



GEORGIAN FOUNDATION FOR
STRATEGIC AND INTERNATIONAL STUDIES

SHORTAGE OF WATER RESOURCES IN THE MIDDLE EAST AND ITS IMPACT ON THE ONGOING REGIONAL PROCESSES

ZURAB BATIASHVILI

188

EXPERT OPINION





საქართველოს სტრატეგიისა და საერთაშორისო ურთიერთობათა კვლევის ფონდი
GEORGIAN FOUNDATION FOR STRATEGIC AND INTERNATIONAL STUDIES

EXPERT OPINION

ZURAB BATIASHVILI

**SHORTAGE OF WATER RESOURCES IN THE MIDDLE EAST AND ITS
IMPACT ON THE ONGOING REGIONAL PROCESSES**

188

2022



The publication is made possible with the support of the US Embassy in Georgia. The views expressed in the publication are the sole responsibility of the author and do not in any way represent the views of the Embassy.

Technical Editor: Artem Melik-Nubarov

All rights reserved and belong to Georgian Foundation for Strategic and International Studies. No part of this publication may be reproduced in any form, including electronic and mechanical, without the prior written permission of the publisher. The opinions and conclusions expressed are those of the author/s and do not necessarily reflect the views of the Georgian Foundation for Strategic and International Studies.

Copyright © 2022 Georgian Foundation for Strategic and International Studies

ISSN 1512-4835

ISBN

The Middle East is one of the most water-depleted regions in the world and as time goes on, water scarcity problems are increasing there.

Water scarcity is caused by many factors: rapid population growth and chaotic urbanization caused by a demographic explosion, global warming and the climate crisis, conflicts between countries, civil wars, the inefficient use of existing water resources, etc.

In addition to reduced crop yields, famine and illegal migration, water scarcity also creates socio-economic, political and security problems.

What should we expect in this regard in the future? What kind of impact does the water shortage have on the current processes in the region? And what kinds of threats and challenges might it pose in the future?

Drivers of the Shortage of Water Resources

Water resources have been a serious challenge for the Middle East region for centuries. But as the UNICEF (United Nations Children's Fund) 2021 report states, water scarcity in this region has reached unprecedented proportions today and poses a serious threat to children as well as the poor, marginalized and most vulnerable groups.¹

The Middle East (along with North Africa) is the poorest region in the world in terms of water resources. It is home to 6.3% of the world's population but has only 1.4% of renewable fresh water.²

According to the joint monitoring program of the WHO (World Health Organization) and UNICEF, 41 million people in this region do not have access to drinking water.³

According to a World Bank report, more than 60% of the population of this region live in areas with high or very high water scarcity (this figure does not exceed 35% worldwide).⁴

It should be noted that 12 of the 15 countries with water shortages in the world are located precisely in this region.⁵

Many countries in the Middle East have an average of 170 cubic meters of water per capita per year. While according to the international standards, consumption below 1,000 cubic meters per capita per year is already considered a water deficit.⁶

The situation is further complicated by both global climate change (increasing temperature and concomitant decrease in rainfall) and local factors: rapid population growth as a result of the “demographic explosion” (which needs more and more water), disagreements and conflicts between countries, civil wars, financial problems and so on.

Impact of Water Resource Scarcity on Life in the Middle East

The scarcity of water resources is already affecting politics and economics in the Middle East.

Along with other factors, its irrational use also played an important role in the reduction of water resources in the region. Between 1965 and 1997, the area of irrigated land in the region doubled. This was mainly done to meet the increased demand of the population for food.⁷

The use of water resources sometimes causes problems in relations between neighboring countries. Sometimes Arab countries accuse Ankara of cutting water supplies and using it as a means of pressure. In particular, they recall the case of December 2020 when the Euphrates River water supplies were reduced by 60%, leading to food and energy crises in Syria and Iraq. This river is vital for these two countries.⁸ Thus, the issue of the Euphrates is one (but not the only) example of how relations between countries can be strained over water resources in the region.

In this regard, it is necessary to consider the fact that Turkey, which controls 90% of the water flow of the Euphrates and 44%⁹ of the Tigris, is not a member of the international water resource management conventions which allows it to act more freely in this direction.



