pollution. It also includes identifying the changing health threats that children face due to climate and environmental factors and prioritizing health responses accordingly. This includes ensuring that climate and environmentally sensitive diseases are integrated into national and local disease surveillance mechanisms, as well as introducing policies and actions to reduce environmental threats to children’s health, such as air pollution or lead pollution.

**Support health sectors to better adapt and respond to environmental determinants of health.** This includes investing in quality maternal and newborn care services, sustaining immunization programmes, and supporting preventive, promotive, and curative services for pneumonia, diarrhoea, malaria, and other child health conditions. It can also involve supporting adolescent health and well-being and providing age-specific health information. Such actions require strengthening health systems to deliver integrated services for children.

### Climate-smart food and nutrition

**Increase capacity at community levels to assess local vulnerabilities to shifting food availability and diets, and sustain nutritional security for children, particularly during early childhood.** Developing and promoting local food chains will reduce the impact of trade disruptions and any disasters on food security. Localizing food systems will also generate jobs and income and increase the offer and consumption of fresh produce. Considering shorter value chains will significantly reduce emissions associated with the long-distance food trade.

**Establish anticipatory action mechanisms like climate risk monitoring and early warning systems** to reduce the effects of hazards on agri-food systems by linking nutrition actors and services to such systems at national, sub-national, and community levels.

**Incorporate nutritional requirements and goals into climate adaptation plans of the agricultural and social welfare sectors,** which meet the needs of the most vulnerable groups, including children.

### Climate-smart education systems

**Integrate climate change education in teaching, learning, and curriculum:** Climate change, DRR, and environmental education must be incorporated into formal and non-formal curriculum and textbooks, as well as professional development for educators. Climate change must also be part of the mental health and psychosocial support schools offer, as well as school leadership and management training programmes. Digital learning also offers significant opportunities. Green skills and transition to green jobs for adolescents and youth will be key to ensuring they can participate in the growing green economy. Skills-based learning is also essential to empower children, adolescents, youth, and teachers to actively participate in the shaping of adaptation and climate-resilience activities in schools, and to encourage them to become part of the solution to climate change. Improved education which builds knowledge and skills will also contribute to improved sustainability practices and a reduction in emissions at individual, institutional, and communal levels.

**Invest in climate resilient education systems.** Climate change must also be integrated into education sector plans, and education must be part of climate change plans and financing. Targeted climate change frameworks that include both mitigation and adaptation strategies can be developed, as well as contingency plans for emergencies, including the implementation of hybrid learning approaches and remote learning modalities. Coordination with multi-stakeholders is also key to ensuring a strong and supportive enabling environment.

**Invest in climate resilient infrastructure and DRR.** This includes conducting multi-hazard, child-centered risk assessments focused on the education sector, integrating climate change into Education Management Information Systems, and ensuring schools receive early warning on disasters - including those related to climate change. This also includes establishing procedures and protocols for disaster preparedness and risk reduction for schools and early childhood development centers, including the implementation of the [Comprehensive School Safety Framework](#). Investing in safe school guidelines and climate-resilient education infrastructure, supporting access to clean and sustainable energy sources, and climate and disaster-proofed WASH— helps ensure schools are safe for all children, especially girls.

### Climate-smart social protection

**Adaptive and shock-responsive social protection systems.** This includes improving the connection between social protection and early warning systems and climate data. It also requires a more humanitarian approach to be able to activate and respond timely to shocks and stresses, reaching the right people at the right time through methods like the pre-registration of vulnerable households.<sup>dccclxxiii</sup> The outreach of social protection programmes and structures to assist populations in a scalable and more sustainable way may be also beneficial for assuming an anticipatory approach. By connecting them both, climate risks can be proactively managed to reduce humanitarian needs and prevent climate shocks from becoming major humanitarian crises.

Doing so requires improving multi-hazard and risk-informed public finance management (PFM) processes so they can act beyond expenditure and disbursement by assessing and accounting for multi sector investments (linked to prevention, DRR, preparedness, response, and recovery), including investments in shock responsive social protection. This may also involve the use of innovative national, regional, and international climate finance tools for risk reduction, retention, and transfer due to the increasing frequency and intensity of climate-related disasters and slow onset events. Bringing a strong gender lens to adaptive and shock-responsive social protection can also build resilience through child benefits, family-friendly policies such as maternity benefits, and childcare or livelihoods programmes.

**Find synergies between climate finance and social budgets for children.** This includes identification of child-sensitive risk markers in climate finance mechanisms, as well as identifying where social budgets contribute to climate and environmental goals. Solutions must be devised that address the economic and non-economic losses and damages due to climate change and disasters, especially for the most marginalized, including children, to increase the adaptive capacities of the impacted population. Innovation and private sector investment must be utilized, where possible, and financial inclusion fostered for the poorest people by delivering cash transfers via mobile money mechanisms and electronic transfers, including in remote areas.

**Integrate climate, disaster, and environmental dimensions into child poverty analysis at sub-national levels.** UNICEF measures child poverty according to access to water and sanitation, play, nutrition, information, housing, health, education, and clothing. Incorporating a climate and environmental lens to child poverty analysis, as either a dimension or as an overlap, can help provide a picture of not only the potential for climate and environmental shocks and risk, but also provide a basis for targeting specific programmes and services to help families mitigate and adapt to the impacts, protect assets, and reduce child poverty.

### Climate-smart child protection systems

**Ensure that children are safe and protected from the impacts of climate change and associated disasters, including children who are forced to migrate internally or across borders.** Climate change stands to alter and disrupt child protection systems in many ways. When social and institutional systems breakdown due to a shock, children are increasingly susceptible to exploitation, abuse and physical harm. Even more vulnerable are boys and girls who are from poor families, children with disabilities, ethnic minorities, and refugees/migrant families. Child protection systems need to be made responsive to the increasing frequency and severity of these types of shocks. Migration as an adaptive strategy (both voluntary and forced) is already a reality for many children and their families impacted by the climate crisis. Without adequate protections put in place, children will increasingly be at risk of exploitation and abuse when on the move.

**Ensure children have continuation of learning when they move.** Children need to be provided with a continuity of learning even when forced to migrate. While there is no substitute to consistent formal education, one such innovative platform that can support children in the move is a “learning passport.” A “learning passport” is a digital, personalized platform that ensures displaced children and young people can continue their studies and have their achievements recorded, wherever they are. Every user has a personalized record of their learning history, that is unique to them, and can be taken across physical and digital borders subject to context. Whilst digital methods are important, supporting educational systems to physically accept students who have relocated is crucial.

**Establish legal frameworks for children to access their rights.** Children typically have limited access to formal judicial mechanisms. A framework with recommendations and a strategy for its implementation for children and young people, caregivers, civil society, and governments can support the empowerment of children to advance climate and environmental justice. Specifically, this includes addressing education, expression, and access to remedy and safety. The draft [General Comment 26](#), on children’s rights and the environment with a special focus on climate change, is one example of authoritative guidance on how children’s rights are impacted by the environmental crisis and what governments must do to uphold these rights.

**Address increased risks of gender-based violence (GBV) and harmful practices as a result of climate-related disasters.** Disasters increase the risks of different forms of violence, abuse, and harm especially for children and women. Actions focus on working with government, partners, and communities to prevent, mitigate, and respond to different forms of GBV, including child marriage, intimate partner violence, sexual exploitation, and abuse. There is a strong need to reduce risks of GBV across all sectors in humanitarian and climate-related preparedness and response including for education, health, nutrition, WASH, social protection, and child protection.



## Child-centred disaster risk reduction

The increasing frequency and severity of disaster events — exacerbated by an accelerating climate crisis, environmental degradation and lagging risk governance systems — require that all children need immediate action to build resilience. Natural hazard monitoring, forecasting, and multi-hazard early warning are all gaining traction in LDCs but are failing to be matched sufficiently by DRR measures that equip people with the information and skills they need to protect themselves when disasters strike. Few LDCs have comprehensive and child-centred DRR plans in place and **none of the “Extremely High Risk” countries, according to the CCRI, have an extremely high (>80 percent) score on the adoption and implementation of national DRR strategies in line with the Sendai Framework for DRR.** A comprehensive DRR strategy is a critical component to better protect children from the impacts of climate change.



© UNICEF/JUN0617656/Pedro

## Call to Action

Across the globe, climate change is taking a significant toll on children's development, well-being, survival, and future potential. As this report has illustrated, nowhere is this more acute than in LDCs.

---

Children in LDCs face a deadly combination of exposure to multiple climate and environmental hazards, shocks, and stresses, and a high vulnerability to climate change due to inadequate access to essential services.

**LDCs contribute less than 1 percent of global emissions (0.98 percent)<sup>46</sup>** – placing them among the least responsible parties for causing the crisis. Even the **top 10 LDC countries with largest contribution to global emissions only produce 0.71 percent of global CO<sub>2</sub> emissions**. This underscores the importance of high-emitting countries' responsibility to take immediate action to support the most vulnerable children, including those in LDCs.

The only long-term solution to the climate crisis is a reduction of emissions to safe levels – reaching net-zero by 2050 to stay on course for warming that does not exceed 1.5°C. However, climate dynamics are such that mitigation efforts will take decades to reverse the impacts of climate change, and for the children on the frontlines in LDCs, this will be too late.

Even with ambitious action to reduce emissions, everyone will be living in a world with higher global average temperatures than present. This means more droughts, flooding, and other climate-related disasters are inevitable. Urgent action is required today to improve the protection of children most at-risk, which includes:

---

<sup>46</sup> The sum percentage of global emissions of 46 LDC is 0.98% (rounded 1%).



## 1. Increase investments in climate adaptation and resilience for key services for children

To protect the health, safety, learning, and opportunities of every child, the social services they rely on – WASH, health, education, nutrition, social protection, and child protection – must be adapted and made resilient to the growing impacts of climate change.

Adaptation finance in child critical sectors remains critically underfunded and resourced, and climate finance mobilised by developed countries remains far short of commitments made and what is required to respond to the needs of children and families in LDCs. The failed collective goal of mobilizing USD 100 billion in climate finance per year, by 2020, for developing countries must be made up urgently, and the adaptation and resilience needs of LDCs adequately reflected in the new collective quantified goal on adaptation for 2025.

Capacity building and finance for adaptation to climate change must be scaled up including through comprehensive multi-stakeholder resilience-building measures for LDCs, leveraging the Green Climate Fund and existing measures and initiatives including (but not limited to) the National Adaptation Plan Global Network and the United Nations Capital Development Fund's Local Climate Adaptive Living Facility.<sup>dcclxxiv</sup> Governments and other funders must leverage and increase access to all available traditional, innovative, and alternative climate and risk-reduction finance mechanisms, to fill funding gaps and finance urgent and essential adaptation action in LDCs.

As outlined in [Article 9.4 of the Paris Agreement](#), the provision of scaled-up financial resources should be intended to achieve a balance between adaptation and mitigation, taking into account country driven strategies, and the priorities and needs of developing country parties, especially those that are particularly vulnerable to the adverse effects of climate change and have significant capacity constraints, such as the LDCs, considering the need for public and grant-based resources for adaptation.



## 2. Reduce greenhouse gas emissions

The latest [IPCC Working Group II report](#) is clear that there is no climate resilient development for vulnerable countries above 1.5°C. The very survival of children in LDCs is at stake. To avert the worst impacts, comprehensive and urgent action is required to close the 2030 emissions gap. Countries must cut their emissions by at least 50 percent (compared to 2010 levels) by 2030, and net zero by mid-century to keep warming to no more than 1.5°C.



## 3. Offer and scale green skills training and capacity-building

Every child should have the education and green skills to adapt to a changing climate and environment, to prepare and respond to disasters, and to create a more sustainable world. Green skills-building — such as the ability to gather and interpret climate data and identify and implement climate-friendly technologies, empowers young people to participate in the growing green economy and lay the path from livelihoods that will be less viable due to climate change. Climate change education enables children and young people to participate in climate adaptation, and resilience activities; to influence household behaviour; and ultimately drive greater national action and commitments to address and respond to the climate crisis. Children should also have access to DRR education, including all aspects of school and community disaster management, and learn safety rules for specific hazards.



#### **4. Include children and young people in climate adaptation and resilience-building plans, policies, and decision-making**

National climate change and DRR policies, plans, and finance should prioritize building the adaptation and resilience of essential social services that children depend on most. They must be inclusive and supportive of all children and young people's rights, participation, and roles as stakeholders and drivers of change. This includes integrating child sensitivity indicators and identifying adaptation measures which target priority social services into NDCs and NAPs.

Further, children and young people must be included and consulted on all national, regional, and international climate negotiations and decision-making processes, including contributing to the implementation and review of the [2022-2031 Doha Programme of Action](#). This requires commitments to strengthen meaningful child and youth participation mechanisms, in policies and activities that enhance sustainable development efforts.

Every child and young person in LDCs – should be protected from the worst impacts of climate change and environmental degradation, as well as provided with the resources and capabilities to be part of the solution in addressing the planetary crisis.

# References

- i** UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index*, 2021.
- ii** Department of Economic and Social Affairs (UNDESA), The Least Developed Country Category: 2021. Country Snapshots, 2021. [www.un.org/development/desa/dpad/wp-content/uploads/sites/45/Snapshots2021.pdf](http://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/Snapshots2021.pdf).
- iii** UNDESA, LDC Identification Criteria & Indicators, 2020. [www.un.org/development/desa/dpad/least-developed-country-category/ldc-criteria.html](http://www.un.org/development/desa/dpad/least-developed-country-category/ldc-criteria.html).
- iv** UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index*, 2021.
- v** OECD, *States of Fragility 2022*, 2022.
- vi** UNICEF, Fast facts WASH in conflict, 2019. [www.unicef.org/stories/fast-facts-water-sanitation-hygiene-conflict](http://www.unicef.org/stories/fast-facts-water-sanitation-hygiene-conflict).
- vii** UNICEF, Children uprooted in a changing climate: Turning challenges into opportunities with and for young people on the move, 2022. <https://www.unicef.org/environment-and-climate-change/migration>.
- viii** Internal Displacement Monitoring Centre (IDMC), *Global Report on Internal Displacement*, 2021.
- ix** IDMC, *Global Report on Internal Displacement*, 2022.
- x** UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index*, 2021.
- xi** The UN Refugee Agency (UNCHR) UK, *Global Trends Report 2021*, 2021.
- xii** Jones, D.H., and Grove, A. T., Chad, Encyclopedia Britannica, 2021. [www.britannica.com/place/Chad](http://www.britannica.com/place/Chad).
- xiii** Food and Agriculture Organization of the United Nations (FAO). Water for Life Voices Knowledge Bank, Shrinking Lake Chad humanitarian impacts, n.d., [www.un.org/waterforlifedecade/waterforlifevoices/cases\\_fao\\_lake\\_chad.shtml](http://www.un.org/waterforlifedecade/waterforlifevoices/cases_fao_lake_chad.shtml).
- xiv** ClimateWatch, Top 10 Greenhouse Gas Emitters: 2019, 2019. [www.climatewatchdata.org/key-visualizations?visualization=2](http://www.climatewatchdata.org/key-visualizations?visualization=2).
- xv** UNFCCC. Conference of the Parties (COP), Copenhagen Accord, 2009. <https://unfccc.int/documents/6103#beg>.
- xvi** UNFCCC (COP), Cancun Agreements, 2010 <https://unfccc.int/process/conferences/pastconferences/cancun-climate-change-conference-november-2010/statements-and-resources/Agreements>.
- xvii** UNFCCC (COP), The Paris Agreement, 2015 <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>.
- xviii** OECD, *Climate Finance Provided and Mobilised by Developed Countries in 2016-2020: Insights from Disaggregated Analysis, Climate Finance and the USD 100 Billion Goal*, 2022.
- xix** United Nations Environment Programme (UNEP) *Adaptation Gap Report 2022*, 2022.
- xx** OECD, *Climate Finance Provided and Mobilised by Developed Countries in 2016-2020: Insights from Disaggregated Analysis, Climate Finance and the USD 100 Billion Goal*, 2022.
- xxi** Ibid.
- xxii** Ibid.
- xxiii** OECD, *Aggregate Trends of Climate Finance Provided and Mobilised by Developed Countries in 2013-2020, Climate Finance and the USD 100 Billion Goal*, 2022.
- xxiv** OECD, *Climate Finance Provided and Mobilised by Developed Countries in 2016-2020: Insights from Disaggregated Analysis, Climate Finance and the USD 100 Billion Goal*, 2022.
- xxv** Ibid.
- xxvi** Ibid.
- xxvii** United Nations Environment Programme (UNEP) *Adaptation Gap Report 2022*, 2022.
- xxviii** OECD, *Climate Finance Provided and Mobilised by Developed Countries in 2016-2020: Insights from Disaggregated Analysis, Climate Finance and the USD 100 Billion Goal*, 2022.
- xxix** Ibid.
- xxx** Ibid.
- xxxi** Ibid.
- xxxii** Doshi, D., and Matthias, G. "Understanding Adaptation Finance Allocation: Which Factors Enable or Constrain Vulnerable Countries to Access Funding?" *Sustainability* 12, no. 10: 4308, 25 May 2020. <https://doi.org/10.3390/su12104308>.
- xxxiii** International Monetary Fund (IMF). Swapping Debt for Climate or Nature Pledges Can Help Fund Resilience, 2022. [www.imf.org/en/Blogs/Articles/2022/12/14/swapping-debt-for-climate-or-nature-pledges-can-help-fund-resilience](http://www.imf.org/en/Blogs/Articles/2022/12/14/swapping-debt-for-climate-or-nature-pledges-can-help-fund-resilience).
- xxxiv** IPCC, *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]*. IPCC, Geneva, Switzerland, 151 pp, 2014.
- xxxv** UNICEF EAPRO, *Investment Case for Child-Centred Climate Actions in the Context of COVID-19 in East Asia and the Pacific*, 2021.
- xxxvi** Ibid.
- xxxvii** The World Bank Group and Asian Development Bank, *Climate Risk Country Profile: Cambodia*, 2021.
- xxxviii** Mekong River Commission. *Adaptation to Climate Change in the Countries of the Lower Mekong Basin: Regional Synthesis Report; MRC Technical Paper No. 24, Mekong River Commission: Vientiane, Lao*, 2009.
- xxxix** The World Bank Group and Asian Development Bank, *Climate Risk Profile: Cambodia*, 2021.
- xl** Boyer, S., Marcombe, S., Yean, S., Fontenille, D. *High diversity of mosquito vectors in Cambodian primary schools and consequences for arbovirus transmission*. PLoS One, 2020 Jun 5;15(6):e0233669.
- xli** The Mirror. Environmental Pollution Has to Be Reduced in Four Industrial Target Areas, Expat Advisory Services, 2010. [www.expats-advisory.com/articles/southeast-asia/cambodia/environmental-pollution-has-be-reduced-four-industrial-target-areas](http://www.expats-advisory.com/articles/southeast-asia/cambodia/environmental-pollution-has-be-reduced-four-industrial-target-areas).
- xlii** World Bank Group, Climate Change Knowledge Portal For Development Practitioners and Policy Makers, Cambodia Key Vulnerabilities. <https://climateknowledgeportal.worldbank.org/country/cambodia/vulnerability>, accessed 29 December 2022.
- xliii** Dasgupta, S., Laplante, B., Murray, S. and Wheeler, D. *Exposure of developing countries to sea-level rise and storm surges*. *Climatic Change*, 106(4), 2011.
- xliv** Key Indicator Report, Cambodia Demographic and Health Survey (2021-22), MOP/MOH.
- xlv** Ibid.
- xlvi** Ibid.
- xlvii** Global Nutrition Report, Country Nutrition Profiles: Cambodia, 2020. <https://globalnutritionreport.org/resources/nutrition-profiles/asia/south-eastern-asia/cambodia/>.
- xlviii** Springmann, M., Mason-D'Croz, D., Robinson, S., Garnett, T., Godfray, H. C. J., Gollin, D., Scarborough, P. *Global and regional health effects of future food production under climate change: a modelling study*. *Lancet*. 2016 May 7;387(10031):1937-46.
- xlix** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Cambodia, 2020. <https://washdata.org/data/household#/table?geo0=country&geo1=KHM>.
- l** Ibid.
- li** UNICEF, Indicator: Children living in households with income below the national poverty line (as a % of all children), Cambodia, 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=.PV\\_CHLD\\_INCM-PL.&startPeriod=2010&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=.PV_CHLD_INCM-PL.&startPeriod=2010&endPeriod=2020)
- lii** The World Bank, Cambodia: Reducing Poverty and Sharing Prosperity, 2019. [www.worldbank.org/en/results/2019/10/30/cambodia-reducing-poverty-and-sharing-prosperity](http://www.worldbank.org/en/results/2019/10/30/cambodia-reducing-poverty-and-sharing-prosperity).
- liii** UNICEF, Cambodia Indicator: Adjusted net attendance rate for children of primary school age, 2014. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=KHM.ED\\_ANAR\\_L1.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=KHM.ED_ANAR_L1.&startPeriod=1970&endPeriod=2023).
- liv** UNICEF Cambodia. *Education*, n.d. [www.unicef.org/cambodia/education](http://www.unicef.org/cambodia/education).
- lv** UNICEF Cambodia, *Learning Loss in the Covid-19 Pandemic Era: Evidence from the 2016-2021 Grade Six National Learning Assessment in Cambodia*, 2022.
- lvi** The World Bank Group and Asian Development Bank, *Climate Risk Profile: Lao PDR*, 2021.
- lvii** Ibid.
- lviii** Ibid.
- lix** WHO, *Climate and Health Country Profile: Lao People's Democratic Republic*, Geneva, Switzerland 2015.
- lx** Ibid.
- lxi** EANET Acid Deposit Monitoring Network in East Asia. *Lao PDR: Policies and practices concerning Acid Deposition*, 2020. [www.eanet.asia/wp-content/uploads/2020/04/5-Lao-PDR\\_Factsheet\\_compressed.pdf](http://www.eanet.asia/wp-content/uploads/2020/04/5-Lao-PDR_Factsheet_compressed.pdf).

