CLIMATE RISK COUNTRY PROFILE

CAMEROON

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ACKNOWLEDGEMENTS

This profile is part of a series of Climate Risk Country Profiles developed by Climate Change Group of the World Bank Group (WBG). The country profiles aim to present a high-level assessment of the climate risks faced by countries, including rapid-onset events and slow-onset changes in climate conditions, many of which are already underway, as well as summarize relevant information on policy and planning efforts at the country level.

The country profile series are designed to be a reference source for development practitioners to better integrate detailed climate data, physical climate risks and need for resilience in development planning and policy making.

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Unless otherwise noted, data is sourced from the WBG's Climate Change Knowledge Portal (CCKP), the WBG's designated platform for climate data. Climate, climate change and climate-related data and information on CCKP represents the latest available data and analysis based on the latest Intergovernmental Panel on Climate Change (IPCC) reports and datasets. The team is grateful for all comments and suggestions received from climate and development specialists, as well as climate research scientists and institutions for their advice and guidance on the use of climate related datasets.

CONTENTS

FOREWORD

Development progress has stalled in many countries amid low growth, increased fragility and conflict, pandemic-related setbacks, and the impacts of climate change. Droughts, extreme heat, flooding and storms push millions into poverty annually, causing unemployment and risking unplanned internal and cross-border migration. Every year, an estimated 26 million people fall behind due to extreme weather events and natural disasters. These shocks have the potential to push a total of 130 million into poverty by 2030.

The World Bank Group (WBG) is supporting countries to meet these challenges. As part of our vision to end poverty on a livable planet, we are investing in development projects that improve quality of life while creating local jobs, strengthening education, and promoting economic stability. We are also helping people and communities adapt and prepare for the unpredictable and life-changing weather patterns they are experiencing, ensuring that limited development resources are used wisely and that the investments made today will be sustainable over time.

Having access to data that is accurate and easily understandable is of course critical to making informed decisions. This is where the report you are about to read comes in.

Climate Risk Country Profiles offer country-level overviews of physical climate risks across multiple spatiotemporal scales. Each profile feeds into the economy-wide Country Climate and Development Reports and draws its insights from the Climate Change Knowledge Portal, the WBG's 'one-stop-shop' for foundational climate data.

Guided by World Bank Group data and analytics, developing countries can conduct initial assessments of climate risks and opportunities that will inform upstream diagnostics, policy dialogue, and strategic planning. It is my sincere hope that this country profile will be used to inform adaptation and resilience efforts that create opportunities for people and communities around the world.

Valerie Hickey, PhD
Global Director
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KEY MESSAGES

Cameroon is a tropical country that experiences high levels of precipitation, which becomes more erratic and sporadic in the northern regions. Over the past 50 years, rainfall has decreased, with longer drought periods and shorter wet seasons. While future projections suggest a slight overall increase in precipitation, the change is not expected to be significant. More concerning, however, is the anticipated rise in extreme and rare rainfall events, particularly in the northern regions. Rainfall patterns will become increasingly erratic, with shorter wet spells, making it more difficult to plan for flooding and complicating agricultural practices.

Rising temperatures will result in more extreme hot days, with the central regions expected to experience the most significant increase by mid-century, followed by other parts of the country. Northern and coastal areas will see more hot nights by mid-century, with other regions likely to follow in later decades. The northern regions and the coastal Littoral will also begin to face the challenges of extreme humid heat, which is expected to gradually affect the rest of the country as well.

Sea-level rise poses a significant threat to densely populated coastal areas, while warming oceans will severely impact marine biodiversity. Furthermore, Cameroon, already vulnerable to recurrent bacterial diseases, will face heightened public health risks. Addressing water sanitation and preparing for extreme precipitation events will be crucial to mitigating these growing challenges.

COUNTRY OVERVIEW

Cameroon is a lower-middle-income country located on the western-central coast of Africa along the Gulf of Guinea, extending northward to Lake Chad. Its geography is incredibly diverse, with low-lying coastal plains giving way to high plateaus and mountain ranges, particularly along the northwestern border with Nigeria. Known as "Africa in miniature," Cameroon boasts a wide range of climates and vegetation, representing a microcosm of the continent's environmental variety[1].

The southern region is characterized by dense tropical rainforests and coastal mangrove forests, receiving heavy rainfall year-round, with either a short dry season or no dry season at all. Mount Cameroon, rising to 4,000 meters near the coast, plays a key role in rain formation in this area. The western Bamenda and Bamiléké Highlands, known for their fertile volcanic soil, contrast with the rainforests. To the north, the Adamaoua Highlands form a natural barrier between the wetter south and the drier north. As the landscape shifts, rainforests give way to savannahs. Further north, the climate becomes increasingly arid and semi-arid, with the Saharan influence making the region hotter and drier. This Sahelian region is marked by sparse rainfall and a pronounced dry season (**Fig. 1a**).

Cameroon has multiple river systems which drain into the Gulf of Guinea, the Congo River, the Niger River, and northward into Lake Chad. Cameroon's biodiversity is rich, with about 42% of its land covered by forests. It includes parts of the Congo Basin and is home to many endemic species. The country has established numerous protected areas for conservation. It also boasts an array of natural resources: oil, gas, high value timber species, minerals, and agricultural products (e.g. coffee, cotton, cocoa, maize, and cassava).

Population is over 28 million (2023)[2], with more than half (59%) living in urban areas (**Fig. 1b**). Cameroon's market-based, diversified economy features oil and gas, timber, aluminum, agriculture, mining and the service sector. Agriculture remains a significant part of the economy, providing about 42% of employment.

Cameroon is highly susceptible to various natural hazards, such as coastal and riverine floods, landslides, droughts, epidemics, and soil erosion. Importantly, waterborne diseases, such as cholera, remain a recurring concern. The effects of climate change are exacerbating these risks, leading to rising temperatures and shifting rainfall patterns. This includes more frequent heavy rainfall events and greater unpredictability in rainfall.

Cameroon submitted its Second National Communication to the UNFCCC in 2015[3] and the Revised Nationally Determined Contribution (NDC) in 2021[4]. These reports identify agriculture, forestry, and other land uses, along with energy, waste, and industry as crucial adaptation and resilience areas.

1 Wikipedia https://en.wikipedia.org/wiki/Geography_of_Cameroon
2 World Bank Data
3 Second National Communication https://unfccc.int/documents/71099
4 Revised National Determined Contribution (French) https://unfccc.int/sites/default/files/NDC/2022-06/CDN%20révisée%20CMR%20finale%20sept%202021.pdf

FIGURE 1A. Topography (GMTED2010[5]) and Political Boundaries (World Bank Cartography)

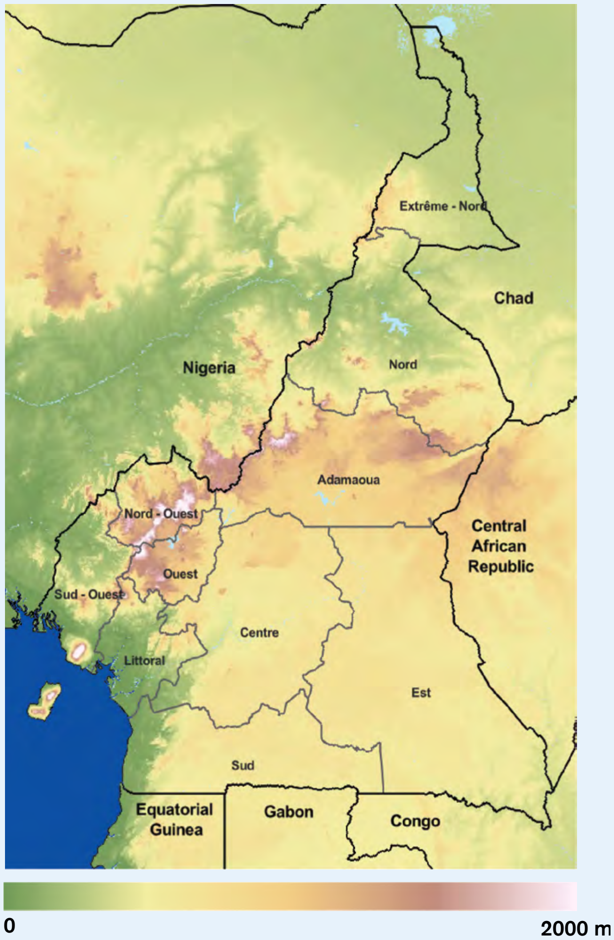
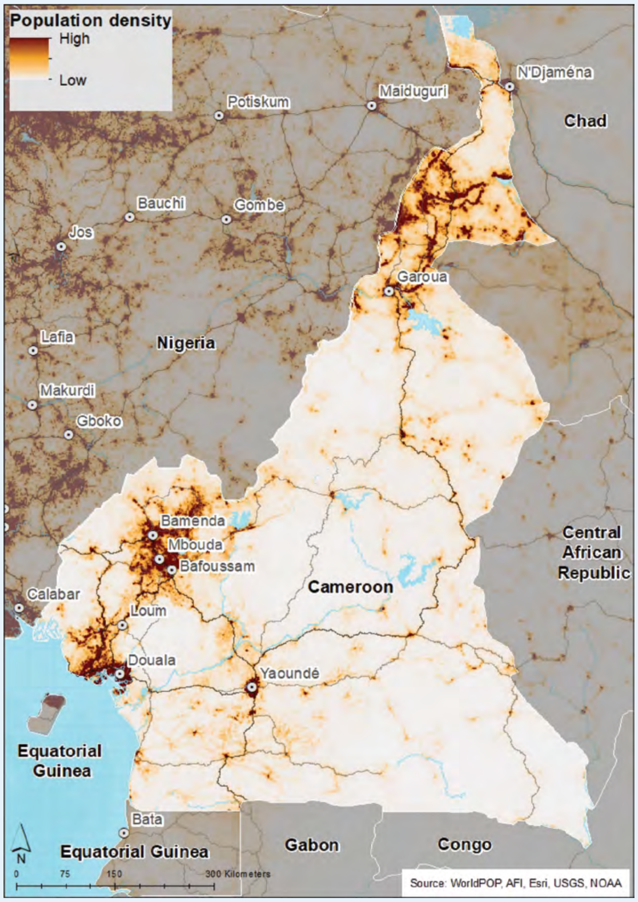