Important Surface Water Resources in the Middle East

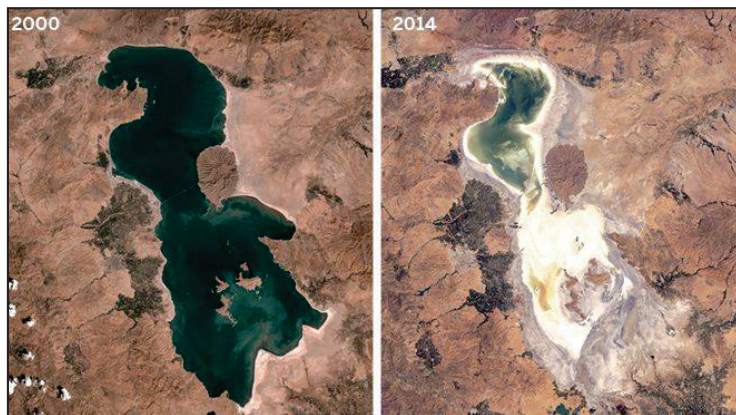
It was also the case with Iran when it reduced the amount of water flowing from the Tigris tributaries to Iraq in the same period.¹⁰

To take the example of Iraq and Syria again, 12 million people have already lost access to water, food and electricity due to rising temperatures and record low rainfall.¹¹ It is precisely the reason that demonstrations in Iraq, which have become a daily part of the life of this country, very often protest against the reduction of water resources,¹² meaning that this topic has already become a political problem.

Water scarcity is also directly related to poverty which drives the rural population of the Middle East to migrate to cities for better living conditions (currently, 60% of the region's population already lives in cities and this process continues unchecked¹³). Such chaotic urbanization creates problems with the domino effect at local, national and international levels.¹⁴

Less water means less crops, slower economic development and political instability throughout the Middle East¹⁵ which also affects neighboring regions such as through increased illegal migration to Europe.¹⁶

The climate crisis and the resulting waves of migration are accompanied by socio-political explosions and the clearest example of this is the Syrian civil war. The civil war in Syria was preceded by a five-year drought starting in 2007 (unprecedented in its scale in the last 100 years¹⁷) which caused unprecedented poverty, rising food prices and migration from the country's peripheries to Syria's big cities where there were already many problems. Thus, climate change and scarcity of water resources, among other factors, have led to the internal explosion of this country.¹⁸



Lake Urmia, once the largest in the Middle East, is slowly disappearing in northern Iran.

One clear example of the dire situation is the condition of Lake Urmia in Iran which was the largest lake in the Middle East just 20 years ago and is now on the verge of drying up.

The lake and its islands have attracted many tourists over the decades, both for therapeutic mud treatments, as well as tourism and recreation purposes, contributing significantly to Iran's economy.¹⁹

The catastrophic decrease of the water level in the aforementioned lake and, accordingly, the destruction of the tourist business around it was caused by the irrational use of water resources. In the last 20 years, many dams were built on the lake's tributary rivers for irrigation purposes which has caused a catastrophic reduction in the size of the lake. In addition, Lake Urmia is salty and the decrease in the inflow of water has made the water in the lake hypersaline and its use became a threat for plants.²⁰

Protests caused by water shortage are common to Iran. For example, a wave of protests swept the country in July 2021 where the main demand from the government was to supply water to the population. Clashes

between the population and law enforcement agencies during these demonstrations resulted in the loss of three lives.²¹ In other words, the water shortage turned into a political problem in Iran as also in other countries of the region.

Another problem related to water scarcity is desertification which has become a serious problem, not only in Syria, Iraq and Iran but also in Jordan.

