



Somalia

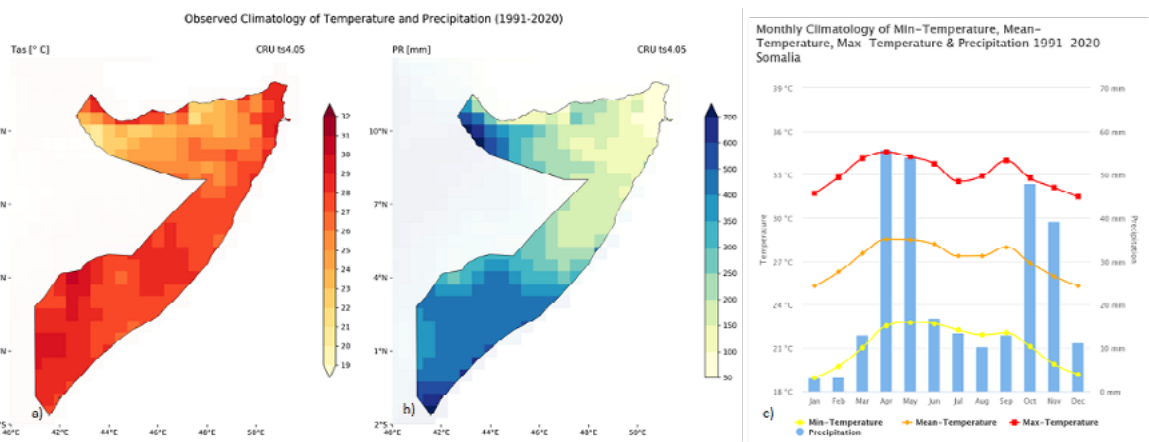
The following climate factsheet summarizes available information on the climate of Somalia, climate change and impacts of these changes on humanitarian activities in country. Each of the factsheets were written as a compilation of information from peer-reviewed academic papers, government publications, and INGO documentation.

1. Climate overview

Average annual temperature: The northern parts of the country experience mean temperatures as low as 19°C while the central and southern parts experience higher temperature with values around 30°C (Figure 1a).

Average annual rainfall: Rainfall varies strongly in space with northern and central parts experiencing considerably lower rainfall than in the south, with the exception of the Northern Plateau Rainfall in some parts of the central semi-arid areas of the country is as low as 50-150mm/year while parts in the south can receive rainfall more than 400 mm and highest in the southwest with around 600 mm rainfall (Figure 1b).

Figure 1. Observed Climatology of mean Temperature (a), annual mean total precipitation (b) and monthly climatology (c) over 1991-2020. (Adapted from World Bank, 2022).



Short overview

According to the Köppen-Geiger Climate Classification, the climate in Somalia ranges from arid in majority of land areas (hot desert climate, BWh and semi-arid, BSh) to tropical wet-and-dry (tropical savanna climate, Aw). Mean temperatures across the country do not vary significantly with the season, mean annual temperatures remain between 25°C and 28°C. There are two main rainfall seasons from April to June (Gu) and between October to December (Deyr) (Figure 1c). Rainfall and temperature in Somalia is influenced by a number of factors, including the Inter-Tropical Convergence Zone (ITCZ), monsoonal winds and ocean currents, jet-streams including the Somali Jetstream or Somalia Current, easterly waves, tropical cyclones, Indian Ocean's variable sea-surface temperatures and the El Niño–Southern Oscillation (ENSO) cycle (Gure, 2021). During El Niño periods, parts of Somalia typically experience wetter than normal conditions and during La Niña periods, drier than usual conditions typically occur.

The diverse and varied geography of Somalia means that it is exposed to a broad array of environmental hazards (hydrometeorological as well as geophysical) which are directly impacted and exacerbated by the impacts of climate change across the country. Ranked 1 out of 191 countries by the 2022 Inform Risk Index, Somalia is considered the most at risk countries in the world (DRMKC, 2022).

