SYRIA Climate Fact Sheet

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I- GENERAL CLIMATE OVERVIEW

Syria has four geographic zones: the Mediterranean coast in the west, mountains east of the coast, steppe east of the mountains and along the northern border, and desert in the southeast bordering Jordan and Iraq (USAID, 2017). Summers are usually very dry with high evaporation rates. In most parts of the country, summer temperatures tend to exceed 30°C. During the winter, temperatures are moderate to cold. Temperatures are influenced and moderated by proximity to the sea and elevation. The annual average temperature is 18.1°C on the coastal plain and 15.2°C in the mountains (WB CCKP, 2021). Annual rainfall ranges between 365 to 1365 mm/year on the coast, 500 to 1820 mm/year in the mountains, 50 to 600 mm/year in the steppe, and 20 to 370 mm/year in the desert (USAID, 2017).

II- CLIMATE CHANGE TRENDS

The ND-GAIN Country Index summarizes a country's vulnerability(1) to climate change and other global challenges in combination with its readiness(2) to improve resilience. Syria's ND-GAIN Index rank is 153. It is the 66th most vulnerable country and the 185th most ready country. The high vulnerability score and low readiness score of Syria places it in the upper-left quadrant of the ND-GAIN Matrix, which means it has both a great need for investment and innovations to improve readiness and a great urgency for action (University of Notre Dame, 2023).

From Past to Present:

The average annual mean temperature in Iraq for the year 1901 was 17.94 °C. This number increased to reach 19.72 °C in 2021 (+ 1.78 °C) (figure 1).

Regarding precipitation, there was a decrease in mean rainfall of 18.23 mm/month/century.

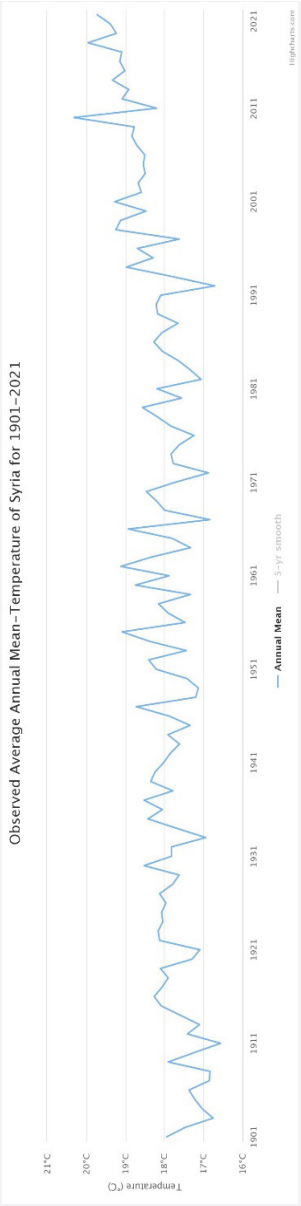


Figure-1: Observed Average Annual Mean Temperature (1901-2021) (WB CCKP, 2021)

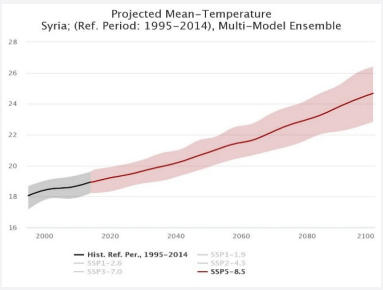
1 Vulnerability measures a country's exposure, sensitivity, and ability to adapt to the negative impact of climate change. ND-GAIN measures the overall vulnerability by considering vulnerability in six life-supporting sectors – food, water, health, ecosystem service, human habitat, and infrastructure.

2 Readiness measures a country's ability to leverage investments and convert them to adaptation actions. ND-GAIN measures overall readiness by considering three components – economic readiness, governance readiness and social readiness.