FIGURE 1B. Population Density Map for 2019[6]



Note: topography is relevant for sea level rise and climate – coastal regions near mountains capture more rain. Mount Cameroon (on the coast) rises to 4,000 m.

CLIMATE OVERVIEW

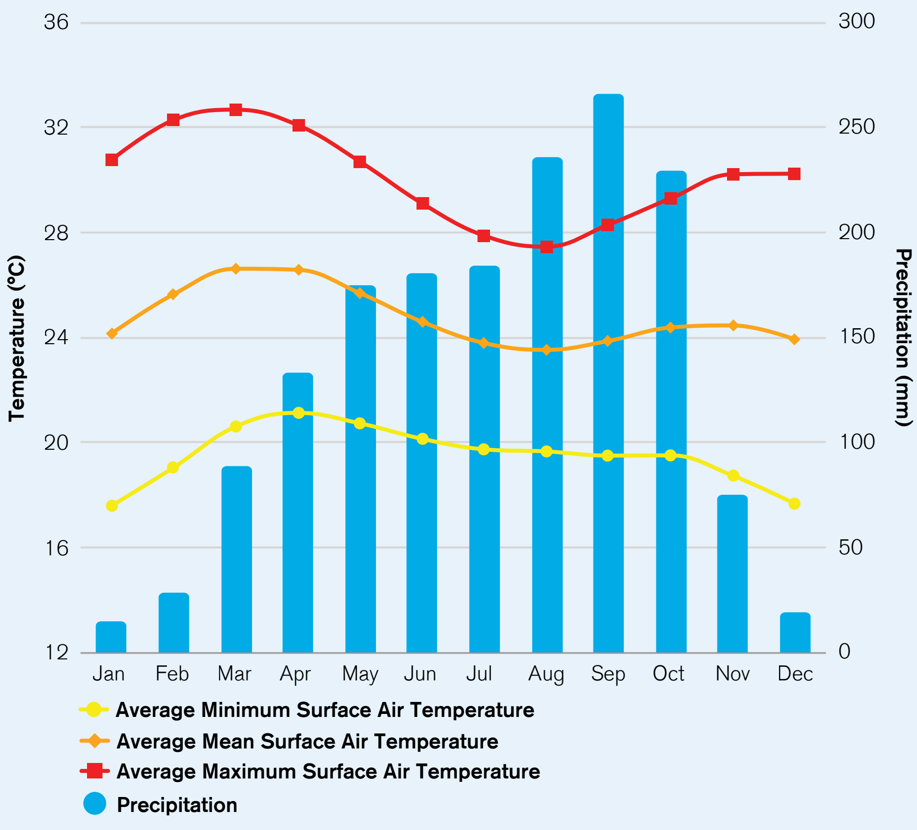
Data overview: Historically, observed data is derived from the Climatic Research Unit, University of East Anglia (CRU), CRU TS version 4.08 gridded dataset (data available 1901–2023) - stations data -, and from the ERA5 reanalysis collection from ECMWF (1950–2023).

[5] Global Multi-resolution Terrain Elevation Data GMTED2010 https://pubs.usgs.gov/of/2011/1073/
[6] Population density, 2019, https://futures.issafrica.org/geographic/countries/cameroon/

Cameroon's tropical climate is shaped by several climatic and geographical factors. One of the most influential climate factors is the Intertropical Convergence Zone (ITCZ), which shifts seasonally and plays a crucial role in driving rainfall patterns. Additionally, the West African monsoon, closely linked to the ITCZ, carries moist air from the Atlantic Ocean, contributing to the wet season in the southern and central parts of the country. Topography also significantly impacts rainfall distribution. The mountainous regions, particularly Mount Cameroon, which rises to 4,000 meters, experience some of the heaviest rainfall in the world, making the area one of the wettest on the planet. In contrast, the northern regions of Cameroon are influenced by the Harmattan winds—dry, dusty winds originating from the Sahara Desert. These winds contribute to the dry season in the north, where the effects of the arid climate are especially pronounced. In summary, climate variability in West Africa is driven by the interaction of changes in Atlantic surface temperatures, shifts in the West African Monsoon, Sahelian climate patterns, and teleconnections to the El Niño-Southern Oscillation (ENSO), the main driver of global climate variability.

Cameroon's average annual precipitation is high, at 1,629 mm (CRU data), with a peak of 266 mm in September and a minimum of 15 mm around the dry months of December to February (**Fig. 2**). Temperature variation is minimal throughout the year, typical of tropical climates. The average air surface temperature is 24.75°C, reaching a maximum of 26.61°C in March, just before the onset of the wet season, again peaking in November

FIGURE 2. Monthly Historical Climatology of Average Temperature (minimum, average, and maximum) and Total Precipitation (1991–2022) for Cameroon (CRU dataset)



as the country transitions into the dry months, and reaching a minimum of 24°C during the rainest and driest months. Nighttime temperatures average 19.5°C, cooling further during the dry season. Daily maximum temperatures average 30.06°C, with a peak in March at the end of the dry season, when they often exceed 32°C. See **Tables A1 and A2** for historical temperature and precipitation values across regions.

Temperatures are highest in the northern provinces of Nord and Extrême-Nord, while the lowest temperatures are found in the mountainous regions of Nord-Ouest, Ouest, and Adamaoua. Minimum (night) temperatures tend to be highest in the northern Extrême-Nord and the coastal Littoral. Annual rainfall varies widely across the country, decreasing as you move north. The coastal Littoral and Sud-Ouest receive over 2,600 mm annually on average, while Nord-Ouest, Ouest, and Sud see nearly 2,000 mm. The Centre, Est, and Adamaoua regions receive just over 1,500 mm, Nord gets around 1,200 mm, and Extrême-Nord receives more than 700 mm. Most provinces have a unimodal precipitation pattern, with peak rainfall occurring in August. However, the southern regions of Sud, Centre, and Est follow a distinct pattern, experiencing two rainfall peaks: one in September–October and another in May, with shorter drier periods in between.

TEMPERATURE AND PRECIPITATION HISTORICAL AND PROJECTED TRENDS

Data overview: Historical observed data is derived from the ERA5 reanalysis collection from ECMWF (1950–2023). Modeled climate data is derived from CMIP6, the Coupled Model Intercomparison Project, Phase 6. This risk profile focuses primarily on SSP3-7.0[7], which projects a doubling of CO2 emissions by 2100, a global temperature change of approximately 2.1°C by mid-century (2040–2059) and 2.7°C (likely 2.1°C to 3.5°C) by the end of the century (2080–2099), with respect to pre-industrial conditions (1850–1900).

