Climate Centre

Country-level | Climate fact sheet

Palestine

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

1. Climate overview

The geographic location of Palestine, between the Mediterranean Sea and the Jordan River, and its diverse topography contribute to the territories' diverse climate and bioclimatic characterization.

In terms of climate Palestine belong to the arid, semiarid, dry, sub-humid and humid zones. Palestine may also be divided into three bioclimatic belts: the Inframediterranean, Thermomediterranean and Mesomediterranean bioclimatic belts (Ighbareyeh *et al.*, 2014).

About 70 per cent of the average rainfall in the country falls from November–March, while the months of June–August are often rainless. Rainfall is unevenly distributed, decreasing sharply as one moves southwards. In the extreme south close to the Dead Sea area, annual rainfall averages less than 100 mm while; in the north, average annual rainfall is more than 1100 mm (FAO, 2008). The area at the southeastern edge of the West Bank has the greatest aridity (44%) (UNDP, 2009).

The West Bank in general is relatively arid, with about 50 per cent of the land receiving rainfall less than 500 mm/year, with a hyper-arid area with rainfall less than 100 mm/year. The northern part of the West Bank receives the most rainfall, approximately 700 mm/year, whereas the southern end receives only 80–100 mm/year (United Nations Development Programme (UNDP, 2010). The Gaza strip has a

predominantly flat coastal terrain however still receives varied rainfall ranging between 200 mm/year in the south and 400mm/year in the North (UNDP, 2010).

Even though the Palestinian territories are traditionally characterized by a "Mediterranean" climate, temperature, just like rainfall, varies with latitude and altitude. While January is the coldest month in the Palestinian territories with an average of around 12°C, July – August is the peak summer with averages of around 27°C.

1.1 Climate Change in Palestine

Historical Climate change	Projected climate change
Temperature	
▪ The mean annual temperature in Palestine has increased at a rate of 0.3 °C/decade from 1961 to 2015 (Gutiérrez et al., 2021a). Annual mean temperatures on land and sea across the Mediterranean Basin-wide are 1.5°C higher than during pre-industrial periods (MedECC, 2020). ▪ Since the 1950s, hot and cold extremes have become warmer and the number of cold days has decreased, and the number of warm days hashas increased (Dunn et al., 2020),	▪ Mean temperature over the Mediterranean region is projected to rise until 2100 by an additional 3.8 to 6.5°C for a high greenhouse gas concentration scenario (RCP8.5) and 0.5 to 2.0°C for a low greenhouse gas concentration scenario (RCP2.6) (MedECC, 2020). ▪ In a r medium-range scenario, the annual mean temperature in Palestine will increase by around 1°C by 2025, by about 2°C by 2055, and by approximately 3°C by 2090 (ClimateSouth 2016; UNFCCC 2016a) ▪ Cold temperature will decrease, and warm temperature extremes will increase 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 dramatically and with high certainty (Gutiérrez et al., 2021b; Ranasinghe et al., 2021).
Precipitation	
▪ Annual mean precipitation shows a high level of spatial variability over the Mediterranean region. Over Palestine, from the period 1980-2015, there have been downward trends in mean annual precipitation (Gutiérrez et al., 2021b; MedECC, 2020). ▪ According to the National Adaptation Action Plan (INCR) by the State of Palestine "there is very low confidence that annual and seasonal rainfall totals have changed in either direction over the past 50 years or so but also very low confidence that there has been no change in annual and seasonal rainfall totals", this means there is a disagreement among authors about a decrease in precipitation (State of Palestine, 2016).	▪ Climate models project a consistent decrease in precipitation over Palestine during the 21st Century. ▪ Annual average precipitation is likely to decline in the eastern Mediterranean by 20 per cent by 2050 – with an increased risk of summer drought (IPCC,2014). ▪ Under a mid-range scenario, annual rainfall in Palestine decreases by around 10 per cent by, 2025, by about 15 per cent by 2055, and by approximately 20 per cent by 2090 (ClimateSouth 2016; UNFCCC, 2016a).

Historical Climate change	Projected climate change

Sea Level Rise

- Mean sea level has risen by 2.8 mm/yr during 1993–2018 across the Mediterranean Basin (MedECC, 2020).
- Ten centimetres (cm) of sea level rise has been observed in the Mediterranean Sea over the past two decades (Israel Ministry of Environmental Protection (IMEP), 2014a).