Projected:

- **Temperature:** While mean temperature for the reference period 1995-2014 was between 18.07 and 18.94 ºC, it is expected to increase and reach 20.87 ºC by mid-century under a high-emission scenario(3), and 24.68 ºC by the end of the century under a high-emission scenario (figure 2, left). In addition, the number of hot days where the maximum temperature (Tmax) is greater than 35 ºC is expected to rise from 99.15 days (2014 reference) to reach 122.13 days by mid-century and 156.87 days by end of century under a high-emission scenario (figure 2, right).

- **Precipitation:** While the average precipitation for the reference period 2014 was 208.94 mm, it is projected to decrease by mid-century under a high-emissions scenario to reach 199.58 mm and by end of century under a high-emissions scenario to reach 182.94mm (figure 3).



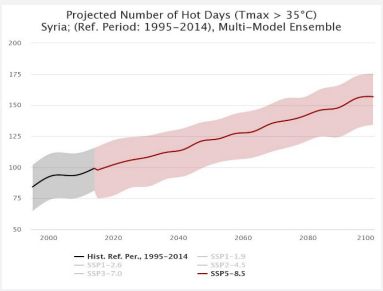


Figure-2: Projected Mean Temperature (Top) and Projected Number of Hot Days [Tmax greater than 35 ºC] (Bottom) (WB CCKP, 2021)

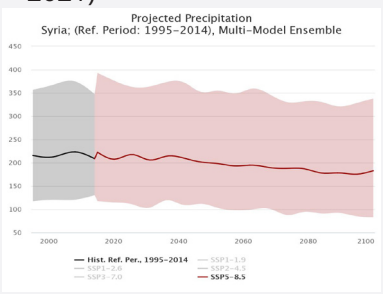


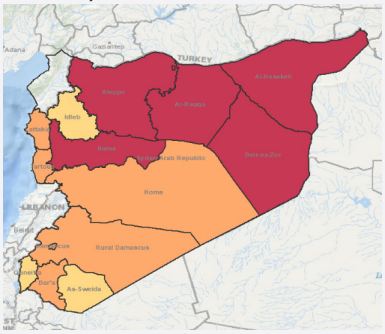
Figure-3: Projected Precipitation (WB CCKP, 2021)

III- CLIMATE CHANGE IMPACTS

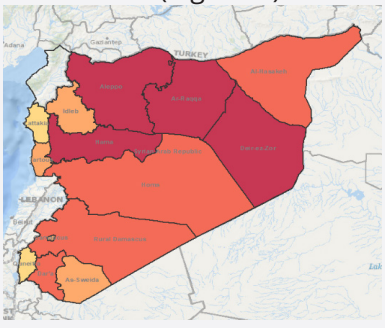
a- Natural Hazards

One of the main impacts of the change in temperature and rainfall patterns is the occurrence of natural hazards. Figure 4 summarizes the risk level of natural hazards in Syria. It shows that the country has a high risk of river and urban floods as well as landslides, extreme heat, water scarcity, and wildfire.

The main climate-related natural hazards that have occurred from 1900 till 2023 in Syria are seen in table 1:



Urban flood (high risk)



River flood (high risk)

3 SSP5\RCP8.5-The highest baseline emissions scenario in which emissions continue to rise throughout the twenty-first century, depicting a world of rapid and unconstrained growth in economic output and energy use.

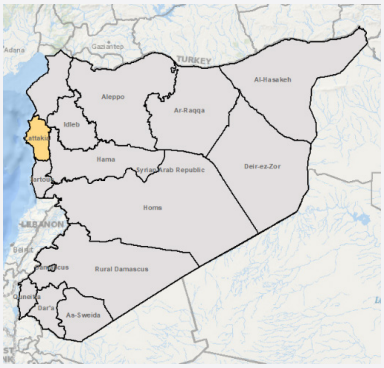
Table 1: Climate-related Natural Hazards (from 1900 till 2023) (EM-DAT, 2023)

Disaster Type	Occurrence (1900-2023)
Convective Storm	5
Flood	(of which 1 recorded riverine flood) 5
Drought	3
Wildfire	1
Landslide	1
	Total deaths: 139 **Total damages ('000 US$): 275 338**