Historical Temperature Changes

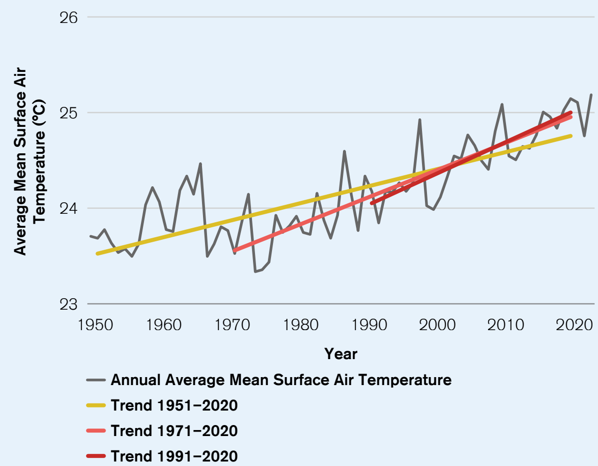
Over the past few decades, mean surface air temperatures have increased significantly, with a trend of 0.18°C per decade from 1951 to 2020, 0.29°C per decade from 1971 to 2020, and even higher 0.35°C per decade from 1991 to 2020 (ERA5, **Fig. 3**). The districts Sud and Centre experienced the largest 50-year trend per decade at 0.33°C per decade from 1971 to 2020. The trend (from 1971 to 2020) is highest for day temperatures (Tmax), 0.33°C per decade, than night temperatures (Tmin), 0.26°C per decade for the same period (**Table A1**). This

[7] Climate scientists may prioritize SSP4.5 and SSP8.5 to cover a range of potential futures, but SSP8.5 is frequently avoided in policy discussions due to its extreme nature. SSP3-7.0 is understood as a balanced compromise—sufficiently pessimistic yet in line with current policies. Note that patterns of change are generally consistent across scenarios, differing only in timing and impact intensity. For example, impacts projected under SSP3-7.0 by 2070 (2.8°C warming) are projected to occur by 2060 under SSP5-8.5, given the same level of warming. This approach allows scenarios to be translated by focusing on the warming signal rather than specific timelines. Please see the attached tables, which illustrate the relationship between warming levels and future periods for different scenarios. For more information see: IPCC AR6 https://data.ceda.ac.uk/badc/ar6_wg1/data/spm/spm_08/v20210809/panel_a

may be explained by increased dryness, consistent with the observed decline in precipitation during the historical period, as shown below.

Seasonally, the largest temperature increase has occurred during the transition from the dry to the wet season (December to May), with a trend of 0.33°C per decade from 1971 to 2020. Across regions, the trend is most pronounced from December to February in most districts, except in the northern Adamaoua, Nord, and Extrême-Nord, where the highest increase occurs from March to May.

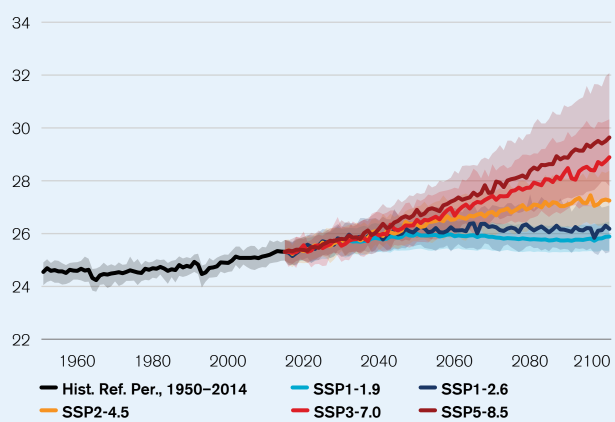
FIGURE 3. Cameroon's Annual Mean Surface Air Temperature Time Series and Decadal Trends for Different Periods Between 1951 and 2020 as Indicated, ERA5 Data



Projected Temperature Changes

Cameroon's temperatures are projected to increase further into the future for all the scenarios (**Fig. 4**). Under SSP3-7.0, the mean air surface temperature nationwide increases from 25.05°C during the historical reference period of 1995–2014 to 26.42°C (10th percentile 25.65°C, 90th percentile 27.19°C) for the period 2040–2059. The minimum temperature nationwide increases from 20.40°C during the historical reference period to 21.89°C (21.18°C, 22.66°C) for 2040–2059. Maximum temperature increases from 29.70°C to 30.96°C (30.02°C, 31.82°C) for 2040–2059. Projected warming under SSP2-4.5 and SSP1-2.6 is lower, and under SSP5-8.5, higher.

FIGURE 4. Projected Average Mean Surface Air Temperature for Different Climate Change Scenarios as Labeled, Along with the 10th–90th Percentile Dispersion Across Models

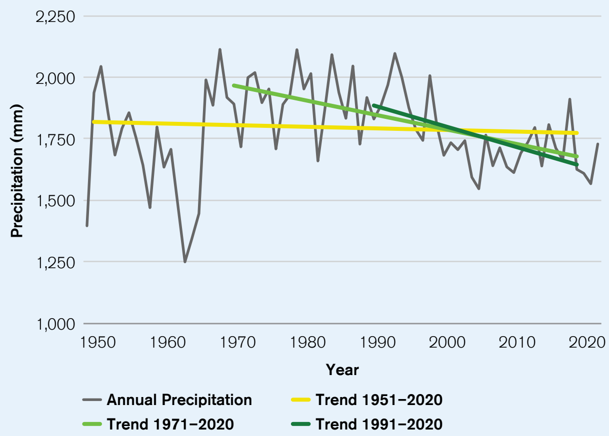


The projected average temperature increase from 2000 to 2050 is 0.28°C per decade under SSP3-7.0, aligning with the historical trend observed over the past 50 years. However, this rate accelerates to 0.46°C per decade from 2050 to 2100 under the same scenario. The median temperature anomaly from 1995–2014 to 2040–2059 under SSP3-7.0 is projected to be 1.37°C, with the largest increases seen in minimum temperatures (Tmin) at 1.5°C, while maximum temperatures (Tmax) increase by 1.24°C. The highest projected temperature anomalies by 2040–2059 are in Adamaoua (1.48°C) and Nord (1.45°C) (**Table A3**). contrary to what was observed during the historical period. This aligns more closely with typical climate change patterns, as greenhouse gases trap heat more effectively at night when there is no incoming solar radiation.

Historical Precipitation Changes

Historical annual precipitation averages 1,764 mm per year from 1990 to 2020 (ERA5, **Fig. 5**), with values ranging from 1,500 to 2,100 mm, showing significant interannual variability. While no long-term trend is observed from 1950 to 2020, discernible trends emerge in the past 50 years. Precipitation has declined by 62 mm per decade from 1971 to 2020, a 3.5% decrease compared to 1990–2020, and by 76 mm per decade from 1991 to 2020, marking a steeper 4.3% decline. The steepest decline between 1971 and 2020 is recorded in the Est region, with a significant 5.9% reduction (**Table A2**).

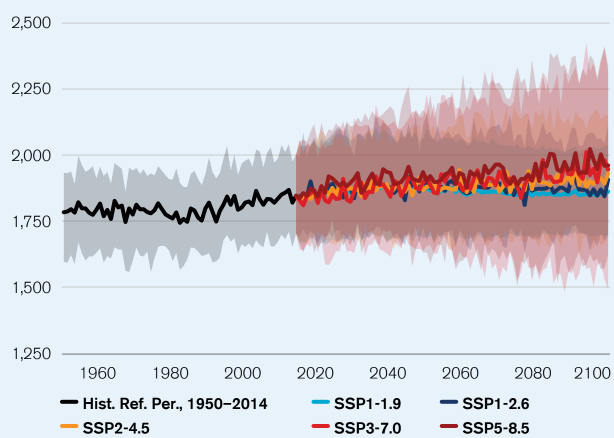
FIGURE 5. Cameroon's Annual Precipitation Time Series and Decadal Trends for Different Periods Between 1951 and 2020 as Indicated, ERA5 Data



Projected Precipitation Changes

Cameroon is located in a region where light increases in total precipitation are projected, contrary to recent historical drying trends, although the change is not robust across CMIP6 models (**Fig. 6**). Under SSP3-7.0, Cameroon's average annual precipitation is predicted to change nationwide from 1826.87 mm (1722.82 mm, 10th percentile, 1953.84 mm, 90th percentile) during the historical period (1995–2014, historical scenario) to 1884.9 mm (1627.17 mm, 2184.01 mm) for 2040–2059. Projections suggest the larger increase occurs during November, end of the rainy season, suggesting a lengthening of the rainy season.

FIGURE 6. Projected Annual Precipitation for Different Climate Change Scenarios as Labeled, Along with the 10th-90th Percentile Dispersion Across Models



The median precipitation anomaly projected for 2040–2059 compared to 1995–2014 is 73 mm, reflecting a 3.9% increase. All regions, except for the northern parts of Nord and Extrême-Nord, are projected to experience changes of less than 3%. However, these northern areas are expected to see larger increases, with projected changes of 7% in Nord and 11.4% in Extrême-Nord by 2050 (**Table A5**). Median changes are projected to be minimal after 2050 (see **Fig. 6**).

Hot Days

Hot days pose significant risks to both human and animal health, increasing the likelihood of heat-related illnesses, while also heightening the threat of wildfires, damaging crops, straining water supplies, increasing irrigation needs, and driving up energy demand, all of which can disrupt infrastructure, ecosystems, food security, and livelihoods.

Future projections indicate a significant increase in the number of extremely hot days (Tmax > 35°C), driven by rising temperatures. During the historical period (1995–2014), Cameroon experienced an average of 29 hot days per year (25, p10, 32, p90). Under the SSP3-7.0 scenario, this number is expected to rise to 44 (27 to 62) days per year from 2040 to 2059, and by the end of the century (2080–2099), it could reach 75 (33 to 141) days per year (**Table A3**). The increase is highest during February and March, the months with the hottest maximum temperatures.

The risk is particularly high in the northern regions, especially in Nord and Extrême-Nord. By 2040–2059, projections show that Nord will experience 144 days per year with Tmax > 35°C while Extrême-Nord will see 200 such days, compared to 102 and 162 days historically. This represents a median increase (anomaly) of 42 and 36 additional days, respectively, from the 1995–2014 period, meaning more than a month of extra hot days by mid-century.