- Mean sea level is projected to increase and together increase the frequency and intensity of coastal floods and erosion (MedECC, 2020).
- Total sea level rise projected, under the moderate scenario, is 0.23 m by mid-century and 0.27m under the worst case scenario relative to 1995-2014 baseline.

2. IFRC priorities and climate change

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

Ranked 61 out of 191 countries by the 2022 Inform Risk Index (DRMKC, 2022), Palestine is part of the medium-risk class.

Existing Hazard	Projected risks
Heat waves	
Extreme weather events have been increasing in the Mediterranean region in general including within Palestine. For example, heat waves have increased in intensity, frequency and duration in the Mediterranean region (Perkins-Kirkpatrick & Lewis, 2020).	Projected climate changes indicate increases in temperature and extremes. With increases in global warming levels (e.g., at 2°C) these changes will be more widespread and more intense (MedECC, 2020; Seneviratne *et al.*, 2021). Heat waves will intensify in duration and peak temperatures for every increase in global warming levels above pre-industrial values.
Droughts	**Drought (and wildfire)**
Droughts have notably increased in some parts of the West Bank where agricultural production is mostly rainfed (Abdo, n.d.).	Projected climate changes indicate increases in prolonged dry and drought events (MedECC, 2020; Seneviratne *et al.*, 2021). Droughts are projected to intensify as a result of climate change over the Mediterranean region.
Flood	
In Gaza, fluctuations and variance in rainfall have led to extreme flooding events since 2008 (WASH Cluster, 2021). In contrast, when rainstorms occur in the wet season, they are projected to be more intense as a result of the warmer atmosphere (Gutiérrez *et al.*, 2021b; MedECC, 2020; Ranasinghe *et al.*, 2021; Seneviratne *et al.*, 2021). According to climate change numerical simulation models, extreme flooding events are expected to worsen in the coming years, and the number of people affected by flooding will increase (WASH Cluster, 2021).	Projected climate changes indicate increases in heavy precipitation events when they occur. (MedECC, 2020; Seneviratne *et al.*, 2021)

It is essential to note that many of these hazards are interrelated and produced compound risks to the same areas and communities. In addition, risk must be understood as the interplay between hazard risk, exposure, and vulnerability which make certain communities, individuals, and sectors more impacted by the hazards. All project designs should consider the risk mentioned above and the compounding risks they represent.

2.2 Reduce health impacts of climate change

Climate change poses direct and indirect health risks in Palestine. Some of the direct health effects of climate change in the Mediterranean region (including Palestine) are heat stress due to extreme heat waves and drought and an increase in vector-borne diseases. The indirect health risks due to climate change are caused by the adverse impact on water availability, food provision, and quality and air pollution (Linares *et al.*, 2020, WHO & UNFCCC, 2022).

Temperature rises are expected to lead to 60% of days in Palestine becoming 'hot days' by the end of the century thus increasing the number of people exposed to heat waves (WHO & UNFCCC, 2022). Heat stress results in heat-related illnesses such as dehydration, rash, cramps, heat stroke, heat exhaustion and death (WHO & UNFCCC, 2022). Older people, especially those above 65 years of age, people with pre-existing health conditions, young children, and people who are homeless or have inadequate housing (IFRC, 2019). In Palestine, urban heat islands (UHI) could pose significant risks due to climate change since 92.6 per cent of the total population lives in urban areas as of 2020 (Linares *et al.*, 2020).

Warmer days in the region are expected to cause higher exposure to vector-borne diseases, especially dengue and West Nile virus (Linares *et al.*, 2020). As temperatures increase, a combination of shifts and changing the intensity of seasons as well as different human and animal migration patterns may also cause a change in the geographical distribution of diseases and their seasonal patterns (UNDP, 2010). Higher temperatures and water scarcity due to low rainfall will also increase Palestine's diarrhoeal disease burden (Hajat *et al.*, 2022). Over one million diarrhoea cases in Gaza alone were linked to temperature and rainfall deficiencies between 2009-2020 (Hajat *et al.*, 2022). Lack of safe and adequate water, especially in Gaza (Ives *et al.*, 2019), has led to a high burden of diarrhoeal diseases expected to increase with rising temperatures and declining rainfall (Hajat *et al.*, 2022). In addition, high flooding risks increase the risks of contamination of water sources with pathogens (WHO & UNFCCC, 2022).