Water charges in Jordan have increased by 30% over the past decade due to groundwater scarcity. The situation is aggravated by the fact that the level of underground water drops by one meter every year because of intensive consumption in Jordan.²² However, people with low incomes in this country consume 40 liters of water per day for all their needs - for drinking, bathing, washing dishes and laundry (for comparison, this figure is ten times higher in America) and this amount will be halved by the end of the century.²³

In such a situation, Jordan has to buy recycled seawater from Israel which has been desalinated. But, this is quite an expensive pleasure because processing sea water requires a lot of electricity and is not ecologically justified²⁴ (for example, calcium is also removed from the water during desalination and the salt is usually thrown back into the sea²⁵). The same applies to the rich Arab countries of the Persian Gulf which are trying to obtain additional fresh water resources in this way thanks to their stable financial income²⁶ (these countries account for 60% of processed sea water in the world²⁷).

In addition, water quality is deteriorating in the entire region due to environmental pollution which in turn creates new problems and challenges. For example, we can cite the Euphrates River where the number of hazardous substances (including pesticides) tripled between 1980 and 2009 according to the Future of the Arab Climate study.²⁸

This directly affects the health of millions of people. For example, at least 118,000 people in Iraq, half of whom were children, had to go to hospitals because of diseases (viruses, parasites, bacteria, etc.) caused by contaminated drinking water in 2018.²⁹

Also due to contaminated water, the largest diarrhea epidemic in modern times raged in Yemen in 2017, affecting 1.3 million people, 30 percent of whom were children under the age of five years.³⁰

What Does the Future Hold for the Middle East?

According to the existing studies, 80 to 90 million people living in the region will be directly affected by the problems caused by the lack of water resources in the coming years³¹ (it should be taken into account that about 60% of the population of the region currently lives in places where the lack of water resources is already felt in one way or another³²).

It is expected that the issue of temperature increase will also be problematic in the future.

Of important note is that the air temperature rises faster on this part of the Earth than anywhere else. This was shown by a study conducted in Iraq where it was determined that the temperature in this country is rising 2.7 times faster than in other regions of the world.³³

The air temperature in the region increased by 1.5 degrees since 1950.³⁴ According to the Future of the Arab Climate study, the air temperature in the region will increase by 2-2.7 C between 2040 and 2059. In some places, the increase will reach 3.3 C.³⁵ By the end of this century, it is expected that the air temperature in this region will increase by another four degrees.³⁶

This will further accelerate the process of already ongoing desertification (and migration from those regions).

Against this background, rising temperatures in the region are causing fires in many places (the most visible example of which is Turkey where fires raged for almost the entire summer of 2021), destroying forests and existing ecosystems. Fires accelerate the process of desertification and reduce the amount of water in the soil. The number of such fires will increase in the future.³⁷

At the same time, the amount of precipitation and, accordingly, the amount of renewable water resources is decreasing in the region. According to the current calculations, this number will decrease by 4% in the region by 2050. In some countries, the situation will become even more dire. For example, rainfall in Jordan is expected to decrease by 30% by the end of this century.³⁸

It is natural that along with the rapid increase of the population in the region, the amount of water per capita decreases every year and this reduction is especially noticeable in a poor country where it is difficult not

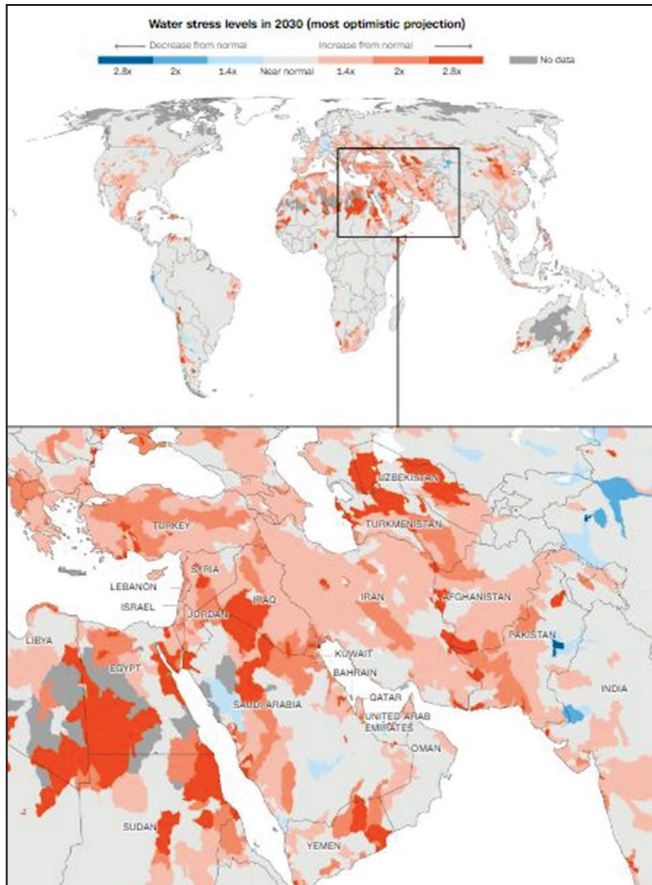
only to solve the problem but also to develop a plan necessary to overcome the challenge because of the economic and political problems.