From 2050 to 2100, the trend in number of hot days is projected to accelerate. Cameroon is expected to experience an additional 10 hot days per year on average each decade. The northern regions, Nord and Extrême-Nord, will see even sharper increases, with an additional 13.5 and 11 days per decade, respectively (**Table A3**).

Next, we examine the percentage of the population at high health risk due to extremely hot days. For the calculation of population exposure, high-risk areas are locations where the 50-year return level[8] of the annual number of days with maximum temperatures exceeding 35°C is greater than 30[9] (**Table A6**). As a result of rising extreme temperatures, the proportion of Cameroon's population exposed to high heat is projected to increase throughout the 21st century. Exposure is expected to rise from 29% during the historical period (1975–2024, centered on 2000) to 39% by 2035 (2010–2059), and could reach 60% by the century's end (2050–2099, centered on 2075).

The northern regions, including Nord and Extrême-Nord, have long been exposed to dangerous heat levels and will continue to experience this risk (>98% population exposure). Further south, the Adamaoua and East regions are projected to see near-complete exposure by the end of the century (over 98.5%), up from just 16% exposure historically and no exposure in East. The Centre region is projected to be 50% exposed by 2100, compared to just 6% historically. Other provinces will also see significant increases in exposure, with at least 20% of their populations at risk by century's end, compared to minimal exposure during the historical period.

8 A 50-year return level refers to an event that is expected to occur, on average, once every 50 years.

9 Population dataset: Gridded Population of the World, Version 4: GPWv4; Revision 11, Dec 2018. For each pixel (at approximately 25 km resolution), the return level for a given return period is calculated by fitting a Generalized Extreme Value (GEV) distribution to the time series. A pixel is classified as "too risky" (1) if the return level exceeds the specified threshold, and "not too risky" (0) otherwise. The reported population exposure represents the percentage of the total population in each region that is exposed to risk (1).

Hot Nights

Hot nights pose risks to sleep quality, human health, and agricultural crops, as the lack of cooling during the night can exacerbate heat stress on plants, hindering growth and reducing yields, while also increasing the risk of heat-related illnesses, higher energy consumption, and greater strain on power grids.

The number of hot (tropical) nights (Tmin > 23°C) is projected to rise significantly. Historically (1995–2014), Cameroon experienced an average of 42 tropical nights per year (35, p10, 53, p90), typically reaching their peak between March and May. Between 2000 and 2050, the projection shows an increase of 10.5 additional tropical nights per decade, reaching 97 tropical nights annually (over three months) by 2040–2059 (61 to 125). This trend will continue, with an additional 32 nights per decade from 2050 to 2100, leading to 238 tropical nights annually (about eight months) by the end of the century (2080–2099) (135 to 313). The increase is highest during March. Notably, the rate of increase triples in the second half of the century (2050–2100) compared to the first half (2000–2050) (**Table A4**).

Tropical nights exceeding a higher threshold (Tmin > 26°C) are rarer but are also projected to increase. From 8 (6, 10) nights in the historical period, this is expected to rise to 17 (11, 28) nights by mid-century and 49 (22, 123) nights by the end of the century. The increase is projected to be 10.5 more tropical nights per decade between 2000 and 2050 but will accelerate to 33 additional tropical nights per decade from 2050 to 2100, showing a sharper rise in the latter part of the century. The increase is highest during April.

The northern regions of Nord and Extrême-Nord are already heavily exposed to hot nights. Currently, Nord experiences 114 tropical nights per year (almost 4 months) with Tmin > 23°C, and 15 nights with Tmin > 26°C. Extrême-Nord is even more affected, with 172 nights (almost 5 months) at Tmin > 23°C, and 60 nights at Tmin > 26°C. By 2080–2099, these regions are projected to endure over 9 months of tropical nights (281 and 283 nights, respectively) with Tmin > 23°C, and around 4 months (124 nights) and 5.5 months (171 nights) of even hotter nights (Tmin > 26°C).

The coastal provinces, Littoral and Sud-Ouest, are also accustomed to hot nights (Tmin > 23°C). Currently, Littoral experiences 126 tropical nights per year, and Sud-Ouest 56. These numbers are expected to rise sharply between 2000 and 2050, with Littoral seeing an increase of 24 more hot nights per decade, and Sud-Ouest an increase of 21 per decade, reaching 242 nights (8 months) and 160 nights (more than 5 months), respectively, by 2040–2059. Hotter nights (Tmin > 26°C) in these regions, though currently less prevalent, will become more common by the end of the century. In Littoral, tropical nights with Tmin > 26°C are projected to increase by 30 nights per decade from 2050 to 2100, reaching 129 nights (over 4 months) by 2080–2099.

The central and eastern regions—Sud, Centre, and East—are expected to experience a rapid increase in the number of tropical nights at a low threshold (Tmin > 23°C) in the second half of the century. From an average of less than a month in the historical period, these regions will experience around 9 months of tropical nights by 2080–2099, with an increase of more than 45 tropical nights per decade from 2050 to 2100.

At the national level, population exposure to dangerous levels of tropical nights (Tmin > 26°C) is projected to rise from 22% in the historical period to 30% by 2035 and 50% by 2075 (**Table A6**). For the calculation of population exposure, high-risk areas are locations where the 50-year return level of the annual number of days with night temperatures > 26°C is greater than 30. Historically, only the Nord and Extrême-Nord regions have been highly exposed to hot night temperatures, with 78.5% and 87.5% of the population affected, respectively. By 2035, exposure is expected to exceed 90% in these two regions and spread to the coastal Littoral, where around 39% of the population will be affected. In contrast, the other regions will experience little exposure. By the end of the 21st century (around 2075), over 97.5% of the population in Nord and Extrême-Nord is projected to be exposed to hot nights, with 78.5% in Littoral, 45% in Sud-Ouest, 52% in Centre, and 53% in East. This dramatic increase in exposure will significantly heighten risks to both health and agriculture.

Humid Heat

The Heat Index is a measure of perceived temperature that combines both air temperature and humidity in the shade[10]. When both are high, the Heat Index rises, significantly increasing the risk to human health. In such conditions, the body's ability to cool itself through sweating is impaired, which can lead to heat-related illnesses or even fatalities. The number of days with a Heat Index of 35°C or higher is expected to become increasingly significant by the end of the 21st century, especially during the transitional months around the rainy season (April–May and October, on a national level). While the period from 2040–2059 is projected to experience only a small number of days (about 3.5 days) with a Heat Index above 35°C, the trend will accelerate from 2051 to 2100, with an increase of 10 additional days per decade. By 2081–2100, the total number of such days could reach 59 per year (19 to 136)—nearly two months of extreme humid heat (**Table A4**).

This risk is particularly severe in Nord and Extrême-Nord, where the number of days with a Heat Index above 35°C is projected to rise significantly by the end of the 21st century under the SSP3-7.0 scenario. By 2081–2100, these regions are expected to experience 113 days (about 3.7 months) and 153 days (over 5 months) per year, respectively. In comparison, during the mid-century period (2040–2059), the number of such days is projected to reach 40 and 77 per year, while historically (1995–2014), the regions experienced only 10 and 27 days per year, respectively.

Littoral is projected to experience 29 days per year with a Heat Index above 35°C by 2040–2059, a sharp increase from no instances during the historical period. By the end of the 21st century, this number is expected to rise to 155 days, with the highest rate of increase occurring from 2050 to 2100, at 30 additional days per decade. Sud-Ouest follows closely in terms of risk, with 13 such days projected for 2040–2059, rising to 85 by 2080–2099. This represents a trend of 17 more days per decade from 2050 to 2100. Finally, the regions of Sud, Centre, and Est will see a marked increase in dangerous humid heat after mid-century, with more than 35 nights per year expected by 2080–2099.

Next, we examine the percentage of the population at high health risk due to increased humid heat. High-risk areas are locations where the 50-year return level of the annual number of days with heat index exceeding 35°C is greater than 20—a threshold considered particularly dangerous for health (**Table A6**). Historically (2000), 19% of the

[10] Heat Index as defined by US-National Weather Service - Steadman R.G., 1979: The assessment of sultriness. Part I: A temperature-humidity index based on human physiology and clothing science. J. Appl. Meteorol., 18, 861–873, doi: http://dx.doi.org/10.1175/1520-0450

population was exposed to a high heat index. By 2035, this exposure is projected to rise to 33%, and by 2075, it is expected to reach 67%. By 2035, exposure will be particularly high in Nord and Extrême-Nord (91% and 89%, respectively), up from 63% and 71.5% during the historical period. Littoral will see a notable rise to 66%, and Sud-Ouest will experience 26% exposure, compared to less than 4% historically. By 2075, nearly all of Nord, Extrême-Nord, Sud, Centre, and Est will be exposed to high heat indexes (>95%), while Littoral will have 84% exposure and Sud-Ouest 76%. The remaining regions remain more safeguarded and will experience less than 20% exposure by the end of the century.