1.1 Climate Change in Somalia

Historical climate change

Temperature

- The mean annual temperature over Kenya have increased at a rate of approximately 0.2°-0.3°C/decade since 1961 to 2015 (Gutiérrez *et al.*, 2021)
- The frequency and intensity of **hot extremes have increased** and cold extremes have decreased (Seneviratne *et al.*, 2021)

Climate Projections change

- **Mean temperature over the region are projected to rise until 2050 by at least 1.5°-2.5°C** for a high greenhouse gas concentration scenario (SSP5-85) and 1°-2°C for low greenhouse gas concentration scenario (SSP2-4.5) (Gutiérrez *et al.*, 2021).
- **Maximum and minimum temperature will increase, and heat waves will intensify** in duration and peak temperatures for every increase in global warming levels above the pre-industrial values. In line with rising mean annual temperatures, the annual number of very hot days (days with daily maximum temperature above 35 °C is projected to rise and with high certainty (Gutiérrez *et al.*, 2021; Ranasinghe *et al.*, 2021; Seneviratne *et al.*, 2021)

Precipitation

- Overall, **no clear trend in rainfall** or extreme rainfall events due to high year to year natural variability.
- Mid-century estimates (2040-2060) of annual precipitation changes over Somalia under a low emission scenario (SSP2-4.5) and high emissions scenario (SSP5-8.5) is projected to increase around 10-20%, with enhanced interannual variability (Gutiérrez *et al.*, 2021)
- The **frequency and intensity of heavy precipitation events are projected to increase with potential effects in flooding and soil erosion** (Seneviratne *et al.*, 2021)

2. Priorities of the Movement and climate change

2.1 Scale up climate-smart DRR, early action and preparedness: DRR portrait

Existing Hydrometeorological Hazard	Projected Risks
Floods	
<p>Somalia is vulnerable to and experiences river floods and flash floods. River floods typically occur along the Juba and Shabelle rivers in Southern Somalia and flash floods are more common along the northern areas in the intermittent streams in the country (FAO, 2022). Recent years have seen an increase in severity and frequency of floods (FAO, 2022) with some of the most severe events occurring in 1961, 1977, 1997 and 2006 in the Deyr season, and 1981 and 2005 in the Gu season. All these floods resulted in major economic impacts and damage and lead to human casualties (FAO, 2022).</p>	<p>Higher rainfall and runoff is expected in the Deyr season across the various climate scenarios which would lead to increased threat of flash flooding (Government of Somalia, 2022).</p>
Droughts	
<p>As of 2015, Somalia has been experiencing severe drought conditions, worsened by the impacts of El Niño in 2015/16 (OCHA, 2016). Currently, the number of people affected by the drought context has risen from 4.9 million in March 2022 to 6.1 million in April 2022, of whom, 760,000 people are displaced and in urgent need of shelter, food and access to basic health services (OCHA, 2022).</p>	<p>Haile <i>et al.</i> (2020) project that drought event duration, frequency and intensity will increase by the end of the 21st century under all scenarios. Drought area will increase by 16%, 36% and 54% under increasing RCPs (2.6, 4.6, 8.5 respectively).</p>

Disaster Risk Management Strategies

SWALIM, is one example of an information management programme run by the UN’s Food and Agriculture Organization (FAO) in Somalia. SWALIM provides early warning information through regular updates on water resources with a focus on drought and flood risk early warning. However, the Somali government, in the most recent National Water Resource Strategy, has identified that a key challenge to water resource and DRR is the lack of available meteorological and hydrological information and data (Government of Somalia, 2021).

Disaster Risk Management Law and Policies

- [Somalia National Water Resource Strategy 2021-2025](#). Sets out the country's vision for the 4-year period and outlines three goals: 1) Establishing a Functional Water Sector Governance Framework, 2) Operationalising Integrated Water Resources Management, and 3) Improving the Provision of Priority Water Services.
- [Somalia Recovery and Resilience Framework \(2018\)](#). Aims to break the cycle of vulnerability and humanitarian crises and inform future financing for DRR and align with the Sustainable Development Goals.
- [National Drought Plan for Somalia \(2020\)](#). The three pillars the drought plan are 1) Implement drought monitoring and early warning system, 2) Assessing of drought vulnerability and Risk, and 3) Implement measures to limit the impacts of drought and better response to it.

2.2 Reduce health impacts of climate change

Climate change will lead to a rise in heat-related health conditions, psychological stress due to droughts, and increased food insecurity and malnutrition (AfDB, 2018). Frequent and higher exposure to heatwaves will increase heat-related mortality. Climate models indicate that the population affected by heatwaves will increase by 21.1% in 2030, while heat-related deaths will increase from 1.3 deaths per 100,000 people to 3.2 deaths per 100,000 people per year until 2030 (Binder *et al.*, 2022).

