

Somalia

1. Country overview

Somalia (officially, the Federal Republic of Somalia) is located in the eastern region of the Horn of Africa. It is an equatorial country with a warm desert climate in the north, transforming toward a semi-arid climate in the south. The country has the longest coastline of all African states (Eklow and Krampe 2019), extending 2720km along the Gulf of Aden and the Indian Ocean. The two main rivers flowing into Somalia, the Juba and the Shabelle, both enter from the South.

Demographically the Somalian population comprises 16 million people (UN 2019). The population is growing at a rate of 2.89 per cent annually (11th in the world) (UN 2019). The main economic sectors revolve around agriculture, with livestock farming accounting for 40 per cent of GDP and over 50 per cent of export earnings (CIA 2021).

Somalia is a country that has suffered several shocks, and continues to face increasing challenges. In 2020, the country saw ongoing conflict, locust swarms, prolonged and returning droughts, and flooding form some of the major challenges facing the population. These shocks are exacerbated by the high levels of poverty prevalent across the country- where 69 per cent of the population live below the poverty line (OCHA 2021).



Figure 1: Map of Somalia. Source: (CIA 2021)

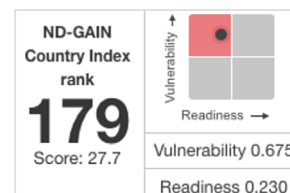


Figure 2: Somalia's ND-GAIN Ranking (ND-GAIN 2021).

1.1 Climate

Somalia experiences four distinct seasons and two monsoon periods. The main rainy season is known as *Gu* and occurs between April to June. This is followed by *Xagaa*, a dry period between June to October and a second rain season (*Deyr*) between October to December. Finally, December to March is known as the *Jilaa* period, which is typically dry. In regards to temperature, annual mean temperature is close to 30°C throughout the country (World Bank 2021). Typically, Somalia's rainfall patterns are not very regular (Eklow and Krampe 2019). Average rainfall is about 250 millimetres (mm) across the country, but this is unequally distributed, with the northeast and north of the country seeing between 50 to 150 mm rain annually and the south accumulating between 400-700 mm (Eklow and Krampe 2019; Federal Republic of Somalia 2013).

The climate of the region is affected by a number of factors, including the El Niño Southern Oscillation (ENSO) which typically causes flooding and increased rainfall in El Niño years and droughts in La Niña years. The country is also subject to climatic variability as a result of the Inter-Tropical Convergence Zone (ITCZ) as well as the variable sea surface temperatures of the Indian Ocean (Anyah and Semazzi 2006).

1.2 Climate change

Historical climate

Temperature

Overall, Somalia has experienced increases in mean annual temperature since 1991 - this in a country with one of the world's highest mean annual temperatures (Eklow and Krampe 2019).

The Lower Jubba Region has seen an increasing trend in the average minimum and maximum temperatures experienced throughout the year (Ogallo *et al.* 2018).

Climate Projections

Projections for 2030, 2050 and 2070 show a warming trend across the country. The trend ranges between 0.3°C-0.7°C increase by 2035. These figures will vary from season to season and regionally (Ogallo *et al.* 2018).

Projections anticipate a 3.2°C to 4.3°C temperature increase by the end of the century (Eklow and Krampe 2019).

Precipitation

The country experienced a series of severe droughts in the years of 2007/2008, 2011/2012, 2015, 2016 (EM-DAT 2021).

Between the years of 1981 to 2015, the Lower Jubba region saw a decreasing rainfall trend in the *Gu* rainfall season (April-June) and an increasing trend in rainfall in the *Deyr* season (September to November) (Ogallo *et al.* 2018).

Rainfall patterns in Somalia demonstrate interannual variability as well as susceptibility to ENSO events (Eklow and Krampe 2019). Rainfall is characterized as 'low and erratic' (NASA-IDS 2015).

Somalia is expected to receive increased rainfall in part of the country in the future, however this will be less regular and more intense which is predicted to cause flooding and soil erosion (IPCC 2014). Precipitation is predicted to increase by 3 per cent by 2050 in relation to 1981-2000 averages (Federal Republic of Somalia 2013).