Palestine is vulnerable to the 'adverse health impacts of climate change. Over 20 per cent of the population is older than 55, a group most susceptible to direct and indirect health risks caused by climate change (Linares *et al.*, 2020). Palestine's fragile healthcare system is likely to face increased challenges in health access and services as the health impacts of climate change affect a greater subset of the population (Keelan, 2016).

2.3 Enable climate-resilient livelihoods and services and sustainable water resource management

Water, Sanitation and Hygiene

Average monthly precipitation in Palestine will decrease by 8-10 mm by the end of the century, and seasonal rainfall patterns may change, leading to greater aridity (UNEP, 2020). In addition, rising temperatures, scarcity of water resources, desertification, droughts and sea-level rise will compromise water access in the country (Al-Hindi *et al.*, 2022). The absence of a resolution on natural water allocations between Israel and Palestine, where the former controls access to water in the latter, adds additional complexities to the situation. Climate change will likely worsen existing water stress challenges in Palestine as it is expected that climate change will increase competition and tension with neighbouring countries sharing transboundary river basins in the Mediterranean (Teotónio *et al.*, 2020).

The conflict context in Palestine contributes to overall vulnerability to climate stressors. For example, the 2021 airstrikes in Gaza damaged the North Gaza Seawater Desalination Plant, affecting the sanitation, water supply, and hygiene of around 600,000 people (Amnesty International, 2021).

Frequent droughts are expected to increase water shortages, and with increasing temperatures and population, the demand for limited water resources will increase (USAID, 2017). Reducing rainfall and increasing droughts will also likely reduce groundwater infiltration (Netherlands Ministry of Foreign Affairs, 2019). In addition, Palestine is restricted by Israel and Israeli settlements that are controlling about 80% of the aquifer's flow (Al Ajarma *et al.*, 2019). Increased demand for water resources is leading to over-abstraction rates of coastal aquifers by almost three times the sustainable rate (World Bank, 2018). Over abstraction combined with sea-level rise drives seawater intrusion leading to deteriorating water quality (Abd-Elhamid *et al.*, 2015; Melloul & Collin, 2009). Finally, flash floods that are expected to increase due to climate change will impact water quality and disrupt water distribution facilities (WHO & UNFCCC, 2022). Increased frequency of storms, combined with limited water and sanitation infrastructure in the Gaza strip, are expected to increase the risks of sewage contamination in the water supply (Ives *et al.*, 2019)

Livelihood

Over 80% of agriculture in Palestine is rainfed, while 19% is irrigated (WHO & UNFCCC, 2022). Agriculture is an essential sector in Palestine, formally employing 13.4% of the labour force and making up 90% of all informal employment (Anera, 2020). In addition, it contributes about 5% to the heavily aid-dominated GDP (USAID, 2018). Due to a high reliance on rainfed agriculture in the West Bank, depleting amounts of water available to Palestinians overall, and the dire water situation in Gaza, Palestinians are disproportionately vulnerable to the livelihood impacts of climate change (Feitelson *et al.*, 2012).

Increased temperatures and frequent droughts are reducing crop yields, diminishing soil quality and reducing water available for irrigation (USAID, 2018). In addition, dry conditions and higher temperatures increase crop water demands (Netherlands Ministry of Foreign Affairs, 2019). Furthermore, floods are becoming more frequent, leading to soil erosion and crop damage (USAID, 2018).

Impacts and hazards such as floods, erosion, and land degradation may decrease the availability of arable land for agricultural production, compounding risks associated with conflict. Research indicates that, in 2017, there was an 80 per cent extension of *agricultural drought* in the Middle East region. In 2009, the *hydrological drought* extent reached 50% in the region (Hameed *et al.*, 2020). Both the extent and frequency of drought are likely to rise in the future. Consequently, drought events will negatively impact crop yield and threaten food security across the Middle East, including Palestine (Hameed *et al.*, 2020). Frequent drought events will also likely lead to significant losses in agricultural land and desertification, especially in Palestine (USAID, 2018).