In addition, rapid population growth, which is an unsolvable problem for the region, is directly related to the shortage of water resources. This can be clearly seen in the table below:³⁹

| | Population (millions) | | | Percent of Population Living in Urban Areas, 2001 | Annual Renewable Fresh Water (km ³) ^b | Per Capita Annual Renewable Fresh Water (m ³) | | |
|---|-----------------------|-------|-------|---|--|---|-------|-------|
| | 1970 | 2001 | 2025 | | | 1970 | 2001 | 2025 |
| MIDDLE EAST AND NORTH AFRICA ^a | 173.4 | 385.6 | 568.0 | 59 | 632.3 | 3,645 | 1,640 | 1,113 |
| Algeria | 13.8 | 31.0 | 43.2 | 49 | 14.3 | 1,040 | 462 | 331 |
| Bahrain | 0.2 | 0.7 | 1.0 | 88 | 0.1 | 455 | 140 | 97 |
| Egypt | 35.3 | 69.8 | 96.2 | 43 | 86.8 | 2,460 | 1,243 | 903 |
| Iran | 28.8 | 66.1 | 88.4 | 64 | 137.5 | 4,770 | 2,079 | 1,555 |
| Iraq | 9.4 | 23.6 | 40.3 | 68 | 96.4 | 10,304 | 4,087 | 2,392 |
| Israel | 3.0 | 6.4 | 8.9 | 91 | 2.2 | 740 | 342 | 247 |
| Jordan | 1.6 | 5.2 | 8.7 | 79 | 0.9 | 555 | 174 | 103 |
| Kuwait | 0.7 | 2.3 | 4.2 | 100 | 0.02 | 27 | 9 | 5 |
| Lebanon | 2.5 | 4.3 | 5.4 | 88 | 4.8 | 1,944 | 1,120 | 896 |
| Libya | 2.0 | 5.2 | 8.3 | 86 | 0.6 | 302 | 114 | 72 |
| Morocco | 15.3 | 29.2 | 40.5 | 55 | 30.0 | 1,960 | 1,027 | 741 |
| Oman | 0.7 | 2.4 | 4.9 | 72 | 1.0 | 1,383 | 416 | 206 |
| Qatar | 0.1 | 0.6 | 0.8 | 91 | 0.1 | 901 | 170 | 129 |
| Saudi Arabia | 5.7 | 21.1 | 40.9 | 83 | 2.4 | 418 | 114 | 59 |
| Syria | 6.3 | 17.1 | 27.1 | 50 | 46.1 | 7,367 | 2,700 | 1,701 |
| Tunisia | 5.1 | 9.7 | 12.5 | 62 | 4.1 | 800 | 422 | 327 |
| Turkey | 35.3 | 66.3 | 85.2 | 66 | 200.7 | 5,682 | 3,029 | 2,356 |
| United Arab Emirates | 0.2 | 3.3 | 4.5 | 84 | 0.2 | 897 | 60 | 44 |
| Yemen | 6.3 | 18.0 | 39.6 | 26 | 4.1 | 648 | 228 | 103 |