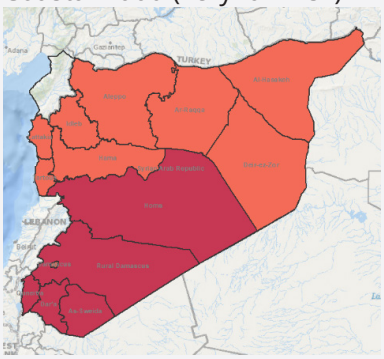
Specific recent examples of such hazards include the April 2019 floods, which were the worst flooding event in a decade across Syria's Al Hasakeh region. These were caused by heavy rains and left 118,000 people facing near complete destruction of their homes and livelihoods (ReliefWeb, 2019). Another recent example are the October 2020 wildfires which have killed 3 people and left around 80 injured with breathing complications and skin burns. Most of the rugged mountainous areas were destroyed in the western countryside of Homs province, the eastern countryside of Tartus, and the northern countryside of Latakia. These fires caused material and environmental damage, burning homes of residents, agricultural crops, large parts of vegetation, forests, and nature reserves. The fires had significant damage reported in 179 villages and forestry points, affecting more than 40,000 families through injuries, temporary displacement, loss of houses and assets, and a major loss of livelihoods such as lands, corps, and livestock (ReliefWeb, 2020). In addition, a cold wave occurred during January 2022 where heavy snowfall affected north-west Syria, damaging displacement sites, tents and people's belongings. According to preliminary reports, 22 sites in Aleppo Governorate (mainly Afrin and Azaz districts) and nine sites in Idleb Governorate (mainly Harim district) were affected (ReliefWeb, 2022). Syria was also subject to a sandstorm during May 2022 mainly in the province of Deir el -Zour, where hundreds were hospitalized with breathing problems (AlJazeera, 2022).

Figure 5 shows that under a high-emissions scenario, sea level rise is projected to increase and reach 0.26 m by mid-century and 0.78 m by the end of the century.

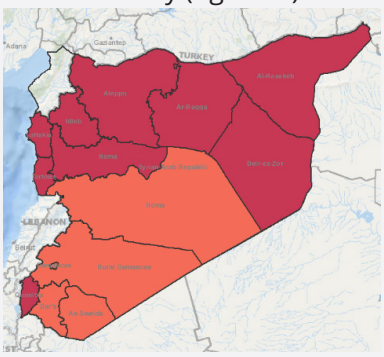
While the coastal zones of Syria only make up 2% of the total landmass, coastal areas in 2011 were home to 11% of the total population and produced 12% of Syria's GDP. Rising sea levels are likely to result in flooding of Syrian coastal plains, causing erosion and threatening critical coastal infrastructure and agricultural areas. Saltwater intrusion could contaminate some of the only sustainable groundwater aquifers in the country, further threatening the region's agricultural productivity (USAID, 2017).



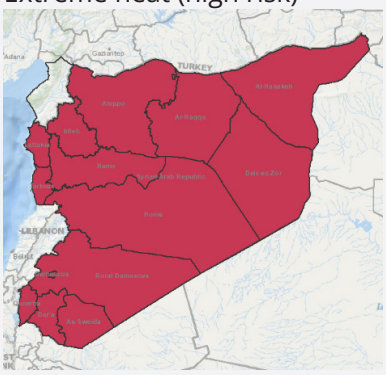
Coastal flood (very low risk)



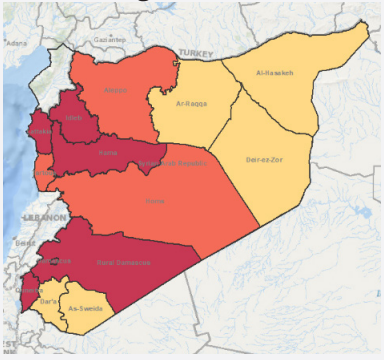
Water scarcity (hgh risk)



Extreme heat (high risk)



Wildfire (high risk)



Landslide (high risk)