Hunger and malnutrition, especially in the central and southern regions and particularly among children, are expected to increase with the changing climate due to the disruption of agricultural production (Oberg *et al.*, 2021). According to the Somalia National Bureau of Statistics, as recently as 2021, 27% of the children under the age of 5 are stunted, while 16% are severely stunted (2021). In addition, 12% are wasted while 6% are severely wasted (*ibid*, 2021). Yet, this number is expected to increase due to projections of prolonged drought. For example, after the prolonged drought of 2022, there was a sharp increase in cases of malnutrition, especially among children (UNICEF, 2022)

Rising temperatures are projected to increase the incidence of vector-borne and water-borne diseases (such as cholera and diarrhoea due to flooding) (UNICEF, 2022). Temperature rises are expected facilitate breeding areas for vectors such as mosquitoes as well as their expansion into previously uninhabitable areas (Ajuang Ogallo *et al.*, 2018). Due to higher temperatures skin diseases and respiratory infections (such as pneumonia, asthma and other lung infections) are also expected to increase (AfDB, 2018).

Droughts, floods and high temperatures worsen existing health challenges and compound mental health and trauma caused by long periods of war (Lindvall *et al.*, 2020). The public health system and health infrastructure are severely constrained by climate variability and protracted armed conflict (Oberg *et al.*, 2021). The shortage of health staff and poor conditions of health infrastructure, especially in the IDP camps, aggravates climate change-induced health impacts (Lindvall *et al.*, 2020). In Somalia, less than 30% of the population had access to sufficient medical and health services in 2020 (Gele, 2020).

2.3 Sustainable water: resources management, infrastructure and access

Water, Sanitation and Hygiene

Somalia is located in the downstream riparian area from Ethiopia and Kenya, making Somalia highly reliant on upstream rainfall patterns and water management decisions, an example of which is the spike in dam-building activities in Ethiopia. This plays into geo-political tensions in the region. Somalia ranks 154th of 169 in terms of water vulnerability (low scores mean higher vulnerability) (ND-GAIN 2021).

Somalia comprises 80 percent arid and semi-arid areas, which have reduced capacity to weather climate shocks due to their low water retention levels. This in turn amplifies the effects of climate-related extreme events such as droughts and flash floods (Eklow and Krampe 2019).

Droughts are reducing the availability of ground- and surface water resources and increasing competition for available water (AfDB, 2018). Other climate-induced water risks are decreased water quality (due to floods and droughts), increased water prices as water becomes scarce, infrastructure damage, and salinisation of coastal aquifers from sea level rise (*ibid*). Somalia lacks proper drinking water systems, and over 33% of people lack access to drinking water (Mourad, 2022; Somalia National Bureau of Statistics, 2021). Furthermore, 42% of households do not have improved water and sanitation facilities (Somalia National Bureau of Statistics, 2021). Climate change will make these water and sanitation challenges worse. Notably, water shortages caused by drought may contribute to tensions and conflicts over water access (DanChurchAid *et al.*, 2020). Water scarcity is already a prevailing issue in conflict, and it is projected to escalate as river volumes drop (Eklöw & Krampe, 2019; Barringer, 2017). As water shortages increase, the poor will ultimately bare the brunt of increased water prices (Mourad, 2021).

Infrastructure, Power and Electricity

Somalia has a (largely untapped) hydroelectric and other renewable energy potential, including geothermal, solar, and wind. The Government of Somalia outlined the ways in which the civil war interrupted this development by halting construction on the Baardheere Dam and derailing upkeep from the already constructed Fanoole Dam on the Middle Jubba. Once again, climate change also comes into play, with the severe El Nino season in 1998 shifting the trajectory of the river away from the Fanoole Dam (State Minister for Environment 2015).

2.4 Enable climate resilient livelihoods and economic security

Temperature rises, and recurring floods and droughts due to climate change are causing crop and livestock production declines in Somalia. Crop yields are generally expected to decrease with the changing climate in Somalia (Binder *et al.*, 2022). Households have already reported declines in crop harvests due to prolonged and intense dry spells, pests and diseases, in addition to other challenges such as low access to agricultural inputs (FAO, 2021).

