

# Central African Republic: Climate Risk Profile (the effects on water and livelihood)

**Fact Overview**  
GDP per Capita (2022)<sup>1</sup>: 427.1 USD  
Population(2021)<sup>2</sup>: 6.100 million  
ND-GAIN Ranking<sup>3</sup>: 184th position

## Key Trends

### Temperature

The Central African Republic (CAR) is projected to experience a significant temperature increase by the end of the century, with an annual mean temperature rise of 3.1°C to 5.7°C<sup>4</sup>. This will lead to more hot days, extreme temperatures, and longer heat waves. These changes will affect seasons and agriculture. The increasing heat will have severe consequences for human health, agriculture, and ecosystems, particularly during the late summer and fall planting seasons<sup>5</sup>. This temperature rise is consistent across different emission scenarios, indicating the ongoing impact of climate change (Table 1).

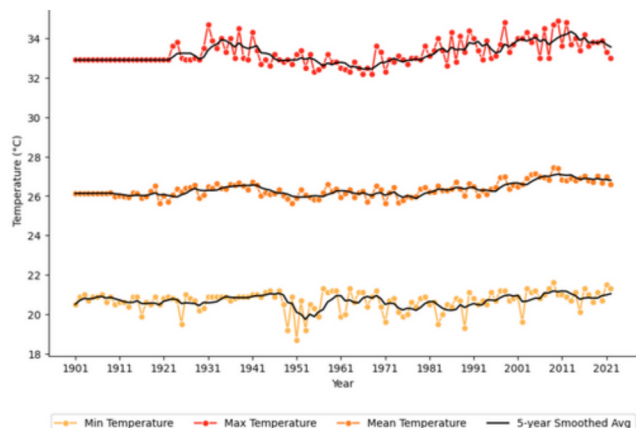


Figure 1: Observed average annual mean, minimum and maximum temperature of CAR (1901-2022)<sup>7</sup>

### Precipitation

As seen in Figure 2 precipitation patterns in the Central African Republic (CAR) exhibit considerable variability, especially in recent years. This variability is expected to increase even more as the German Climate Service Center (GERICS) projects a rainfall surge ranging from 12% to as much as 19% by the century's end.<sup>6</sup> Rainfall variability in the CAR has significant consequences such as the rise in the occurrence and severity of floods and droughts. Across all emission scenarios, there is a projected increase in average precipitation, spanning the end of the century.

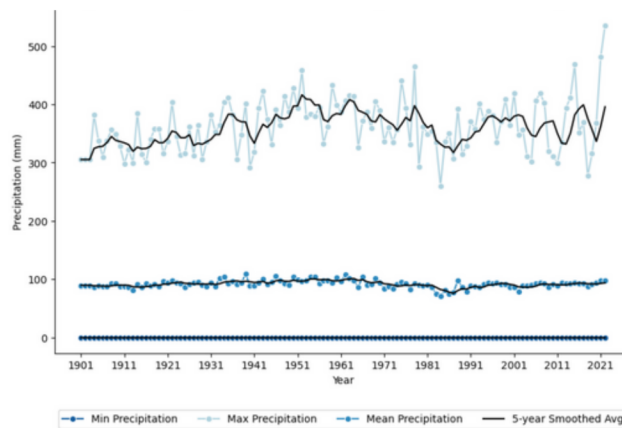


Figure 2: Observed average annual mean, minimum and maximum precipitation of CAR (1901-2022)<sup>7</sup>

Table 1: Projected temperature of CAR under various Shared Socioeconomic Pathways.<sup>8</sup>

CMIP6 Projection	SSP1-1.9	SSP1-2.6	SSP2-4.5	SSP3-7.0	SSP4-6.0	SSP5-8.5
2020-2039	25.18 to 26.84 (30.5)	25.41 to 27.07 (30.81)	25.54 to 27.69 (31.51)	25.88 to 28.51 (32.27)	25.76 to 28.19 (32.02)	25.95 to 28.88 (32.92)
2040-2059	25.27 to 26.83 (30.32)	25.36 to 27.03 (30.48)	25.68 to 27.82 (31.46)	25.87 to 28.45 (32.16)	25.90 to 28.24 (31.86)	25.93 to 28.95 (33.10)
2060-2079	25.21 to 26.84 (30.39)	25.31 to 27.01 (30.52)	25.75 to 27.84 (31.53)	25.89 to 28.46 (32.30)	25.95 to 28.23 (32.05)	26.04 to 28.93 (33.22)
2080-2099	25.16 to 26.79 (30.47)	25.48 to 27.10 (30.5)	25.77 to 28.58 (32.39)	25.90 to 28.57 (32.49)	25.92 to 28.21 (32.05)	26.03 to 28.99 (33.06)

Note: Values are the range (10th–90th Percentile) and values in parentheses show the 50th Percentile.

