

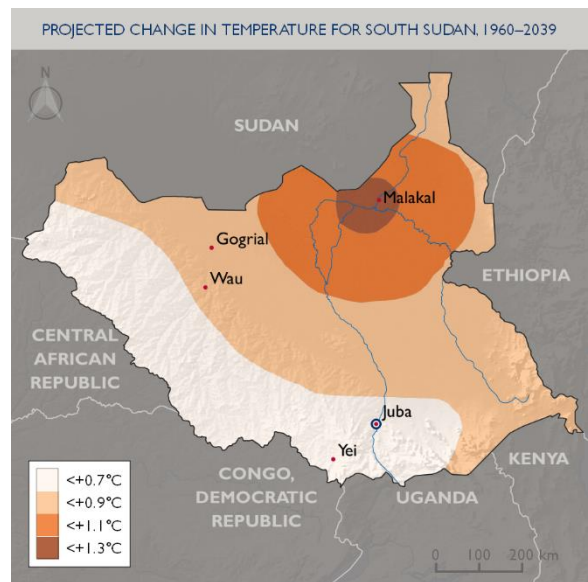


CLIMATE CHANGE RISK PROFILE SOUTH SUDAN

COUNTRY OVERVIEW

As the youngest and one of the least developed countries in the world, South Sudan faces several development challenges due to decades of political instability, poverty and persistent food insecurity, all of which are exacerbated by climate change. With about 50 percent of the population living below the national poverty line, a weak economy, and ongoing internal conflict, South Sudan also ranks among the most fragile states in the world. It has one of the richest agricultural areas in Africa with fertile soils and abundant water, but frequent flooding, droughts, ongoing conflict and the displacement of millions of people have drastically reduced food production, to the point where an estimated 7.5 million people are currently considered food insecure. (4)

While oil exports comprise the majority of GDP, 95 percent of the population depends on climate-sensitive natural resources, particularly rainfed subsistence agriculture. Rapid population growth and the expansion of farming and pastoralism, coupled with climate change, could aggravate South Sudan's fragile situation and exacerbate existing tensions and conflict. (2, 11)



CLIMATE PROJECTIONS



Increase of 1° C in temperature on average by 2060



Increased unpredictability of seasonal rains and increased intensity of rainfall events



Increased incidence of drought

KEY CLIMATE IMPACTS

Agriculture

Increased crop losses/failure
Loss of pasture lands and water resources for livestock



Ecosystems

Reduction of critical habitats for biodiversity in wetlands and forests



Water Resources

Reduced river flows
Reduction of key habitats in wetland ecosystems



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CLIMATE SUMMARY

South Sudan has a humid equatorial climate characterized by:

- Annual rainfall ranging from 200 mm in the southeast to 1,200–2,200 mm in the forest zone in Western Equatoria and the Equatorial highlands. In the northern states, rainfall varies between 700 and 1,300 mm. The rainy season is from April to December and results in seasonal river flooding.
- Mean average temperatures vary between 26°C and 32°C. (8)

HISTORICAL CLIMATE

Historical climate trends include:

- Decline of rains by 10 to 20 percent since the mid-1970s.
- Increasing variability in the amount and timing of rainfall from year to year.
- Significant warming over the past 30 years, with the central and southern regions of South Sudan among the most rapidly warming locations on the globe, with station temperatures increasing as much as 0.4°C per decade.

Temperature increases intensify the impacts of drought through increased evapotranspiration and reduced soil moisture. For example, observed warming of more than 1°C is equivalent to another 10–20 percent reduction in rainfall. (15)

FUTURE CLIMATE

Projected changes include:

- All projections agree that South Sudan will get warmer by an average of 1°C by 2060, with lower increases in the south. (6)
- Projections of rainfall patterns are less certain, with some models suggesting increases and others decreases.
- The current increased variability of rains, in terms of onset, duration and totals, is likely to continue. (6,15)
- If current rainfall trends continue, the drying impacts could extend into West and North Bahr al-Ghazal, Warrap, Unity, Al Buhairat (Lakes) and Central Equatoria by 2025. (10, 15).