- lxii** World Bank Group, Climate Change Knowledge Portal For Development Practitioners and Policy Makers, Laos PDR Key Vulnerabilities, n.d. <https://climateknowledgeportal.worldbank.org/country/lao-pdr/vulnerability> accessed 11 January 2023.
- lxiii** UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index*, 2021.
- lxiv** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Lao People's Democratic Republic, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=LAO>.
- lxv** Ibid.
- lxvi** Educational Management Information System (EMIS), (2017) UNICEF, as cited in Safe Water, Sanitation and Good Hygiene Practices. [www.unicef.org/laos/wash](http://www.unicef.org/laos/wash).
- lxvii** World Bank Group, Climate Change Knowledge Portal For Development Practitioners and Policy Makers, Laos PDR Key Vulnerabilities, n.d. <https://climateknowledgeportal.worldbank.org/country/lao-pdr/vulnerability> accessed 11 January 2023.
- lxviii** UNICEF, Lao People's Democratic Republic, Indicator: Under-five mortality rate, 2021. <https://www.unicef.org/Lao/water-sanitation-hygiene-and-climate-change-resilience>
- lxix** UNICEF, Lao People's Democratic Republic, Indicator: Under Percentage of children who received the 2nd dose of measles-containing vaccine, as per administered in the national schedule, 2021. [www.unicef.org/Lao/water-sanitation-hygiene-and-climate-change-resilience](http://www.unicef.org/Lao/water-sanitation-hygiene-and-climate-change-resilience).
- lxx** The World Bank, Prevalence of stunting, height for age (% of children under 5), 2017. <https://data.worldbank.org/indicator/SH.STA.STNT.ZS>.
- lxxi** The World Bank, Lao PDR Poverty Profile and Poverty Assessment 2020, 2020. [www.worldbank.org/en/country/lao/publication/lao-pdr-poverty-profile-and-poverty-assessment-2020](http://www.worldbank.org/en/country/lao/publication/lao-pdr-poverty-profile-and-poverty-assessment-2020).
- lxxii** Ibid.
- lxxiii** UNICEF Lao People's Democratic Republic, Education, n.d. [www.unicef.org/laos/education](http://www.unicef.org/laos/education).
- lxxiv** UNICEF Lao People's Democratic Republic, Education, n.d. [www.unicef.org/laos/education](http://www.unicef.org/laos/education).
- lxxv** United Nations Office for the Coordination of Humanitarian Affairs (OCHA) Myanmar Humanitarian Update No. 10 | 27 August 2021, 2021. <https://reliefweb.int/report/myanmar/myanmar-humanitarian-update-no-10-27-august-2021>.
- lxxvi** Ibid.
- lxxvii** WHO Myanmar, Help Prevent Malaria, WHO Myanmar newsletter special, September 2018. Available at: [www.who.int/docs/default-source/searo/myanmar/help-prevent-malaria-\(english\).pdf?sfvrsn=7e71af10\\_0](http://www.who.int/docs/default-source/searo/myanmar/help-prevent-malaria-(english).pdf?sfvrsn=7e71af10_0).
- lxxviii** Ibid.
- lxxix** The Global Fund, Myanmar makes major progress fighting Malaria, 2020. [www.theglobalfund.org/en/stories/2020/2020-09-14-myanmar-makes-major-progress-fighting-malaria/](http://www.theglobalfund.org/en/stories/2020/2020-09-14-myanmar-makes-major-progress-fighting-malaria/).
- lxxx** IQAir, Air quality in Yangon, 2023. [www.iqair.com/myanmar/yangon](http://www.iqair.com/myanmar/yangon).
- lxxxi** UNICEF Myanmar, UNICEF, Government and partners convene to jointly address the impact of air pollution on children in Myanmar, 2019. [www.unicef.org/myanmar/press-releases/unicef-government-and-partners-convene-jointly-address-impact-air-pollution-children](http://www.unicef.org/myanmar/press-releases/unicef-government-and-partners-convene-jointly-address-impact-air-pollution-children).
- lxxxii** Lwin, T.Z., Than, A.A., Min, A.Z., Robson, M.G., & Siriwong, W. Effects of pesticide exposure on reproductivity of male groundnut farmers in Kyauk Kan village, Nyaung-U, Mandalay region, Myanmar. *Risk Manag. Healthc. Policy*, 2018, 11, 235–241.
- lxxxiii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Myanmar, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=MMR>.
- lxxxiv** UNICEF Myanmar, Water, sanitation, and hygiene (WASH), n.d. [www.unicef.org/myanmar/water-sanitation-and-hygiene-wash](http://www.unicef.org/myanmar/water-sanitation-and-hygiene-wash).
- lxxxv** World Health Organization and UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation, *Progress on Drinking Water, Sanitation and Hygiene in Schools*, UNICEF, New York, 2020.
- lxxxvi** UNICEF Myanmar, Water, sanitation, and hygiene (WASH), n.d. [www.unicef.org/myanmar/water-sanitation-and-hygiene-wash](http://www.unicef.org/myanmar/water-sanitation-and-hygiene-wash).
- lxxxvii** UNICEF, Myanmar Indicator: Skilled birth attendant - percentage of deliveries attended by skilled health personnel, 2016. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=MMR.MNCH\\_SAB.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=MMR.MNCH_SAB.&startPeriod=1970&endPeriod=2023).
- lxxxviii** UNDP, Pandemic and political crisis could result in half of Myanmar's population living in poverty by 2022, UNDP says. [www.undp.org/press-releases/pandemic-and-political-crisis-could-result-half-myanmar-s-population-living-poverty](http://www.undp.org/press-releases/pandemic-and-political-crisis-could-result-half-myanmar-s-population-living-poverty).
- lxxxix** ILO, Social Protection: Myanmar, 2019. [www.undp.org/press-releases/pandemic-and-political-crisis-could-result-half-myanmar-s-population-living-poverty-2022-undp-says](http://www.undp.org/press-releases/pandemic-and-political-crisis-could-result-half-myanmar-s-population-living-poverty-2022-undp-says).
- xc** UNICEF, Myanmar Indicator: Adjusted net attendance rate for children of primary school age, 2016. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=MMR.ED\\_ANAR\\_L1.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=MMR.ED_ANAR_L1.&startPeriod=1970&endPeriod=2023).
- xcii** UNICEF, Myanmar Indicator: Literacy rate for 15-24 years, 2019. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=MMR.ED\\_15-24\\_LR.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=MMR.ED_15-24_LR.&startPeriod=1970&endPeriod=2023).
- xciii** The World Bank, Land area (sq. km) -Solomon Islands, 2020. <https://data.worldbank.org/indicator/AG.LND.TOTL.K2?locations=SB>.
- xciiii** Taylor, S. The Vulnerability of Health Infrastructure to the Impacts of Climate Change and Sea Level Rise in Small Island Countries in the South Pacific. *Health Services Insights*, Vol.14, 2021.
- xcv** The World Bank Group, *Climate Risk Country Profile: Solomon Islands*, 2021.
- xcvi** Secretariat of the Pacific Regional Environment Programme (SPREP). *Solomon Islands State of Environment Report, 2019*, 2019.
- xcvii** The World Bank, Safer, Cleaner Water and Sanitation for Solomon Islanders, 2019. [www.worldbank.org/en/news/press-release/2019/05/16/safer-cleaner-water-and-sanitation-for-solomon-islanders](http://www.worldbank.org/en/news/press-release/2019/05/16/safer-cleaner-water-and-sanitation-for-solomon-islanders).
- xcviii** SPREP, *Solomon Islands State of Environment Report*, 2019.
- xcix** The World Bank Group, *Climate Risk Country Profile: Solomon Islands*, 2021.
- c** Ministry of Environment, Climate change, Disaster Management, and Meteorology, Second National Communication of the Solomon Islands to the UNFCCC, 2017. [https://unfccc.int/sites/default/files/resource/SI\\_percent20SNC\\_percent20FINAL\\_1-1.pdf](https://unfccc.int/sites/default/files/resource/SI_percent20SNC_percent20FINAL_1-1.pdf).
- ci** The World Bank Group, *Climate Risk Country Profile: Solomon Islands*, 2021.
- cii** Australian Bureau of Meteorology and CSIRO. *Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports*. Pacific-Australia Climate Change Science and Adaptation Planning Program Technical Report, Australian Bureau of Meteorology and CSIRO, Melbourne, Australia, 2014.
- ciii** SPREP, *Solomon Islands State of Environment Report*, 2019.
- civ** Australian Bureau of Meteorology and CSIRO. *Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports*. Pacific-Australia Climate Change Science and Adaptation Planning Program Technical Report, Australian Bureau of Meteorology and CSIRO, Melbourne, Australia, 2014.
- cv** Reid, K. World Vision, Solomon Islands: Earthquakes, tsunamis, volcanoes, and floods, 2018. [www.worldvision.org/disaster-relief-news-stories/solomon-islands-earthquakes-tsunamis-volcanoes-floods-facts#FAQ](http://www.worldvision.org/disaster-relief-news-stories/solomon-islands-earthquakes-tsunamis-volcanoes-floods-facts#FAQ).
- cv** Ibid.
- cvii** WHO & UNICEF, Joint Monitoring Programme: Schools WASH data Solomon Islands, 2020. <https://washdata.org/data/school#!/table?geo0=country&geo1=SLB>.
- cviii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Solomon Islands, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=SLB>.
- cx** UNICEF, Thousands of Pacific Island children at risk in the aftermath of Tropical Cyclone Harold, 2020. [www.unicef.org/press-releases/thousands-pacific-island-children-risk-aftermath-tropical-cyclone-harold](http://www.unicef.org/press-releases/thousands-pacific-island-children-risk-aftermath-tropical-cyclone-harold).
- cx** UNICEF, Solomon Islands Indicator: Neonatal mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=SLB.CME\\_MRM0.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SLB.CME_MRM0.&startPeriod=1970&endPeriod=2023).
- cx** UNICEF, Solomon Islands Indicator: Infant mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=SLB.CME\\_MRY0.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SLB.CME_MRY0.&startPeriod=1970&endPeriod=2023).
- cx** UNICEF, Solomon Islands Indicator: Child mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=SLB.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SLB.CME_MRY0T4.&startPeriod=1970&endPeriod=2023).
- cxii** UNICEF, Indicator: Children living in households with income below the national poverty line (as a % of all children), Solomon Islands, 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=.PV\\_CHLD\\_INCM-PL.&startPeriod=2010&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=.PV_CHLD_INCM-PL.&startPeriod=2010&endPeriod=2020).
- cxiii** Action On Poverty, Solomon Islands, n.d. <https://actiononpoverty.org/%20our-impact/where-we-work/solomon-islands/#:~:text=The%20Solomon%20%20Islands%20is%20one,%2C%20tropical%20cyclones%2C%20and%20tsunamis.>
- cxiv** The World Bank, Solomon Islands: Human Capital Index, 2020. [https://databankfiles.worldbank.org/public/ddpext\\_download/hci/HCI\\_2pager\\_SLB.pdf](https://databankfiles.worldbank.org/public/ddpext_download/hci/HCI_2pager_SLB.pdf).
- cxv** Coram International & UNICEF Pacific, *Situation Analysis of Children in the Pacific Island Countries*, 2021.



- cxvi** UNICEF, Solomon Islands Indicator: Adjusted net attendance rate for children of primary school age, 2015. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=SLB.ED\\_ANAR\\_L1.&startPeriod=1970&endPeriod=2022](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SLB.ED_ANAR_L1.&startPeriod=1970&endPeriod=2022).
- cxvii** WHO & UNICEF, Joint Monitoring Programme: Schools WASH data Solomon Islands, 2020. <https://washdata.org/data/school#!/table?geo0=country&geo1=SLB>.
- cxviii** Pacific Community (SPC), *The status of Pacific education: a sector analysis based on internationally comparable statistics*, 2021.
- cxix** Coram International & UNICEF Pacific, *Situation Analysis of Children in the Pacific Island Countries*, 2021.
- cxx** UNICEF, *Regional call to action horn of Africa drought crisis: climate change is here now*, 2022.
- cxixi** UNICEF, Angola Indicator: Percentage of households with at least one insecticide-treated mosquito net (ITN), 2016. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=AGO.MNCH\\_ITNOWN.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=AGO.MNCH_ITNOWN.&startPeriod=1970&endPeriod=2023).
- cxixii** Silvano, J., & Abreu, C. Dengue fever in Portuguese speaking countries: which epidemiological links may we set?. *Acta Medica Portuguesa*. 2014, 27(4):503–510.
- cxixiii** World Food Programme (WFP) Drought in south-western Angola drives severe hunger, 2021. [www.wfp.org/news/drought-south-western-angola-drives-severe-hunger](http://www.wfp.org/news/drought-south-western-angola-drives-severe-hunger).
- cxixiv** African Center for Strategic Studies. How Global Warming Threatens Human Security in Africa, 2021. <https://africacenter.org/spotlight/how-global-warming-threatens-human-security-in-africa/>.
- cxixv** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- cxixvi** Ibid.
- cxixvii** International Association for Medical Assistance to Travellers (IAMAT), Angola General Health Risks: Air Pollution, 2021. [www.iamat.org/country/angola/risk/air-pollution](http://www.iamat.org/country/angola/risk/air-pollution).
- cxixviii** The World Bank, Mortality rate attributed to household and ambient air pollution, age standardized (per 100,000 population), 2016. <https://data.worldbank.org/indicator/SH.STA.AIRP.P5>.
- cxixix** França, F., Muteca, F., & Oliveira, F. Bioremediation of fluvial sediment contaminated by Angolan crude oil. *Brazilian Journal of Petroleum and Gas*, 2015, 8: 139–149.
- cxixx** Majavu, A. (2022) The mine leak was bad. The DRC and Angola's response are no better, report says. <https://news.mongabay.com/2022/10/the-mine-leak-was-bad-the-drc-and-angolas-response-are-no-better-report-says/#:~:text=In%20July%202021%2C%20an%20Angolan,affected%20by%20the%20polluted%20water>.
- cxixxi** UNICEF, Angola Indicator: Proportion of population using at least basic drinking water services, 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=AGO.WS\\_PPL\\_W-ALB.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=AGO.WS_PPL_W-ALB.&startPeriod=1970&endPeriod=2023).
- cxixxii** UNICEF, Humanitarian Action for Children: Angola, 2022. [www.unicef.org/media/131461/file/2023-HAC-Angola.pdf](http://www.unicef.org/media/131461/file/2023-HAC-Angola.pdf).
- cxixxiii** UNICEF, Angola: Indicator: Proportion of population using at least basic sanitation services, 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=AGO.WS\\_PPL\\_S-ALB.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=AGO.WS_PPL_S-ALB.&startPeriod=1970&endPeriod=2023).
- cxixxiv** UNICEF, Angola: Indicator: Under-five mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=AGO.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2021](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=AGO.CME_MRY0T4.&startPeriod=1970&endPeriod=2021).
- cxixxv** Lombana C., Camilo, A, Luis, A., Da Costa, L, A.M. Fenwick, C. *Diagnosing Angola's WASH Sector : An Urgent Call to Action*. World Bank, 2021.
- cxixxvi** INE et al., 2017a. As Cited in: Lombana C., Camilo, A, Luis, A., Da Costa, L, A.M. Fenwick, C. *Diagnosing Angola's WASH Sector : An Urgent Call to Action*. World Bank, 2021.
- cxixxvii** UNICEF, Humanitarian Action for Children: Angola, 2022. [www.unicef.org/media/131461/file/2023-HAC-Angola.pdf](http://www.unicef.org/media/131461/file/2023-HAC-Angola.pdf).
- cxixxviii** Ibid.
- cxixxix** Organization of the Petroleum Exporting Countries (OPEC) Angola facts and figures, 2021. [https://www.opec.org/opec\\_web/en/about\\_us/147.htm](https://www.opec.org/opec_web/en/about_us/147.htm).
- cxli** International Labour Organization (ILO) Social Protection Angola, 2019. <https://www.social-protection.org/gimi/ShowCountryProfile.action?iso=AO>
- cxlii** Prates, M., UNICEF, Where drinking water is a 90-minute walk away, 2019. [www.unicef.org/stories/where-drinking-water-90-minute-walk-away](http://www.unicef.org/stories/where-drinking-water-90-minute-walk-away).
- cxliii** Levantamento feito pelo GEPE-MED Junto dos Gabinetes Provinciais da Educação.
- cxliiii** UNICEF, Humanitarian Action for Children: Angola, 2022. [www.unicef.org/media/131461/file/2023-HAC-Angola.pdf](http://www.unicef.org/media/131461/file/2023-HAC-Angola.pdf).
- cxliiv** UNICEF, Humanitarian Action for Children: Angola, 2021. [www.unicef.org/media/86381/file/2021-HAC-Angola.pdf](http://www.unicef.org/media/86381/file/2021-HAC-Angola.pdf).
- cxliv** UNEP, Technical Highlight: Chemicals & Pollution Action, *Burundi tackles chemicals and waste management with circular economy principles*, 2022. [www.unep.org/technical-highlight/burundi-tackles-chemicals-and-waste-management-circular-economy-principles](http://www.unep.org/technical-highlight/burundi-tackles-chemicals-and-waste-management-circular-economy-principles).
- cxlv** Ibid.
- cxlvii** UNICEF, Burundi Humanitarian Situation Report No.4, 2020. [www.unicef.org/media/91936/file/Burundi-Humanitarian-SitRep-December-2020.pdf](http://www.unicef.org/media/91936/file/Burundi-Humanitarian-SitRep-December-2020.pdf).
- cxlviii** UNICEF, Humanitarian Situation Report No.3: Burundi, 2022. [www.unicef.org/media/129566/file/Burundi-Humanitarian-Situation-Report-No.3-%2030-September-2022.pdf](http://www.unicef.org/media/129566/file/Burundi-Humanitarian-Situation-Report-No.3-%2030-September-2022.pdf).
- cxlix** UNICEF Burundi, *The impact of climate, energy, and environment on children and their families in Burundi*, 2022.
- cl** World Bank Group, Climate Change Knowledge Portal For Development Practitioners and Policy Makers, Burundi Key Vulnerabilities, n.d. <https://climateknowledgeportal.worldbank.org/country/burundi/vulnerability> accessed 11 January 2023.
- cli** UNICEF, Burundi Humanitarian Situation Report No.4, 2020. [www.unicef.org/media/91936/file/Burundi-Humanitarian-SitRep-December-2020.pdf](http://www.unicef.org/media/91936/file/Burundi-Humanitarian-SitRep-December-2020.pdf).
- clii** UNICEF Burundi, *The impact of climate, energy, and environment on children and their families in Burundi*, 2022.
- cliii** Ibid.
- cliv** UNICEF, Burundi: Indicator: Under-five mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=BDI.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=BDI.CME_MRY0T4.&startPeriod=1970&endPeriod=2023).
- cliv** UNICEF, Humanitarian Situation Report No.3: Burundi, 2022. [www.unicef.org/media/129566/file/Burundi-Humanitarian-Situation-Report-No.3-%2030-September-2022.pdf](http://www.unicef.org/media/129566/file/Burundi-Humanitarian-Situation-Report-No.3-%2030-September-2022.pdf).
- clvi** UNICEF Burundi, *The impact of climate, energy, and environment on children and their families in Burundi*, 2022.
- clvii** The World Bank, Prevalence of stunting, height for age (% of children under 5), 2020. <https://data.worldbank.org/indicator/SH.STA.STNT.ZS>.
- clviii** UNICEF, Indicator: Children living in households with income below the national poverty line: Burundi, 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=.PV\\_CHLD\\_INCM-PL.&startPeriod=2010&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=.PV_CHLD_INCM-PL.&startPeriod=2010&endPeriod=2020).
- clix** African Development Bank Group, Burundi - National Climate Change Profile, 2019. [www.afdb.org/en/documents/burundi-national-climate-change-profile](http://www.afdb.org/en/documents/burundi-national-climate-change-profile).
- clx** Ibid.
- clxi** UNICEF Burundi, *The impact of climate, energy, and environment on children and their families in Burundi*, 2022.
- clxii** Ibid.
- clxiii** Ibid.
- clxiv** UNICEF, *Regional call to action horn of Africa drought crisis: climate change is here now*, 2022.
- clxv** The World Bank, The World Bank in Eritrea: Overview, 2021. [www.worldbank.org/en/country/eritrea/overview#1](http://www.worldbank.org/en/country/eritrea/overview#1).
- clxvi** WHO Eritrea Country Office & WHO, *Annual Report 2020: Journey towards GPW13 Goals through the achievement of UHC in Eritrea*, Asmara, Eritrea, 2020.
- clxvii** WHO Eritrea Country Office & WHO, *Annual Report 2020: Journey towards GPW13 Goals through the achievement of UHC in Eritrea*, Asmara, Eritrea, 2020.
- clxviii** UNICEF, Country Office Annual Report, 2020. [www.unicef.org/media/100656/file/Eritrea-2020-COAR.pdf](http://www.unicef.org/media/100656/file/Eritrea-2020-COAR.pdf)
- clxix** UNICEF, Eritrea Country Office Humanitarian Situation Report No. 16, 2021. [www.unicef.org/documents/eritrea-humanitarian-situation-report-mid-year-2021](http://www.unicef.org/documents/eritrea-humanitarian-situation-report-mid-year-2021).
- clxx** The World Bank, The World Bank in Eritrea: Overview, 2021. [www.worldbank.org/en/country/eritrea/overview#1](http://www.worldbank.org/en/country/eritrea/overview#1).
- clxxi** UNICEF, Country Profiles Eritrea: Key Demographic Indicators: Education. Indicator: Adjusted net attendance rate, one year before the official primary entry age & Adjusted net attendance rate for children of primary school age, 2010. <https://data.unicef.org/country/eri/>.
- clxxii** UNICEF, Eritrea. Key Demographic Indicators: Education. Indicator: Youth literacy rate for 15-24 years, 2018. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=ERI.ED\\_15-24\\_LR.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=ERI.ED_15-24_LR.&startPeriod=1970&endPeriod=2023).
- clxxiii** Ministry of Education, Essential Education Indicators, 2021. As cited in: UNICEF, Eritrea Humanitarian Action for Children, 2023. [www.unicef.org/media/131891/file/2023-HAC-Eritrea.pdf](http://www.unicef.org/media/131891/file/2023-HAC-Eritrea.pdf).
- clxxiv** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- clxxv** Ibid.

