

# Azerbaijan

This climate fact sheet summarizes the available information on the climate of Azerbaijan and the impact of climate change on humanitarian activities in-country. Each fact sheet in the series was written using information from peer-reviewed academic papers, government publications, and other documentation from international non-governmental organizations.

## 1. Climate overview

**Average temperature:** Temperatures tend to be highest in the south-east of the country, with a mean temperature near 18°C, and lowest in the north and south-west with a mean temperature near 6°C.

**Average rainfall:** Annual rainfall is highest in the north and south-western parts of the country (700–800mm), while it is lowest in the south-east (200mm). It rains all year, with a spring and autumn peak.

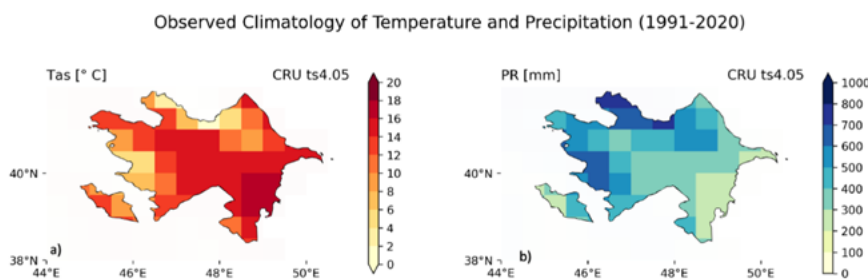


Figure 1: Observed climatology of (left to right) mean temperature (a) and annual mean total precipitation (b) (Adapted from World Bank Climate Change Knowledge Portal, 2022).

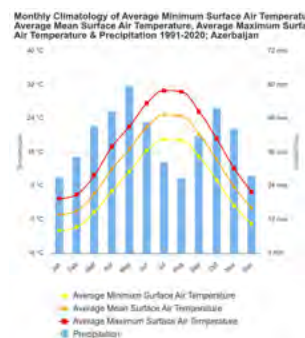


Figure 2: Observed average monthly climatology between 1991 and 2020 (Climate Change Knowledge Portal, World Bank)

## Short overview

Azerbaijan is located in the South Caucasus region of Eurasia. Its climate is highly varied and contains examples of nine out of the world's eleven climate zones, having marked variations in average temperature and precipitation in different regions. The Caucasus Mountains in the northern part of the country protect it from the direct influence of cold air masses from the north, leading to subtropical conditions in most foothills and plains. The climate in east Azerbaijan is moderated by the Caspian Sea, the world's largest body of water, which moderates temperatures, reducing both summer heat and winter cold. In general, mountainous parts of the country receive higher precipitation and lower than average temperatures than the central lowlands and the Caspian Sea coast where the climate is drier and hotter with moderate winters (World Bank, 2021).

The diverse and varied geography of Azerbaijan 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. Azerbaijan is at high risk of these hazards and was ranked 24th out of 191 countries in the 2022 Inform Risk Index (DRMKC, 2022). The country is exposed to droughts, earthquakes, floods, landslides and extreme temperatures.

## 1.2 Climate change in Azerbaijan

### Historical climate change

### Projected climate change

#### Temperature

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| <ul style="list-style-type: none"> <li>▪ The mean annual temperature over Azerbaijan has increased. The western part of the country has warmed faster than the rest of the country.</li> <li>▪ The frequency and intensity of hot extremes have increased, and cold extremes have decreased.</li> </ul> | <ul style="list-style-type: none"> <li>▪ Mean temperature over the region is projected to rise until 2050 by at least 2–3°C for a high greenhouse gas concentration scenario (SSP5–8.5) and 1–2°C for low greenhouse gas concentration scenario (SSP2–4.5).</li> <li>▪ Maximum and minimum temperature will increase, and heatwaves 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.</li> </ul> |
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#### Precipitation

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| <ul style="list-style-type: none"> <li>▪ There is currently no significant trend in total rainfall.</li> <li>▪ In some parts of Azerbaijan, the frequency and magnitude of extreme rainfall events has increased.</li> </ul> | <ul style="list-style-type: none"> <li>▪ Mid-century estimates (2040–2060) of annual precipitation changes over Azerbaijan indicate a slight decrease under a low (SSP2–4.5) and high emissions scenario (SSP5–8.5). The decrease in precipitation is particularly pronounced in the summer (July and August) months.</li> <li>▪ The frequency and intensity of heavy precipitation events are projected to increase with potential effects such as flooding, soil erosion and landslides.</li> </ul> |
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## 2. Priorities of the Red Cross Red Crescent Movement under climate change