SECTOR IMPACTS AND VULNERABILITIES

AGRICULTURE AND PASTORALISM

Agriculture in South Sudan is vulnerable to climate variability as most of the production is rainfed and therefore dependent on seasonal rains for optimal crop performance. Droughts and increasing variability negatively impact the economy and nutrition status of South Sudanese who depend on agriculture for their livelihoods. Recent evidence suggests reductions in yields of sorghum, the staple grain of the majority of the population, of 5–25 percent between 2000 and 2050. (6)

In a country of 12 million people, South Sudan is home to 38 million cattle, goats and sheep, which provide livelihoods for about 80 percent of the population. Livestock are raised in a variety of production systems, including pastoralism, which depends on access to grazing land and watering points. Climate change can exacerbate existing tensions over land use among and between farmers and pastoralists as they compete for increasingly scarce resources. For example, pastoralists might change their migration patterns in search of water and fodder, thus coming into contact with existing agricultural lands and other pastoralists.

Climate Risks and Potential Impacts AGRICULTURE and PASTORALISM	
Climate Risk	Potential Impacts
Increased minimum temperatures	Loss of productive agricultural lands due to desertification
	Delayed planting and earlier harvest leading to a shortened growing season
Increased rainfall variability - onset and length of rainy season	Reduced yields and/or crop failure
	Loss of pasture lands and reduced access to water resources for livestock
Increased incidence of drought	Increased local conflicts over land use and resources between and among pastoralists and farmers

Meanwhile, farmers are expanding agricultural land to areas previously used as seasonal pasture to cope with declining yields and soil quality. At the same time, the area receiving adequate rainfall to support agro-pastoralist livelihoods (500 mm) has reduced by 18 percent since 1960. (1, 7, 9, 13, 14)

WATER RESOURCES

Climate change could reduce water availability in the country, which will have several impacts on agriculture, ecosystems and water and sanitation services. Situated in the Nile catchment area, South Sudan receives water from the highlands of neighboring countries, which flows into the country's low and vast clay basin. In contrast to the Nile, these catchments are highly sensitive to seasonal temperature variation. For example, a 2°C increase in temperature could cause the average natural flow in the Equatorial Lakes and Bahr El Ghazal sub-basins to fall by 50 percent. Additionally, rivers previously considered permanent have been drying up and becoming seasonal over the last two decades. (3, 8)

Decreasing water levels due to climate change would heavily impact the one-third of the population that still relies on surface water for domestic use. After decades of war, access to water supply and sanitation services is severely constrained; piped water is practically nonexistent. More than 60 percent of the population relies on wells and boreholes for access to water. (1)

ECOSYSTEMS

A diversity of ecosystems provides South Sudan with a wide range of environmental services, such as provision and maintenance of water resources, flood mitigation and food sources, all of which could be affected by climate change. South Sudan is home to the largest designated Ramsar wetland, the Sudd, which is pivotal in regulating weather patterns in the Sahel, Horn of Africa and greater East Africa region. The Sudd acts as a barrier to the southward encroachment of the Sahara Desert; its preservation is consequently expected to be South Sudan's most significant contribution to buffering against climate change impacts at the regional level. (11)

South Sudan has diverse natural forests and woodlands that cover about 33 percent of total land area and contain rich biodiversity. These forests provide direct benefits in the form of income, food and fodder, as well as indirect benefits through environmental protection (shade, wind belts) and improved agricultural production (from mulching and nitrogen fixation).

Climate Risks and Potential Impacts WATER RESOURCES	
Climate Risk	Potential Impacts
Increased rainfall variability	Rivers dry up or change from perennial to seasonal flows due to higher evaporation
	Reduced water quality in stagnating ponds due to prolonged dry season
Rising temperatures	Reduced access to water for drinking and sanitation
	Increased conflict over rights and access to water at the national and regional level

Three decades of low rainfall and periodic severe drought have led to disputes over water resources. Water rights continue to be a source of tension between South Sudan and Sudan. Across the region, access to water from the Nile has sparked conflict between nations. There is concern that climate change may exacerbate South Sudan's existing instability –nationally, regionally and locally. (7, 9, 10)

Climate Risks and Potential Impacts ECOSYSTEMS	
Climate Risk	Potential Impacts
Increased rainfall variability	Reduction of habitat and spawning areas for fish in rivers
	Reduction of wetlands, impacting food and fodder availability for livestock and wildlife
Rising temperatures	Reduced forest density and diversity due to desertification and increased incidence of wildfires
	Increased competition for scarce resources