In Somalia, agriculture is the most important sector in terms of employment, contributing to the GDP and supporting local livelihoods and food security. The sector employs 80% of the population (ILO, 2021), contributes 75% of the country's GDP and makes up 93% of the total exports (World Bank & FAO, 2018). Livestock alone contributes over 60.7% of the GDP (Mourad, 2021) with as many as 80% of livestock keepers being nomadic or semi-nomadic pastoralists (Warsame *et al.*, 2022).

There is growing unpredictability and variability in precipitation and temperature patterns, which makes livelihoods and labour cycles dependent on agriculture and pastoralism more volatile and stressful (Eklow and Krampe 2019). Interannual variability is especially salient in Somalia, where more extreme weather is shifting seasons. This will also be compounded by the increasing frequency and severity of dry spells (World Bank 2021b).

Droughts and higher temperatures are expected to reduce soil moisture and water availability for crop and animal production, causing severe losses. Four consecutive dry seasons, with the March-May rainy season expected to be the driest, are killing livestock and crops (UNICEF, 2022). Furthermore, temperature rises and droughts are causing declines in water levels in Jubba and Shabelle rivers (southern Somalia) which are the country's high agricultural potential areas (Binder *et al.*, 2022). Water reductions and erosion caused by dry conditions also reduce the available water and pasture areas for livestock farming. Consequently, herders in Somalia are facing declining livestock numbers (ICRC, 2021). Therefore, climatic changes threaten the livestock subsector leading to widespread food insecurity and loss of livelihoods.

Warming temperatures and increases in droughts are also increasing the incidence of diseases and pests, most notably locust infestation (DanChurchAid *et al.*, 2020; FAO, 2022; Salih *et al.*, 2020). Projected increases in extreme floods due to climate change will destroy crops and displace and claim lives of farmers foremostly (ICRC, 2021; Warsame *et al.*, 2021). Finally, climate change threatens the fisheries subsector by destroying fish habitats and reducing plankton due to rising temperature (AfDB, 2018).

2.5 Address climate displacement and protection

Current and future displacement challenges

While displacement in Somalia is mostly due to conflict, drought, flooding, and cyclones are also drivers of displacement. Somalia has 3 million internally displaced people (IDPs) (IDMC 2022) as well as about 30,000 refugees and asylum seekers, mainly from Ethiopia and Yemen (UNHCR 2022). Successive drought has driven many to leave their homes and settle in urban or peri-urban areas such as Baidoa outside of Mogadishu, home to approximately 400,000 IDPs (AA 2022).

Displacement in Somalia is increasingly climate-driven, with 75% of all new displacements in 2020 attributable to climate events (Hodder 2022). 919,000 people were displaced due to flooding alone (Adelphi 2021), illustrating the variety of climate risks the country faces. In the first half of 2022 alone over 745,000 Somalis were displaced by drought (NRC 2022).

Climate-induced rural-urban migration will fuel Somalia's already fast urbanization rate, with over nearly 65% of the population expected to live in urban areas by 2050 (UNDESA 2018).

Urban IDPs in Somalia have contested rights and often live in informal settlements without basic services (World Bank 2020). Urban settlement is often characterized by highly segregated ethnic groups/clans, yet in-migration risks destabilising these dynamics (*ibid.*). Most IDPs live in informal settlements on private land and face ongoing threats of evictions (UNHCR 2021).

The climate conditions and severe drought affecting herders and pastoralists often make migration to cities the only viable coping mechanism as herds die out. This trend will likely continue as the country faces more droughts and other hazards (ICRC 2021). This is particularly notable as 60% of the population lives in rural areas as nomadic or semi-nomadic pastoralists, while 65% of the country's GDP come from agricultural activities (World Bank 2021).

Potential needs for migrants and displaced people

As more climate-induced displaced people and other migrants enter urban areas, there is a need for urban climate change adaptation, planned urban expansion, and increased service provisions such as centralised water systems, which much of Somalia lacks (REF 2020).

Protection

As climate-related security risks increase (Groundtruth Project 2017), climate sensitivity is becoming mainstreamed in peacekeeping efforts in Somalia. A recent policy brief conducted by the Stockholm International Peace Research Institute revealed that climate change was jeopardizing the UN's peacebuilding mission through constraining governance, limiting judicial systems, and rendering it difficult to provide security (Eklow and Krampe 2019). The main drivers for this are climate-related loss of livelihood, causing internal migration, forced displacement, and increases in poverty that in turn inflame volatile political dynamics. These cascading impacts highlight some of the key ways in which climate change is amplifying and driving conflict in Somalia.