Additionally, Cameroon's population is expected to face dangerous wet-bulb temperatures—another measure of extreme heat and humid conditions, which are particularly hazardous for outdoor workers[11]. By the second half of the century (2075), approximately 46% of the population will be exposed to these hazardous conditions. The risks will be especially high in the Littoral (83%), Nord (92%), and Extrême-Nord (97%) regions, where more than 80% of the population will be at risk. Littoral is already experiencing significant exposure, with 57% of its population at risk by 2035. Risk areas associated to high wet bulb temperatures are defined as locations where, the 50-year return level of the annual number of days with wet-bulb temperature exceeding 27°C is greater than 15.

Drought

Drought conditions can severely disrupt the growth cycle of crops, leading to crop collapse and reduced yields, especially in places with poor irrigation systems. This not only affects agricultural productivity but also the livelihoods of small farmers, particularly those who rely on their crops for access to nutritious food.

The yearly maximum number of consecutive dry days (<1 mm daily), or CDD, reflects the duration and severity of the dry season. Changes in CDD can signal either an extension or reduction of the dry season, as well as shifts in weather erraticity. Historically, the number of consecutive dry days has ranged between 30 and 60 days per year, with an average of 48 days annually from 1990 to 2020 (according to ERA5 data), and has mirrored the trends in precipitation. Over the past 50 years, as precipitation has declined, the duration of the dry season has notably increased, extending by an average of 2.2 days per decade (**Fig. 7a**). The trend is most pronounced in the regions of Nord, Extrême-Nord, and Est, where droughts are extending by more than 3 days per decade (**Table A2**).

In accordance, the yearly maximum number of consecutive wet days (>1 mm daily), which has historically varied between 40 and 90 days per year, with an average of 60 days annually from 1990 to 2020, has followed an opposite trend (**Fig. 7b**). There has been a reduction of 4.2 fewer days of continuous wet spells, with a decline of around 8 days per decade in regions such as Littoral, Nord-Ouest, and Adamaoua (**Table A2**).

In the future, no significant changes in drought durations are expected across any province (**Table A5**). The average drought length will remain around 41 days (based on CMIP6 models during the historical period 1995–2014), with northern dry areas experiencing longer droughts and southern areas having shorter ones similarly throughout the 21st century. However, the maximum number of consecutive wet days, which historically averaged 126 days in

[11] Wet Bulb Temperature formulation by Stull (2011) - Stull R., 2011: Wet-bulb temperature from relative humidity and air temperature. J. Appl. Meteorol. Climatol., 50(11), 2267–2269, doi: 10.1175/JAMC-D-11-0143-1

FIGURE 7A. Cameroon's Historical Annual Maximum Number of Consecutive Dry Days, Along with Decadal Trends for Various Periods Between 1951 and 2020, Based on ERA5 Data

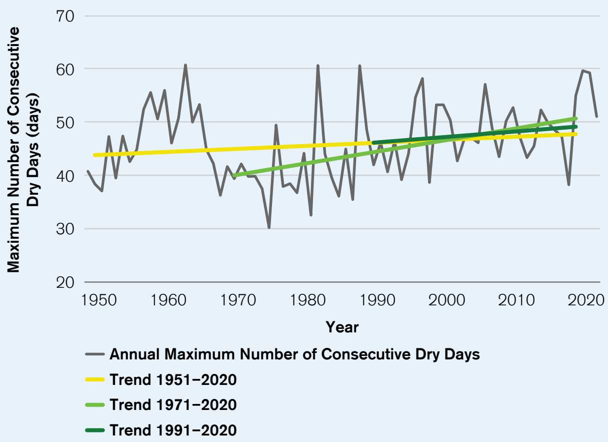
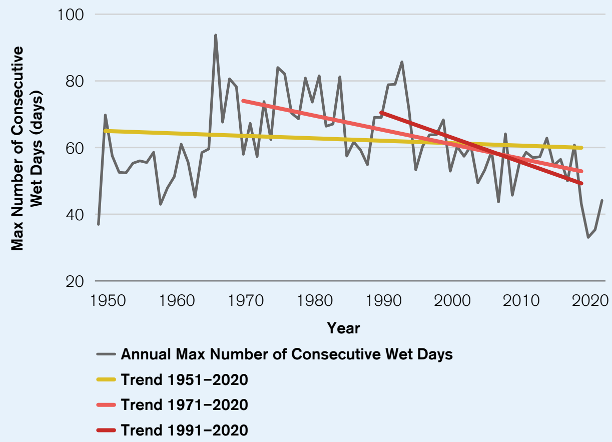


FIGURE 7B. Cameroon's Historical Annual Maximum Number of Consecutive Wet Days, Along with Decadal Trends for Various Periods Between 1951 and 2020, Based on ERA5 Data



CMIP6 simulations (note this is higher than actual historical data), is projected to decrease by 9 days by 2040–2059, compared to 1995–2014 under the SSP3-7.0 scenario (7.1% decrease). This reduction is most pronounced in Littoral, where a decrease of 21 days is expected from a historical average of 241 days (8.7% decrease). The decline will continue at a rate of 3 fewer wet days per decade from 2050 to 2100, with Littoral seeing an even steeper drop of 5 fewer days per decade. The trend is also notable in Ouest (4.4 fewer days per decade) and Adamaoua (3.9 fewer days per decade). This shift aligns with the broader expectation of more erratic weather patterns due to climate change, leading to greater weather discontinuity, even when the total rain increases.

Extreme Precipitation

Intense precipitation events are expected to become more frequent, with their return periods decreasing. In a warmer world, the potential of air to carry moisture goes up, and thus the potential for heavier precipitation goes up. Intense precipitation events, characterized by the largest single-day event during the historical period, will likely recur more frequently (e.g. the return period will decrease, **Table 1**), which can negatively affect the flooding risk, and be dangerous for infrastructure, human safety, or agriculture. In Cameroon, recurrent flooding, flash floods and landslides will become more frequent due to intense rain. Extreme precipitation events with return periods of 100 years are projected to occur 2.75 times more frequently by mid-century (2035–2064) under the SSP3-7.0 scenario, compared to historical data from 1985–2014. This means that what was historically a 100-year event will occur approximately every 38 years by 2050. In Cameroon, a historical 100-year precipitation event corresponds to 92 mm of rain falling in a single day—an amount that, historically, has been observed during the whole driest 2 months and a half (mid-Dec to end of February) or the same amount that historically takes at least 10 days during the wettest month of the year. The maximum increase in rare 100-year extreme precipitation is projected for Extrême-Nord, where the likelihood of such events is expected to be more than 4.5 times higher by 2050 compared to historical frequencies.

TABLE 1. Future (2035–2064) and (2070–2099) Return Period (years) for Extreme Precipitation Events that Correspond to the Return Levels for the Largest Single-day Event During the Historical Period (1985–2014) for SSP3-7.0. Change in Future Exceedance Probability Expressed as Change Factor for Extreme Precipitation Events that Correspond to the Return Levels for the Largest Single-day Event During the Historical Period (1985–2014) for Future (2035–2064) and (2070–2099) SSP3-7.0.

Time Period	Historical Return Period (1985–2014, Center 2000)					
1985–2014 center 2000	5-yr	10-yr	20-yr	25-yr	50-yr	100-yr
	Return Level (mm) - Median (10th, 90th)					
1985–2014 center 2000	55.29 (32.99–118.26)	63.43 (37.52–138.84)	71.86 (41.94–162.36)	74.58 (43.35–169.96)	83.46 (47.68–194.46)	91.73 (52.00–219.89)
	Future Return Period (years) - Median (10th, 90th)					
2035–2064 center 2050	2.82 (1.73–4.35)	5.15 (2.88–8.67)	9.39 (4.87–17.36)	11.41 (5.75–21.71)	20.92 (9.55–43.62)	38.19 (15.82–89.14)
2070–2099 center 2085	1.79 (1.01–3.48)	3.02 (1.51–6.61)	5.06 (2.24–12.63)	5.96 (2.53–15.59)	9.99 (3.67–30.04)	16.76 (5.22–58.22)
	Change in Future Annual Exceedance Probability (change factor) - Median (10th, 90th)					
2035–2064 center 2050	1.80 (1.06–2.80)	1.98 (1.05–3.36)	2.19 (1.04–4.01)	2.26 (1.04–4.26)	2.49 (1.02–5.18)	2.75 (1.00–6.34)
2070–2099 center 2085	2.83 (1.23–4.67)	3.39 (1.27–6.32)	4.09 (1.31–8.53)	4.35 (1.33–9.43)	5.25 (1.38–13.11)	6.36 (1.48–18.62)

Fractional change above 1 indicates increased probability and decreased return period. For example, a Fractional change of 1.80 indicates a 80% increase in the probability of suffering 100-year extreme precipitation events in the future, or 1.80 more likely.