A hotter, drier climate with intermittent droughts may see a southward shift in the Sahel, leading to declines in tree density and tree species, limited tree growth and increased incidence of wildfire. (1, 10)

Overall, degradation of ecosystem services, in part caused by climate change, causes friction between competing forms of land use and competition for resources within land use sectors, which often leads to social conflicts and instability. (8, 13)

POLICY CONTEXT

INSTITUTIONAL FRAMEWORK

Institutional frameworks in response to climate change are at nascent stages in South Sudan. New institutions mandated to address climate change have been weakened by a lack of technical know-how and financial resources, and by the low priority assigned to environment and climate change issues by the government due to the ongoing conflict. The Ministry of Foreign Affairs and International Cooperation is the political focal point for international environmental conventions and treaties and the Ministry of Environment is the technical and operational focal point. The Ministry of Environment has established a climate change unit, but it is not operational due to lack of financial and human resources. (9, 12)

In 2013, South Sudan joined the Global Environment Facility (GEF), which, pending creation of enabling conditions, could open it up to an additional US\$40-70 million of climate financing in the coming years. The Ministry of Environment and relevant institutions are working on enabling activities with technical assistance from donors. (9, 12)

Traditional authorities still play an important role in South Sudanese society that should not be overlooked. Traditional regulations include the obligation to return any small fish caught to the water, regulations on the use of forest fires and protection of certain wildlife and tree species. (8)

NATIONAL STRATEGIES AND PLANS

The **National Environmental Policy**, a key document governing natural resources, calls for development of a national strategy for climate change adaptation and mitigation; formulation of a climate change policy for South Sudan; and efforts to reduce communities' vulnerability to climate variability and change. To date, South Sudan has not yet developed any standalone climate change policy or strategies; however, adaptation strategies and plans have been incorporated into country development plans. **Priority sectors for adaptation strategies include:** agriculture and forestry, livestock, health, water and disaster risk management. (5)

Other policies that include climate change adaptation include:

- The **National Policy on Food Security** identifies development of drought- and flood-resistant seed varieties as a way to build adaptive capacity.
- The **draft (as of 2015) Disaster Risk Management Policy** proposes building dikes to prevent floods, but says little about building resilience to droughts. (12)

Prior to the current conflict that began in 2013, South Sudan was also working on its First National Communication to the UNFCCC, National Adaptation Programme of Action (NAPA), National Adaptation Plan (NAP) and National Biodiversity Strategy and Action Plan (NBSAP). (9)

KEY RESOURCES

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13. UNEP. 2007. [Sudan Post-conflict Environmental Assessment](#).
14. UNEP. 2011. [Global Environmental Alert Service: Food Security in the Horn of Africa: The Implications of a Drier, Hotter and More Crowded Future](#).
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Map Source: Adapted from USAID and USGS. 2011. [A Climate Trend Analysis of Sudan](#).

SELECTED ONGOING EXPERIENCES

The majority of foreign aid to South Sudan is dedicated towards emergency food aid, governance, peace building, infrastructure and health. UNEP is a major donor in regard to environmental and climate change programming. UNEP's environmental programs include:

- Development and implementation of environmental improvement projects, including building resilience of communities to climate change and other natural disasters, such as floods, extreme weather and desertification.
- Conservation of biodiversity by strengthening both wildlife conservation programs and protected area management initiatives.
- Integrated water resource and wetlands management.
- Wider stakeholder engagement in forest resource management and utilization through the up-scaling of community management of natural forests on communal lands.

OTHER RELATED PROJECTS

Selected Program	Amount	Donor	Year	Implementer
BRACED: Strategies and Technologies to Build Resilience Against Droughts and Floods		DfID	2015–2018	Concern Worldwide, ACTED, Oxfam, FAO and The Sudd Institute
Increase Water Availability for Multiple Purposes in the Nyimur Region of South Sudan	US\$2.3 million	African Water Facility	2015	Nile Equatorial Lakes Subsidiary Action Program (NELSAP)
Food Security and Development of Agricultural Markets		GIZ	2013–2015	GIZ
Building Resilient Agricultural Production	US\$6.5 million	CIDA	2015–2017	Agriteam Canada
2SCALE (sustainable clusters in agribusiness)		Netherlands Ministry of Foreign Affairs	2012–2017	IFDC