



Interprovincial Water Challenges in Iraq

Initial Analysis of an Urgent and Under-researched Crisis

“The conflict over water amongst the local communities in and between the Iraqi provinces poses a threat to security and stability in the future”¹

AUTHORS:

Dorith Kool, Laura Birkman, Bianca Torossian

CONTRIBUTORS:

Juliette Schaffrath, Rolien Sasse, Susanne Schmeier

Understanding the Context

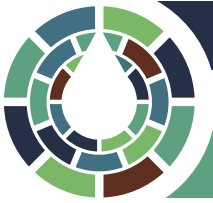
The water situation in Iraq is strained. Challenges related to water quantity and quality are numerous and complex. Water flow from the Euphrates and Tigris rivers that together provide up to 98% of Iraq's water supply has decreased by 30% since the 1980s and is expected to shrink to a further 50% by 2030.² By 2025, overall water supply is predicted to decrease by up to 60%, compared to 2015.³ Reduced water flow in both rivers is the

result of decreases in rainfall, the construction of dams, increased water abstractions, heavy water use by the oil industry, and the impacts of war and conflict on water infrastructure.⁴

The Mesopotamian Marshes, once the largest wetland ecosystem of Western Eurasia and the main source of freshwater in southern Iraq, are now only a fraction of what they were 30 years ago.⁵ While supply is decreasing, water demand is increasing due to rapid population growth, inefficient water use by the agricultural and industrial sectors, as well as levels of urbanization for which the current infrastructure is not able to accommodate.⁶ At the same time, water quality has deteriorated due to decreased water flows and untreated wastewater discharge from cities, agricultural farms, and industrial areas.⁷ In the summer of 2018, the province of Al-Basrah (or Basra), which is home to about 4.7 Million inhabitants, experienced a severe health crisis that was later found to be related to poor water quality.⁸ An estimated 118,000 people had to be hospitalized due to water-related illness leading hundreds of protestors to storm the Basra Health Directorate complaining about the inadequate health services in local hospitals during the crisis.⁹ A year later, in October 2019 protests also erupted in the capital city Baghdad.

1. Sulaiman, Interprovincial Water Challenges Iraq.
2. Von Lossow, “More than Infrastructure: Water Challenges in Iraq,”
3. Alwash, Istepanian, and Khatteeb, “Towards Sustainable Water Resources Management In Iraq,” 6.
4. Von Lossow, “More than Infrastructure: Water Challenges in Iraq.”
5. Alwash, Istepanian, and Khatteeb, “Towards Sustainable Water Resources Management In Iraq.”

5. Human Rights Watch, “Basra Is Thirsty: Iraq's Failure to Manage the Water Crisis.”
6. Von Lossow, “More than Infrastructure: Water Challenges in Iraq.”
7. Human Rights Watch, “Basra Is Thirsty: Iraq's Failure to Manage the Water Crisis.”
8. Human Rights Watch.
9. Human Rights Watch.



Although the protests concerned a lack of public services, corruption, and foreign influence in Iraq more broadly, the people also expressed discontent with the quantity and quality of available water.¹⁰ The spread of COVID-19 presents another threat to Iraq's stability and its people, as Iraq's health care system has limited treatment capacities. Some regions are short on sanitation facilities and supplies necessary to effectively prevent infection from spreading.¹¹

Water challenges in Iraq can be examined at different spatial levels. At the transboundary level, the quantity and quality of water in Iraq are impacted by water management activities of neighboring countries on the Euphrates and Tigris rivers: Turkey, Iran, and Syria. The construction of dams and the interception of tributaries in Turkey and Iran have reduced water levels in Iraq, seriously straining relations between Iraq and its upstream neighbors. Due to their political nature, these transboundary water disputes have captured considerable attention in academic literature and made the headlines in several news outlets.¹² The question of transboundary water management and related sharing arrangements revolves around one main problem: namely, the quantity of water available in Iraq. However, Iraq's water-related issues extend beyond the amount of water flowing from the Euphrates and Tigris rivers; Effective water management within Iraq's borders is also a critical facet for developing sustainable solutions. Cheap water tariffs, gaps in awareness, and damaged infrastructure from consecutive wars have all contributed to very high per capita consumption of water in Iraq (392L/per capita/

per day, as opposed to 200L international average).¹³ As explained, the low water levels do not only lead to a lack of water in terms of volume but also contribute to the critical issues Iraq faces regarding water quality. The main factors influencing water quality are salinity due to changes in water flows and decreasing water quantity and pollution due to wastewater discharge. Finally, Iraq is also struggling with access to water services. Water supply coverage in urban areas is about 73%, while in some rural areas it might be as low as 40–45%.¹⁴