Similarly, 50-year return events are projected to increase 2.5 times, 25-year events 2.3 times, and 10-year events 2.2 times by mid-century. However, there is significant uncertainty in these projections (**Table 1**). By the end of the 21st century, 100-year rare events are projected to occur 6.36 times more frequently, happening every 17 years instead of every 100 years. Similarly, 20-year, 25-year, and 50-year events are expected to occur at least four times as often—4.1, 4.3, and 5.5 times more frequently, respectively. This means rare precipitation events will become normal on a yearly basis.

As a result, 56% of the population will be exposed to dangerous levels of extreme rainfall by 2075, from 38% during the historical period (2000) (**Table A7**). Risk areas as defined as locations where the 25-year return level of the annual largest 5-day precipitation exceeds 130 mm. Historically, the highest risks have been observed in Littoral (88.5%), Sud-Ouest (100%), and Nord-Ouest (86.5%). In these regions, the risk is expected to remain exceptionally high. In Ouest, the population exposure increases from 35% in 2000 to 59% by 2035, reaching 61.5% by 2075. In Adamaoua, the rise in exposure is more pronounced, going from 19% to 53% and then to 73.5%. A similar trend is observed in Extrême-Nord, where the risk jumps from 9% to 23% and reaches 60%. In Est, the increase is less dramatic but still significant, rising from 6% to 15% and then to 26% by 2075.

Sea Surface Temperatures

The IPCC Western and Central Africa regions, with Cameroon located on the intersection, have historically experienced an average sea surface temperature of 28.1°C (ranging from 27.5°C to 28.8°C, p10 to p90) between 1995 and 2014 (CMIP6 models[12]). With climate change, the region is already experiencing more frequent marine heatwaves. Under the SSP3-7.0 scenario, sea surface temperatures are projected to increase by 0.5°C (with a range of 0.3°C at the 10th percentile to 0.8°C at the 90th percentile) in the near term (2021–2040), 1.1°C (0.9°C to 1.4°C) by mid-century (2041–2060), and 2.5°C (1.9°C to 3.1°C) by the end of the century (2081–2100), relative to recent historical averages (1995–2014), which are already higher than sea temperatures during pre-industrial conditions. This temperature increase is expected to be similar throughout the year.

Due to the inertia of the oceans, these temperature increases are unlikely to reverse anytime soon. A rise of more than 1°C is expected to have catastrophic consequences for fisheries, biodiversity, and coral reefs, which are especially vulnerable to even small increases in sea temperature.

Sea Level Rise

According to altimetry (satellite) data, sea level rose 12 centimeters total from 1993 to present along Cameroon's coastline[13]. The rise in sea level represents a significant threat for populated coastal cities such as Douala that already flood regularly. Under the SSP3-7.0 scenario, sea level is expected to rise 19 centimeters from 2020 to 2050, with a likely range from 14 to 26 centimeters, and 69 centimeters from 2020 to 2100, with a likely range from 52 to 94 centimeters (**Fig. 8**). This means that sea level rise is projected to increase by 0.25 meters by 2050 and 0.75 meters by 2100 under the SSP3-7.0 scenario, relative to 1995–2014.

Over the next two decades, sea level rise is expected to occur at a similar rate regardless of emissions, scenarios, or warming levels. However, beyond this period, high-emission scenarios project significantly greater increases in sea level. Despite uncertainties, it is certain that sea levels will continue to rise across all scenarios for centuries, underscoring the need for long-term planning. Sea level rise could reach 0.3 m above historical conditions starting around 2050 or earlier in all scenarios, and 0.5 m during the second half of the 21st century with respect to the 1995–2014 baseline[14]. "Under the SSP3-7.0 scenario, there is a 92% chance of exceeding half meter of global sea level rise 9% chance of exceeding 1 meter of global sea level rise by 2100"[15].

Extreme sea level surge events are projected to become significantly more frequent across much of the tropics. In Cameroon, a sea level event with a 100-year return period, currently reaching around 1.1 meters, is expected to occur as often as once every year by 2050 under the RCP4.5 scenario, with approximately 2.0°C of warming[16]. Tebaldi et al. (2021)[17] project that 100-year sea level events will become annual occurrences with just 1.5°C of global.

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[12] IPCC AR6 WGI Interactive Atlas https://interactive-atlas.ipcc.ch/.

[13] NASA https://earth.gov/sealevel/sea-level-explorer/ at the location 3N, 9E

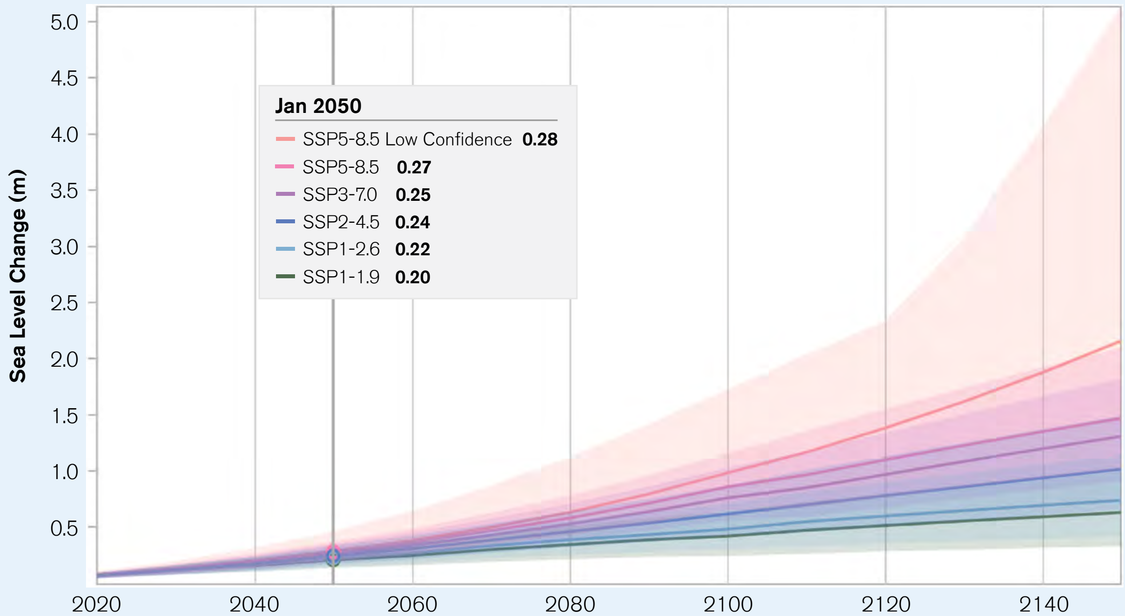
[14] NASA Sea Level Projection tool at 3°N, 9°E https://sealevel.nasa.gov/ipcc-ar6-sea-level-projection-tool?lat=3&lon=%209&data_layer=scenario

[15] NASA https://earth.gov/sealevel

[16] Vousdoukas, M.I., Mentaschi, L., Voukouvalas, E. et al. Global probabilistic projections of extreme sea levels show intensification of coastal flood hazard. Nat Commun 9, 2360 (2018). https://doi.org/10.1038/s41467-018-04692-w

[17] Tebaldi, C., Ranasinghe, R., Vousdoukas, M. et al. Extreme sea levels at different global warming levels. Nat. Clim. Chang. 11, 746–751 (2021). https://doi.org/10.1038/s41558-021-01127-1

FIGURE 8. Projected Total Sea Level Change Under Different SSP Scenarios Relative to the Historical Baseline (1995–2014). The Shaded Ranges Show Uncertainties at 17th–83rd Percentile Ranges. Data Reflects the Grid at 3°N, 9°E (along Cameroon's coast). Data from NASA Sea Level Tool[18].



Natural Hazards

Climate change is now recognized to have a significant impact on disaster management efforts and poses a significant threat to the efforts to meet the growing needs of the most vulnerable populations. According to EM-DAT[19], 60 events were recorded from 1983 to 2023 in Cameroon, with bacterial diseases emerging as the most common natural hazard (38% of events), followed by floods, droughts, and landslides (**Table 2**). Bacterial diseases in Cameroon are primarily water-borne, exacerbated by existing issues with water sanitation. The growing unpredictability of climate change is expected to hinder efforts to address these diseases. Additionally, rising temperatures will alter the timing and distribution of vector-borne diseases, further complicating public health efforts.

Think Hazard[20] identifies river floods, urban floods, coastal floods, landslides, volcanic activity, water scarcity, extreme heat, and wildfires as the highest natural risks, most of which are closely linked to the climate crisis.

[18] What are low confidence scenarios? https://earth.gov/sealevel/about-sea-level-change/future-sea-level/the-basics/#otp_what_are_low_confidence_projections_vs._medium_con
[19] The International Disaster Database https://www.emdat.be/
[20] Think Hazard, GFDRR, https://thinkhazard.org/en/report/45-cameroon

TABLE 2. EM-DAT Natural Disaster Subtype Counts and Percentages, Categorized by type: Purple for Diseases and Infestations, Blue for Water-related Disasters, Orange for Droughts, and Black for Other Events. A Total of 60 Events were Recorded from 1983 to 2023.