Figure-4: Climate-Related Natural Hazards Risk Level (ThinkHazard, 2020)

b- Water

Water resources in Syria are limited. They are not homogeneously distributed in relation to population, which makes these resources highly pressured. The total of surface and ground water resources was estimated to approximately 15 billion cubic meters, ten of which are surface water and five are groundwater (Syria's First National Communication, 2010). Climate change along with poor agricultural policies have created a water resource crisis in Syria. In 2011, Syria's annual water withdrawal was 160% of its internal renewable water resources, markedly higher than other in-region countries. Additionally, an estimated 78% of all groundwater use was deemed unsustainable in 2012, most of which was used for agriculture. Agricultural reliance on rain and groundwater have left Syria vulnerable to drought, compared to its neighbors. For example, over-exploitation of groundwater in Syria's northeast has resulted in the drying up of the Khabur river, which in turn has created an even greater reliance on groundwater (USAID, 2017).

Figure 6 shows the projected annual Standardized Precipitation Evapotranspiration Index (SPEI)(4) in Syria. The projected maximum annual SPEI drought index under a high-emissions scenario will score a value of -2.47 by 2050 and will reach -3.41 by the end of the century. Such negative values imply an increasing high pressure on water resources, leading to water scarcity. A consequence of water scarcity could be a decline in agricultural productivity especially for crops that need irrigation. Other consequences include inadequate sanitation which can lead to deadly diarrheal diseases and other water-borne illnesses (WWF, 2023).

c- Agriculture

Before the drought of 2006-2011, agriculture accounted for 25% of Syria's GDP, 32% of its land use, and 90% of its water use. Most crops are rain-fed, with about two thirds of farmers relying exclusively on rainwater to water their crops, with the rest irrigating from rivers or, more commonly, groundwater. Due to drought-induced crop failures between 2006 and 2011, an estimated 1.5 million people abandoned their lands and livelihoods to move to urban areas, frequently leading to unemployment. Small and medium-scale farmers and pastoralists have suffered significantly, with extremely low or non-existent levels of production and complete or near-complete death of herds (USAID, 2017). Other than the frequently occurring droughts impacting yields, the Russia-Ukraine conflict also exacerbated Syria's food insecurity, in addition to a decade of conflict resulting in economic instability.

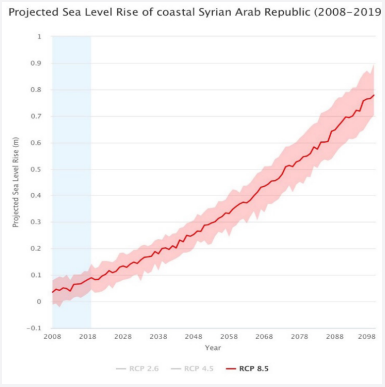


Figure-5: Projected Sea Level Rise in Coastal Syria (WB CCKP, 2021)

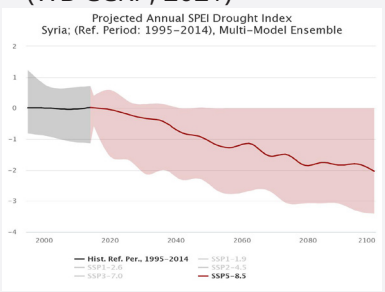


Figure-6: Projected Annual SPEI Drought Index (WB CCKP, 2021)

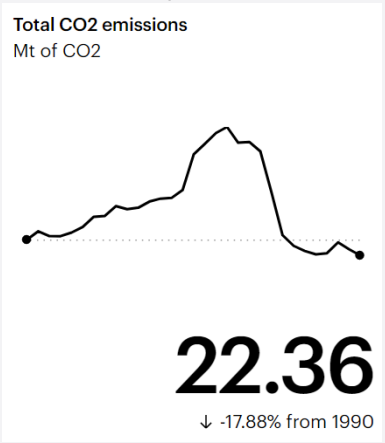


Figure-7: Total CO2 Emissions from the Energy Sector (IEA, 2022)

4 An index which represents the measure of the given water deficit in a specific location, accounting for contributions of temperature-dependent evapotranspiration and providing insight into increasing or decreasing pressure on water resources. Negative values for SPEI represent dry conditions, with values below −2 indicating severe drought conditions, likewise positive values indicate increased wet conditions.