Iraq's eighteen provinces face disparate water challenges. Disputes over the fair allocation and use of water resources often transpire between provincial governments and their constituents. Recently, for example, Dhi Qar province accused its northern neighbor Wasit province of not sharing water equally, negatively impacting the livelihood of Dhi Qar's agriculture dependent population.¹⁵ This type of dispute over water is not uncommon, with various reports suggesting that in some cases the protection of water resources may even result in deadly conflict.¹⁶ However, an assessment of the complex interplay between water issues in Iraq and their potential to ignite conflict within and across Iraq's provinces remain underdeveloped. Indeed, water-related challenges at the interprovincial level in Iraq have long been overshadowed by transboundary water disputes in the region. This may be because interprovincial water challenges are highly complex, less visible, and more technical in nature.

10. Over a period of months, tens of thousands of protesters took to the streets across several provinces in Iraq. Since the start of the conflict over 600 have been killed and thousands more injured, according to human rights organizations. These protests are arguably the largest grassroots socio-political movement in Iraqi history. Armed Conflict Location & Event Data Project (ACLED), "Iraq's October Revolution"; Alaaldin, "The Irresistible Resiliency of Iraq's Protesters"; Amnesty International, "Horror Scenes in Iraq as Security Forces Resort to Lethal Force to Disperse Karbala Protests"; Amnesty International, "Iraq"; Voice of America, "Tens of Thousands of Iraqis Turn Out for Largest Day of Protests"; The Fund for Peace, "Iraq's Improving Trajectory."

11. Aboulenein and Levinson, "The Medical Crisis That's Aggravating Iraq's Unrest."

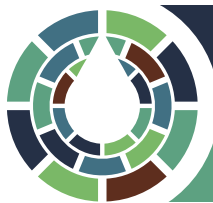
12. Al-Muqdad et al., "Dispute over Water Resource Management—Iraq and Turkey"; Al-Ansari et al., "Geopolitics of the Tigris and Euphrates Basins"; Forsythe, "Water and Politics in the Tigris–Euphrates Basin"; Adelphi, "Turkey, Syria and Iraq"; Kibaroglu and Scheumann, "Evolution of Transboundary Politics in the Euphrates-Tigris River System"; Kibaroglu and Ünver, "An Institutional Framework for Facilitating Cooperation in the Euphrates-Tigris River Basin."

13. Alwash, Istepanian, and Khatteeb, "Towards Sustainable Water Resources Management In Iraq."

14. Alwash, Istepanian, and Khatteeb.

15. Almada Paper, "Rainfall and Transgressions Herald a Season of Thirst and Drought"; Asharq Al-Awsat, "Conflict over Water Looms in Southern Iraq."

16. Global Witness, "Enemies of the State?," 8.



The Water Peace and Security (WPS) partnership aims to address this gap and capture the broad range of water-related challenges and conflicts present at the interprovincial level. To highlight the importance of examining water-related challenges and conflict potential at the interprovincial level, this paper provides a brief snapshot of the geographical, legal, economic, and socio-political factors that shape both the water reality across Iraq's provinces and how actors respond to this reality.

Assessing Interprovincial Tensions

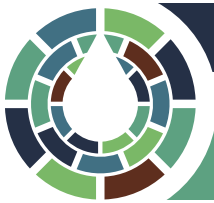
The relationship between water and stability is complex and highly dependent on context. It can be asserted, however, that geographical, legal, economic, and socio-political factors impact levels of water stress and the likelihood of water-related conflict in important and multi-directional ways. Geographical and legal factors influence the quantity and quality of available water. The quantity and quality of available water, in turn, has economic and socio-political implications and shape the wider context in which water-related conflicts develop. Lack of available water undermines local economies and livelihoods that may force populations to migrate, which can further cause or exacerbate tensions between population groups.¹⁷ Economic and socio-political factors also influence water use practices that, in turn, influence the quantity and quality of available water. These multi-directional links between geographical, legal, economic, socio-political factors and water are complex and important to understand water and conflict dynamics.