- clxxvi** Demie, G. Analyzing soil contamination status in garage and auto mechanical workshops of Shashemane City: implication for hazardous waste management. *Environmental Systems Research*, 2015, 4(1): 15.
- clxxvii** Haile, T., & Abiye, T.A. Environmental impact and vulnerability of the surface and ground water system from municipal solid waste disposal site: Koshe, Addis Ababa. *Environmental Earth Sciences*, 2012, 67(1): 71–80.
- clxxviii** The World Bank Group, Climate Risk Country Profile: Ethiopia, 2021.
- clxxix** IQAir, Air Quality in Ethiopia, 2021. [www.iqair.com/ethiopia](http://www.iqair.com/ethiopia).
- clxxx** UNICEF, *Regional call to action horn of Africa drought crisis: climate change is here now*, 2022.
- clxxxi** UNICEF, Humanitarian Action for Children, Ethiopia, 2022. [www.unicef.org/appeals/ethiopia](http://www.unicef.org/appeals/ethiopia).
- clxxxii** UNICEF, Ethiopia Humanitarian Situation Report No.11, 2022. [www.unicef.org/media/132866/file/UNICEF\\_Ethiopia\\_Humanitarian\\_Situation\\_Report\\_No.\\_11\\_-\\_November\\_2022.pdf](http://www.unicef.org/media/132866/file/UNICEF_Ethiopia_Humanitarian_Situation_Report_No._11_-_November_2022.pdf).
- clxxxiii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Ethiopia, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=ETH>.
- clxxxiv** Ibid.
- clxxxv** UNICEF Ethiopia, Water, Sanitation, and Hygiene, n.d. Available at: <https://www.unicef.org/ethiopia/water-sanitation-and-hygiene-wash>
- clxxxvi** UNICEF (date) Ethiopia: Survival and health. [www.unicef.org/ethiopia/survival-and-health](http://www.unicef.org/ethiopia/survival-and-health). Accessed 02 January 2023.
- clxxxvii** UNICEF, Indicator: Under-five mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=ETH.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=ETH.CME_MRY0T4.&startPeriod=1970&endPeriod=2023).
- clxxxviii** UNICEF Ethiopia, Water, Sanitation, and Hygiene, n.d. Available at: <https://www.unicef.org/ethiopia/water-sanitation-and-hygiene-wash>
- clxxxix** UNICEF, *Regional call to action horn of Africa drought crisis: climate change is here now*, 2022.
- cx** UNICEF, Indicator: Children living in households with income below the national poverty line (as a % of all children), 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=.PV\\_CHLD\\_INCM-PL..&startPeriod=2010&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=.PV_CHLD_INCM-PL..&startPeriod=2010&endPeriod=2020).
- cxci** UNICEF Ethiopia, Learning and Development, n.d. [www.unicef.org/ethiopia/learning-and-development](http://www.unicef.org/ethiopia/learning-and-development). Accessed 03 January 2023.
- cxcii** Ibid.
- cxci** Ibid.
- cxci** Ibid.
- cxci** Maluti Community Development Forum, Large-Scale Diamond Mining in Lesotho: unpacking its Impact on Adjacent Communities, 2021. [https://media.business-humanrights.org/media/documents/KPCSC\\_Grassroots\\_Research\\_Lesotho.pdf](https://media.business-humanrights.org/media/documents/KPCSC_Grassroots_Research_Lesotho.pdf).
- cxcv** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Lesotho Vulnerability. <https://climateknowledgeportal.worldbank.org/country/lesotho/vulnerability>. Accessed 29 December 2022.
- cx cvi** United Nations Office of the Resident and Humanitarian Coordinator in Lesotho. Lesotho: FlashUpdate 01 – Hailstorms and flash floods, 2018. <https://reliefweb.int/report/lesotho/lesotho-flash-update-01-hailstorms-and-flash-floods-4-april-2018>.
- cx cvii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Lesotho, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=LSO>.
- cx cviii** Ibid.
- cx cxix** Lesotho: IPC Acute Food Insecurity Analysis July 2020–March 2021; and Lesotho Vulnerability Assessment Committee, 2020.
- cc** The World Bank, Prevalence of stunting, height for age (% of children under 5): Lesotho, 2018. <https://data.worldbank.org/indicator/SH.STA.STNT.ZS>.
- cci** UNICEF, Indicator: Children living in households with income below the national poverty line (as a % of all children), 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=.PV\\_CHLD\\_INCM-PL..&startPeriod=2010&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=.PV_CHLD_INCM-PL..&startPeriod=2010&endPeriod=2020).
- ccii** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Lesotho Vulnerability. <https://climateknowledgeportal.worldbank.org/country/lesotho/vulnerability>. Accessed 29 December 2022.
- cciii** The World Bank, Lesotho Poverty Assessment: Poverty and Inequality Remain Widespread Despite Decline, 2019. [www.worldbank.org/en/country/lesotho/publication/lesotho-poverty-assessment-poverty-and-inequality-remain-widespread-despite-decline](http://www.worldbank.org/en/country/lesotho/publication/lesotho-poverty-assessment-poverty-and-inequality-remain-widespread-despite-decline).
- cciv** Save The Children and UNICEF. *Adaptation and response for children affected by droughts and disasters: How national social protection systems are responding to El Niño in Eastern and Southern Africa, with a particular focus on Ethiopia, Lesotho, Malawi, Zambia and Zimbabwe*, 2017.
- ccv** UNICEF, Key demographic indicators: Education, Lesotho, 2018. <https://data.unicef.org/country/lso/>.
- ccvi** Ibid.
- ccvii** UNICEF, Lesotho Humanitarian Situation Report No.3, 2021. [www.unicef.org/media/104171/file/Lesotho-Humanitarian-SitRep-June-2021.pdf](http://www.unicef.org/media/104171/file/Lesotho-Humanitarian-SitRep-June-2021.pdf).
- ccviii** UNICEF, Climate Landscape Analysis for Children in Madagascar: Summary Brochure, 2019. [www.unicef.org/madagascar/en/reports/climate-landscape-analysis-children-madagascar](http://www.unicef.org/madagascar/en/reports/climate-landscape-analysis-children-madagascar).
- ccix** The Global Facility for Disaster Reduction and Recovery (GFDRR) Vulnerability, Risk Reduction, and Adaptation to Climate Change: Madagascar, 2011. [https://climateknowledgeportal.worldbank.org/sites/default/files/2018-10/wb\\_gfdrr\\_climate\\_change\\_country\\_profile\\_for\\_MDG.pdf](https://climateknowledgeportal.worldbank.org/sites/default/files/2018-10/wb_gfdrr_climate_change_country_profile_for_MDG.pdf).
- ccx** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Madagascar Key Vulnerabilities. <https://climateknowledgeportal.worldbank.org/country/madagascar/vulnerability>. Accessed 29 December 2022.
- ccxi** OCHA, Madagascar, 2021. [www.unocha.org/southern-and-eastern-africa-rosea/madagascar](http://www.unocha.org/southern-and-eastern-africa-rosea/madagascar).
- ccxii** Humanity & Inclusion, Madagascar: Over 52,000 people affected by Cyclone Enawo, 2017. <https://humanity-inclusion.org.uk/en/news/madagascar-over-52-000-people-affected-by-cyclone-enawo>
- ccxiii** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Madagascar Key Vulnerabilities. <https://climateknowledgeportal.worldbank.org/country/madagascar/vulnerability>. Accessed 29 December 2022.
- ccxiv** GFDRR, Disaster Risk Profile: Madagascar, Risk Profile – SWIO, 2016. [www.geonode-gfdrrlab.org/documents/1069](http://www.geonode-gfdrrlab.org/documents/1069).
- ccxv** UNICEF, Madagascar Indicator: Percentage of Households with at least one Insecticide-Treated Mosquito Net (ITN), 2018. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=MDG.MNCH\\_ITN.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=MDG.MNCH_ITN.&startPeriod=1970&endPeriod=2023).
- ccxvi** UNICEF, Combatting pollution and its effects on the health of children in Madagascar, 2019. [www.unicef.org/madagascar/en/press-releases/combating-pollution-and-its-effects-health-children-madagascar](http://www.unicef.org/madagascar/en/press-releases/combating-pollution-and-its-effects-health-children-madagascar).
- ccxvii** UNICEF Madagascar, Water, Sanitation and Hygiene, n.d. [www.unicef.org/madagascar/en/programme/wash](http://www.unicef.org/madagascar/en/programme/wash). Accessed 02, January, 2023.
- ccxviii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Madagascar, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=BDI>.
- ccxix** UNICEF, Climate Landscape Analysis for Children in Madagascar: Summary Brochure, 2019. [www.unicef.org/madagascar/en/reports/climate-landscape-analysis-children-madagascar](http://www.unicef.org/madagascar/en/reports/climate-landscape-analysis-children-madagascar).
- ccxx** UNICEF, Country Office Annual Report 2020: Madagascar, 2020. [www.unicef.org/media/100376/file/Madagascar-2020-COAR.pdf](http://www.unicef.org/media/100376/file/Madagascar-2020-COAR.pdf).
- ccxxi** UNICEF, Climate Landscape Analysis for Children in Madagascar: Summary Brochure, 2019. [www.unicef.org/madagascar/en/reports/climate-landscape-analysis-children-madagascar](http://www.unicef.org/madagascar/en/reports/climate-landscape-analysis-children-madagascar).
- ccxxii** Ibid.
- ccxxiii** UNICEF, Key demographic indicators: Education Madagascar, 2018. <https://data.unicef.org/country/mdg/>.
- ccxxiv** Ibid.
- ccxxv** UNICEF Madagascar, Education, n.d. [www.unicef.org/madagascar/en/programme/education](http://www.unicef.org/madagascar/en/programme/education). Accessed December 22, 2023.
- ccxxvi** UNICEF, Climate Landscape Analysis for Children in Malawi, UNICEF Working Paper, 2017.
- ccxxvii** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- ccxxviii** UNICEF, Climate Landscape Analysis for Children in Malawi, UNICEF Working Paper, 2017.
- ccxxix** World Bank, GFDRR, the RMSI Pvt Ltd, International Food Policy Research Institute, *Economic Vulnerability and Disaster Risk Assessment in Malawi and Mozambique Measuring Economic Risks of Droughts and Floods*, 2009.
- ccxxx** UNICEF, Climate Landscape Analysis for Children in Malawi, UNICEF Working Paper, 2017.
- ccxxxi** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Malawi, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=MWI>.
- ccxxxii** UNICEF, Climate Landscape Analysis for Children in Malawi, UNICEF Working Paper, 2017.
- ccxxxiii** Ibid.
- ccxxxiv** National Statistical Office in collaboration with the Ministry of Finance, Economic Planning & Development, Child Poverty in Malawi, 2018. [www.unicef.org/esa/sites/unicef.org.esa/files/2019-01/UNICEF-Malawi-2018-Child-Poverty-in-Malawi.pdf](http://www.unicef.org/esa/sites/unicef.org.esa/files/2019-01/UNICEF-Malawi-2018-Child-Poverty-in-Malawi.pdf).

- ccxxxv** UNICEF, Key demographic indicators: Education, Malawi, 2016. <https://data.unicef.org/country/mw/>.
- ccxxxvi** GFDRR, Vulnerability, Risk Reduction and Adaptation to Climate Change, 2011. [https://climateknowledgeportal.worldbank.org/sites/default/files/2020-04/wb\\_gfdr\\_risk\\_reduction\\_adaptation\\_country\\_profile\\_for MOZ\\_0.pdf](https://climateknowledgeportal.worldbank.org/sites/default/files/2020-04/wb_gfdr_risk_reduction_adaptation_country_profile_for MOZ_0.pdf)
- ccxxxvii** NASA, Earth Observatory: Eloise Floods Mozambique, 2021. <https://earthobservatory.nasa.gov/images/147866/elioise-floods-mozambique>.
- ccxxxviii** Ejigu BA, Geostatistical analysis and mapping of Malaria risk in children of Mozambique. *PLoS ONE*, 2020, 15(11): e0241680.
- ccxxxix** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- ccxl** Ibid.
- ccxli** FAO, FAO defends urgent measures to combat soil pollution in Mozambique, 2018. [www.fao.org/mozambique/news/detail-events/en/c/1173887/](http://www.fao.org/mozambique/news/detail-events/en/c/1173887/).
- ccxlii** UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index*, 2021.
- ccxliiii** GFDRR, The Global Support Program of the Climate Investment Funds, and The Climate Change Team of the Environment Department of the World Bank, *Climate Risk and Adaptation Country Profile: Mozambique, Vulnerability, Risk Reduction, and Adaptation to Climate Change*, 2011.
- ccxliv** Ibid.
- ccxlv** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Mozambique, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=MOZ>.
- ccxlvi** Ibid.
- ccxlvii** UNICEF Mozambique, Water, Sanitation and Hygiene (WASH), n.d. <https://www.unicef.org/mozambique/en/water-sanitation-and-hygiene-wash>. Accessed 03 January 2023.
- ccxlviii** UNICEF Mozambique, UNICEF is increasing its humanitarian appeal 2021 for Mozambique, 2021. [www.unicef.org/mozambique/en/press-releases/unicef-increasing-its-humanitarian-appeal-2021-mozambique](http://www.unicef.org/mozambique/en/press-releases/unicef-increasing-its-humanitarian-appeal-2021-mozambique).
- ccxlix** UNICEF, Humanitarian Action for Children: Mozambique, 2022. [www.unicef.org/media/112181/file/2022-HAC-Mozambique.pdf](http://www.unicef.org/media/112181/file/2022-HAC-Mozambique.pdf).
- ccl** UNICEF, *Multidimensional Child Poverty in Mozambique*, 2020.
- ccli** International Organization for Migration (IOM), Displacement Tracking Matrix, 2022, <https://dtm.iom.int/reports/northern-mozambique-crisis-%E2%80%94-dtmbaseline-assessment-abridged-report-round-16-june-2022>.
- cclii** UNICEF, Mozambique Humanitarian Action for Children, 2022. [www.unicef.org/media/131906/file/2023-HAC-Mozambique.pdf](http://www.unicef.org/media/131906/file/2023-HAC-Mozambique.pdf).
- ccliii** UNICEF Mozambique, Education, n.d. [www.unicef.org/mozambique/en/education](http://www.unicef.org/mozambique/en/education). Accessed 12 January 2023.
- ccliv** UNICEF, Mozambique Humanitarian Action for Children 2023, 2022. [www.unicef.org/media/131906/file/2023-HAC-Mozambique.pdf](http://www.unicef.org/media/131906/file/2023-HAC-Mozambique.pdf).
- cclv** FAO and UNEP, *Global assessment of soil pollution: Report*. Rome.
- cclvi** Mukanyandvi, V., Kurban, A., Hakorimana, E. *et al.*, Seasonal assessment of drinking water sources in Rwanda using GIS, contamination degree (Cd), and metal index (MI). *Environ Monit Assess* 191, 734, 2019.
- cclvii** The World Bank Group, Climate Risk Country Profile: Rwanda, 2021.
- cclviii** Ibid.
- cclix** Ibid.
- ccxl** Ibid.
- ccxli** Flood List, Rwanda, 2022. <http://floodlist.com/tag/rwanda>.
- ccxlii** WHO & UNICEF, Joint Monitoring Programme: School WASH data Rwanda, 2019. <https://washdata.org/data/school#!/table?geo0=country&geo1=RWA>.
- ccxliiii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Rwanda, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=RWA>.
- ccxliv** WHO & UNICEF, Joint Monitoring Programme: School WASH data Rwanda, 2019. <https://washdata.org/data/school#!/table?geo0=country&geo1=RWA>.
- ccxlv** The World Bank, The World Bank in Rwanda: Overview, 2022. [www.worldbank.org/en/country/rwanda/overview#1](http://www.worldbank.org/en/country/rwanda/overview#1).
- ccxlvi** UNICEF, Rwanda Indicator: ITN use by children - percentage of children (under age 5) who slept under an insecticide-treated mosquito net the night prior to the survey, 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=RWA.MNCH\\_ITN.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=RWA.MNCH_ITN.&startPeriod=1970&endPeriod=2023).
- ccxlvii** The World Bank, The World Bank in Rwanda: Overview, 2022. [www.worldbank.org/en/country/rwanda/overview#1](http://www.worldbank.org/en/country/rwanda/overview#1).
- ccxlviii** Ibid.
- ccxlix** Ibid.
- ccclxx** ILO, Social Protection Rwanda, 2019. <https://www.social-protection.org/gimi/ShowCountryProfile.action?iso=RW#:~:text=Established%20in%202008%2C%20the%20VUP,poor%20and%20labour%20constrained%20households>.
- ccclxxi** UNICEF, Key demographic indicators: Education, Rwanda, n.d. <https://data.unicef.org/country/rw/>.
- ccclxxii** Ibid.
- ccclxxiii** UNICEF Rwanda, Education, n.d. [www.unicef.org/rwanda/education](http://www.unicef.org/rwanda/education). Accessed 30 December 2022.
- ccclxxiv** OCHA, Somalia 2021 Gu' season floods update #1, 2021. <https://reliefweb.int/report/somalia/somalia-2021-gu-season-floods-update-1-9-may-2021>.
- ccclxxv** Ibid.
- ccclxxvi** OCHA, Somalia 2021 Gu' season floods update #3, 2021. Available at: <https://reliefweb.int/report/somalia/somalia-2021-gu-season-floods-update-1-9-may-2021>.
- ccclxxvii** UNICEF, *Regional call to action horn of Africa drought crisis: climate change is here now*, 2022.
- ccclxxviii** Federal Government of Somalia Ministry of Health report, October 2020, as cited in: UNICEF, Humanitarian Action for Children: Somalia 2023, 2022. [www.unicef.org/media/131931/file/2023-HAC-Somalia.pdf](http://www.unicef.org/media/131931/file/2023-HAC-Somalia.pdf).
- ccclxxix** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- ccclxxx** Varela, R., Rodríguez-Díaz, L., deCastro M. Persistent heatwaves projected for Middle East and North Africa by the end of the 21st century. *PLoS ONE*, 2020, 15(11): e0242477.
- ccclxxxi** WHO & UNICEF, Joint Monitoring Programme: Household WASH data, Somalia, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=SOM>.
- ccclxxxii** Ibid.
- ccclxxxiii** WASH Cluster Somalia, Somalia drought update, as of 13 October 2022, 2022. <https://reliefweb.int/report/somalia/somalia-wash-cluster-drought-update-13-october-2022>.
- ccclxxxiv** Federal Government of Somalia Ministry of Health report, October 2020, as cited in: UNICEF, Humanitarian Action for Children: Somalia 2023, 2022. [www.unicef.org/media/131931/file/2023-HAC-Somalia.pdf](http://www.unicef.org/media/131931/file/2023-HAC-Somalia.pdf).
- ccclxxxv** Health Cluster estimate to inform Humanitarian Needs Overview 2022, as cited in: UNICEF, Humanitarian Action for Children: Somalia 2023, 2022. [www.unicef.org/media/131931/file/2023-HAC-Somalia.pdf](http://www.unicef.org/media/131931/file/2023-HAC-Somalia.pdf)
- ccclxxxvi** UNICEF Somalia, Health, n.d. [www.unicef.org/somalia/health](http://www.unicef.org/somalia/health).
- ccclxxxvii** Ibid.
- ccclxxxviii** UNICEF, *Regional call to action horn of Africa drought crisis: climate change is here now*, 2022.
- ccclxxxix** UNICEF, Humanitarian Action for Children: Somalia, 2022. [www.unicef.org/media/112271/file/2022-HAC-Somalia.pdf](http://www.unicef.org/media/112271/file/2022-HAC-Somalia.pdf).
- ccxc** UNICEF, Humanitarian Action for Children: Somalia 2023, 2022. [www.unicef.org/media/131931/file/2023-HAC-Somalia.pdf](http://www.unicef.org/media/131931/file/2023-HAC-Somalia.pdf).
- ccxc** WASH Cluster estimates to inform the 2022 Humanitarian Needs Overview for Somalia.
- ccxcii** Education Cluster report, August 2022, as cited in UNICEF, Humanitarian Action for Children: Somalia 2023, 2022. [www.unicef.org/media/131931/file/2023-HAC-Somalia.pdf](http://www.unicef.org/media/131931/file/2023-HAC-Somalia.pdf).
- ccxciii** UNICEF, South Sudan Indicator: ITN use by children - percentage of children (under age 5) who slept under an insecticide-treated mosquito net the night prior to the survey, 2017. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=SSD.MNCH\\_ITN.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SSD.MNCH_ITN.&startPeriod=1970&endPeriod=2023).
- ccxciv** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- ccxcv** Ibid.
- ccxcvi** The Borgen Project, The water crisis in South Sudan: providing access to resources, 2020. <https://borgenproject.org/water-crisis-south-sudan/>.
- ccxcvii** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, South Sudan, Vulnerability. <https://climateknowledgeportal.worldbank.org/country/south-sudan/vulnerability>. Accessed 29 December 2022.
- ccxcviii** UNHCR UK, South Sudan floods wreak havoc on vulnerable communities, 2021. [www.unhcr.org/uk/news/briefing/2021/10/616e89034/south-sudan-floods-wreak-havoc-vulnerable-communities.html](https://www.unhcr.org/uk/news/briefing/2021/10/616e89034/south-sudan-floods-wreak-havoc-vulnerable-communities.html).
- ccxcix** Peter Bol Gai Kuany, Prof, Xuefei Zhou, Dr. Ahmed A. Abdelhafez, Islam A. Abdelhafeez, Wailing of the people of South Sudan from oil contamination (overview of oil production and effects on people health). *International Journal of Scientific and Research Publications (IJSRP)* 2019, 9(5).
- ccc** WHO & UNICEF, Joint Monitoring Programme: Household WASH data South Sudan, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=SSD>.
- ccci** Ibid.
- cccii** OCHA, *Humanitarian Needs Overview: South Sudan, Humanitarian Programme cycle 2021 issued January 2021*, 2021.
- ccciiii** UNICEF, Nutrition in South Sudan Briefing note, 2021. [www.unicef.org/southsudan/media/9306/file/Nutrition%20Briefing%20Note\\_2021%20Q4.pdf](http://www.unicef.org/southsudan/media/9306/file/Nutrition%20Briefing%20Note_2021%20Q4.pdf)