### 2.1 Scale up climate-smart disaster risk reduction (DRR), early action and preparedness

Existing hydrometeorological hazard	Projected risks
<p><b>Floods</b></p> <p>Azerbaijan frequently experiences flooding, particularly riverine flooding from the transboundary Kura River, the southern slope of the Greater Caucasus and in the rivers of the Lankaran-Astara region (Government of Azerbaijan, 2021). Most floods occur in the high mountainous areas of Sheki-Zagatala and Nakhchivan, and mudflows as a secondary consequence from flooding are common in the high-altitude areas (Government of Azerbaijan, 2021).</p> <p>In the high-altitude areas, flooding occurs in late spring and early summer, while in the plains this occurs in spring and autumn with the southern and south-eastern regions most at risk (WB &amp; ADB, 2021). Severe flooding events occurred in 1995 and 2003. On an annual basis, on average, 10,000 people are affected by flooding, which causes 30 million US dollars of damage (GFDRR, 2017). Flooding is more common on deforested slopes, as well as in areas that suffer from erosion due to overgrazing (Government of Azerbaijan, 2021).</p>	<p>The likelihood of floods is on the rise, due to more intense rainfall – although overall reductions in river flow may reduce this risk (USAID, 2017).</p>
<p><b>Drought</b></p> <p>Azerbaijan faces both meteorological (low rainfall) and hydrological (low river flow) drought, which in turn can lead to agricultural drought (low soil moisture), depending on management practices (WB &amp; ADB, 2021). Drought conditions affect agriculture and increase the likelihood of fires.</p>	<p>Severe meteorological drought occurs on average once every 50 years, although this is projected to increase rapidly under global warming. Under the higher global emissions scenarios (RCP 6–8.5), the probability of drought is projected to increase drastically (from an average 2 per cent probability (1986–2005) to 73–85 per cent by the end of the century (WB &amp; ADB, 2021). This would mean a long-term shift to a more arid climate.</p>

**Existing hydrometeorological hazard**

**Projected risks**

**Landslides**

The area at risk of landslides has increased dramatically over the past two decades, mainly due to human activity – induced erosion combined with intense rainfall and earthquakes (ACAPS, 2020). Landslides affect the southern and north-eastern slopes of the Great Caucasus, the north-eastern part of the Lesser Caucasus, the lower and middle parts of the Nakhchivan Autonomous Republic, and in large river basins within the Talysh Mountains (ACAPS, 2020).

Ongoing land use change and erosion, combined with more intense rainfall and the risk of earthquakes, could lead to an increase in landslides across the country.

**Heatwaves**

Extremely high temperatures are increasing the risk of heatwaves in the Southern Caucasus region at large, and specifically affect the lower lying plains of Azerbaijan. Baku is particularly at risk because of the urban heat island effect, as cities have more dark surfaces (heating more quickly) and cool down slower (WB & ADB, 2021; Government of Azerbaijan, 2021).

With increasing temperatures projected across the region and country, heatwaves are likely to pose an increasing risk.

It is important to note that many of these hazards are interrelated and produce compound risks in the same areas and communities. In addition, risk must be understood as the interplay between hazard, exposure and vulnerability which makes certain individuals, communities and sectors more impacted by the hazards. All project design should take such compounding risks into account.

**Disaster risk management strategies**

Azerbaijan is currently in the process of establishing its national DRR strategy, which will last until 2030 and is aimed at increasing the country’s resilience to disasters (FAO, 2022). The country is also pursuing the implementation of an early warning system (EWS) and the Strategic Roadmap strives to develop a multi-hazard and information EWS system by 2025 (FAO, 2022).

## 2.2 Reduce health impacts of climate change

Vector-borne diseases such as malaria are a potential threat, especially in the highlands of Azerbaijan, where favourable conditions for mosquitoes have increased (WB & ADB, 2021). Decreasing quality and availability of safe drinking water due to more frequent and intense floods could also contribute to the increased prevalence of diseases such as cholera and gastrointestinal issues (WB & ADB 2021).