## The Impacts

### Water

CAR's population heavily relies on forest-based groundwater and springs for drinking water. Altered precipitation patterns due to changing Congo Basin dynamics might affect water availability, impacting both households and businesses. Irrigation schemes, although limited, could be jeopardised by climate impacts on hydrology, particularly in savannas and drier zones. More intense rainfall events could worsen urban water quality and increase river flooding. Drinking water pollution is a pressing health concern, especially in urban areas. Floods in navigable rivers could disrupt transportation and drought and increased aridity could lead to land degradation, biodiversity loss, reduced surface water, crop damage, and wildfires. Heavy rainfall might flood agricultural areas, hurting crops like cassava, taro, and yam. Altered rainfall and evaporation could reduce groundwater reliability and increase strain on pumping systems during droughts. Rising temperatures could worsen soil moisture deficits despite increased rainfall.<sup>9</sup>

### Adaptation Options

- Develop and promote integrated water resources management through the establishment of a national water policy and water code.
- Coordinate efforts across public, private, and local sectors for effective water resource management and mobilize investments for critical water infrastructure projects, including water access, irrigation, and hydropower generation.
- Collaborate to support public-private partnerships for sector management.
- Enhance hydro-meteorological forecasting capabilities to improve planning and preparedness for rainfall events and potential flooding.
- Conduct research to assess the quality of surface and underground water for improved resource allocation and conservation planning.
- Develop adaptable infrastructure to accommodate projected hydrological changes and river flows, reducing flooding risks and enhancing transportation networks.
- Improve water management and usage efficiency to benefit agriculture, water quality, availability, food security, and community well-being.
- Strengthen the supply of potable water and establish systems for monitoring water quality, as well as underground and surface water resources.

### Livelihood: Agriculture

The agricultural sector's pivotal role in the CAR's economy and food security renders it highly vulnerable to upcoming climate changes. Around 72% of the CAR population depends on agriculture, serving as a main income and sustenance source. Projected climate shifts, including intensified rainfall, extreme events, prolonged dry spells, and rising temperatures, will impact crop yields, necessitate adaptive farming approaches, and potentially lead to expansion into forests. Rising temperatures could escalate pest and pathogen issues, such as the cassava mosaic virus. Agricultural product processing and storage might suffer due to heightened temperatures and humidity. The region's existing ground transportation challenges will be compounded by climate change, triggering increased erosion, transportation costs, and market access issues due to floods, heavy rain, instability, and conflict. The changing climate is poised to disrupt planting schedules through more frequent and extended dry spells.<sup>9</sup>

### Adaptation Options

- To address Livelihood challenges, there's a need for improved policies for environmental and agricultural protection.
- Enhanced financing mechanisms can assist both small-scale farmers and commercial industries in recovering from displacement and conflict and restarting investment and production.
- Targeted research is necessary to understand the specific impacts of climate change on the agricultural sector.
- Access to seasonal information is crucial to inform farmers about optimal planting times.
- Emphasizing the preservation of natural ecosystems is essential due to their diverse roles, including providing habitats, supporting agriculture, and maintaining soil quality.
- Training and awareness initiatives among local farmers can lead to improved planting techniques and soil enrichment practices.
- Agricultural support should be strengthened through enhanced extension programs.
- Involving local communities, including farmers, in managing local forest ecosystems is important.
- Developing improved road networks and transportation systems can enhance market accessibility.

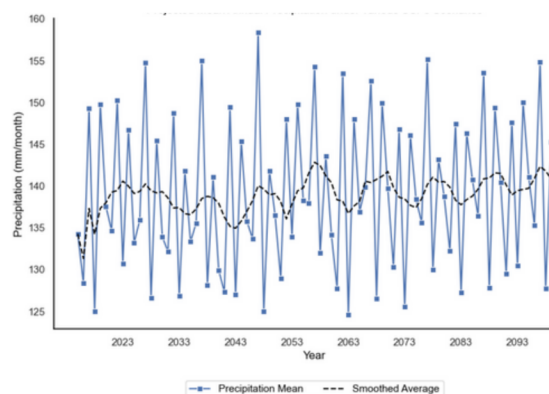


Figure 3: Projected Mean Annual Precipitation under various SSP5-8.5 Scenarios.<sup>8</sup>

<sup>1</sup> World Bank Data Bank (2022). World Development Indicators. CAR. URL: <https://databank.worldbank.org/source/world-development-indicators>  
<sup>2</sup> Central African Institute of Statistics, Economic and Social Studies (2022). URL: <https://cises.org/index.php/region/region?grand-banque=1-429-276-hts>  
<sup>3</sup> University of Notre Dame (2020). Notre Dame Global Adaptation Initiative. URL: <https://gdi.nd.edu/en/work/county/index>  
<sup>4</sup> Climate Risk Profile: Central African Republic (2022). The World Bank Group.  
<sup>5</sup> Doss, A. (2020). Projection of temperature and heat waves for Africa with an ensemble of CORDEX Regional Climate Models.

<sup>6</sup> GERICS (2015). Climate-Fact-Sheet, Central African Republic.  
<sup>7</sup> Harris, I., Osborn, T.J., Jones, P. et al. Version 4 of the CRU TS monthly high-resolution gridded multivariate climate dataset. Sci Data 7, 109 (2020). <https://doi.org/10.1038/s41597-020-0463-3>  
<sup>8</sup> CMIP6 - WCRP Coupled Model Intercomparison Project Phase 6. URL: <https://code.climate.cosmos.europa.eu/dataset/search?type=dataset>  
<sup>9</sup> Climate Risk Profile: Central African Republic (2022). The World Bank Group.