- ccciv** UNICEF South Sudan, Education, n.d. [www.unicef.org/southsudan/what-we-do/education](http://www.unicef.org/southsudan/what-we-do/education). Accessed 23 January 2023.
- cccv** WHO, World malaria report 2019. Geneva, Switzerland: World Health Organization, 2019. Licence: CC BY-NC-SA 3.0 IGO.
- cccvii** World Economic Forum, Air Pollution: These low-cost sensors are helping Uganda tackle rising air pollution, 2022. <https://www.weforum.org/agenda/2022/06/uganda-researchers-low-cost-sensors-air-pollution/>.
- cccviii** Mili Varugheshyam & Shyam KC, World Bank Blogs: Protecting Lake Victoria for a green, resilient, and inclusive future. <https://blogs.worldbank.org/water/protecting-lake-victoria-green-resilient-and-inclusive-future>.
- cccviii** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Uganda Key Vulnerabilities. <https://climateknowledgeportal.worldbank.org/country/uganda/vulnerability>. Accessed 29 December 2022.
- cccix** Ibid.
- cccix** Ibid.
- cccxi** The Republic of Uganda Ministry of Agriculture, Animal Industry and Fisheries, *National Adaptation Plan for the Agricultural Sector*, 2017.
- cccxi** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Uganda, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=UGA>.
- cccxi** UNICEF Uganda, Water, Sanitation and Hygiene (WASH), n.d. [www.unicef.org/uganda/what-we-do/wash](http://www.unicef.org/uganda/what-we-do/wash). Accessed 14 January 2023.
- cccxi** UNICEF Uganda, Reproductive maternal, new-born, child and adolescent health (RMNCAH), n.d. [www.unicef.org/uganda/what-we-do/rmncah](http://www.unicef.org/uganda/what-we-do/rmncah). Accessed 14 January 2022.
- cccxi** UNICEF Uganda, Nutrition, scaling up high impact nutrition interventions, n.d. [www.unicef.org/uganda/what-we-do/nutrition#:~:text=Malnutrition%20threatens%20to%20destroy%20a,bearing%20Dage%20women%20are%20anemic](http://www.unicef.org/uganda/what-we-do/nutrition#:~:text=Malnutrition%20threatens%20to%20destroy%20a,bearing%20Dage%20women%20are%20anemic). Accessed, 28 December 2023.
- cccxi** Opportunity International, Where we work: Uganda, n.d. <https://opportunity.org/our-impact/where-we-work/uganda-facts-about-poverty>. Accessed 19 January 2023.
- cccxi** The World Bank, The World Bank in Uganda, 2022. [www.worldbank.org/en/country/uganda/overview#1](http://www.worldbank.org/en/country/uganda/overview#1).
- cccxi** Magambo, R, SaferWorld: World Refugee Week 2022: it's time to prioritise mental health support in peacebuilding responses in Uganda, 2022. [www.saferworld.org.uk/resources/news-and-analysis/post/989-world-refugee-week-2022-it-as-time-to-add-mental-health-support-to-peacebuilding-responses-in-uganda](http://www.saferworld.org.uk/resources/news-and-analysis/post/989-world-refugee-week-2022-it-as-time-to-add-mental-health-support-to-peacebuilding-responses-in-uganda).
- cccxi** UNICEF Uganda, Education, n.d. [www.unicef.org/uganda/what-we-do/education](http://www.unicef.org/uganda/what-we-do/education). Accessed 29 December 2022.
- cccxi** Ibid.
- cccxi** Ibid.
- cccxi** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Tanzania Vulnerability. <https://climateknowledgeportal.worldbank.org/country/tanzania/vulnerability>. Accessed 29 December 2022.
- cccxi** Katharina Kreppel *et al.*, Impact of ENSO 2016-2017 on regional climate and Malaria vector dynamics in Tanzania. *Environ, 2019 Res. Lett.* 14 075009.
- cccxi** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- cccxi** The World Bank, Water Stress Could Hurt Tanzania's Growth and Poverty Reduction Efforts – New World Bank Report, 2018. [www.worldbank.org/en/news/press-release/2017/11/06/water-stress-could-hurt-tanzania-growth-and-poverty-reduction-efforts---new-world-bank-report](http://www.worldbank.org/en/news/press-release/2017/11/06/water-stress-could-hurt-tanzania-growth-and-poverty-reduction-efforts---new-world-bank-report).
- cccxi** Ibid.
- cccxi** UNICEF, Tanzania Humanitarian Situation Report No.4, 2020. [www.unicef.org/media/91381/file/UNICEF%20Tanzania%20Humanitarian%20Situation%20Report%20No.%204%20-%20January%20-%20December%202020.pdf](http://www.unicef.org/media/91381/file/UNICEF%20Tanzania%20Humanitarian%20Situation%20Report%20No.%204%20-%20January%20-%20December%202020.pdf).
- cccxi** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Tanzania, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=TZA>.
- cccxi** UNICEF United Republic of Tanzania, WASH Fact Sheet, 2017. [www.unicef.org/tanzania/media/856/file/UNICEF-Tanzania-2017-WASH-fact-sheet.pdf](http://www.unicef.org/tanzania/media/856/file/UNICEF-Tanzania-2017-WASH-fact-sheet.pdf).
- cccxi** UNICEF United Republic of Tanzania, Maternal and child health, n.d. [www.unicef.org/tanzania/what-we-do/health](http://www.unicef.org/tanzania/what-we-do/health). Accessed 15 January 2023.
- cccxi** The World Bank, Poverty headcount ratio at national poverty lines (% of population) – Tanzania, 2017. <https://data.worldbank.org/indicator/SI.POV.NAHC?locations=TZ>.
- cccxi** UNICEF, United Republic of Tanzania: Key demographic indicators: Education, 2016. <https://data.unicef.org/country/tza/>.
- cccxi** UNICEF United Republic of Tanzania, Education, n.d. [www.unicef.org/tanzania/what-we-do/education](http://www.unicef.org/tanzania/what-we-do/education). Accessed 7 January 2023.
- cccxi** Libanda, B. Multi-model synthesis of future extreme temperature indices over Zambia. *Model. Earth Syst. Environ.* 6, 743–757, 2020.
- cccxi** Hill, H.M. World's Biggest Dam Has 'Extremely Dangerous' Low Water Levels, 2016. [www.bloomberg.com/news/articles/2016-01-08/world-s-biggest-dam-has-extremely-dangerous-low-water-levels](http://www.bloomberg.com/news/articles/2016-01-08/world-s-biggest-dam-has-extremely-dangerous-low-water-levels).
- cccxi** Ibid.
- cccxi** Libanda, B., Chilekana, N. Projection of frequency and intensity of extreme precipitation in Zambia: a CMIP5 study. *Clim Res* 76:59–72, 2018.
- cccxi** Libanda, B. Multi-model synthesis of future extreme temperature indices over Zambia. *Model. Earth Syst. Environ.* 6, 743–757, 2020.
- cccxi** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- cccxi** Ibid.
- cccxi** IFRC, Emergency Plan of Action (EPOA) Zambia / Namwala Flash Floods: DREF Operation n° MDRZM015, 2022. <https://reliefweb.int/report/zambia/zambia-namwala-flash-floods-emergency-plan-action-epoa-dref-operation-n-mdrzm015>.
- cccxi** Ibid.
- cccxi** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Zambia, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=TZA>.
- cccxi** UNICEF Zambia, Health, n.d. [www.unicef.org/zambia/health](http://www.unicef.org/zambia/health). Accessed 11 January 2023.
- cccxi** UNICEF, Children living in households with income below the national poverty line (as a % of all children), 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=.PV\\_CHLD\\_INCM-PL..&startPeriod=2010&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=.PV_CHLD_INCM-PL..&startPeriod=2010&endPeriod=2020).
- cccxi** ILO, Social protection profile: Zambia, 2019. [www.social-protection.org/gimi/ShowCountryProfile.action?iso=ZM](http://www.social-protection.org/gimi/ShowCountryProfile.action?iso=ZM).
- cccxi** Ibid.
- cccxi** UNICEF Zambia, Education, n.d. [www.unicef.org/zambia/education](http://www.unicef.org/zambia/education). Accessed 11 January 2023.
- cccxi** Ibid.
- cccxi** The World Bank, Land area (sq. km) –Haiti, 2020. <https://data.worldbank.org/indicator/AG.LND.TOTL.K2?locations=HT>.
- cccxi** UNICEF, Climate Change Landscape Analysis for Children in Haiti, 2019.
- cccxi** Ibid.
- cccxi** Ibid.
- cccxi** Emmanuel, A., & Evens, E. Chemical pollution of drinking water in Haiti: An important threat to public health. *Environmental Health*, December, 2021, IntechOpen.
- cccxi** UNICEF, Humanitarian Action for Children: Haiti, 2021. [www.unicef.org/media/87006/file/2021-HAC-Haiti.pdf](http://www.unicef.org/media/87006/file/2021-HAC-Haiti.pdf).
- cccxi** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Haiti, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=HTI>.
- cccxi** UNICEF, Haiti earthquake: over half a million children at risk of waterborne diseases – UNICEF, 2021. [www.unicef.org/press-releases/haiti-earthquake-over-half-million-children-risk-waterborne-diseases-unicef](http://www.unicef.org/press-releases/haiti-earthquake-over-half-million-children-risk-waterborne-diseases-unicef).
- cccxi** UNICEF, Haiti, Key Demographic Indicators, 2021. <https://data.unicef.org/country/hti/>.
- cccxi** WHO Maternal Child Epidemiology Estimation Group (WHO - MCEE), 2021.
- cccxi** WHO, Cholera – Haiti, 2022. [www.who.int/emergencies/disease-outbreak-news/item/2022-DON427#:~:text=Between%20%20October%20through%206,ten%20departments%20in%20the%20country](http://www.who.int/emergencies/disease-outbreak-news/item/2022-DON427#:~:text=Between%20%20October%20through%206,ten%20departments%20in%20the%20country).
- cccxi** UNICEF, Humanitarian Action for Children: Haiti, 2021. [www.unicef.org/media/87006/file/2021-HAC-Haiti.pdf](http://www.unicef.org/media/87006/file/2021-HAC-Haiti.pdf).
- cccxi** OECD & The World Bank, *Health at a Glance: Latin America and the Caribbean 2020*, OECD Publishing, Paris, 2020.
- cccxi** The World Bank, Haiti Overview, 2022. [www.worldbank.org/en/country/haiti/overview#1](http://www.worldbank.org/en/country/haiti/overview#1).
- cccxi** UN News, Can recycling cut unsafe migration from Haiti?, 2021. <https://news.un.org/en/story/2021/12/1108192>.
- cccxi** Hergersberg, P. Hot Air in the Orient, Environment & Climate\_Extreme heat, *MaxPlanckResearch*, 2016. [www.mpg.de/10856695/W004\\_Environment\\_climate\\_062-069.pdf](http://www.mpg.de/10856695/W004_Environment_climate_062-069.pdf).
- cccxi** UNICEF, *Running Dry: The impact of water scarcity on children in the Middle East and North Africa*, UNICEF, August 2021.
- cccxi** IAMAT, Djibouti General Health Risks: Air Pollution, 2020. [www.iamat.org/country/djibouti/risk/air-pollution](http://www.iamat.org/country/djibouti/risk/air-pollution).
- cccxi** Ryan, S.J., *et al.*, Warming temperatures could expose more than 1.3 billion new people to Zika virus risk by 2050. *Glob Chang Biol.* 2021, Jan;27(1):84-93.
- cccxi** Qing-Sheng, L. Analysis of grades of the historical heatwave in Djibouti city, Djibouti, *International Conference on Energy, Environmental and Civil Engineering (EECE 2019)*, 2019.