Population Growth and Freshwater Resources in the Middle East and North Africa

In the Middle East region, the so-called “population explosion” means a further reduction of water resources per capita. The population of the region is growing by 2% (about 7 million) per year.⁴⁰ According to the calculations of one of the most reliable statistics companies, Statista, the population of the region will increase by almost 50% and reach 723 million by 2050.⁴¹ This will put enormous pressure on already scarce water resources throughout the Middle East.⁴²



Levels of Water Scarcity by 2030 According to the World Resources Institute

The World Resources Institute has compiled a map of where water shortages will be by 2030 with a particular focus on the Middle East and its neighboring regions (including the Caucasus). As is clear from this map, the deficit (level 1.4x) will also affect the eastern part of Georgia.⁴³

In addition, it should be noted that according to the FAO (the Food and Agriculture Organization of the United Nations), the region will have serious economic losses caused by water shortage in the future. According to the calculations of this organization, the economies of the countries of the region will decrease from six to 14 percent by 2050. This will create a great deal of problems and challenges on the ground. The same problems will also force many locals to look for new places to live.⁴⁴

One of the biggest ecological catastrophes in the not too distant future may be played out in Iraq by 2040 because the Tigris and the Euphrates Rivers may dry up completely if the current situation does not change, bringing about severe economic, humanitarian and political consequences.⁴⁵

Against this backdrop, water shortages are expected to have an even greater impact on political situations across the region.

Conclusions

- The problem of water resources is long-term, it will not decrease and it is expected that it will be one of the main challenges for the region in the coming decades;
- To date, many programs and proposals have been developed to solve the water shortage but it is impossible to completely solve the problem of water resources in the near future for many reasons (financial problems, poverty, civil wars, conflicts and disagreements between the countries of the region, faulty economic and political systems, etc.);
- On the contrary, if appropriate measures are not taken (and the chances of this are high), the problems in the region caused by temperature rise and the shortage of water resources will become even more tangible;
- These problems may give impetus to new regional conflicts (which are often referred to as “water wars”) both among the countries of the Middle East as well as within them. There, water scarcity has already become a political problem;
- In this regard, the so-called “failed states” of the region are particularly vulnerable. Their number is not few in the Middle East and they do not have the economic and political resources and leverage to solve these problems;
- Such a situation creates the danger of the influx of new waves of illegal migrants; first of all, in the direction of Turkey and Europe (however, it is not excluded that a similar problem will arise in relation to Georgia as well) - i.e., water shortage, along with other problems, creates humanitarian and security challenges (including for Europe);
- Accordingly, the actors who border this region (including Georgia) or are interested in maintaining stability there (first of all, the West), are obliged to take into account the above-mentioned factors when planning long-term policies;

- On the other hand, this situation creates a new window of opportunity for the economy of Georgia; in particular, for the producers of drinking and mineral waters. In light of the water resource shortages, their products will be in demand in the entire Middle East.

References:

1. UNICEF, *Running Dry: The Impact of Water Scarcity on Children in the Middle East and North Africa* (August 2021), <https://www.unicef.org/mena/reports/running-dry-impact-water-scarcity-children>
2. Farzaneh Roudi-Fahimi, Liz Creel and Roger-Mark De Souza, "Finding the Balance: Population and Water Scarcity in the Middle East and North Africa," MENA Policy Brief 2002, *Population Reference Bureau*, https://www.prb.org/wp-content/uploads/2021/01/FindingTheBalance_Eng.pdf
3. UNICEF, *Running Dry: The Impact of Water Scarcity on Children in the Middle East and North Africa* (August 2021), <https://www.unicef.org/mena/reports/running-dry-impact-water-scarcity-children>
4. World Bank, *Beyond Scarcity: Water Security in the Middle East and North Africa* (Washington D.C.: World Bank, 2018), 10, <https://openknowledge.worldbank.org/handle/10986/27659>
5. Farzaneh Roudi-Fahimi, Liz Creel and Roger-Mark De Souza, "Finding the Balance: Population and Water Scarcity in the Middle East and North Africa," MENA Policy Brief 2002, *Population Reference Bureau*, https://www.prb.org/wp-content/uploads/2021/01/FindingTheBalance_Eng.pdf
6. Hussein Al-Rimmawi, "Middle East Chronic Water Problems: Solution Prospects," *Energy and Environment Research*, no.1 (2012), https://www.researchgate.net/publication/267262498_Middle_East_Chronic_Water_Problems_Solution_Prospects
7. Farzaneh Roudi-Fahimi, Liz Creel and Roger-Mark De Souza, "Finding the Balance: Population and Water Scarcity in the Middle East and North Africa," MENA Policy Brief 2002, *Population Reference Bureau*, https://www.prb.org/wp-content/uploads/2021/01/FindingTheBalance_Eng.pdf
8. Ranj Alaaldin, "Climate Change May Devastate the Middle East. Here's How Governments Should Tackle It," *Brookings Institution*, March 14, 2022, <https://www.brookings.edu/blog/planetpolicy/2022/03/14/climate-change-may-devastate-the-middle-east-heres-how-governments-should-tackle-it/>
9. Ibid.