Temperature increase due to climate change could reverse the successful elimination of malaria in Azerbaijan (Bunyadzada, 2022; Fernando, n.d.; Mammadov *et al.*, 2016). Increased temperatures could also lead to an increased risk of heat-related illness and mortality, especially in urban areas such as Baku (WB & ADB, 2021). Older populations (above the age of 65) and those with pre-existing medical conditions are particularly vulnerable to such issues as are those with lower energy security or limited access to technologies such as air conditioning (Mayrhuber *et al.*, 2018). In addition, climate change could aggravate the risks of cardiovascular and respiratory diseases (CAREC, 2022; USAID, 2017). Its impacts could also compound existing mental health challenges such as stress and anxiety caused by periods of war (Ismayilov, 2022).

## 2.3 Ensure sustainable water supplies

### Water, Sanitation and Hygiene (WASH)

During the last 30 years, Azerbaijan's water reserve has decreased up to 20 per cent. It is expected that by 2050 water reserves will see a 15–20 per cent decrease (Karimov, Deputy Minister of Ecology and Natural Resources, 2023). Azerbaijan already struggles with water deficits, and further climatic changes will exacerbate this problem. Available water resources are expected to decline by 5–10 per cent by 2040 and by 10–15 per cent by 2070 under an optimistic scenario (RCP 4.5). Under a pessimistic scenario (RCP 8.5) water resources may decline up to 10–15 per cent by 2040 and 15–25 per cent by 2070 compared to current values (EU4Climate, 2023).

Azerbaijan is facing severe water stress conditions (EEA, 2019). Most of the country's water comes from external inflows from upstream basins, making it vulnerable to climate shocks and stressors such as climate change (EEA, 2019; Aksoy *et al.*, 2018). These trends are coupled with increasing demand for irrigation to counter drought conditions and an increasingly urban population. With an average evaporation rate of 2.5 times higher than its total rainfall, water scarcity in the country is projected to worsen in the future (Aksoy *et al.*, 2018).

## Infrastructure and electricity

Azerbaijan is one of the world's highest producers of energy per capita due to its major exports of crude oil and gas. Energy diversification is a major issue, highlighted by recent national policies, notably as worries about stranded assets are pushing the country towards a focus on diversifying sources of domestic energy consumption by adding, for example, energy from renewables to the grid (IEA, n.d.). Azerbaijan is seeing a push for the development of renewables to support growing demand and respond to trends in the global economy away from fossil fuels (Mammadli, 2022). Climate change threatens the non-fossil fuel electricity production in the region – indeed, loss of hydropower is thought to be one of the main impacts of lower precipitation and higher temperatures. This may lead to a greater reliance on thermal energy, causing both shortages and higher prices, which, in turn, will greatly increase inequalities of access which are already an issue in the region. (WB & ADB, 2021).

Significant clashes have erupted in the region around issues of energy production and supply. Notably, after the yet unresolved dispute over Nagorno-Karabakh beginning in the mid-1990s, Azerbaijan and Turkey have built pipelines to transport hydrocarbon resources that bypass Armenia, which its government calls an “illegal blockade” (Yegparian, 2020). The location of an important Armenian nuclear power plant is also a source of tension, lying only 16km away from the Turkish border and within range of the conflict at the Armenian–Azerbaijan border. Indeed, in recent border clashes threats were made by the Ministry of Defence of the Republic of Azerbaijan towards the nuclear plant (Yegparian, 2020).

Infrastructure will also suffer because of climate change. Projected increases in the frequency and intensity of extreme weather events will cause heightened damage to roads, highways and buildings. In Azerbaijan, the estimated damage due to flooding lies in the range of 18–25 million US dollars annually (World Bank, 2022).