Consequences are seen in rising food prices, as these increased by 86% in 2022 compared to the previous year, making items unaffordable for citizens. It was also reported that the number of food insecure people in the country increased by 9% in 2022, a problem that is particularly acute in north-western Syria (ReliefWeb, 2022).

d- Energy

With the decline in productive and service economic activities and the contraction of GDP due to the effects of unilateral coercive economic measures, the demand on energy sources has fallen between 2011 and 2016 by less than half (approximately from 25 to 10 million tons of oil equivalent), and many generation plants are out of service .The overall demand for energy consumption, including in transportation, industry and household sectors, has led to a significant reduction in emissions as a whole, including CO2 emissions from the energy sector (Syria's First NDC, 2019). The drastic reduction started with the beginning of the conflict in 2011 as seen in figure 7.

The ratio of renewable energy is expected to reach 10% of power production by 2030 in case a real support by international donors is provided (Syria's First NDC, 2019).

e- Health

Health institutions have been severely overstretched and damaged by the conflict, leaving Syria more vulnerable to the types of health impacts it may expect because of climate change. After the 2006-2011 drought, there was a dramatic increase in nutrition-related diseases in children. As these long and intense droughts are expected to become more common, nutritional deficiencies are likely to increase. In 2022 alone, the number of food-insecure children across the country rose to 4.6 million, with the northern and eastern regions affected the most (WHO, 2022). Disease incidence is also likely to increase. With the expansion of drought-tolerant rodent species and a decline in predators (like hawks), more frequent rodent population booms have the potential to increase the incidence of leishmaniasis (Aleppo boil). The decreased water access and quality expected from climate change can result in significant spikes in waterborne disease, such as diarrhea and typhoid (USAID, 2017). For instance, a cholera outbreak was declared in Syria in September 2022 which has spread to all the 14 governorates. Between 25 August and 26 November 2022, over 52 013 suspected cholera cases and 98 deaths were reported across the country, with Deir-ez-Zor, Ar-Raqqa, Aleppo, Idleb, and Al-Hasakeh, reporting the highest numbers. Camps hosting internally displaced people (IDPs) have reported more than 2100 cases (WHO, 2022). Climate-related disasters such as heat waves, floods,

droughts, and dust storms have a severe effect on disaster mortality and may further stress the already drained public health infrastructure (USAID, 2017).

IV- CLIMATE CHANGE RESPONSE: NATIONAL AND INTERATIONAL

➔ National laws and policies include:

- **Law No.6 of 2018 on Forestry:** this act requires the Forestry Ministry to establish local forestry committees, issue regulations for permitting resource extraction from forests, requires the government to undertake reforestation measures after wildfires, allows the government to establish protected forest lands, and requires the Forest Ministry and Tourism Ministry to create a National Ecotourism System

- **Law no 32 of 2010 on the electric sector:** modifies the institutional framework regulating the electricity market. Articles 2 (3) and 3 (1) aim at supporting the production and use of renewable energy, alongside enhanced energy efficiency. Article 28 sets preferable tariffs to small private producers and from industrial actors when the energy surplus can be sent to the grid.

- **Law no 32 of 2009:** energy conservation law aims at supporting economic and social development and extending the extraction time of oil reserves as much as possible. The law seeks a rationalisation of energy consumption, energy efficiency in all fields, and the adoption renewable energy resources. The National Energy Research Center is charged with edict and coordination of energy efficiency measures in all appropriate sectors.

- **11th five-year plan 2011-2015:** includes several sectoral targets related to climate change, notably aimed at providing a sustainable transport matrix in Syria, enhanced renewable energy production, and the sustainable development of rural areas

➔ **The different international documents submitted as part of the UNFCCC are seen in table 2:**

Table 2: Timeline of UNFCCC Document Submission (ClimateWatch, 2022)

Date	Document Submitted
2010	First National Communication
2018	First NDC (Arabic)
2019	First NDC (English)

V- REFERENCES

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