1.3 Climate vulnerability

Despite contributing to just 0.08 per cent of global emissions, Somalia is ranked among the most climate vulnerable countries in the world (LSE 2021). It occupies a spot in the top ten percent of most vulnerable countries (Ministry of Foreign Affairs 2018). Somalia ranks 179th on the ND-Gain Index, scoring 27.7 (low) and behind only Chad. In terms of vulnerability, Somalia scores last (181st with 0.675) (ND-GAIN 2021). The country faces a number of climatic risks, including but not limited to prolonged droughts and flash floods, erratic rainfall, rising temperatures, cyclones, sandstorms and dust storms.

The climate risks that Somalia faces are cascading and add to the overall vulnerability of the country. One example of the compounding of these risks is seen in 2019 where delayed onset of regional rains left Somalia in drought. The prolonged drought period was followed by intense rainfall which consequently led to flooding and displacement of over 370,000 people. Infrastructure such as roads were destroyed and water sources contaminated (Soderberg *et al.* 2020). To add to this, Somalia is experiencing and predicted to continue experiencing temperature increases, which add to the risks by creating the conditions necessary for unprecedented numbers of locust swarms. Somalia declared a national emergency in February of 2020 when desert locusts caused catastrophic damage to crops and livelihoods (Soderberg *et al.* 2020).

Outlined in more detail below, it is important to flag that climate vulnerability is inextricably linked to and driving overall vulnerability in-country through increased conflict over resource degradation, eroded livelihoods, and increased poverty and displacement (UNDP 2021).

2. Humanitarian sectors and climate change

2.1 Water and habitat

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).

Climate change is projected to exacerbate water access issues already strained by geographical and geo-political stressors. Additional impacts to the country's hydrological health are felt through increases in (charcoal-driven) deforestation, desertification, and land degradation – all of which are amplified by the effects of climate change, in a reinforcing and accelerating cycle (Eklow and Krampe 2019).

Water scarcity is already a prevailing issue which is projected to escalate as river volumes drop (Eklow and Krampe 2019). Agricultural production, a key livelihood staple, is largely concentrated in the floodplains of the two main rivers, the Juba and Shabelle - both of which now sometimes dry up (Eklow and Krampe 2019).

It is important to note that with the longest coastline in Africa (at 3333km in length), and over half the population clustered on its shores, Somalia is also vulnerable to rising sea levels, tsunamis, and an increase in Tropical Cyclones (State Minister for Environment 2015). For example, in November 2020, Cyclone Gati became the strongest cyclone ever to make landfall in Somalia, displacing thousands and inundating the coastline with more than a year's precipitation in just two days (NASA 2020).

Finally, it would be remiss not to point out Somalia's (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).

2.2 Economic Security

In Somalia, income generating activities are highly intertwined with seasonal, climate, and weather patterns, rendering the Somalian economy vulnerable to a changing climate (Eklow and Krampe 2019).

The main part of Somalia's economy is its climate-sensitive agricultural sector which contributes to GDP by 75 per cent and to the country's total export earnings by 93 per cent (WB & FAO 2018). This sector is threatened by increasing temperatures and the increased frequency of droughts (Warsame *et al.* 2021). The 2017 drought in Somalia led to a monetary loss of \$71 million US dollars to the four major Somalian crops (WB & FAO 2018). It is estimated that with increasing temperatures, and likelihood of droughts, economic security will be further threatened. Warsame *et al.* (2021) found that a one percent rise in temperature reduces crop productivity by 11.6 per cent; this not only affects local subsistence farming but also the country's exports and income.

Further challenges arise from the 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 2021).

2.3 Health

Increases in temperature and changes in precipitation are expected to be a major cause of increased health risks in Somalia. One way in which climatic changes are predicted to increase risks to health in the following years is through experiences of famine and food insecurity that are related to drought. The 2011 famine in Somalia was reported to have affected roughly 3.1 million people (Maxwell and Fitzpatrick 2012). Although a multitude of factors were thought to have caused this particular famine, one large direct correlation was the lowest recorded rainfall in the past 50 years (Zaracostas 2011).

Since, Somalia has seen additional drought and food insecurity. In 2019, the UN estimated that approximately 2.2 million people in Somalia were food insecure (UN 2019). With increasing droughts predicted across the country, famine and food insecurity are a major concern for Somalia over the coming years.