- ccclxx** Daher, D.H., Gaillard, L., Amara, M., & Menezo, C. Impact of tropical desert maritime climate on the performance of a PV grid-connected power plant, *Renewable Energy* 125, 2018, 729-737.
- ccclxxi** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Djibouti, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=DJI>.
- ccclxxii** Ibid.
- ccclxxiii** Ibid.
- ccclxxiv** UNICEF, Djibouti: Indicator: Under-five mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=DJI.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2021](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=DJI.CME_MRY0T4.&startPeriod=1970&endPeriod=2021).
- ccclxxv** UNICEF Djibouti, Nutrition, n.d. [www.unicef.org/djibouti/node/36](http://www.unicef.org/djibouti/node/36). Accessed 8 January 2023.
- ccclxxvi** UNICEF, Country Office Annual Report 2020, 2020. [www.unicef.org/media/100621/file/Djibouti-2020-COAR.pdf](http://www.unicef.org/media/100621/file/Djibouti-2020-COAR.pdf).
- ccclxxvii** Ibid.
- ccclxxviii** Ibid.
- ccclxxix** UN Educational, Scientific and Cultural Organization (UNESCO) & UNICEF, Middle East and North Africa, *Out-of-school children initiative: Djibouti Factsheet*, 2015.
- ccclxxx** Ibid.
- ccclxxxi** UNICEF, Country Office Annual Report 2020, 2020. [www.unicef.org/media/100621/file/Djibouti-2020-COAR.pdf](http://www.unicef.org/media/100621/file/Djibouti-2020-COAR.pdf).
- ccclxxxii** IAMAT, Sudan General Health Risks: Air Pollution, 2020. [www.iamat.org/country/sudan/risk/air-pollution](http://www.iamat.org/country/sudan/risk/air-pollution).
- ccclxxxiii** UNEP, Sudan Air Quality Policies, 2015. <https://wedocs.unep.org/bitstream/handle/20.500.11822/17114/Sudan.pdf?sequence=1&amp%3BisAllowed=>.
- ccclxxxiv** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Sudan vulnerability. <https://climateknowledgeportal.worldbank.org/country/sudan/vulnerability>. Accessed 29 December 2022.
- ccclxxxv** Tayebi, N. World Bank Blogs: On the road to recovery: How Sudan is saving its water sector, 2021. <https://blogs.worldbank.org/water/road-recovery-how-sudan-saving-its-water-sector>.
- ccclxxxvi** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Sudan vulnerability. <https://climateknowledgeportal.worldbank.org/country/sudan/vulnerability>. Accessed 29 December 2022.
- ccclxxxvii** Radio Dabanga, Vector-borne diseases continue to spread in Sudan, 2019. <https://reliefweb.int/report/sudan/vector-borne-diseases-continue-spread-sudan>.
- ccclxxxviii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Sudan, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=SDN>.
- ccclxxxix** Ibid.
- ccxc** WHO, *Global Nutrition Monitoring Framework Country Profile: Sudan*. Geneva, Switzerland: World Health Organization, 2017.
- ccxc** Mercy Corps, Sudan, n.d. <https://europe.mercycorps.org/en-gb/where-we-work/sudan>.
- ccxcii** IMF, Country Data: Sudan, IMF DataMapper, 2022. [www.imf.org/en/Countries/SDN#countrydata](http://www.imf.org/en/Countries/SDN#countrydata).
- ccxciii** UNICEF, Key Demographic Indicators, Sudan, Education, 2014. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=SDN.ED\\_ANAR\\_L2.&startPeriod=1970&endPeriod=2022](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SDN.ED_ANAR_L2.&startPeriod=1970&endPeriod=2022).
- ccxciv** UNICEF, Sudan Education Programme, 2016. [www.unicef.org/sudan/media/981/file/UNICEF-Sudan-Education-Programme-2016.pdf](http://www.unicef.org/sudan/media/981/file/UNICEF-Sudan-Education-Programme-2016.pdf).
- ccxcv** The World Bank, *Yemen study: Assessing the Impact of Climate Change and Variability on the Water and Agriculture Sectors, and the Policy Implications*, World Bank. © World Bank, 2010.
- ccxcvi** The World Bank Group, *Climate Risk Country Profile, Yemen*, 2011. [https://climateknowledgeportal.worldbank.org/sites/default/files/2018-10/wb\\_gfdrr\\_climate\\_change\\_country\\_profile\\_for\\_YEM.pdf](https://climateknowledgeportal.worldbank.org/sites/default/files/2018-10/wb_gfdrr_climate_change_country_profile_for_YEM.pdf).
- ccxcvii** Ibid.
- ccxcviii** UN News, Yemen: Health, environment and economy remain under threat from stricken oil tanker, 2021. <https://news.un.org/en/story/2021/06/1093352>.
- ccxcix** WHO, WHO partners with KSlrelief to support national response for malaria and Dengue vector control in Yemen, 2020. [www.emro.who.int/yemen/information-resources/who-partners-with-ksrelief-to-support-national-response-for-malaria-and-dengue-vector-control-in-yemen.html](http://www.emro.who.int/yemen/information-resources/who-partners-with-ksrelief-to-support-national-response-for-malaria-and-dengue-vector-control-in-yemen.html).
- cd** Eyal Meltzer, Chapter 32 - Zika virus and the Middle East, Editor(s): Colin R. Martin, Caroline J. Hollins Martin, V.R., & Preedy, R.R. *Zika Virus Biology, Transmission, and Pathology*, *Academic Press*, 2021, 351-358.
- cdi** UNICEF, Humanitarian Action for Children, Yemen 2023, 2022. [www.unicef.org/appeals/yemen#download](http://www.unicef.org/appeals/yemen#download).
- cdii** UNICEF, Yemen Country Office Humanitarian Situation Report, 2021. [www.unicef.org/media/110101/file/Yemen-Humanitarian-SitRep-30-September-2021.pdf](http://www.unicef.org/media/110101/file/Yemen-Humanitarian-SitRep-30-September-2021.pdf).
- cdiii** Ibid.
- cdiv** UNICEF, Humanitarian Action for Children, Yemen 2023, 2022. [www.unicef.org/appeals/yemen#download](http://www.unicef.org/appeals/yemen#download).
- cdv** UNICEF Yemen, UNICEF's Cash Transfer and Nutrition Programme: Addressing Yemen's Surging Cases of Malnutrition, n.d. [www.unicef.org/yemen/stories/unicefs-cash-transfer-and-nutrition-programme-addressing-yemens-surging-cases-malnutrition](http://www.unicef.org/yemen/stories/unicefs-cash-transfer-and-nutrition-programme-addressing-yemens-surging-cases-malnutrition). Accessed 11 January 2023.
- cdvi** UNICEF, Yemen Country Office Humanitarian Situation Report, 2021. [www.unicef.org/media/110101/file/Yemen-Humanitarian-SitRep-30-September-2021.pdf](http://www.unicef.org/media/110101/file/Yemen-Humanitarian-SitRep-30-September-2021.pdf).
- cdvii** UNDP, Assessing the Impact of War in Yemen on Achieving the Sustainable Development Goals, 2019. [www.ye.undp.org/content/yemen/en/home/library/assessing-the-impact-of-war-on-development-in-yemen-SDGs.html](http://www.ye.undp.org/content/yemen/en/home/library/assessing-the-impact-of-war-on-development-in-yemen-SDGs.html).
- cdviii** UNICEF, Yemen: Education, 2013. <https://data.unicef.org/country/yem/>.
- cdix** Ibid.
- cdx** UNICEF, Yemen Country Office Humanitarian Situation Report, 2021. [www.unicef.org/media/110101/file/Yemen-Humanitarian-SitRep-30-September-2021.pdf](http://www.unicef.org/media/110101/file/Yemen-Humanitarian-SitRep-30-September-2021.pdf).
- cdxi** WHO EMRO, Afghanistan Environmental Health, 2023. [www.emro.who.int/afg/programmes/eh.html](http://www.emro.who.int/afg/programmes/eh.html).
- cdxii** Ibid.
- cdxiii** Mahaqi, A., *et al.*, Nitrate pollution in Kabul water supplies, Afghanistan: sources and chemical reactions: a review. *Int. J. Environ. Sci. Technol*, 2021.
- cdxiv** Hayat, E., Baba, A. Quality of groundwater resources in Afghanistan. *Environ Monit Assess*, 189, 318, 2017.
- cdxv** Conflict and Environment Observatory, The slow violence of pollution in Afghanistan, 2018. <https://ceobs.org/the-slow-violence-of-pollution-in-afghanistan/>.
- cdxvi** The World Bank Group, *Climate Risk Country Profile: Afghanistan*, 2021.
- cdxvii** Ibid.
- cdxviii** Ibid.
- cdxix** Ibid.
- cdxx** Ibid.
- cdxxi** Ibid.
- cdxxii** Russo, S., *et al.*, Magnitude of extreme heatwaves in present climate and their projection in a warming world. *Journal of Geophysical Research: Atmospheres*, 119:22, 2014.
- cdxxiii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Afghanistan, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=AFG>.
- cdxxiv** UNICEF Afghanistan, WASH: Water, sanitation, and hygiene, n.d. [www.unicef.org/afghanistan/wash-water-sanitation-and-hygiene](http://www.unicef.org/afghanistan/wash-water-sanitation-and-hygiene). Accessed 11 January 2023.
- cdxxv** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Afghanistan, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=AFG>.
- cdxxvi** UNICEF Afghanistan, Health, n.d. [www.unicef.org/afghanistan/health](http://www.unicef.org/afghanistan/health). Accessed 12 January 2023.
- cdxxvii** UNICEF Afghanistan, Nutrition, n.d. [www.unicef.org/afghanistan/nutrition](http://www.unicef.org/afghanistan/nutrition). Accessed 12 January 2023.
- cdxxviii** UNICEF, Humanitarian Action for Children, Afghanistan 2023, 2022. [www.unicef.org/media/131871/file/2023-HAC-Afghanistan.pdf](http://www.unicef.org/media/131871/file/2023-HAC-Afghanistan.pdf).
- cdxxix** OCHA, Afghanistan: Conflict Induced Displacements, (as of 12 February 2023) Actual displacements between 10 April 2022 and 13 September 2022, 2023. [www.humanitarianresponse.info/en/operations/afghanistan/idps](http://www.humanitarianresponse.info/en/operations/afghanistan/idps).
- cdxxx** UNICEF Afghanistan, Education, n.d. [www.unicef.org/afghanistan/education](http://www.unicef.org/afghanistan/education). Accessed 12 January 2023.
- cdxxxi** IDMC, Country Profile: Bangladesh, 2021. [www.internal-displacement.org/countries/bangladesh](http://www.internal-displacement.org/countries/bangladesh).
- cdxxxii** The World Bank, Bangladesh: Building Resilience to Climate Change, 2016. [www.worldbank.org/en/results/2016/10/07/bangladesh-building-resilience-to-climate-change#:~:text=Bangladesh%20has%20invested%20more%20than,of%20lands%20vulnerable%20to%20flooding\)%20C](http://www.worldbank.org/en/results/2016/10/07/bangladesh-building-resilience-to-climate-change#:~:text=Bangladesh%20has%20invested%20more%20than,of%20lands%20vulnerable%20to%20flooding)%20C).
- cdxxxiii** UNICEF Bangladesh, Monsoon floods push millions of children into uncertainty amid COVID-19, 2020. [www.unicef.org/bangladesh/en/stories/monsoon-floods-push-millions-children-uncertainty-amid-covid-19](http://www.unicef.org/bangladesh/en/stories/monsoon-floods-push-millions-children-uncertainty-amid-covid-19).
- cdxxxiv** Mackay, D., *et al.*, Smoke-free Legislation and Hospitalizations for Childhood Asthma, *New England Journal of Medicine*, 16:363, 2010, 1139-1145, as cited in: UNICEF, *Clear the Air for Children*, 2016.
- cdxxxv** WHO, *Climate and Health Country Profile: Bangladesh*. World Health Organization. Geneva, Switzerland, 2015.

- cdxxxvi** The World Bank Group, *Climate Risk Country Profile: Bangladesh*, 2021.
- cdxxxvii** Ibid.
- cdxxxviii** Ibid.
- cdxxxix** Matthews, T. K. R., Wilby, R. L., & Murphy, C. Communicating the deadly consequences of global warming for human heat stress. *Proceedings of the National Academy of Sciences*, 114(15), 2017, 3861–3866.
- cdxl** UNICEF, Saving new-born lives, n.d. [www.unicef.org/bangladesh/en/saving-new-born-lives](http://www.unicef.org/bangladesh/en/saving-new-born-lives). Accessed 12 January 2023.
- cdxli** Bangladesh Demographic and Health Survey 2014, via the DHS Program STATcompiler as cited in UNICEF, *Maternal and New-born Health Disparities: Key Facts*, 2018.
- cdxlii** UNICEF, Diarrhoea: Percentage of deaths caused by diarrhoea in children under 5 years of age (2019), 2022. <https://data.unicef.org/topic/child-health/diarrhoeal-disease/>.
- cdxliii** FAO, International Fund for Agricultural Development (IFAD), UNICEF, WFP & WHO, 2017 *The state of food security and nutrition in the world. Building Resilience for peace and food security*. FAO, Rome, 2017.
- cdxliv** Springmann, M., et al., Global and regional health effects of future food production under climate change: a modelling study. *The Lancet*: 387: 1937–1946, 2016.
- cdxlv** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Bangladesh, 2020. <https://washdata.org/data/household#/table?geo0=country&geo1=TZA>.
- cdxlvi** UNICEF Bangladesh, Water, sanitation and hygiene, n.d. [www.unicef.org/bangladesh/en/water-sanitation-and-hygiene](http://www.unicef.org/bangladesh/en/water-sanitation-and-hygiene). Accessed 12 January 2023.
- cdxlvii** UNICEF Bangladesh, Scaling up social protection, n.d. [www.unicef.org/bangladesh/en/scaling-social-protection](http://www.unicef.org/bangladesh/en/scaling-social-protection). Accessed 12 January 2023.
- cdxlviii** UNICEF, Bangladesh: Key Demographic Indicators, Education, 2019. <https://data.unicef.org/country/bgd/>.
- cdxlx** Ibid.
- cdli** UNICEF Bangladesh, Education, n.d. [www.unicef.org/bangladesh/en/education](http://www.unicef.org/bangladesh/en/education). Accessed 12 January 2023.
- cdlii** Ibid.
- cdliii** WHO, Urban Health Initiative: Kathmandu, Nepal, n.d. [www.who.int/initiatives/urban-health-initiative/pilot-projects/kathmandu#:~:text=In%20recent%20years%2C%20air%20pollution,risk%20of%20several%20health%20problems](http://www.who.int/initiatives/urban-health-initiative/pilot-projects/kathmandu#:~:text=In%20recent%20years%2C%20air%20pollution,risk%20of%20several%20health%20problems). Accessed 12 January 2023.
- cdliiii** Pathak, K. & Gaire, T. Nepal: country report on children's environmental health. *Reviews on Environmental Health*, 2019, 35:1, 53-56.
- cdliv** Sharma, B., & Schultz, K. New York Times: As Himalayas Warm, Nepal's Climate Migrants Struggle to Survive, 2020. [www.nytimes.com/2020/04/05/world/asia/nepal-himalayas-glacier-climate.html](http://www.nytimes.com/2020/04/05/world/asia/nepal-himalayas-glacier-climate.html).
- cdlv** The World Bank Group, *Climate Risk Country Profile: Nepal*, 2021. <https://washdata.org/data/household#/table?geo0=country&geo1=BGD>.
- cdlvi** Dhimal, M., Ahrens, B., & Kuch, U. Climate Change and Spatiotemporal Distributions of Vector-Borne Diseases in Nepal – A Systematic Synthesis of Literature. *PLOS ONE*, 2015, 10(6), 1–31.
- cdlvii** Chen, C., Cane, M. A., Wittenberg, A. T., & Chen, D. ENSO in the CMIP5 Simulations: Life Cycles, Diversity, and Responses to Climate Change. *Journal of Climate*, 2017, 30(2), 775–801.
- cdlviii** The World Bank Group, *Climate Risk Country Profile: Nepal*, 2021.
- cdlix** Rounce, D. R., Watson, C. S., & McKinney, D. C. Identification of Hazard and Risk for Glacial Lakes in the Nepal Himalaya Using Satellite Imagery from 2000–2015, *Remote Sensing*, 2017, 9(7).
- cdlix** The World Bank Group, *Climate Risk Country Profile: Nepal*, 2021.
- cdlxi** UNDP, Climate Change Adaptation Country Profile – Bhutan, 2018. [www.adaptation-undp.org/explore/Bhutan](http://www.adaptation-undp.org/explore/Bhutan).
- cdlxii** Pathak, K. and Gaire, T. Nepal: country report on children's environmental health. *Reviews on Environmental Health*, 2020, 35:1, 53-56.
- cdlxiii** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- cdlxiv** Ibid.
- cdlxv** The World Bank Group, *Climate Risk Country Profile: Nepal*, 2021.
- cdlxvi** World Vision, 2015 Nepal earthquake: Facts, FAQs, and how to help, 2018. [www.worldvision.org/disaster-relief-news-stories/2015-nepal-earthquake-facts](http://www.worldvision.org/disaster-relief-news-stories/2015-nepal-earthquake-facts).
- cdlxvii** UNICEF ROSA, Nepal Earthquakes: 12 babies born every hour without basic healthcare in worst hit areas – UNICEF, 2015. [www.unicef.org/rosa/press-releases/nepal-earthquakes-12-babies-born-every-hour-without-basic-healthcare-worst-hit-areas](http://www.unicef.org/rosa/press-releases/nepal-earthquakes-12-babies-born-every-hour-without-basic-healthcare-worst-hit-areas).
- cdlxviii** UNICEF ROSA, Nepal Earthquake: Education for nearly 1 million children in jeopardy – UNICEF, 2015. [www.unicef.org/rosa/press-releases/nepal-earthquake-education-nearly-1-million-children-jeopardy-unicef](http://www.unicef.org/rosa/press-releases/nepal-earthquake-education-nearly-1-million-children-jeopardy-unicef).
- cdlxix** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Nepal, 2020. <https://washdata.org/data/household#/table?geo0=country&geo1=NPL>.
- cdlxx** Ibid.
- cdlxxi** WHO & UNICEF, Joint Monitoring Programme: School WASH data Nepal, 2019. <https://washdata.org/data/school#/table?geo0=country&geo1=NPL>.
- cdlxxii** Paudel, K. P., Adapting Nepal's polio eradication programme. *Bulletin of the World Health Organization*, 2017, 95(3), 227–232.
- cdlxxiii** Bhandari, G. P., Gurung, S., Dhimal, M., & Bhusal, C. L. Climate change and occurrence of diarrheal diseases: evolving facts from Nepal. *Journal of Nepal Health Research Council*, 2012, 10(22), 181–186.
- cdlxxiv** Kjellstrom, T. Heat, human performance, and occupational health: A key issue for the assessment of global climate change impacts. *Annual Review of Public Health*: 2016, 37: 97–112.
- cdlxxv** Dunne, J. P., Stouffer, R. J., & John, J. G. Reductions in labor capacity from heat stress under climate warming. *Nature Climate Change*, 2013, 3(6), 563–566.
- cdlxxvi** UNICEF Nepal, Education, n.d. [www.unicef.org/nepal/education](http://www.unicef.org/nepal/education). Accessed 12 January 2023.
- cdlxxvii** Jullien, S., Pradhan, D., & Bassat, Q. Pneumonia in Bhutanese children: What we know, and what we need to know. *Pneumonia*, 2020, 12, 1.
- cdlxxviii** GFDRR, Think Hazard Country Profile, Bhutan: Extreme Heat, n.d. <https://thinkhazard.org/en/report/31-bhutan/EH>. Accessed 28 December 2022.
- cdlxxx** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- cdlxxxi** Tsheten T, et al., Epidemiological Analysis of the 2019 Dengue Epidemic in Bhutan. *International Journal of Environmental Research and Public Health*. 2021, 18(1):354.
- cdlxxxii** Dhimal, M, et al., Threats of Zika virus transmission for Asia and its Hindu-Kush Himalayan region. *Infectious diseases of poverty*, 2018, 7(1), 40.
- cdlxxxiii** Tshering, D., & Sithey, G. Climate change and health in Bhutan. Thimpu: *Royal Society for Protection of Nature*, 2008.
- cdlxxxiv** The International Centre for Integrated Mountain Development (ICIMOD), Field survey in Bhutan's most at-risk glacial lakes, 2016. [www.icimod.org/article/field-survey-in-bhutans-most-at-risk-glacial-lakes/](http://www.icimod.org/article/field-survey-in-bhutans-most-at-risk-glacial-lakes/).
- cdlxxxv** UNDP, Climate Change Adaptation Country Profile – Bhutan, 2018. [www.adaptation-undp.org/explore/Bhutan](http://www.adaptation-undp.org/explore/Bhutan).
- cdlxxxvi** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Bhutan, 2020. <https://washdata.org/data/household#/table?geo0=country&geo1=BTN>.
- cdlxxxvii** UNICEF Bhutan. WASH: Water, Sanitation and Hygiene, n.d. [www.unicef.org/bhutan/wash-water-sanitation-and-hygiene/maternal-new-born-and-child-health/wash-water-sanitation-and-0-0-1](http://www.unicef.org/bhutan/wash-water-sanitation-and-hygiene/maternal-new-born-and-child-health/wash-water-sanitation-and-0-0-1).
- cdlxxxviii** Ibid.
- cdlxxxix** UNICEF, Key Demographic Indicators: Bhutan, 2020. <https://data.unicef.org/country/btn/>.
- cdxc** UNICEF Bhutan, Annual Report 2021: Accelerating Results for Every Child in Bhutan, 2021. [www.unicef.org/bhutan/media/3066/file/Annual%20Report%202021.pdf](http://www.unicef.org/bhutan/media/3066/file/Annual%20Report%202021.pdf).
- cdxc** ILO, World Social Protection Data Dashboard: Bhutan, 2020. [www.social-protection.org/gimi/WSPDB.action?id=13](http://www.social-protection.org/gimi/WSPDB.action?id=13).
- cdxcii** UNICEF, Key Demographic Indicators: Bhutan, Education, 2010. <https://data.unicef.org/country/btn/>.
- cdxciii** UNICEF (2018) Annual Report 2018. Accelerating Results for Every Child in Bhutan, 2018. [www.unicef.org/bhutan/media/781/file/UNICEF%20Annual%20Report%202018.pdf](http://www.unicef.org/bhutan/media/781/file/UNICEF%20Annual%20Report%202018.pdf).
- cdxciv** Godfrey, S. and Tunhuma, F.A., *The Climate Crisis: Climate Change Impacts, Trends and Vulnerabilities of Children in Sub Sahara Africa*, United Nations Children's Fund Eastern and Southern Africa Regional Office, Nairobi, 2020.
- cdxcv** UNICEF WCAR, UNICEF's Children Climate Risk Index places children from WCA as the most at risk, 2021. [www.unicef.org/wcar/reports/unicefs-children-climate-risk-index-places-children-wca-most-risk](http://www.unicef.org/wcar/reports/unicefs-children-climate-risk-index-places-children-wca-most-risk).
- cdxcvi** IAMAT, Benin General Health Risks: Air Pollution, 2020. [www.iamat.org/country/benin/risk/air-pollution#:~:text=In%20accordance%20with%20the%20World,maximum%20of%2010%20C2%B5g%2Fm3](http://www.iamat.org/country/benin/risk/air-pollution#:~:text=In%20accordance%20with%20the%20World,maximum%20of%2010%20C2%B5g%2Fm3).
- cdxcvii** UNICEF & Pure Earth, *The Toxic Truth: Children's Exposure to Lead Pollution Undermines a Generation of Future Potential*, 2020.
- cdxcviii** NASA: Earth observatory. Flooding in Benin, 2010. <https://earthobservatory.nasa.gov/images/46511/flooding-in-benin>.
- cdxcix** IFRC, Emergency Plan of Action Benin: Floods, 2021. <https://reliefweb.int/sites/reliefweb.int/files/resources/MDRBJ016do.pdf>.
- d** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Benin Overview. <https://climateknowledgeportal.worldbank.org/country/benin>. Accessed 29 December 2022.
- di** GFDRR, Think Hazard Country Profile, Benin. <https://thinkhazard.org/en/report/29-benin/EH>. Accessed 28 December 2022.