Finally, climate change impacts in the region will result in less vegetation in pasture lands, increased animal disease, and scarcity of drinking water for animals, which will affect the livestock in the area (Hameed *et al.*, 2020).

2.4 Address climate displacement

Current and future displacement challenges

Palestine experiences migration and displacement. In the Palestine internal displacement is largely conflict-driven, with over 118,000 conflict-induced displacements in 2021 (IDMC 2022a). Forced evictions and the seizure of property by the Israeli authorities led to more than 1,200 displacements in the West Bank in 2021. The territories have not recorded any recent disaster displacements (IDMC 2022a).

- Indirect health effects arising from food insecurity, air pollution, conflicts and migration are rising significantly in ILOT and climate change impacts will exacerbate the present situation (Green et al. 2013). The warmer days in the region will lead to higher exposure to vector-borne diseases, especially dengue and West Nile virus (Linares et al. 2020). The shifts and changing intensity of seasons and different human and animal migrations combined may cause a change in the geographical distribution of diseases and their seasonal patterns (UNDP 2010).
- The immobility of Palestinians in Palestine increases the climate vulnerability of residents, who will likely experience increasing water stress (due to both climate change and Israel's control over water resources) and ongoing soil degradation due in part to over-farming due to limited agricultural land (Freij 2021). This also links to the compounding effects of conflict and climate hazards, which in turn is further exacerbated when migration is not an option for Palestinian.

Potential needs for migrants and displaced people

Palestinians leaving in Palestine are particularly vulnerable to the impacts of climate change due to the interplay of conflict and hazards (Freij 2021). Sub-standard housing increases the dangers of extreme heat, which is projected to rise and poses a particular risk to the elderly as well as children, the latter of whom currently represent 43.9% of the Palestinian population in Palestine (Palestinian Central Bureau of Statistics 2022).

Migration Law and Policies

- 1951 Convention relating to the Status of Refugees and its 1967 Protocol, 1976. Israel is a State Party to the 1951 Convention Relating to the Status of Refugees and its 1967 Protocol, but has not added Palestine to its national refugee legislation.
- **Not a signatory:** Global Compact for Safe, Orderly and Regular Migration (GCM), 2018. Israel was one of only five countries in the UN General Assembly which voted against the GCM, which is the world's current framework for addressing migration.
- Settlement Policy in the West Bank, 1967. Israel has used a set of policy tools over decades, such as the declaration of 'state land' and incentives for Israeli settlers, to displace Palestinians in the West Bank and Gaza Strip.

2.5 Policy

Relevant information from the National Determined Contribution (NDC) (2021)

The State of Palestine has ratified the Paris Agreement in 2016.

Emission target: Commit to reduce reduce reducingits GHG emissions by 17.5% by 2040 relative to the business-as-usual and by '26.6% by 2040 under a scenario where the Israeli occupation ends'.

Area of focus on Adaptation: Agriculture, Energy, Health, Transport, Waste, Water, CoastalCoastal and marine, food, industry, terrestrial ecosystem, tourism, urban and infrastructure. Adaptation and mitigation activities represent a budget of 5,7 billion USD.

Inclusion of DRR: The only mention of DRR encourages the support of the sector of the private sector in business plans. Climate risks and vulnerabilities are mentioned in the adaptation sections.

National Designated Entity: Environment Quality Authority

Key stakeholders: World Bank, Islamic Development Bank, Ricardo, Enable, Bilateral cooperation with Belgium, France, United Kingdom and Germany

Relevant information from the National Adaptation Plan (NAP) (2016)

Area of focus on Adaptation: Agriculture, Energy, Gender, Health, Transport, Waste, Water, CoastalCoastal and marine, food, industry, terrestrial ecosystem, tourism, urban and infrastructure.

Inclusion of DRR: Yes, as an adaptation measure on agriculture, waste and health management. Flood and drought risks have also been highlighted throughout the document.

Climate finance

In addition to GCF Readiness activities, the project 'Water Banking and Adaptation of Agriculture to Climate Change in Northern Gaza' is taking place in Palestinan as a cross-cutting on mitigation and adaptation (GCF, 2022). National societies cannot directly apply for climate finance from the GCF, but they can be an implementing partner for an accredited entity.

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 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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