10. Ranj Alaaldin, "Climate Change May Devastate the Middle East. Here's How Governments Should Tackle It," *Brookings Institution*, March 14, 2022, <https://www.brookings.edu/blog/planetpolicy/2022/03/14/climate-change-may-devastate-the-middle-east-heres-how-governments-should-tackle-it/>
11. "Water Crisis and Drought Threaten 12 million in Syria, Iraq," *Aljazeera*, August 23, 2021, <https://www.aljazeera.com/news/2021/8/23/water-crisis-and-drought-threaten-12-million-in-syria-iraq>
12. "Iraqis Protest Over Power, Water Cuts Amid Heat Wave," *Reuters*, July 2, 2021, <https://www.reuters.com/world/middle-east/iraqis-protest-over-power-water-cuts-amid-heat-wave-2021-07-02/>
13. Farzaneh Roudi-Fahimi, Liz Creel and Roger-Mark De Souza, "Finding the Balance: Population and Water Scarcity in the Middle East and North Africa," MENA Policy Brief 2002, *Population Reference Bureau*, https://www.prb.org/wp-content/uploads/2021/01/FindingTheBalance_Eng.pdf
14. Ranj Alaaldin, "Climate Change May Devastate the Middle East. Here's How Governments Should Tackle It," *Brookings Institution*, March 14, 2022, <https://www.brookings.edu/blog/planetpolicy/2022/03/14/climate-change-may-devastate-the-middle-east-heres-how-governments-should-tackle-it/>
15. Hussein Al-Rimmawi, "Middle East Chronic Water Problems: Solution Prospects," *Energy and Environment Research* 2, no. 1 (2012), https://www.researchgate.net/publication/267262498_Middle_East_Chronic_Water_Problems_Solution_Prospects
16. Ibid.
17. "Middle East: Running Out of Water," *DW*, January 24, 2022, <https://www.dw.com/en/middle-east-running-out-of-water/a-60509788>
18. Ranj Alaaldin, "Climate Change May Devastate the Middle East. Here's How Governments Should Tackle It," *Brookings Institution*, March 14, 2022, <https://www.brookings.edu/blog/planetpolicy/2022/03/14/climate-change-may-devastate-the-middle-east-heres-how-governments-should-tackle-it/>
19. Frederik Pleitgen, Claudia Otto, Angela Dewan and Mohammed Tawfeeq, "The Middle East is Running Out of Water and Parts of It are Becoming Uninhabitable," *CNN*, August 22, 2021, <https://edition.cnn.com/2021/08/22/middleeast/middle-east-climate-water-shortage-iran-urmia-intl/index.html>
20. Ibid.
21. Ibid.
22. Ranj Alaaldin, "Climate Change May Devastate the Middle East. Here's How Governments Should Tackle It," *Brookings Institution*, March 14, 2022, <https://www.brookings.edu/blog/planetpolicy/2022/03/14/climate-change-may-devastate-the-middle-east-heres-how-governments-should-tackle-it/>
23. Frederik Pleitgen, Claudia Otto, Angela Dewan and Mohammed Tawfeeq, "The Middle East is Running Out of Water and Parts of It are Becoming Uninhabitable," *CNN*, August 22, 2021, <https://edition.cnn.com/2021/08/22/middleeast/middle-east-climate-water-shortage-iran-urmia-intl/index.html>
24. Ibid.