- dii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Benin, 2020. <https://washdata.org/data/household#/table?geo0=country&geo1=BN>.
- diii** UNICEF, Estimates of child cause of death, Diarrhea, 2018. [https://data.unicef.org/wp-content/uploads/2018/02/CoD\\_Diarrhoea\\_Feb-2018\\_WHO\\_MCEE\\_234.xlsx](https://data.unicef.org/wp-content/uploads/2018/02/CoD_Diarrhoea_Feb-2018_WHO_MCEE_234.xlsx).
- div** The Centers for Disease Control and Prevention (CDC), CDC in Benin. [www.cdc.gov/globalhealth/countries/benin/pdf/Benin\\_Factsheet.pdf](http://www.cdc.gov/globalhealth/countries/benin/pdf/Benin_Factsheet.pdf).
- dv** Sanyang, Y. Prevalence of under-five years of age mortality by infectious diseases in West African region, *International Journal of Africa Nursing Sciences*, 2019, 11, 2214-1391.
- dvi** WFP, WFP Benin Country Brief: June 2021. [https://docs.wfp.org/api/documents/WFP-0000130346/download/?\\_ga=2.206804947.1919619137.1638386734-826472913.1638386734](https://docs.wfp.org/api/documents/WFP-0000130346/download/?_ga=2.206804947.1919619137.1638386734-826472913.1638386734)
- dvii** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Benin vulnerability, n.d.. <https://climateknowledgeportal.worldbank.org/country/benin>. Accessed 29 December 2022.
- dviii** UNICEF Benin, L'école inaccessible à 43 pour cent de filles et 36 pour cent de garçons des ménages plus pauvres, 2020. [www.unicef.org/benin/recits/l%C3%A9cole-inaccessible-%C3%A0-43-pour-cent-de-filles-et-36-pour-cent-de-gar%C3%A7ons-des-m%C3%A9nages-plus](http://www.unicef.org/benin/recits/l%C3%A9cole-inaccessible-%C3%A0-43-pour-cent-de-filles-et-36-pour-cent-de-gar%C3%A7ons-des-m%C3%A9nages-plus).
- dx** Ibid.
- dx** Ibid.
- dx** IAMAT, Burkina Faso General Health Risks: Air Pollution, 2020. [www.iamat.org/country/burkina-faso/risk/air-pollution#:~:text=Contributors percent20to percent20poor percent20air percent20quality,high percent20levels percent20of percent20air percent20pollution](http://www.iamat.org/country/burkina-faso/risk/air-pollution#:~:text=Contributors percent20to percent20poor percent20air percent20quality,high percent20levels percent20of percent20air percent20pollution).
- dxii** GFDRR, The Global Support Program of the Climate Investment Funds, and The Climate Change Team of the Environment Department of the World Bank, *Climate Risk and Adaptation Country Profile: Burkina Faso, Vulnerability, Risk Reduction, and Adaptation to Climate Change*, 2011.
- dxiii** Ibid.
- dxiv** Ministère de l'Environnement et du Cadre de Vie 2007. Programme d'Action National d'adaptation à la variabilité et aux Changements Climatiques (PANA).
- dxv** GFDRR, The Global Support Program of the Climate Investment Funds, and The Climate Change Team of the Environment Department of the World Bank, *Climate Risk and Adaptation Country Profile: Burkina Faso, Vulnerability, Risk Reduction, and Adaptation to Climate Change*, 2011.
- dxvi** Ibid.
- dxvii** CDC, Facts About Cyanide, 2018. <https://emergency.cdc.gov/agent/cyanide/basics/facts.asp>.
- dxviii** Geller, R.J., Barthold, c., Saiers, A.J., & Hall, A.H. Pediatric Cyanide Poisoning: Causes, Manifestations, Management, and Unmet Needs. *Pediatrics*, 2006, 118:5, 2146–58.
- dxix** Razanamahandry, L.C., *et al.*, Prediction model for cyanide soil pollution in artisanal gold mining area by using logistic regression. *CATENA*, 2018, 162: 40–50.
- dx** UNICEF & Pure Earth, *The Toxic Truth: Children's Exposure to Lead Pollution Undermines a Generation of Future Potential*, 2020.
- dxxi** UNICEF, Humanitarian Action for Children: Burkina Faso, 2021. [www.unicef.org/media/98281/file/2021-HAC-Burkina-Faso-May-Update.pdf](http://www.unicef.org/media/98281/file/2021-HAC-Burkina-Faso-May-Update.pdf).
- dxxii** UNICEF, Humanitarian Action for Children: Burkina Faso, 2023. [www.unicef.org/media/131986/file/2023-HAC-Burkina-Faso.pdf](http://www.unicef.org/media/131986/file/2023-HAC-Burkina-Faso.pdf).
- dxxiii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Burkina Faso, 2020. <https://washdata.org/data/household#/table?geo0=country&geo1=BFA>.
- dxxiv** GFDRR, The Global Support Program of the Climate Investment Funds, and The Climate Change Team of the Environment Department of the World Bank, *Climate Risk and Adaptation Country Profile: Burkina Faso, Vulnerability, Risk Reduction, and Adaptation to Climate Change*, 2011.
- dxv** UNICEF, Humanitarian Action for Children: Burkina Faso, 2021. [www.unicef.org/media/98281/file/2021-HAC-Burkina-Faso-May-Update.pdf](http://www.unicef.org/media/98281/file/2021-HAC-Burkina-Faso-May-Update.pdf).
- dxvvi** The World Bank, The World Bank in Burkina Faso, 2021. <https://www.worldbank.org/en/country/burkinafaso/overview>. Accessed January 2022.
- dxvii** Conseil National de Secours d'Urgence et de Réhabilitation (CONASUR), 2022.
- dxviii** UNICEF, The Radio Education Programme: Ray of hope for internally displaced children in the Boucle du Mouhoun, 2022. [www.unicef.org/burkinafaso/en/stories/radio-education-programmeray-hope-internally-displaced-children-boucle-du-mouhoun](http://www.unicef.org/burkinafaso/en/stories/radio-education-programmeray-hope-internally-displaced-children-boucle-du-mouhoun).
- dxvix** Climate and Clean Air Coalition, Central African Republic - National planning on short-lived climate pollutants, n.d. [www.ccacoalition.org/en/activity/central-african-republic-national-planning-short-lived-climate-pollutants](http://www.ccacoalition.org/en/activity/central-african-republic-national-planning-short-lived-climate-pollutants). Accessed January 2023.
- dxxx** UNICEF, Central African Republic: ITN - percentage of children (under age 5) who slept under an insecticide-treated mosquito net the night prior to the survey, 2019. [https://data.unicef.org/resources/data\\_explorer/unicef\\_ff?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=CAF.MNCH\\_ITN.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_ff?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=CAF.MNCH_ITN.&startPeriod=1970&endPeriod=2023).
- dxxxi** The World Bank Group, *Climate Risk Country Profile: Central African Republic*, 2021.
- dxxxii** UNICEF, Analyses des risques et de l'impact des aleas sur les enfants en RCA, 2022. [www.unicef.org/car/rapports/analyse-des-risques-et-de-limpact-des-al%C3%A9as-sur-les-enfants-en-rca](http://www.unicef.org/car/rapports/analyse-des-risques-et-de-limpact-des-al%C3%A9as-sur-les-enfants-en-rca).
- dxxxiii** IFRC, Emergency Plan of Action (EPoA) Central African Republic: Floods, 2021. <https://reliefweb.int/sites/reliefweb.int/files/resources/MDRCF027do.pdf>.
- dxxxiv** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Central African Republic, 2020. <https://washdata.org/data/household#/table?geo0=country&geo1=CAF>.
- dxxxv** UNHCR data as of February 15, 2022, as cited in: The World Bank, The World Bank in Central African Republic: Overview. Available at: <https://www.worldbank.org/en/country/centralafricanrepublic/overview>.
- dxxxvi** The World Bank Group, *Climate Risk Country Profile: Central African Republic*, 2021.
- dxxxvii** UNICEF, Central African Republic: Humanitarian Action for Children, 2023. [www.unicef.org/media/131881/file/2023-HAC-CAR.pdf](http://www.unicef.org/media/131881/file/2023-HAC-CAR.pdf).
- dxxxviii** The World Bank, The World Bank in Central African Republic: Overview. Available at: <https://www.worldbank.org/en/country/centralafricanrepublic/overview#1>
- dxxxix** UNICEF, Central African Republic: Humanitarian Action for Children, 2023. [www.unicef.org/media/131881/file/2023-HAC-CAR.pdf](http://www.unicef.org/media/131881/file/2023-HAC-CAR.pdf).
- dxl** UNICEF, Central African Republic: Key Demographic Indicators, Education, 2019. <https://data.unicef.org/country/cafr/>.
- dxli** Health Effects Institute, State of Global Air / 2019, Chad. Available at: [www.stateofglobalair.org/sites/default/files/2019-09/soga\\_fact\\_sheet\\_chad\\_20190827\\_v02.pdf](http://www.stateofglobalair.org/sites/default/files/2019-09/soga_fact_sheet_chad_20190827_v02.pdf).
- dxlii** Ibid.
- dxliii** OCHA, When the desert becomes flooded: climate change in Chad, 2021. [www.preventionweb.net/news/when-desert-becomes-flooded-climate-change-chad](http://www.preventionweb.net/news/when-desert-becomes-flooded-climate-change-chad).
- dxliv** IOM, Nearly 120,000 People Displaced, at Least 10 Dead After Flash Floods in Chad, 2020. [www.iom.int/news/nearly-120000-people-displaced-least-10-dead-after-flash-floods-chad](http://www.iom.int/news/nearly-120000-people-displaced-least-10-dead-after-flash-floods-chad).
- dxlv** WHO, Disease outbreak news- Chad, 2020. [www.who.int/emergencies/disease-outbreak-news/item/chikungunya-chad](http://www.who.int/emergencies/disease-outbreak-news/item/chikungunya-chad).
- dxlvi** Nambatingar, N., *et al.*, Heavy Metal Pollution of Chari River Water during the Crossing of N'Djamena (Chad). *Toxics*, 2017, 5(4), 26.
- dxlvii** Usigbe, L. Drying Lake Chad Basin gives rise to crisis, 2019. [www.un.org/africarenewal/magazine/december-2019-march-2020/drying-lake-chad-basin-gives-rise-crisis](http://www.un.org/africarenewal/magazine/december-2019-march-2020/drying-lake-chad-basin-gives-rise-crisis).
- dxlviii** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Chad vulnerability, n.d. <https://climateknowledgeportal.worldbank.org/country/chad/climate-data-historical>. Accessed 29 December 2022.
- dxlix** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Chad, 2020. <https://washdata.org/data/household#/table?geo0=country&geo1=TCD>.
- dl** Ibid.
- dli** Save the Children, UNICEF, & Every Breath Counts Coalition, Fighting for breath in Chad, 2020. <https://stopppneumonia.org/wp-content/uploads/2020/06/CHAD-2020.pdf>.
- dlii** UNICEF Chad, Health, n.d. [www.unicef.org/chad/health](http://www.unicef.org/chad/health). Accessed 11 January 2023.
- dliii** UNICEF Chad, Nutrition, n.d. [www.unicef.org/chad/nutrition](http://www.unicef.org/chad/nutrition). Accessed 11 January 2023.
- dliiv** UNICEF, Chad: Key demographic indicators: Education, 2019. <https://data.unicef.org/country/tcd/>.
- dli** UNICEF Chad, Education, n.d. <https://www.unicef.org/chad/education>. Accessed 09 January 2023.
- dli** UNICEF, DRC Climate, Energy and Environment Landscape Analysis for Children, 2019.
- dli** Ibid.
- dli** The World Bank Group, *Climate Risk Country Profile: Congo, Democratic Republic*, 2021.
- dlix** Ministry of Foreign Affairs, Climate Change Profile – Democratic Republic of the Congo, 2018. <https://reliefweb.int/sites/reliefweb.int/files/resources/DRC%2B%28east%29.pdf>.
- dlx** Emina, J.B.O., Doctor, HV., & Yé, Y. Profiling Malaria infection among under-five children in the Democratic Republic of Congo. *PLoS ONE* 2021, 16(5).

- dlxi** OCHA (2022) Democratic Republic of the Congo - Flash Update #1: Floods caused by heavy rains in Kinshasa, 14 December 2022, 2022. <https://reliefweb.int/report/democratic-republic-congo/democratic-republic-congo-flash-update-1-floods-caused-heavy-rains-kinshasa-14-december-2022>.
- dlxii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Democratic Republic of the Congo, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=COD>.
- dlxiii** Ibid.
- dlxiv** The World Bank Group, *Climate Risk Country Profile: Congo, Democratic Republic*, 2021.
- dlxv** UNICEF, DRC Climate, Energy and Environment Landscape Analysis for Children, 2019.
- dlxvi** World Bank (2022) Democratic Republic of Congo Overview. World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Democratic Republic of Congo Overview, n.d. <https://climateknowledgeportal.worldbank.org/country/congo-dem-rep>. Accessed 29 December 2022.
- dlxvii** Ibid.
- dlxviii** UNICEF, Democratic Republic of Congo, Indicator: Adjusted net attendance rate for children of primary school age, 2018. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=COD.ED\\_ANAR\\_L1.&startPeriod=1970&endPeriod=2021](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=COD.ED_ANAR_L1.&startPeriod=1970&endPeriod=2021).
- dlxix** UNICEF, Democratic Republic of Congo, Indicator: Percentage of children aged 36-59 months attending an early childhood education programme, 2018. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=COD.ECD\\_CHLD\\_36-59M\\_EDU-PGM.&startPeriod=1970&endPeriod=2021](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=COD.ECD_CHLD_36-59M_EDU-PGM.&startPeriod=1970&endPeriod=2021).
- dlxx** Drammeh, F. Coastal Adaptation to Climate Change in The Gambia, 2014. [https://www.un.org/depts/los/nippon/unfff\\_programme\\_home/fellows\\_pages/fellows\\_papers/Drammeh\\_1314\\_Gam\\_PPT%20.pdf](https://www.un.org/depts/los/nippon/unfff_programme_home/fellows_pages/fellows_papers/Drammeh_1314_Gam_PPT%20.pdf).
- dlxxi** Ibid.
- dlxxii** Mbenga Cham, FAO: Global Programme of Action for the Protection of the Marine Environment from Land-based activities, Report of The Gambia, 2014. [www.fao.org/3/br720e/br720e.pdf](http://www.fao.org/3/br720e/br720e.pdf).
- dlxxiii** UNICEF, Gambia Indicator: Under-five mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=GMB.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=GMB.CME_MRY0T4.&startPeriod=1970&endPeriod=2023).
- dlxxiv** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Gambia, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=GMB>.
- dlxxv** UNICEF, Country Office Annual Report 2021, 2021. [www.unicef.org/media/117006/file/Gambia-2021-COAR.pdf](http://www.unicef.org/media/117006/file/Gambia-2021-COAR.pdf).
- dlxxvi** Ibid.
- dlxxvii** UNICEF, Key Demographic Indicators: Gambia, Education, 2018. <https://data.unicef.org/country/gmb/>.
- dlxxviii** UNICEF, Key Demographic Indicators: Gambia, Education, 2013. <https://data.unicef.org/country/gmb/>.
- dlxxix** USAID, Climate Risk Profile: Guinea - Fact Sheet, 2018. [https://reliefweb.int/sites/reliefweb.int/files/resources/Guinea\\_CRP\\_Final\\_0.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/Guinea_CRP_Final_0.pdf)
- dlxxx** Ibid.
- dlxxx1** UNICEF, Guinea, 2021. Guinea (GIN) - Demographics, Health & Infant Mortality - UNICEF DATA.
- dlxxxii** UNICEF, *Clear the Air for Children*, 2016.
- dlxxxiii** UNICEF, Humanitarian Action for Children: Guinea 2023, 2022. [www.unicef.org/media/131376/file/2023-HAC-Guinea.pdf](http://www.unicef.org/media/131376/file/2023-HAC-Guinea.pdf).
- dlxxxiv** Ibid.
- dlxxxv** Ibid.
- dlxxxvi** Ibid.
- dlxxxvii** UNICEF, Indicator: Children living in households with income below the national poverty line (as a % of all children), 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=.PV\\_CHLD\\_INCM-PL.&startPeriod=2010&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=.PV_CHLD_INCM-PL.&startPeriod=2010&endPeriod=2020).
- dlxxxviii** National Institute of Statistics, Harmonised Household Living Conditions Survey Report, December 2020, as cited in: UNICEF, Humanitarian Action for Children: Guinea 2023, 2022. [www.unicef.org/media/131376/file/2023-HAC-Guinea.pdf](http://www.unicef.org/media/131376/file/2023-HAC-Guinea.pdf).
- dlxxxix** UNICEF, Key demographic indicators: Guinea, Education, 2018. <https://data.unicef.org/country/gin/>.
- dx** Statistical yearbook of the Ministry of Education of Guinea, September 2021, as cited in: UNICEF, Humanitarian Action for Children: Guinea 2023, 2022. [www.unicef.org/media/131376/file/2023-HAC-Guinea.pdf](http://www.unicef.org/media/131376/file/2023-HAC-Guinea.pdf).
- dxci** The World Bank, Land area (sq. km) -Guinea-Bissau, 2020, <https://data.worldbank.org/indicator/AG.LND.TOTL.K2?locations=GW>.
- dxcii** UNICEF, Guinea-Bissau Indicator: Percentage of households with at least one insecticide-treated mosquito net (ITN), 2019. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=GNB.MNCH\\_ITNOWN.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=GNB.MNCH_ITNOWN.&startPeriod=1970&endPeriod=2023).
- dxciiii** Namir, D.R.L., Cheng, Y., & Shi, W.L, Management of Soil Contaminants in Guinea - Bissau, *International Journal of Environmental Monitoring and Analysis*. 6:1, 2018, 26-39.
- dxciiv** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Guinea-Bissau, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=GNB>.
- dxciiv** UNICEF Guinea-Bissau, Water, Sanitation and Hygiene, n.d. [www.unicef.org/guineabissau/water-sanitation-and-hygiene](http://www.unicef.org/guineabissau/water-sanitation-and-hygiene). Accessed 13 January 2023.
- dxciiv** Humanium, Children of Guinea-Bissau, 2021. [www.humanium.org/en/guinea-bissau/](http://www.humanium.org/en/guinea-bissau/).
- dxciiv** WFP, Guinea-Bissau, n.d. [www.wfp.org/countries/guinea-bissau](http://www.wfp.org/countries/guinea-bissau). Accessed 13 January 2023.
- dxciiviii** UNICEF, Guinea-Bissau Country Office Annual Report 2021, 2021. [www.unicef.org/media/117031/file/Guinea-Bissau-2021-COAR.pdf](http://www.unicef.org/media/117031/file/Guinea-Bissau-2021-COAR.pdf).
- dxciix** Ibid.
- dc** WFP, Guinea-Bissau, n.d. [www.wfp.org/countries/guinea-bissau](http://www.wfp.org/countries/guinea-bissau). Accessed 13 January 2023.
- dci** UNICEF, Key Demographic Indicators: Guinea-Bissau, Education 2019. <https://data.unicef.org/country/gnb/>
- dcii** Ibid.
- dciii** UNDP (2021) Monrovia Metropolitan Climate Resilience Project, n.d. [www.adaptation-undp.org/hazards-addressed/sea-level-rise](http://www.adaptation-undp.org/hazards-addressed/sea-level-rise). Accessed 14 January 2023.
- dciv** USAID, *Climate risks in food for peace geographies – Liberia. Climate Risk Profile*, 2017.
- dcv** WHO, *World malaria report 2021*. Geneva: World Health Organization; 2021.
- dcvi** The World Bank Group, *Climate Risk Country Profile: Liberia*, 2021.
- dcvii** Ibid.
- dcviii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data, Liberia, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=LBR>.
- dcix** Ibid.
- dcx** UNICEF & WHO. *Drinking water, sanitation, and hygiene in schools: global baseline report 2018*. New York: 2018.
- dcxi** Drakenberg, O., Andersson, F. and Wingqvist, G, Liberia: Environmental and Climate Change Policy Brief, 2014, as cited in: The World Bank Group, *Climate Risk Country Profile: Liberia*, 2021.
- dcxii** UNICEF Liberia, n.d. Child, maternal and new-born health. [www.unicef.org/liberia/child-maternal-and-new-born-health](http://www.unicef.org/liberia/child-maternal-and-new-born-health). Accessed 10 January 2023.
- dcxiii** UNICEF, Indicator: Children living in households with income below the national poverty line (as a % of all children), 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=.PV\\_CHLD\\_INCM-PL.&startPeriod=2010&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=.PV_CHLD_INCM-PL.&startPeriod=2010&endPeriod=2020).
- dcxiv** The World Bank, Poverty & Equity Brief: African Western & Central Liberia, 2021. [https://databankfiles.worldbank.org/public/ddpext\\_download/poverty/987B9C90-CB9F-4D93-AE8C-750588BF00QA/AM2020/Global\\_POVEQ\\_LBR.pdf](https://databankfiles.worldbank.org/public/ddpext_download/poverty/987B9C90-CB9F-4D93-AE8C-750588BF00QA/AM2020/Global_POVEQ_LBR.pdf)
- dcxv** Ibid.
- dcxvi** Ibid.
- dcxvii** UNICEF Liberia, Basic Education, n.d. [www.unicef.org/liberia/basic-education](http://www.unicef.org/liberia/basic-education). Accessed 13 January 2023.
- dcxviii** UNICEF, Mali, indicator: ITN use by children - percentage of children (under age 5) who slept under an insecticide-treated mosquito net the night prior to the survey, 2018. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=MLI.MNCH\\_ITN.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=MLI.MNCH_ITN.&startPeriod=1970&endPeriod=2023).
- dcxix** UNDP, Flood Hazard and Climate Risk Management to Secure Lives and Assets in Mali Project Overview, 2021. [www.adaptation-undp.org/projects/flood-hazard-and-climate-risk-management-secure-lives-and-assets-mali](http://www.adaptation-undp.org/projects/flood-hazard-and-climate-risk-management-secure-lives-and-assets-mali).
- dcxx** GFDRL, The Global Support Program of the Climate Investment Funds, and The Climate Change Team of the Environment Department of the World Bank, *Climate Risk and Adaptation Country Profile: Mali, Vulnerability, Risk Reduction, and Adaptation to Climate Change*, 2011.
- dcxxi** Ibid.
- dcxxii** British Geological Survey & WaterAid, Groundwater Quality: Mali, 2002. <http://nora.nerc.ac.uk/id/eprint/516317/1/Mali.pdf>.
- dcxxiii** UNICEF WCARO, Technical Report: Climate change risks for children in West and Central Africa: From threats and impacts to child-responsive climate change adaptation, forthcoming in 2023.