These cascading impacts are contributing to heightened tensions and threatening the fragile progress that has been made. Climate change has been recognized by both the UN and the Government of Somalia as a threat multiplier and as a key driver in the protracted conflict and humanitarian crises that Somalia is facing (HRW 2020, Mueller 2019). Already subject to one of the most protracted conflicts, Somalians must now also grapple with climate shocks and a depleted natural resource base that plays a key role in 'determining the severity of humanitarian crises' (State Minister for Environment 2015). This was affirmed in the UN Security Council's Resolution 2408, which was passed unanimously in 2018, and formalized the UN's position that climate change is destabilizing to the country (Planetary Security Initiative 2018; UN Security Council 2018). Climate change was again explicitly linked to the humanitarian situation by UN OCHA in 2019 (Ro 2019). Cumulatively, these impacts have contributed to researchers from the Norwegian Institute of International Affairs to call on the UN Security Council to support the mainstreaming of climate security (Yaw Tchie 2021).

2.6 Policy

Relevant information from the [Nationally Determined Contribution \(NDC\)](#) (2021)

Emission target: Somalia committed to reduce and avoid its emissions 30% by 2030 compared to BAU scenario (107.40MtCO₂eq in 2030). Sectors of forestry, agriculture, energy will be the most impacted.

Area of focus on Adaptation: Agriculture and Food security: **Water resources management and public health; Disaster preparedness and management;** Coastal, marine environment and fisheries; Energy; Forestry and Environment; Human settlements; Infrastructure including roads, bridges

Inclusion of DRR: Yes, including diverse measures (EWEA, community resilience to drought and flood, coordination, displacement, social protection and livelihood) for an estimated budget of 10 billion USD.

Next review of the NDC: n/a

Key stakeholders: The following structure will be implemented following the National Climate Change Policy approved in 2020.

- Directorate of Environment and Climate Change(DoECC) in the Office of the Prime Minister (policies, coordination, UNFCCC National Focal point and the National Designated Authority (NDA) for Green Climate Fund (GCF)).
- National Climate Change Committee (NCCC) - high level policy coordination committee.
- Cross-Sectoral Committee on Climate Change (CSCC) officials from across government working on climate change.

Additional note: The links between conflict and the climate crisis are articulated in the NDC.

Other National Policies on Climate

- [Somalia National Climate Change Policy](#) (2020) 'The objectives of the policy is to promote and strengthen the implementation of adaptation and disaster risk reduction measures to reduce vulnerability to climate change.'
- **Somalia has not yet submitted a National Adaptation Plan (NAP), but is preparing one with the Green Climate Fund (GCF) NAP Readiness Programme.**
- [Somalia Recovery and Resilience Framework: Summary Report](#) (2018). This document focuses on drought recovery and resilience building, including displacement, capacity building and resilience financing.

Climate finance

There is no GCF country specific programme active in Somalia aside of the Readiness (GCF, 2022). UNDP supports a few projects on climate risk resilience, two of them have a water management focus (UNDP, 2022 a,b,c,d).

National Societies can explore options for accessing climate funds through smaller funds, such as the [GEF's Small Grants Programme](#) or the [FFEM's Small Scale Initiatives Program](#). These grants range from about \$20,000 to \$50,000 USD and are intended to support community-level initiatives. The GEF Small Grants Programme sits under UNDP and has a [National Coordinator in each country](#). Some countries have National Climate Funds, which may be accessible to the National Society. Other funding from bilateral donors, national climate funds, or multilateral climate funds like Adaptation Fund, CREWS, or GCCA+ could be explored.

National societies (NS) cannot directly apply for climate finance from [the GCF](#), but they can be an implementing partner for an accredited entity. NS can investigate national GCF projects that are being designed to create partnerships.

Engaging in national climate adaptation planning is vital for accessing climate finance.

Additional Resources

Climate Centre. (2022). Factsheet on Climate Finance. <https://www.climatecentre.org/wp-content/uploads/Fact-Sheet-on-Climate-Finance.pdf>

Climate Centre. (2022). Entry points for National Societies on Climate Finance partnerships. <https://www.climatecentre.org/wp-content/uploads/Entry-Points-for-Climate-Finance-Partnerships.pdf>

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