Disaster Subtype	Count	Percent
Bacterial disease	23	38.3
Riverine flood	10	16.7
Drought	5	8.3
Flood (General)	5	8.3
Landslide (wet)	5	8.3
Flash flood	4	6.7
Volcanic Activity	3	5.0
Viral disease	2	3.3
Grasshopper infestation	1	1.7
Infectious disease (General)	1	1.7
Locust infestation	1	1.7

Blue Economy Impacts

Cameroon's key marine ecosystems—coral reefs, seagrass beds, and mangrove forests—offer numerous benefits, including supporting biodiversity, fisheries, blue carbon, and enhancing resilience to coastal flooding. However, models predict a significant decline in marine biodiversity and fish biomass along the West African coast because of climate change.

By the period 2090–2099 and under the high-emissions scenario RCP8.5 (+4.4°C), marine animal biomass along Cameroon's coast is expected to decline a minimum of at least 25% (Tittensor et al., 2021[21]), relative to levels observed during 1990–1999.

The historical maximum sustainable yield from 2012 to 2021 is 28 metric tons for Cameroon's Exclusive Economic Zone. By 2100, under the RCP8.5 scenario (with a projected warming of +4.5°C), the maximum sustainable yield is expected to decrease substantially by more than 90% compared to historical levels (Free et al., 2020[22]).

Trisos et al. (2020)[23] project that as climate change advances, the risks to biodiversity will intensify, potentially leading to a catastrophic loss of global biodiversity. Using temperature and precipitation projections from 1850 to 2100, they assess the exposure of over 30,000 marine and terrestrial species to hazardous climate conditions.

[21] Tittensor, D.P., Novaglio, C., Harrison, C.S. et al. Next-generation ensemble projections reveal higher climate risks for marine ecosystems. Nat. Clim. Chang. 11, 973–981 (2021). https://doi.org/10.1038/s41558-021-01173-9

[22] Free CM, Mangin T, Molinos JG, Ojea E, Burden M, Costello C, et al. (2020) Realistic fisheries management reforms could mitigate the impacts of climate change in most countries. PLoS ONE 15(3): e0224347. https://doi.org/10.1371/journal.pone.0224347

[23] Trisos, C.H., Merow, C. & Pigot, A.L. The projected timing of abrupt ecological disruption from climate change. *Nature* **580**, 496–501 (2020). https://doi.org/10.1038/s41586-020-2189-9

The study predicts that climate change will abruptly disrupt ecological assemblages, as most species within any given assemblage will simultaneously face conditions beyond their niche limits. Under a high-emissions scenario (RCP 8.5), these abrupt exposure events are expected to begin before 2030, with tropical oceans, including Cameroon, being particularly affected.

ANNEX – TABLES: HISTORICAL AND PROJECTED CHANGES ACROSS REGIONS

Historical Climate Across Regions

Table A1 and A2 show the variations in historical temperature and precipitation across Cameroon's provinces.

TABLE A1. Historical a) Air Surface Temperature Averages (1991–2020) and b) Trends per Decade (1971–2020). All Columns Colored According to Intensity. Significant Trends are Bolded. Based on CRU and ERA5 Datasets, as Indicated.

	Historical Air Surface Temperature Averages (1991–2020) (degrees C), CRU					Trend per Decade (1971–2020) (degrees C/decade), ERA5		
Regions	**Temp**	**Highest Average Temp**	**When Maximum (Unimodal/ Bimodal)**	**Min Temp (night temp)**	**Max Temp (day temp)**	**Temp**	**Min Temp**	**Max Temp**
Cameroon	24.75	26.61	March, Nov	19.5	30.06	**0.29**	**0.26**	**0.33**
Littoral	26.2	27.71	Feb	22.29	30.16	**0.3**	**0.28**	**0.31**
Sud - Ouest	23.64	24.93	March	19.41	27.92	**0.28**	**0.26**	**0.31**
Nord - Ouest	21.96	24.2	April, Nov	17.03	26.95	**0.28**	**0.23**	**0.3**
Ouest	22.4	23.98	March	17.61	27.24	**0.31**	**0.24**	**0.35**
Sud	24.92	25.9	Feb	20.67	29.23	**0.33**	**0.3**	**0.34**
Centre	24.79	26.31	March, Nov	20.15	29.49	**0.33**	**0.28**	**0.39**
Est	24.21	25.55	March, Nov	19.12	29.36	**0.31**	**0.26**	**0.37**
Adamaoua	23.26	25.45	March, Oct	17.37	29.2	**0.26**	**0.24**	**0.27**
Nord	26.31	30.1	April, Oct	19.94	32.73	**0.26**	**0.24**	**0.28**
Extrême - Nord	28.31	33.23	March, Oct	21.33	35.33	**0.24**	**0.22**	**0.23**

TABLE A2. Historical Averages and Trends per Decade for a) Precipitation (the month of maximum precipitation is denoted along with the second maximum wherever the precipitation pattern is bimodal), b) Annual Maximum Number of Consecutive Dry Days (CDD), and c) Annual Maximum Number of Consecutive Wet Days (CWD). Columns are Colored According to Intensity. Significant Trends are Bolded. Based on CRU and ERA5 Datasets, as Indicated. The historical period refers to 1991 to 2020. The trend is calculated from 1971 to 2020.

	Historical Precipitation Totals (1991–2020) (mm) and Precipitation Trend (or % change) per Decade (1971–2020), CRU and ERA5							CDD (days) ERA5		CWD (days) ERA5	
Regions	**Year Total CRU**	**Max Month CRU**	**When CRU**	**Min Month (Dec–Jan) CRU**	**Year Total ERA5**	**Trend ERA5**	**% Change ERA5**	**Hist**	**Trend**	**Hist**	**Trend**
Cameroon	1628.57	266.11	Sept	14.78	1764.43	**–62.06**	**–3.5**	47.6	**2.28**	59.71	**–4.17**
Littoral	2626.37	453.11	August	23.2	2877.95	–44.81	–1.6	9.05	**0.72**	149.49	**–8.06**
Sud - Ouest	2622.24	461.54	August	17.26	3633.1	–14.79	–0.4	23.13	**2.32**	155.61	–3.43
Nord - Ouest	1998.75	348.67	August	5.96	2721.32	**–82.28**	**–3.0**	50.05	1.08	116.71	**–8.11**
Ouest	1955.05	348.1	August	6.8	2095.14	**–57.28**	**–2.7**	45.74	1.37	83.16	**–5.59**
Sud	1916.64	332.17	Oct, May	44.1	2087.92	**–50.38**	**–2.4**	9.77	0.33	72.59	**–3.35**
Centre	1633.5	290.48	Oct, May	11.14	1674.56	**–57.22**	**–3.4**	32.19	**2.42**	49.17	**–3.86**
Est	1574.28	257.91	Sept, May	23.6	1536.28	**–90.62**	**–5.9**	28.36	**3.31**	37.99	**–3.33**
Adamaoua	1584.84	277.07	August	1.89	1936.61	**–87.81**	**–4.5**	67.13	1.98	66.72	**–7.84**
Nord	1179.1	258.72	Agust	0.11	1084.7	–46.73	–4.3	91.05	**3.43**	30.18	**–1.66**
Extrême - Nord	714.62	229.91	August	0.06	586.6	**–18.47**	**–3.1**	111.7	**3.09**	15.42	**–1.17**

Projected Climate Across Regions

Table A3 to A5 show the variations in CMIP6 historical and projected temperature and precipitation related variables across Cameroon's provinces.

TABLE A3. CMIP6 Simulated Historical Averages (1995–2014), Mid-century SSP3-7.0 Projections (2040–2059, central year 2050), Median Anomalies by 2050 (with respect to historical reference period 1994–2015), Decadal Trends (2050–2100), and End-of-Century (2080–2099) Projections for a) Average Surface Air Temperature, b) Number of Hot Days per Year with Tmax > 35°C. Columns are Colored According to Intensity.

	Average Surface Air Temperature (degrees C)					Number of Hot Days per Year with Tmax > 35°C (days)				
Regions	Hist	2040–2059	Anomaly	Trend (2050–2100)	2080–2099	Hist	2040–2059	Anomaly	Trend (2050–2100)	2080–2099
Cameroon	25.05	26.42	1.37	0.46	28.2	28.61	44.15	15.5	9.77	75.47
Littoral	25.46	26.76	1.26	0.43	28.4	0.11	1.56	1.55	5.55	17.37
Sud - Ouest	24.76	26.06	1.28	0.42	27.67	1.82	6.58	4.66	5.48	24.57
Nord - Ouest	22.05	23.42	1.37	0.42	25.15	2.64	9	6.19	5.43	27.46
Ouest	22.8	24.16	1.34	0.45	25.87	3.18	10.76	7.08	5.95	31
Sud	24.61	25.91	1.28	0.44	27.68	0	0.16	0.2	5.94	7.35
Centre	24.78	26.14	1.35	0.46	27.94	4.26	16.09	11.51	9.59	47.11
Est	24.56	25.94	1.37	0.48	27.81	0.69	6.34	5.53	10.79	30.15
Adamaoua	23.73	25.18	1.48	0.47	27	8.85	30.04	21.82	11.32	74.79
Nord	27.22	28.63	1.45	0.47	30.39	101.61	144.04	42.53	13.53	200.28
Extrême - Nord	28.42	29.79	1.38	0.44	31.53	162.29	199.56	36.53	11.36	245.23

TABLE A4. CMIP6 Simulated Historical Averages (1994–2015), Mid-Century SSP3-7.0 Projections (2040–2059, central year 2050), Median Anomalies by 2050 (with respect to historical reference period 1994–2015), Decadal Trends (2050–2100), and End-of-Century (2080–2099) Projections for a) Number of Tropical Nights per Year with Tmin > 23°C and Tmin > 26°C b) Number of Days per Year with Heat Index > 35°C. Columns are Colored According to Intensity.