- dcxxiv** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Mali, <https://washdata.org/data/household#!/table?geo0=country&geo1=MLI>, 2020.
- dcxxv** Ibid.
- dcxxvi** UNICEF Mali, Water, sanitation and hygiene, n.d. [www.unicef.org/mali/en/water-sanitation-and-hygiene](http://www.unicef.org/mali/en/water-sanitation-and-hygiene) Accessed 14 January 2023.
- dcxxvii** UNICEF Mali, Health, n.d. [www.unicef.org/mali/en/health](http://www.unicef.org/mali/en/health). Accessed 14 January 2023.
- dcxxviii** Ibid.
- dcxxix** Ibid.
- dcxxx** World Bank, Prevalence of stunting, height for age (% of children): Mali, 202. <https://data.worldbank.org/indicator/SH.STA.STNT.ZS>.
- dcxxx1** The World Bank, The World Bank in Mali: Overview, 2022. [www.worldbank.org/en/country/mali/overview#1](http://www.worldbank.org/en/country/mali/overview#1).
- dcxxxii** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Mali vulnerability, n.d. <https://climateknowledgeportal.worldbank.org/country/mali/vulnerability>. Accessed 14 January 2023.
- dcxxxiii** The World Bank, The World Bank in Mali: Overview, 2022. [www.worldbank.org/en/country/mali/overview#1](http://www.worldbank.org/en/country/mali/overview#1).
- dcxxxiv** UNICEF Mali, Children in Mali, n.d. [www.unicef.org/mali/en/children-mali](http://www.unicef.org/mali/en/children-mali). Accessed 14 January 2023.
- dcxxxv** UNICEF Mali, Education, n.d. [www.unicef.org/mali/en/education](http://www.unicef.org/mali/en/education). Accessed 14 January 2023.
- dcxxxvi** UNICEF, Mauritania, Indicator: Percentage of households with at least one insecticide-treated mosquito net (ITN), 2015. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=MRT.MNCH\\_ITNOWN.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=MRT.MNCH_ITNOWN.&startPeriod=1970&endPeriod=2023).
- dcxxxvii** WHO, *World malaria report 2019*. Geneva: World Health Organization; 2019.
- dcxxxviii** Caminade, C., Jones, A.E., Ross, R., & Macdonald, G. Malaria in a Warmer West Africa, *Nat. Clim. Chang.*, 6, 2016, 984–985.
- dcxxxix** Boyce, R. *et al.*, Severe Flooding and Malaria Transmission in the Western Ugandan Highlands: Implications for Disease Control in an Era of Global Climate Change, *J. Infect. Dis.*, 214, 2016, 1403–1410.
- dcxl** Floodlist, Mauritania- Deadly Floods in South and East, 2020. <https://floodlist.com/africa/mauritania-floods-september-2020>.
- dcxli** Federal Ministry for Economic Cooperation and Development (BMZ), Climate Risk Profile: Mauritania, 2021. [https://agric.de/wp-content/uploads/2021/02/CRP\\_Mauritania\\_EN\\_20210208.pdf](https://agric.de/wp-content/uploads/2021/02/CRP_Mauritania_EN_20210208.pdf).
- dcxlii** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- dcxliiii** Ibid.
- dcxliv** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Mauritania, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=MRT>.
- dcxlv** Ibid.
- dcxlvi** Federal Ministry for Economic Cooperation and Development (BMZ), Climate Risk Profile: Mauritania, 2021. [https://agric.de/wp-content/uploads/2021/02/CRP\\_Mauritania\\_EN\\_20210208.pdf](https://agric.de/wp-content/uploads/2021/02/CRP_Mauritania_EN_20210208.pdf).
- dcxlvii** Republique Islamique de Mauritanie, *Rapport d'analyse de situation du secteur de la santé*, Nouakchott, Mauritania, 2011.
- dcxlviii** National SMART nutrition survey, Emergency nutrition thresholds are global acute malnutrition rates exceeding 15 percent and/or SAM rates above 2 percent, 2019.
- dcxlix** The World Bank, Prevalence of stunting, height for age. (% of children under 5), 201. <https://data.worldbank.org/indicator/SH.STA.STNT.ZS>.
- dcl** UNICEF, Humanitarian Action for Children: Mauritania, 2023. [www.unicef.org/media/131346/file/2023-HAC-Mauritania.pdf](http://www.unicef.org/media/131346/file/2023-HAC-Mauritania.pdf).
- dcli** Ibid.
- dclii** The World Bank, Poverty headcount ratio at national poverty lines (% of population) – Mauritania, 2014. <https://data.worldbank.org/indicator/SI.POV.NAHC?locations=MR>.
- dcliii** Oxfam, Mauritania, 2021. [www.oxfam.org/en/what-we-do/countries/mauritania](http://www.oxfam.org/en/what-we-do/countries/mauritania).
- dcliv** UNICEF, Key demographic indicators: Education, Mauritania, 2015. [www.unicef.org/media/87276/file/2021-HAC-Mauritania.pdf](http://www.unicef.org/media/87276/file/2021-HAC-Mauritania.pdf).
- dclv** UNICEF, Humanitarian Action for Children: Mauritania, 2023. [www.unicef.org/media/131346/file/2023-HAC-Mauritania.pdf](http://www.unicef.org/media/131346/file/2023-HAC-Mauritania.pdf).
- dclvi** USAID, *Regional Fact Sheet: Climate Change Risk Profile: West Africa Sahel*, 2017.
- dclvii** Ibid.
- dclviii** UNICEF, Niger, Indicator: ITN use by children - percentage of children (under age 5) who slept under an insecticide-treated mosquito net the night prior to the survey. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=NER.MNCH\\_ITN.&startPeriod=1970&endPeriod=2021](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=NER.MNCH_ITN.&startPeriod=1970&endPeriod=2021)
- dclix** OCHA, West and Central Africa: Flooding Situation, 2021. [https://reliefweb.int/sites/reliefweb.int/files/resources/2021\\_percent20Flooding\\_percent20Snapshot\\_August.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/2021_percent20Flooding_percent20Snapshot_August.pdf).
- dclx** OCHA, West and Central Africa: Weekly Regional Humanitarian Snapshot, 2021, 21-27 September. [https://reliefweb.int/sites/reliefweb.int/files/resources/External\\_percent20weekly\\_percent2021-27\\_percent20September\\_percent202021.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/External_percent20weekly_percent2021-27_percent20September_percent202021.pdf).
- dclxi** Niger, Ministère de l'Action Humanitaire et Gestion des Catastrophes, Septembre 2022.
- dclxii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Niger, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=NER>.
- dclxiii** Ibid.
- dclxiv** WHO & UNICEF, Joint Monitoring Programme: Schools WASH data Niger, 2021. <https://washdata.org/data/school#!/table?geo0=country&geo1=NER>.
- dclxv** WHO & UNICEF, Joint Monitoring Programme: Healthcare facilities WASH data Niger, 2021. <https://washdata.org/data/healthcare#!/table?geo0=country&geo1=NER>.
- dclxvi** The World Bank, Maternal mortality ratio (modelled estimate, per 100,000 live births), 2017. <https://data.worldbank.org/indicator/SH.STA.MMRT>.
- dclxvii** UNICEF, Humanitarian Action for Children 2023: Niger, 2022. [www.unicef.org/media/131966/file/2023-HAC-Niger.pdf](http://www.unicef.org/media/131966/file/2023-HAC-Niger.pdf).
- dclxviii** The World Bank, Prevalence of stunting, height for age (% of children under 5) Niger, 2021. <https://data.worldbank.org/indicator/SH.STA.STNT.ZS>.
- dclxix** The World Bank (2022) The World Bank in Niger: Overview, 2022. [www.worldbank.org/en/country/niger/overview#1](http://www.worldbank.org/en/country/niger/overview#1).
- dclxx** World Bank (2021) The World Bank in Niger: Overview. Available at: <https://www.worldbank.org/en/country/niger/overview#1>
- dclxxi** Ministry of National Education, September 2022, as cited in UNICEF, Humanitarian action for Children Niger 2023, 2022. [www.unicef.org/media/131966/file/2023-HAC-Niger.pdf](http://www.unicef.org/media/131966/file/2023-HAC-Niger.pdf).
- dclxxii** GFDRR, The Global Support Program of the Climate Investment Funds, and The Climate Change Team of the Environment Department of the World Bank, *Climate Risk and Adaptation Country Profile: Senegal, Vulnerability, Risk Reduction, and Adaptation to Climate Change*, 2011.
- dclxxiii** UNICEF, Senegal, Indicator: ITN use by children - percentage of children (under age 5) who slept under an insecticide-treated mosquito net the night prior to the survey. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=SEN.MNCH\\_ITN.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SEN.MNCH_ITN.&startPeriod=1970&endPeriod=2023).
- dclxxiv** GFDRR, The Global Support Program of the Climate Investment Funds, and The Climate Change Team of the Environment Department of the World Bank, *Climate Risk and Adaptation Country Profile: Senegal, Vulnerability, Risk Reduction, and Adaptation to Climate Change*, 2011.
- dclxxv** Ibid.
- dclxxvi** S.Y., Ibrahim, Heatwaves and mortality rates in Northern Senegal: temperature-related morbidity and mortality and associated risk factors, 2021. <http://aasciences.africa/news/heatwaves-and-mortality-rates-northern-senegal-temperature-related-morbidity-and-mortality-and>.
- dclxxvii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Senegal, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=SEN>.
- dclxxviii** WHO & UNICEF, Joint Monitoring Programme: School WASH data Senegal, 2020. <https://washdata.org/data/school#!/table?geo0=country&geo1=SEN>.
- dclxxix** WHO & UNICEF, Joint Monitoring Programme: Healthcare facilities. WASH data Senegal, 2020. <https://washdata.org/data/healthcare#!/table?geo0=country&geo1=SEN>.
- dclxxx** UNICEF, Senegal indicator: Under-five mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=SEN.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SEN.CME_MRY0T4.&startPeriod=1970&endPeriod=2023).
- dclxxxi** The World Bank, Senegal indicator: Maternal mortality ratio (modelled estimate, per 100,000 live births). [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=SEN.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SEN.CME_MRY0T4.&startPeriod=1970&endPeriod=2023).
- dclxxxii** Brar, S., Akseer, N., Sall, M., Conway, K., Diouf, I., Everett, K., Islam, M., Sène, P. I. S., Tasic, H., Wigle, J., & Bhutta, Z. (2020). Drivers of stunting reduction in Senegal: a country case study. *The American journal of clinical nutrition*, 112(Suppl 2), 860S–874S. <https://doi.org/10.1093/ajcn/nqaa151>.

- dclxxxiii** UNICEF, Child Survival and Development, n.d. [www.unicef.org/senegal/en/child-survival-and-development](http://www.unicef.org/senegal/en/child-survival-and-development). Accessed 14 January 2023.
- dclxxxiv** UNICEF, Children in Senegal, n.d. [www.unicef.org/senegal/en/children-senegal](http://www.unicef.org/senegal/en/children-senegal). Accessed 14 January 2023.
- dclxxxv** Ibid.
- dclxxxvi** UNICEF, Education: Adjusted net attendance rate of children, 2019. <https://data.unicef.org/country/sen/>.
- dclxxxvii** Ibid.
- dclxxxviii** Fritz, M., McQuilken, J., Collins, N. and Weldegiorgis, F. Global trends in artisanal and small-scale mining (ASM): a review of key numbers and issues. *International Institute for Environment and Development*, 2018.
- dclxxxix** UNICEF, *The Coldest Year of the Rest of their Lives: Protecting children from the escalating impacts of heatwaves*, UNICEF, New York, 2022.
- dcxc** WHO Africa, Tackling Malaria in Sierra Leone, 2016. [www.afro.who.int/news/tackling-malaria-sierra-leone](http://www.afro.who.int/news/tackling-malaria-sierra-leone).
- dcxci** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Sierra Leone, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=SLE>.
- dcxcii** The World Bank, Maternal mortality ratio (modelled estimate, per 100,000 live births), 2017. <https://data.worldbank.org/indicator/SH.STA.MMRT>.
- dcxciii** UNICEF, Maternal, neonatal and child health, n.d. [www.unicef.org/sierraleone/maternal-neonatal-and-child-health](http://www.unicef.org/sierraleone/maternal-neonatal-and-child-health). Accessed 14 January 2023.
- dcxciv** UNICEF, Sierra Leone Indicator: Under-five mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=SLE.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SLE.CME_MRY0T4.&startPeriod=1970&endPeriod=2023).
- dcxcv** UNICEF, Maternal, neonatal and child health, n.d. [www.unicef.org/sierraleone/maternal-neonatal-and-child-health](http://www.unicef.org/sierraleone/maternal-neonatal-and-child-health). Accessed 14 January 2023.
- dcxcvi** The World Bank, Prevalence of stunting, height for age (% of children under 5), Sierra Leone, 2021. <https://data.worldbank.org/indicator/SH.STA.STNT.ZS>.
- dcxcvii** UNDP, Sierra Leone at a glance, n.d. [www.undp.org/sierra-leone](http://www.undp.org/sierra-leone). Accessed 14 January 2023.
- dcxcviii** UNICEF, Sierra Leone: Key Demographic Indicators Education, 2017. <https://data.unicef.org/country/sle/>.
- dcxcix** The World Bank Group, *Climate Risk Country Profile Togo*, 2021.
- dcc** Ibid.
- dcci** Ibid.
- dccii** Ibid.
- dcciii** Ibid.
- dcciv** FAO and UNEP, *Global assessment of soil pollution: Report*. Rome, 2021.
- dccv** The World Bank Group, *Climate Risk Country Profile Togo*, 2021.
- dccvi** Ibid.
- dccvii** Ibid.
- dccviii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Togo, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=TGO>.
- dccix** Ibid.
- dccx** UNICEF, Togo Indicator: Under-five mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=TGO.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=TGO.CME_MRY0T4.&startPeriod=1970&endPeriod=2023).
- dccxi** The World Bank, Maternal mortality ratio (modelled estimate, per 100,000 live births) Togo, 2017. <https://data.worldbank.org/indicator/SH.STA.MMRT>.
- dccxii** The World Bank, Prevalence of stunting, height for age (% children under 5), 2017. <https://data.worldbank.org/indicator/SH.STA.STNT.ZS>.
- dccxiii** The World Bank, Poverty headcount ratio at national poverty lines (% of population), 2015. Available at: <https://data.worldbank.org/indicator/SI.POV.NAHC>.
- dccxiv** UNICEF, Regional call to action to support the children of the Sahel, 2022. [www.unicef.org/wca/reports/regional-call-action-support-children-sahel](http://www.unicef.org/wca/reports/regional-call-action-support-children-sahel).
- dccxv** UNICEF, Togo Key demographic indicators: Education, 2017. <https://data.unicef.org/country/tgo/>.
- dccxvi** The Borgen Project, 8 facts about education in Togo, 2019. <https://borgenproject.org/8-facts-about-education-in-togo/>.
- dccxvii** Union des Comoros, *Initial National Communication on Climate Change: Executive Summary*, 2002.
- dccxviii** Ibid.
- dccxix** Ibid.
- dccxx** UNICEF, Comoros Humanitarian Situation Report, 2019. [www.unicef.org/media/81501/file/Comoros-Cyclone-Kenneth-SitRep-20-May-2019.pdf](http://www.unicef.org/media/81501/file/Comoros-Cyclone-Kenneth-SitRep-20-May-2019.pdf).
- dccxxi** Ibid.
- dccxxii** Ibid.
- dccxxiii** Union des Comoros, *Initial National Communication on Climate Change: Executive Summary*, 2002.
- dccxxiv** Ibid.
- dccxxv** Ibid.
- dccxxvi** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Comoros vulnerability. <https://climateknowledgeportal.worldbank.org/country/comoros/vulnerability>. Accessed 29 December 2022.
- dccxxvii** Union des Comoros, *Initial National Communication on Climate Change: Executive Summary*, 2002.
- dccxxviii** NASA, Karthala Volcano, Comoros, 2005. <https://earthobservatory.nasa.gov/images/5442/karthala-volcano-comoros>.
- dccxxix** Ibid.
- dccxxx** UNICEF, Country Office Annual Report 2020, 2020. [www.unicef.org/media/100581/file/Comoros-2020-COAR.pdf](http://www.unicef.org/media/100581/file/Comoros-2020-COAR.pdf).
- dccxxxi** WHO & UNICEF, Joint Monitoring Programme: Schools WASH data Comoros, 2020. <https://washdata.org/data/school#!/table?geo0=country&geo1=COM>.
- dccxxxii** UNICEF, Key Demographic Indicators: Comoros, n.d. <https://data.unicef.org/country/com/>.
- dccxxxiii** Ibid.
- dccxxxiv** WHO, *Country Cooperation Strategy at a glance: Comoros*, 2016.
- dccxxxv** The World Bank, The World Bank in Comoros Overview, 2022. [www.worldbank.org/en/country/comoros/overview#1](http://www.worldbank.org/en/country/comoros/overview#1).
- dccxxxvi** Ibid.
- dccxxxvii** Ibid.
- dccxxxviii** UNICEF, Country Office Annual Report: Comoros, 2019. [www.unicef.org/media/90361/file/Comoros-2019-COAR.pdf](http://www.unicef.org/media/90361/file/Comoros-2019-COAR.pdf).
- dccxxxix** UNICEF, Key Demographic Indicators: Education, Comoros, 2012. <https://data.unicef.org/country/com/>.
- dccl** The World Bank, The World Bank in Comoros Overview, 2022. [www.worldbank.org/en/country/comoros/overview#1](http://www.worldbank.org/en/country/comoros/overview#1).
- dccli** Ibid.
- dcclii** The World Bank Group, *Climate Risk Country Profile: Kiribati*, 2021.
- dccliii** Ibid.
- dccliv** Republic of Kiribati, *Intended Nationally Determined Contribution*, 2016.
- dcclv** Ibid.
- dcclvi** The World Bank Group, *Climate Risk Country Profile: Kiribati*, 2021.
- dcclvii** Storlazzi, C. D., *et al.*, Most atolls will be uninhabitable by the mid-21st century because of sea-level rise exacerbating wave-driven flooding. *Science Advances*, 2018, 4(4).
- dcclviii** Republic of Kiribati, *Intended Nationally Determined Contribution*, 2016.
- dcclix** Ibid.
- dccl** UNICEF, *The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index*, 2021.
- dccli** The World Bank Group, *Climate Risk Country Profile: Kiribati*, 2021.
- dcclii** 58 Honda, Y., *et al.*, Heat-related mortality risk model for climate change impact projection. *Environmental Health and Preventive Medicine*, 2014, 19: 56–63.
- dccliii** Widlansky, M. J., *et al.*, Tropical Cyclone Projections: Changing Climate Threats for Pacific Island Defense Installations. *Weather, Climate, and Society*, 2019, 11(1), 3–15.
- dccliv** Khan, A. E., *et al.*, Drinking water salinity and maternal health in coastal Bangladesh: implications of climate change. *Environmental health perspectives*, 2011, 119(9), 1328–1332.
- dcclv** OCHA, Asia and the Pacific: Weekly Regional Humanitarian Snapshot (21 - 27 June 2022), 2022. <https://reliefweb.int/report/afghanistan/asia-and-pacific-weekly-regional-humanitarian-snapshot-21-27-june-2022>.
- dcclvi** The World Bank Group, *Climate Risk Country Profile: Kiribati*, 2021.
- dcclvii** Ibid.
- dcclviii** Holding, S., *et al.*, Groundwater vulnerability on small islands. *Nature Climate Change*, 2016, 6, 1100.
- dcclix** The Pacific Islands News Association, Dengue and Chikungunya cases on the decline in Kiribati, 2015. <https://reliefweb.int/report/kiribati/dengue-and-chikungunya-cases-decline-kiribati>.
- dcclx** UNICEF, Kiribati, Indicator: Proportion of population using safely managed drinking water services, 2020. <https://data.unicef.org/country/kir/>.
- dcclxi** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Kiribati, 2020. <https://washdata.org/data/household#!/table?geo0=country&geo1=KIR>.
- dcclxii** Ibid.
- dcclxiii** WHO, Country Cooperation Strategy at a glance: Kiribati, 2018.
- dcclxiv** Ibid.
- dcclxv** UNICEF, Kiribati, Indicator: under-five mortality rate, 2021. <https://data.unicef.org/country/kir/>.
- dcclxvi** The World Bank, Maternal mortality ratio (modelled estimate, per 100,000 live births) Kiribati, 2017. <https://data.worldbank.org/indicator/SH.STA.MMRT?locations=KI>.