25. Alexandra Barton, "Water in Crisis – Middle East," *The Water Project*, <https://thewaterproject.org/water-crisis/water-in-crisis-middle-east>
26. Hussein Al-Rimmawi, "Middle East Chronic Water Problems: Solution Prospects," *Energy and Environment Research* 2,no.1 (2012), https://www.researchgate.net/publication/267262498_Middle_East_Chronic_Water_Problems_Solution_Prospects
27. Farzaneh Roudi-Fahimi, Liz Creel and Roger-Mark De Souza, "Finding the Balance: Population and Water Scarcity in the Middle East and North Africa," MENA Policy Brief 2002, *Population Reference Bureau*, https://www.prb.org/wp-content/uploads/2021/01/FindingTheBalance_Eng.pdf
28. "Middle East: Running Out of Water," *DW*, January 24, 2022, <https://www.dw.com/en/middle-east-running-out-of-water/a-60509788>
29. UNICEF, *Running Dry: The Impact of Water Scarcity on Children in the Middle East and North Africa* (August 2021), <https://www.unicef.org/mena/reports/running-dry-impact-water-scarcity-children>
30. Rasha Abou Dargham, "Water Doesn't Come From a Tap," *UNICEF*, <https://www.unicef.org/mena/water-doesnt-come-tap>
31. Aron Rosenthal, "The Middle East is Running Out of Water," *The Jerusalem Post*, June 3, 2022, <https://www.jpost.com/middle-east/article-708493>
32. Amro Selim, "The MENA Region's Water Crisis: Avoiding Potential Water Wars," *Washington Institute*, July 20, 2020, <https://www.washingtoninstitute.org/policy-analysis/mena-regions-water-crisis-avoiding-potential-water-wars>
33. Ranj Alaaldin, "Climate Change May Devastate the Middle East. Here's How Governments Should Tackle It," *Brookings Institution*, March 14, 2022, <https://www.brookings.edu/blog/planetpolicy/2022/03/14/climate-change-may-devastate-the-middle-east-heres-how-governments-should-tackle-it/>
34. Aron Rosenthal, "The Middle East is Running Out of Water," *The Jerusalem Post*, June 3, 2022, <https://www.jpost.com/middle-east/article-708493>
35. "Middle East: Running Out of Water," *DW*, January 24, 2022, <https://www.dw.com/en/middle-east-running-out-of-water/a-60509788>
36. Aron Rosenthal, "The Middle East is Running Out of Water," *The Jerusalem Post*, June 3, 2022, <https://www.jpost.com/middle-east/article-708493>
37. "Turkish Fires Sweeping Through Tourist Areas Are the Hottest on Record," *The Guardian*, July 30, 2021, <https://www.theguardian.com/world/2021/jul/30/turkish-fires-sweeping-through-tourist-areas-are-the-hottest-on-record>
38. Aron Rosenthal, "The Middle East is Running Out of Water," *The Jerusalem Post*, June 3, 2022, <https://www.jpost.com/middle-east/article-708493>
39. Farzaneh Roudi-Fahimi, Liz Creel and Roger-Mark De Souza, "Finding the Balance: Population and Water Scarcity in the Middle East and North Africa," MENA Policy Brief 2002, *Population Reference Bureau*, https://www.prb.org/wp-content/uploads/2021/01/FindingTheBalance_Eng.pdf
40. Ibid.

41. "Total Population Across the Middle East and North Africa from 1990 to 2050," *Statista*, <https://www.statista.com/statistics/978535/mena-total-population/>
42. Farzaneh Roudi-Fahimi, Liz Creel and Roger-Mark De Souza, "Finding the Balance: Population and Water Scarcity in the Middle East and North Africa," MENA Policy Brief 2002, *Population Reference Bureau*, https://www.prb.org/wp-content/uploads/2021/01/FindingTheBalance_Eng.pdf
43. Frederik Pleitgen, Claudia Otto, Angela Dewan and Mohammed Tawfeeq, "The Middle East is Running Out of Water and Parts of It are Becoming Uninhabitable," *CNN*, August 22, 2021, <https://edition.cnn.com/2021/08/22/middleeast/middle-east-climate-water-shortage-iran-urmia-intl/index.html>
44. Amro Selim, "The MENA Region's Water Crisis: Avoiding Potential Water Wars," *Washington Institute*, July 20, 2020, <https://www.washingtoninstitute.org/policy-analysis/mena-regions-water-crisis-avoiding-potential-water-wars>
45. Ibid.