## 2.4 Enable climate-resilient livelihoods and economic security

Rising temperatures and water stress due to climate change will impact agriculture – a core sector in Azerbaijan, which employs over 27 per cent of the population (USAID, 2017; Republic of Azerbaijan, 2018). In addition, higher temperatures will lead to a reduction of crop yields (such as wheat) due to temperature sensitivity and increase irrigation demand due to high evaporation rates (WB & ADB, 2021; USAID, 2017). Furthermore, the rise of invasive plant species (as ecosystems change in response to climate change) may threaten farming (WB & ADB, 2021). Climate change will also increase the intensity of rainfall events, leading to flooding and subsequent crop destruction (USAID, 2017). Though agriculture contributes only 7 per cent of the GDP (ITA, 2021), it provides income to at least 36.3 per cent of the population (Republic of Azerbaijan, 2018). Agriculture is thus a significant sector in the oil-based Azerbaijan economy (WB & ADB, 2021; CAREC, 2022). In the coming years, as there is a shift away from a reliance on oil, it's likely that the agricultural sector in Azerbaijan may feature even more strongly as a diversification and food security strategy (USAID, 2017). However, agriculture in the country is highly susceptible to droughts, water shortages and temperature rises as 80 per cent of the country's farmland lies in semi-arid or arid areas (USAID, 2017).

The increasing frequency and intensity of very hot days will affect workers' health and productivity, especially those working outside during daytime hours and the tourism sector (ecotourism, summer coastal tourism and winter skiing tourism), which is a growing and major part of the Azerbaijani economy. The tourism sector, construction workers, street vendors and agricultural labourers will be disproportionately exposed to rising temperatures and other climate change-induced extreme weather events such as increased rainfall and flooding (WB & ADB, 2021). In 2019, the country hosted 3.17 million visitors – 11 per cent more than the year before (Republic of Azerbaijan, 2021). Ecotourism will be impacted by ecosystem and species change, while winter tourism centred around skiing could be impacted by shortened ski seasons and reduced snow (USAID, 2017; Karimov, 2020). Up to 40 per cent of the country's population lives on the Caspian Sea coast, which is also home to 75 per cent of the country's industry (USAID, 2017). As a landlocked sea, the Caspian is quite vulnerable to sea level fluctuations due to imbalances between precipitation, runoff and evaporation. Decreasing water levels in the Caspian Sea – which range between 9–18m expected by the end of the century – could impact coastal tourism and overall development (Prange *et al.*, 2020).

## 2.5 Address climate displacement and protection

### Current and future displacement challenges

Conflict-induced displacement has been a longstanding issue in Azerbaijan and the region. Refugee and IDP communities are particularly vulnerable to climate impacts due to poor living conditions, economic insecurity and difficulty accessing public services. In 2002, in the wake of the armed conflict that permeated the South Caucasus after the collapse of the Soviet Union, it was reported that more than one million people remained displaced in the region (Parliamentary Assembly of the Council of Europe, 2002). In 2020, 84,000 newly internally displaced persons (IDPs) were recorded in Azerbaijan, contributing to approximately 735,000 people living in protracted displacement in the country (IDMC, 2022). Additionally, Azerbaijan hosts over 1,600 refugees (UNHCR, 2022), all of whom may also suffer from the impacts of increased climatic variability.

Disaster displacement poses a threat to Azerbaijan, with flooding constituting the highest climate-related hydrometeorological driver. IDMC (2022) projects 4,845 people will be internally displaced in Azerbaijan annually as a result of sudden-onset flood hazards. The Ministry of Ecology and Natural Resources estimated in 2010 that flooding causes 18–25 million US dollars of damage annually (World Bank, 2022; Government of Azerbaijan, 2010). This figure represents the financial loss that people and government incur, and is coupled with the incalculable strain on families, mental health and other factors that come with displacement. An increase in disaster displacement will add additional burden on government and non-governmental agencies to support people living in precarious situations.

Environmental degradation due to slow-onset processes poses threats to livelihoods and communities and is expected to continue and induce significant displacement (IOM, 2016). Slow-onset challenges include water scarcity, rising temperatures, droughts and soil degradation (*ibid.*).

Rural–urban migration and displacement will likely continue and increase due to hazards and ongoing environmental degradation. Current urbanization in the capital Baku and the Absheron Peninsula is already leading to overcrowding and increased poverty. Significantly, IDPs are usually located in Baku and other large cities rather than urban areas, and face poor living conditions and severe poverty (Migrants & Refugees, n.d.), making them at risk of further displacement if they are settled in hazard-prone areas of the cities.

There is currently a gap in policy on environmental migration and displacement in Azerbaijan (IOM, 2016). Environmental policies and programmes rarely address or mention displacement, while migration policies do not substantively focus on climate change-induced displacement. This risks leaving IDPs displaced by changes in climate legally unprotected and in practice unassisted.