- dcclxvii** WHO, *Country Cooperation Strategy at a glance: Kiribati*, 2018.
- dcclxviii** UNICEF, Kiribati Indicator: Height-for-age <-2 SD (stunting), Modeled Estimates, 2020. <https://data.unicef.org/country/ki/>.
- dcclxix** WHO, *Country Cooperation Strategy at a glance: Kiribati*, 2018.
- dcclxx** Ibid.
- dcclxxi** The World Bank Group, *Climate Risk Country Profile: Kiribati*, 2021.
- dcclxxii** ILO, Kiribati Employment and Environmental Sustainability fact sheets 2019, 2019. [www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms\\_627562.pdf](http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms_627562.pdf).
- dcclxxiii** Republic of Kiribati, *Intended Nationally Determined Contribution*, 2016.
- dcclxxiv** Ibid.
- dcclxxv** UNICEF, Key Demographic Indicators: Education, Kiribati, 2019. <https://data.unicef.org/country/ki/>.
- dcclxxvi** Ibid.
- dcclxxvii** Sao Tome and Principe, *Intended Nationally Determined Contributions*, 2015.
- dcclxxviii** UNFCCC, Sao Tome and Principe experiences with the NAPA process, 2021. <https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/lcd-portal/country-experiences-with-napa-process/Sao-Tome-and-Principe>.
- dcclxxix** GFDRR, Sao Tomé-et-Príncipe., n.d. [www.gfdr.org/fr/sao-tome-et-principe](http://www.gfdr.org/fr/sao-tome-et-principe). Accessed 14 January 2023.
- dcclxxx** WHO & UNFCCC, *Health & Climate Change Country Profile 2021, Small Island Developing States Initiative*, 2021.
- dcclxxxi** Ibid.
- dcclxxxii** Wang, Y, *et al.*, Burden of Malaria in Sao Tome and Principe, 1990-2019: Findings from the Global Burden of Disease Study 2019. *International journal of environmental research and public health*, 2021, 19(22), 14817.
- dcclxxxiii** UNICEF, Sao Tome and Principe, Indicator: ITN use by children - percentage of children (under age 5) who slept under an insecticide-treated mosquito net the night prior to the survey, 2019. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=STP.MNCH\\_ITN.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=STP.MNCH_ITN.&startPeriod=1970&endPeriod=2023).
- dcclxxxiv** Yen, T. Y, *et al.*, Dengue virus infection in the Democratic Republic of Sao Tome and Principe. *International Journal of Infectious Diseases*. 2016, 45, 308.
- dcclxxxv** WHO, Zika Virus (ZIKV) Classification Table, 2018. <http://apps.who.int/iris/bitstream/handle/10665/260419/zika-classification-15Feb18-eng.pdf>.
- dcclxxxvi** Sao Tome and Principe, *Intended Nationally Determined Contributions*, 2015.
- dcclxxxvii** Oceans and Law of the Sea (Division for Ocean Affairs and the Law of the Sea), Towards a National Ocean Policy in Sao Tome and Principe, 2009. [www.un.org/depts/los/nippon/unff\\_programme\\_home/fellows\\_pages/fellows\\_papers/costa-alegre\\_0910\\_sao-tome-principe.pdf](http://www.un.org/depts/los/nippon/unff_programme_home/fellows_pages/fellows_papers/costa-alegre_0910_sao-tome-principe.pdf).
- dcclxxxviii** Ibid.
- dcclxxxix** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Sao Tome and Principe, 2020. <https://washdata.org/data/household#/table?geo0=country&geo1=STP>.
- dcclxxx** Sanitation and Water for All, Minister of National Development Planning/ Head of National Development Planning Agency & UNICEF, *Republic Democratic de São Tomé e Príncipe Country Overview*, 2022.
- dcclxxxi** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Sao Tome and Principe, 2020. <https://washdata.org/data/household#/table?geo0=country&geo1=STP>.
- dcclxxxii** UNICEF, Sao Tome and Principe, Indicator: Under-five mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=STP.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2021](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=STP.CME_MRY0T4.&startPeriod=1970&endPeriod=2021).
- dcclxxxiii** The World Bank, Maternal mortality ratio (number of maternal deaths per 100,000 live births), 2017. <https://data.worldbank.org/indicator/SH.STA.MMRT>.
- dcclxxxiv** UNICEF, Sao Tome and Principe, Indicator: Height-for-age <-2 SD (stunting), Modeled Estimates, 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=STP.NT\\_ANT\\_HAZ\\_NE2\\_MOD.&startPeriod=1970&endPeriod=2021](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=STP.NT_ANT_HAZ_NE2_MOD.&startPeriod=1970&endPeriod=2021).
- dcclxxxv** WHO & UNFCCC, *Health & Climate Change Country Profile 2021, Small Island Developing States Initiative*, 2021.
- dcclxxxvi** The World Bank, The World Bank in Sao Tome and Principe, 2022. [www.worldbank.org/en/country/saotome/overview#1](http://www.worldbank.org/en/country/saotome/overview#1).
- dcclxxxvii** Ibid.
- dcclxxxviii** UNDP, Climate Change adaptation: Sao Tome and Principe, n.d. [www.adaptation-undp.org/explore/middle-africa/sao-tome-and-principe](http://www.adaptation-undp.org/explore/middle-africa/sao-tome-and-principe). Accessed 10 January 2023.
- dcclxxxix** The World Bank, World Bank Scales Up the Social Protection and Skills Development Project in São Tomé and Príncipe with \$ 8 million, 2021. [www.worldbank.org/en/news/press-release/2021/03/03/world-bank-scales-up-the-social-protection-and-skills-development-project-in-sao-tome-and-principe-with-8-million](http://www.worldbank.org/en/news/press-release/2021/03/03/world-bank-scales-up-the-social-protection-and-skills-development-project-in-sao-tome-and-principe-with-8-million).
- dcclxxx** UNICEF, Sao Tome and Principe Cross Sector indicators: Education, 2019. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=STP.ED\\_ANAR\\_L1+ED\\_CR\\_L3.&startPeriod=1970&endPeriod=2021](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=STP.ED_ANAR_L1+ED_CR_L3.&startPeriod=1970&endPeriod=2021).
- dcclxxxi** UNICEF, Sao Tome and Principe, Country Office Annual Report 2020, 2020. [www.unicef.org/media/101131/file/Sao-Tome-and-Principe-2020-COAR.pdf](http://www.unicef.org/media/101131/file/Sao-Tome-and-Principe-2020-COAR.pdf).
- dcclxxxii** Ibid.
- dcclxxxiii** East Timor Government, East Timor Geography, 2012. [www.easttimorgovernment.com/geography.htm](http://www.easttimorgovernment.com/geography.htm).
- dcclxxxiv** UNICEF, *Climate Landscape Analysis for Children in Timor-Leste*, 2017.
- dcclxxxv** Ibid.
- dcclxxxvi** GFDRR, Think Hazard: Timor-Leste, 2017. <https://thinkhazard.org/en/report/242-timor-leste/EH>.
- dcclxxxvii** Pacific-Australia Climate Change Science and Adaptation Planning Program Partners, Current and future climate of Timor-Leste, 2015. [www.pacificclimatechangescience.org/wp-content/uploads/2013/06/5\\_PACCSAP-Timor-Leste-9pp\\_WEB.pdf](http://www.pacificclimatechangescience.org/wp-content/uploads/2013/06/5_PACCSAP-Timor-Leste-9pp_WEB.pdf).
- dcclxxxviii** UNICEF, *Climate Landscape Analysis for Children in Timor-Leste*, 2017.
- dcclxxxix** Ibid.
- dcclxxxx** Molyneux, N., *et al.*, 2012. Climate Change and Population Growth in Timor-Leste: Implications for Food Security. *Ambio*, 2012, 41(8), 823–840.
- dcclxxxxi** Government of Timor-Leste and Partners, Government of Timor-Leste, and partners appeal for USD 32 million to assist flood victims and early recovery, 2021. <https://reliefweb.int/sites/reliefweb.int/files/resources/Joint%20Press%20Release%20Flood%20Appeal%2001-June%20English.pdf>.
- dcclxxxxii** UNICEF, *Climate Landscape Analysis for Children in Timor-Leste*, 2017.
- dcclxxxxiii** East Timor Government, East Timor Geography, 2012. [www.easttimorgovernment.com/geography.htm](http://www.easttimorgovernment.com/geography.htm).
- dcclxxxxiv** Asian Development Bank, *State Of The Coral Triangle: Timor-Leste*, 2014. [www.adb.org/sites/default/files/publication/42394/state-coral-triangle-timor-leste.pdf](http://www.adb.org/sites/default/files/publication/42394/state-coral-triangle-timor-leste.pdf).
- dcclxxxxv** IAMAT, Timor-Leste General Health Risks: Air Pollution, 2020. [www.iamat.org/country/timor-leste/risk/air-pollution](http://www.iamat.org/country/timor-leste/risk/air-pollution).
- dcclxxxxvi** WHO & UNFCCC, *Climate and Health Country Profile, 2015, Timor-Leste*, 2015.
- dcclxxxxvii** Ibid.
- dcclxxxxviii** Government of Timor-Leste, Launch of the National Commission for Vector-Borne Infectious Disease Control and Anti-Dengue Campaign, 2021. <http://timor-leste.gov.tl/?p=28418&lang=en>.
- dcclxxxxix** Government of Timor-Leste and UNICEF, *Situation Analysis of Children in Timor-Leste*, Dili, Timor-Leste, 2020.
- dcclxxxxx** Ibid.
- dcclxxxxxi** UNICEF, Timor-Leste, Indicator: Proportion of population using at least basic drinking water services, 2020. <https://data.unicef.org/country/tls/>.
- dcclxxxxxii** WHO & UNICEF, Joint Monitoring Programme: Household WASH data Timor-Leste, 2020. <https://washdata.org/data/household#/table?geo0=country&geo1=TLS>.
- dcclxxxxxiii** WHO & UNICEF, Joint Monitoring Programme: Schools WASH data Timor-Leste, 2019. <https://washdata.org/data/school#/table?geo0=country&geo1=TLS>.
- dcclxxxxxiv** WHO & UNICEF, Joint Monitoring Programme: Healthcare facilities WASH data Timor-Leste, 2019. <https://washdata.org/data/healthcare#/table?geo0=country&geo1=TLS>.
- dcclxxxxv** WHO & UNFCCC, *Climate and Health Country Profile, 2015, Timor-Leste*, 2015.
- dcclxxxxvi** UNICEF, Timor-Leste: Indicator: Under-five mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=TLS.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=TLS.CME_MRY0T4.&startPeriod=1970&endPeriod=2023).
- dcclxxxxvii** The World Bank, Timor-Leste: Maternal Mortality Ratio (modelled estimate, per, 100,000 live births), 2017. <https://data.worldbank.org/indicator/SH.STA.MMRT>.
- dcclxxxxviii** REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE, *National Food and Nutrition Security Policy*, 2014.
- dcclxxxxix** WFP, Timor-Leste Comprehensive Food Security and Vulnerability Analysis (CFSVA), 2006, as cited in REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE, *National Food and Nutrition Security Policy*, 2014.
- dcclxxxxx** WHO, Timor-Leste: Prevalence of stunting, height for age (% of children under 5), 2020. <https://data.worldbank.org/indicator/SH.STA.STNT.ZS>.

- dcccxxxi** UNICEF, Indicator: Children living in households with income below the national poverty line, 2020. Available at: [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=PV\\_CHLD\\_INCM-PL..&startPeriod=2010&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=PV_CHLD_INCM-PL..&startPeriod=2010&endPeriod=2020).
- dcccxxxi** UNDP, Timor-Leste: Economic transformation, n.d. [www.undp.org/timor-leste/economic-transformation](http://www.undp.org/timor-leste/economic-transformation). Accessed 13 January 2023.
- dcccxxxi** UNICEF, *Climate Landscape Analysis for Children in Timor-Leste*, 2017.
- dcccxxxi** UNICEF, Timor-Leste: Key Demographic Indicators: Education, 2016. <https://data.unicef.org/country/tls/>.
- dcccxxxi** UNICEF, Quality Education Timor-Leste, n.d. Available at: <https://www.unicef.org/timorleste/quality-education>. Accessed 20 January 2023.
- dcccxxxi** UNICEF, *Climate Landscape Analysis for Children in Timor-Leste*, 2017.
- dcccxxxi** UNICEF, Situational Analysis of Children in Timor-Leste, 2015.
- dcccxxxi** The World Bank Group, *Climate Risk Country Profile: Tuvalu*, 2021.
- dcccxxxi** WHO & UNFCCC, *Climate and Health Country Profile, 2020, Tuvalu*, 2020.
- dcccxi** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Tuvalu: Climate Change Overview > Country Summary, n.d. <https://climateknowledgeportal.worldbank.org/country/tuvalu>. Accessed 29 December 2022.
- dcccxi** World Bank Group, Climate Change Knowledge Portal for Development Practitioners and Policy Makers, Tuvalu: Vulnerability, n.d. <https://climateknowledgeportal.worldbank.org/country/tuvalu/vulnerability>. Accessed 29 December 2022.
- dcccxlii** Tropical cyclone data provided by the Tuvalu National Meteorological Services, as cited in: WHO & UNFCCC, *Climate and Health Country Profile, 2020, Tuvalu*, 2020.
- dcccxlii** OCHA ROP, *Tuvalu: Tropical Cyclone Pam Situation Report No. 1 (as of 22 March 2015)*, 2015.
- dcccxlii** Ibid.
- dcccxlii** Ibid.
- dcccxlii** The World Bank Group, *Climate Risk Country Profile: Tuvalu*, 2021.
- dcccxlii** Ibid. dcccxlii Frölicher, T. L., Fischer, E. M., & Gruber, N. Marine heatwaves under global warming. *Nature*, 2018, 560 (7718), 360–364.
- dcccxlii** The World Bank Group, *Climate Risk Country Profile: Tuvalu*, 2021.
- dcccxi** Ibid.
- dcccxi** Ibid.

- dccllii** Ministry of Health Tuvalu, *as cited in: WHO & UNFCCC, Climate and Health Country Profile, 2020, Tuvalu, 2020.*
- dcclliii** Tuvalu Ministry of Health. *Dengue1-outbreak, Tuvalu. Situational Report 25th March to 28th July 2019 Epi Week 30 (22–28 July)* Report Date: Thursday 1st August, 2019.
- dcclliv** UNICEF, *Situation Analysis of Children in Tuvalu, 2017.*
- dccllv** Ibid.
- dccllvi** Ibid.
- dccllvii** WHO, Country Cooperation Strategy at a glance, 2018. <https://iris.wpro.who.int/handle/10665.1/13958> <https://www.unicef.org/pacificislands/media/1266/file/Situation-Analysis-of-Children-Tuvalu.pdf>
- dccllviii** UNICEF, *Situation Analysis of Children in Tuvalu, 2017.*
- dccllix** The World Bank Group, How Are Tuvalu's Children Developing? Evidence-based policy recommendations for better early childhood development of Tuvaluan children, © World Bank, 2017.
- dccllx** UNICEF, *Situation Analysis of Children in Tuvalu, 2017.*
- dccllxi** McIver, L, *et al.*, Health impacts of climate change in Pacific Island countries: a Regional Assessment of Vulnerabilities and Adaptation Priorities. *Environ Health Perspect*, 2016, 124:1707–1714.
- dccllxii** UNICEF, Tuvalu: Indicator: Under-five mortality rate, 2021. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=TUV.CME\\_MRY0T4.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=TUV.CME_MRY0T4.&startPeriod=1970&endPeriod=2023).
- dccllxiii** UNICEF, Indicator: Children living in households with income below the national poverty line (as a % of all children), 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=.PV\\_CHLD\\_INCM-PL..&startPeriod=2010&endPeriod=2020](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=.PV_CHLD_INCM-PL..&startPeriod=2010&endPeriod=2020).
- dccllxiv** UNICEF, *Situation Analysis of Children in Tuvalu, 2017.*
- dccllxv** Ibid.
- dccllxvi** Ibid.
- dccllxvii** Ibid.
- dccllxviii** UNICEF, Indicator: Adjusted net attendance rate for children of primary school age, 2020. [https://data.unicef.org/resources/data\\_explorer/unicef\\_f/?ag=UNICEF&df=GLOBAL\\_DATAFLOW&ver=1.0&dq=TUV.ED\\_ANAR\\_L1.&startPeriod=1970&endPeriod=2023](https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=TUV.ED_ANAR_L1.&startPeriod=1970&endPeriod=2023).
- dccllxix** OCHA ROP, *Tuvalu: Tropical Cyclone Pam Situation Report No. 1 (as of 22 March 2015)*, 2015.
- dccllxx** Nature-based Solutions Initiative, Nature based solutions guidelines, 2021. <https://nbsguidelines.info/>.
- dccllxxi** UNDP, The Whole of Islands Approach, 2018. [www.adaptation-undp.org/whole-islands-approach](http://www.adaptation-undp.org/whole-islands-approach).
- dccllxxii** Panorama 4 Blocs Constitutifs de Solution: Applying ecosystem-based disaster risk reduction through a ridge to reef approach, 2017. <https://panorama.solutions/fr/building-block/ridge-reef-approach#:~:text=The%20ridge%20to%20reef%20approach,%2C%20thereby%20mitigating%20storm%20surges%2C>.
- dccllxxiii** Save the Children & UNICEF. *Adaptation and response for children affected by droughts and disasters*, 2017.
- dccllxxiv** UN-OHRLLS, *Doha Programme of Action for the Least Developed Countries*, 2022. [www.un.org/ldc5/sites/www.un.org.ldc5/files/doha\\_booklet-web.pdf](http://www.un.org/ldc5/sites/www.un.org.ldc5/files/doha_booklet-web.pdf).

unicef  | for every child