	Number of Tropical Nights per Year with Tmin > 23°C (days)					Number of Tropical Nights per Year with Tmin > 26°C (days)				Number of Days per Year with Heat Index > 35°C			
Regions	**Hist**	**2040–2059**	**2080–2099**	**Anomaly (2040–2059)**	**Trend (2051–2100)**	**Hist**	**2040–2059**	**2080–2099**	**Trend (2051–2100)**	**Hist**	**2040–2059**	**2080–2099**	**Trend (2051–2100)**
Cameroon	42.33	96.75	237.76	53.83	32.49	8.12	17.02	49.2	10.51	3.48	14.23	58.77	10.08
Littoral	126.44	241.8	326.23	112.02	17.04	0.5	17.34	129.48	30.43	0.31	29.14	154.94	29.58
Sud - Ouest	55.62	159.92	287.19	101.37	27.55	1	9.66	59.01	14.41	0.67	12.79	84.59	16.97
Nord - Ouest	1.1	7.4	40.58	6.43	9.81	0	0.07	1.78	0.7	0	0.31	4.31	0.82
Ouest	0.77	9.62	70.4	8.89	17.79	0	0.02	2.2	1.03	0	0.12	4.06	0.65
Sud	24.37	74.4	292.36	50.34	48.01	0.17	3.68	27.03	7.73	0	2.22	44.99	8.69
Centre	9.36	74.56	272.27	64.27	45.02	0	0.24	22.34	9.19	0	1.91	39.86	8.55
Est	3.26	50.52	263.3	45.81	47.6	0	0.08	14.5	7.17	0	1.17	36.91	7.12
Adamaoua	3.02	18.27	90.97	15.78	21.48	0.07	0.71	5.75	2.29	0.01	0.51	6.89	1.35
Nord	114.29	191.82	281.1	79.32	20.02	25.3	55.29	123.89	19.6	10.14	40.71	113.13	17.93
Extrême - Nord	171.83	233.22	283.52	58.97	12.48	60.5	100.85	170.81	19.79	27.2	77.14	152.66	17.8

TABLE A5. CMIP6 Simulated Historical Averages (1995–2014), Mid-Century SSP3-7.0 Projections (2040–2059, central year 2050), Median Anomalies by 2050 (with respect to historical reference period 1994–2015), and Decadal Trends (2050–2100) for a) Precipitation and b) Annual Maximum Number of Dry (CDD) and Wet (CWD) Days. Columns are Colored According to Intensity. For Precipitation We also Note the Anomaly as a Percentage Change. For CDD, We only Show the Historical Value as There are No Significant Changes Projected in the Future.

	Precipitation Historical and Projected Annual Average Values (mm) and Median Anomaly to Mid-Century (mm and %)				Maximum Number of Consecutive Dry/Wet Days per Year (cdd, cwd) - Historical Averages, Anomaly, and 2050–2100 Trend per Decade				
Regions	**pr Hist**	**pr 2050**	**pr Anomaly**	**pr % Anomaly**	**CDD Hist**	**CWD Hist**	**CWD 2050**	**CWD Anomaly 2050**	**CWD Trend 2050–2100**
Cameroon	1826.87	1884.9	72.98	3.9	40.64	126.47	117.58	–9.13	–2.92
Littoral	2942.94	2995.06	72.59	2.4	5.39	240.71	218.65	–20.98	–5.14
Sud - Ouest	3614.96	3730.93	139.44	3.7	12.43	252.56	241.89	–12.04	–3.64
Nord - Ouest	2798.07	2877.99	86.62	3.0	40.35	206.13	198.89	–7.25	–2.92
Ouest	2140.85	2183.05	62.38	2.9	39.23	194.77	179.52	–14.08	–4.43
Sud	2154.92	2192.44	52.77	2.4	5.73	132.01	118.8	–14.73	–2.64
Centre	1717.47	1760.97	58.3	3.3	26.74	119.78	107.26	–12.68	–3.48
Est	1640.37	1696.06	66.39	3.9	19.83	93.83	85.74	–8.35	–2.58
Adamaoua	2004.19	2051.96	73.12	3.6	61.01	154.32	145.35	–7.85	–3.86
Nord	1129.01	1201.22	83.56	7.0	82.88	84.8	81.49	–3.81	–2.2
Extrême - Nord	630.77	702.61	80.35	11.4	105.42	37.65	39.66	0.74	–0.41

Population Exposure Across Regions

Tables A6 and A7 show the variations in CMIP6 historical and projected population exposure to temperature and precipitation related variables across Cameroon's provinces.

TABLE A6. For Each Admin1 Province, Percent of the Population[24] at High Health Risk for Three Periods: Retrospective (1975–2024, centered on 2000), Future (2010–2059, centered on 2035), and Distant Future (2050–2099, centered on 2075), Under SSP3-7.0. High-risk areas are defined as locations where the 50-year return level indicates, that, on average once every 50 years, a year occurs with a) more than 30 days with Tmax > 35°C, b) more than 20 days with Tmin > 26°C, c) more than 30 days characterized by heat index surpassing 35°C, d) more than 15 days characterized by wet bulb temperatures surpassing 27°C (not showing the retrospective values as it zero everywhere).

Regions	Hot Days (Tmax > 35°C)			Tropical Nights (Tmin > 26°C)			Heat Index > 35°C			Wet Bulb Temp > 27°C	
	hd35 - 2000	hd35 - 2035	hd35 - 2075	tr26 - 2000	tr26 - 2035	tr26 - 2075	hi35 - 2000	hi35 - 2035	hi35 - 2075	wb27 - 2035	wb27 - 2075
Cameroon	28.67	38.85	60.12	22.23	29.7	50.14	18.62	33.32	66.84	11.18	46.36
Littoral	0	0	28.59	0.18	39.25	78.51	3.77	65.82	84.23	57.16	82.91
Sud - Ouest	5.75	14.67	33.52	2.26	6.62	45.39	3.55	26.38	75.67	15.18	64.75
Nord - Ouest	3.35	11.52	42.66	0	0	2.54	0	0.3	7.05	0	1.59
Ouest	1.94	10.82	26.51	0	0	0.8	0	0	3.54	0	0
Sud	0	0	20.39	0.13	5.85	18.02	0	10.19	100	3.58	35.62
Centre	5.86	22.72	50.06	0	0	51.96	0	4.23	95.79	1.09	25.52
Est	0	12.04	98.69	0	0	53.01	0	1.18	98.17	0	37.74
Adamaoua	16.02	69.53	98.63	0.09	1.02	3.77	0	1.02	18.41	0	0.92
Nord	98.46	99.33	100	78.51	90.93	97.64	63.44	90.59	97.4	10.02	91.66
Extrême - Nord	100	100	100	87.52	95.12	100	71.5	88.82	100	20.47	96.65

[24] Population dataset: Gridded Population of the World, Version 4: GPWv4; Revision 11, Dec 2018. For each pixel (at approximately 25 km resolution), the return level for a given return period is calculated by fitting a Generalized Extreme Value (GEV) distribution. A pixel is classified as "too risky" (1) if the return level exceeds the specified threshold, and "not too risky" (0) otherwise. The reported population exposure represents the percentage of the total population in each region that is exposed to risk.

TABLE A7. For Each Admin1 Province, Percent of the Population at High Health Risk for Three Periods: Retrospective (1975–2024, centered on 2000), Future (2010–2059, centered on 2035), and Distant Future (2050–2099, centered on 2075), Under SSP3-7.0. High-risk areas are defined as locations where the 25-return level of the annual largest 5-day precipitation (rx5) exceeds 130 mm.

Regions	rx5 - 2000	rx5 - 2035	rx5 - 2075
Cameroon	38.06	45.6	55.96
Littoral	88.5	91.34	94.56
Sud - Ouest	100	100	100
Nord - Ouest	86.45	88.7	88.86
Ouest	35.3	59.09	61.51
Sud	24.31	23.26	28.57
Centre	1.85	3.56	9.02
Est	5.93	14.71	26.2
Adamaoua	19.43	53.21	72.56
Nord	6.02	14.1	19.77
Extrême - Nord	8.78	23.44	59.71

CLIMATE RISK COUNTRY PROFILE

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