## Potential needs of migrants and displaced people

Azerbaijan hosts significant numbers of IDPs who live in severe and under-resourced conditions, such as the approximately 400,000 people displaced in the Nagorno-Karabakh region who are at risk of further displacement due to environmental and climate change (IOM, 2016). Increasing their adaptive capacity to withstand hazards is crucial alongside providing them with access to basic resources.

The issue of gender inequality has ramifications for climate resilience. Indeed, women are disproportionately affected by climate shocks and the impacts of natural hazards. For instance, the traditional economic and social roles held by women in the region, including domestic tasks and agricultural labour as well as caring for children and the elderly, makes them particularly exposed to climate shocks. As the risk of hydroclimatic hazards increases due to anthropogenic climate change, poverty gaps may widen and should be addressed proactively (ADB, 2019).

## Migration law and policies

- [Law on the Legal Status of Refugees and Displaced Persons](#), 1999. The law sets out the definitions and rights of refugees and IDPs, and includes 'natural disasters' as grounds for IDP status.
- [Law of the Republic of Azerbaijan on Labour Migration](#), n.d. The law defines the legal, economic and social basis for labour migration processes in Azerbaijan.
- [State Migration Management Concept of the Republic of Azerbaijan](#) (Item 1.1), 2004. The statement confirms that people who have been displaced due to changes in the level of the Caspian Sea, landslides, floods and other disasters, are considered ecological migrants.

## Protection

Around the world, prisoners frequently have heightened vulnerability to climate-related disasters due to spatial marginalization, resulting from prison locations on hazard-prone land and/or isolation from emergency evacuation services; limited to no connections to social networks, which are crucial aspects to hazard resilience; and, political marginalization, including a lack of policies and services to prevent disaster impacts on imprisoned populations (Gaillard & Navizet, 2012). While literature does not specifically speak to this issue in the context of Azerbaijan, these vulnerabilities, coupled with more frequent and intense disasters due to climate change, may leave prison populations particularly vulnerable to hazards such as extreme heat, extreme cold and floods. This can include locations that have not previously experienced such risks historically.

## 2.6 Policy

Relevant information from the [Nationally Determined Contribution \(NDC\)](#) (updated in 2023)

**Emission target:** By 2050 the Republic of Azerbaijan targets a 40 per cent reduction in the level of greenhouse gas emissions compared to 1990/base year as its contribution to the global climate change efforts. It targets the energy, industrial processes and product use, agriculture, land use, land use change and forestry, and waste sectors.

**Area of focus on adaptation:** The NDC mentions the necessity of urgently developing relevant adaptation measures for the following vulnerable groups: 'children and adolescents, women, elderly people, people with disabilities, people with chronic diseases, eco-migrants displaced as a result of climate change disasters or those at risk of becoming eco-migrants due to climate change.' It also notes that the country will continue planning and implementing adaptation measures for sectors particularly vulnerable to climate change. Special emphasis is given to the agricultural sector as one of the most vulnerable to climate change, noting that the roadmap for production and processing of agricultural output details a number of adaptation policies.

**Inclusion of DRR:** No

**National designated entity:** Ministry of Ecology and Natural Resources

### Other national policies on climate

- Azerbaijan has not submitted a National Adaptation Plan
- Different climate policies are currently being developed with the support of the European Union, including providing support for the revised NDC for the 2023–2050 period, and preparation of NDC Finance Strategy and Investment Plan (UNDP, 2023). The programme also supports mainstreaming of climate in energy and agriculture and to align with European Union standards (EU4Climate, 2021).
- The National Adaptation Plan is expected in 2024 and will focus on water, agriculture and coastal areas (ADB, 2021).
- In the [Forth National Communication to the UNFCCC](#) (2021), adaptation measures target agriculture, water supply, coastal communities, human health and tourism. It also includes elements on the early warning system.

## Climate finance

There is currently no country focused Green Climate Fund (GCF) project in Azerbaijan, but GCF readiness activities are ongoing (GCF, 2022). National Societies cannot apply directly for climate finance from [the GCF](#), but they can be an implementing partner for an accredited entity (Climate Centre, 2022a).

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](#). Other funding from bilateral donors, national climate funds, or multilateral climate funds like the Adaptation Fund, CREWS, or GCCA+ could be explored (Climate Centre, 2022a).

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

## Additional resources

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

Climate Centre. (2022b). *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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