Bibliography

- Alaaldin, Ranj. "Climate Change May Devastate the Middle East. Here's How Governments Should Tackle It." *Brookings Institution*, March 14, 2022. <https://www.brookings.edu/blog/planetpolicy/2022/03/14/climate-change-may-devastate-the-middle-east-heres-how-governments-should-tackle-it/>
- Al-Rimmawi, Hussein. "Middle East Chronic Water Problems: Solution Prospects." *Energy and Environment Research* 2, no. 1 (2012). https://www.researchgate.net/publication/267262498_Middle_East_Chronic_Water_Problems_Solution_Prospects
- Barton, Alexandra. "Water in Crisis – Middle East." *The Water Project*. <https://thewaterproject.org/water-crisis/water-in-crisis-middle-east>
- Dargham, Rasha Abou. "Water Doesn't Come From a Tap." *UNICEF*. <https://www.unicef.org/mena/water-doesnt-come-tap>
- "Iraqis Protest Over Power, Water Cuts Amid Heat Wave." *Reuters*, July 2, 2021. <https://www.reuters.com/world/middle-east/iraqis-protest-over-power-water-cuts-amid-heat-wave-2021-07-02/>
- "Middle East: Running Out of Water." *DW*, January 24, 2022. <https://www.dw.com/en/middle-east-running-out-of-water/a-60509788>
- Pleitgen, Frederik, Claudia Otto, Angela Dewan and Mohammed Tawfeeq. "The Middle East is Running Out of Water and Parts of It are Becoming Uninhabitable." *CNN*, August 22, 2021. <https://edition.cnn.com/2021/08/22/middleeast/middle-east-climate-water-shortage-iran-urmia-intl/index.html>
- Rosenthal, Aron. "The Middle East is Running Out of Water." *The Jerusalem Post*, June 3, 2022. <https://www.jpost.com/middle-east/article-708493>
- Roudi-Fahimi, Farzaneh, Liz Creel and Roger-Mark De Souza. "Finding the Balance: Population and Water Scarcity in the Middle East and North Africa," MENA Policy Brief 2002. *Population Reference Bureau*. https://www.prb.org/wp-content/uploads/2021/01/FindingTheBalance_Eng.pdf
- Selim, Amro. "The MENA Region's Water Crisis: Avoiding Potential Water Wars." *Washington Institute*, July 20, 2020. <https://www.washingtoninstitute.org/policy-analysis/mena-regions-water-crisis-avoiding-potential-water-wars>
- "Total Population Across the Middle East and North Africa from 1990 to 2050." *Statista*. <https://www.statista.com/statistics/978535/mena-total-population/>
- "Turkish Fires Sweeping Through Tourist Areas Are the Hottest on Record." *The Guardian*, July 30, 2021. <https://www.theguardian.com/world/2021/jul/30/turkish-fires-sweeping-through-tourist-areas-are-the-hottest-on-record>
- UNICEF. *Running Dry: The Impact of Water Scarcity on Children in the Middle East and North Africa*. August 2021. <https://www.unicef.org/mena/reports/running-dry-impact-water-scarcity-children>

- “Water Crisis and Drought Threaten 12 Million in Syria, Iraq.” *Aljazeera*, August 23, 2021. <https://www.aljazeera.com/news/2021/8/23/water-crisis-and-drought-threaten-12-million-in-syria-iraq>
- World Bank. *Beyond Scarcity: Water Security in the Middle East and North Africa*. Washington D.C.: World Bank, 2018. <https://openknowledge.worldbank.org/handle/10986/27659>