The distribution and prevalence of diseases such as Malaria are also expected to affect Somalia directly (Ogallo *et al.* 2018). Rises in temperature are expected to make current breeding areas for vectors such as mosquitoes more conducive, and also expand the reach to areas which were previously disease free (Patz *et al.* 2005; Ogallo *et al.* 2018). This is also true with other vector borne diseases: Gaythorpe *et al.* (2020) describe the ways in which they expect Yellow Fever to spread to East Africa and how Somalia will be a site requiring vaccination in the short-term future. This is an issue which was not present until recently.

Current health issues could be exacerbated with increasing climatic changes. Temperature increases are expected to impact health in terms of heat related morbidity and mortality (Patz *et al.* 2005). This will also increase the burden on health care systems in-country.

Finally, health outcomes will also be vulnerable to climate shocks as a result of ongoing and longstanding structural issues. Service delivery is limited, there is a lack of preventative health measures, and limited coverage under social protection systems all mean increased vulnerability to stressors such as climate change (UNSDCF 2020). The 2018 ND-Gain Country Index reflects this, ranking Somalia last in terms of vulnerability of public health to climate change (with a score of 0.855) (ND-GAIN 2021).

2.4 Protection

Climate change is compounding Somalia's already fragile governance and peace processes in profound and far-reaching ways.

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.

Displacement is a pressing issue in Somalia, with an estimated 2.6 million Somalis displaced, and a high risk per capita of displacement (AMISOM, 2021; Mllano & Ginnetti 2017). Though climate change is not the sole driver of displacement, it does play a key role: climate change contributes indirectly to displacement through jeopardizing livestock and livelihoods and increasing poverty and resource conflict. In some cases, the link is more explicit; some 53,000 individuals were directly displaced due to drought in 2019 alone (Eklow and Krampe 2019). A further 650 000 were displaced due to flash floods early in 2020 (UNHCR 2020). Internally displaced people (IDPs) are especially susceptible to recruitment in armed groups, highlighting another link between climate impacts and increasing potential for conflict (NUPI & SIPRI, 2021).

Groups which have been identified as highly vulnerable to the impacts of climate change include women (especially in rural areas) who have limited access to resources and to political or labour market participation, as well as youth who experience high levels of unemployment, poverty, and instability that render them possible recruits for non-state armed groups (Beier & Stephansson, 2012; NASA IDS 2015). It is this exploitation of climate-related vulnerabilities which led Forbes to declare that 'climate change is benefitting [non-state armed groups] in Somalia' (Ro 2019).

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 Ministry of 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).

2.5 Policy

Somalia suffers from policy gaps when it comes to enacting climate change frameworks and legislation. When the first Central government since the civil war began was formed in 2012, they recognized the risks that climate change poses to Somalia's development and peace processes (NASA IDS 2015). Despite this, Somalia still lacks adequate enforcement of legal frameworks and environmental policy, as well as national level management plans and legislation (Eklow and Krampe 2019; World Bank 2021). In particular, the absence of Disaster Risk Management and land use management policies are amplifying climate impacts (UNDP 2021).

Yet despite the many ongoing and competing issues that detract from advancing climate policy, Somalia has made headway over the past decade. In 2013, Somalia published their National Adaptation Programme of Action (NAPA) on Climate Change outlining three priority areas for adaptation: sustainable land management, water resources management, and disaster management (Federal Republic of Somalia 2013). Somalia's Intended Nationally Determined Contribution (INDC) was published in 2015 and built off of NAPA, outlining a commitment to sustainable land management, integrated water management, building up capacity in renewable energy, and reducing vulnerability to disasters (State Minister of the Environment 2015). Somalia was one of the first nations to become a party to the Paris Agreement, ratifying on April 22, 2016 (UNFCCC 2021). Further, they did so with a hard-hitting message for the rest of the world: "We used to be a failed state, now we're called a fragile state. If we can do this, anyone can," from Foreign Minister Abdusalam Omer (Beeler 2016).

A recent review of progress towards sustainable development goals revealed that Somalia continues to 'face long-standing structural impediments to progress' (UNSCDF 2020). Research did not reveal any domestic legislation related to climate targets (LSE 2021). However, Somalia did adopt an Environmental Management Law (No. 79) on August 25, 2018 (ILO 2021), which outlines environmental assessments, quality standards, restoration, and offences (Somaliland 2018).

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