Geographical. Whether a province is located upstream or downstream within the basin plays a key role in determining the quantity of water it receives. Due to the Mediterranean, semi-arid climate in the north of the country, the Northern provinces receive higher amounts of annual rainfall (400mm/year) compared to the provinces located in the Southern desert zone (<200mm/year).¹⁸ The northern provinces also have early access to the Tigris River at the point where it flows into Iraq from Turkey.¹⁹ Although provinces in the north of Iraq may also be vulnerable to drought due to relatively lower levels of rainfall, the region overall has relatively higher water resources than the provinces in the south.²⁰ Changes in precipitation patterns may lead northern provinces to increase water storage capacity, however.²¹ Decisions to use large quantities of water would have implications for downstream provinces.

Legal. Water availability across Iraq's provinces is also affected by legal provisions that dictate how water should be managed and allocated. The 2017 Irrigation Law number 83 Article 3 establishes that the Ministry of Water Resources (MoWR) is responsible for setting, distributing, and supervising water quotas.²² However, these centrally determined water quotas are often breached by citizens or local businesses and may trigger disputes over water use between different actors, including between provincial governments.²³ The MoWR has taken some steps to address breaches of water quotas. So far, these steps have had a limited, but positive effect on resolving internal water disputes.

17. Jonathan Burden, "Water Shortage and Unrest in Iraq", Global Risk Insights, 24 November 2019
18. Oxfam, "The Case for Improved Water Resource Management in Kirkuk Governorate, Iraq."
19. Dockx, "Sub-National Water Disputes," 17; Ministry of Planning Kurdistan Regional Government, "Kurdistan Region of Iraq 2020," 21.
20. Ministry of Planning Kurdistan Regional Government, "Kurdistan Region of Iraq 2020," 21; Ministry of Foreign Affairs, "Climate Change Profile Iraq," 7; Yenigun and Ibrahim, "Investigation of Drought in the Northern Iraq Region," 492; Al-Hedny and Muhaimeed, "Drought Monitoring for Northern Part of Iraq Using Temporal NDVI and Rain-fall Indices," 301.

21. Guui, "When Canals Run Dry, Displacement Triggered by Water Stress in the South of Iraq," 12; Al-Hasani, "Trend Analysis and Abrupt Change Detection of Streamflow Variations in the Lower Tigris River Basin, Iraq," 1; Othman et al., "GIS-Based Modeling for Selection of Dam Sites in the Kurdistan Region, Iraq," 2.
22. Food and Agriculture Organization of the United Nations, "Iraq Irrigation Law No.83 of 2017"; Al-Husseini, "The Necessary Steps for the Visual Citizen to Obtain His Water Right"; Iraqi Council of Representatives, "Irrigation Law"; Iraqi Council of Representatives, "Irrigation Law Nr. (6) of 1962."
23. Iraqi News Agency, "The Ministry of Water Resources reveals its procedures to reduce transgressions of water quotas."



There are several instances where breaches of the water quota resulted in direct conflict between provinces. For example, on 24 November 2017, the council of Missan province announced that it would file a lawsuit against its neighboring provinces, Wasit and Dhi Qar, for disregarding Missan's allocated water share, causing material damage and harming citizens.²⁴ Similarly, in July 2018 the governor of Muthanna and accompanying local security forces unlawfully entered Qadisiyah to remove the structures that had reduced the flow of water to Muthanna province.²⁵ Additionally, the province of Dhi Qar accused its northern neighbor Wasit of breaching water shares, resulting in shortage of water in Dhi Qar that negatively impacts the income and well-being of Dhi Qar's agriculture-dependent population.²⁶ The province of Wasit denies these accusations.²⁷ In yet another incidence, the province of Basra demanded the province of Missan address the issue of illegal fish farms that tap into the river system and curb the level of river flow that reaches Basra.²⁸ The MoWR has stated it would take steps to solve these interprovincial disputes by enhancing law enforcement and holding provinces involved accountable for any breaches.²⁹

Economic. Decreased water availability has a huge impact on Iraq's economy and undermines the livelihood of local populations. Iraq's economy is dependent on its oil and agricultural sectors, which both require substantial quantities of water.³⁰ Low levels of available water create

heightened tensions and competition over water between water users.

Oil production requires substantial amounts of water for injection and for cooling during the drilling process.³¹ The oil-rich provinces in Iraq hence require large quantities of water to sustain these practices and ensure the continued production of oil that fuels Iraq's economy.³² The south of Iraq is the most oil-rich region, holding 88% of the country's oil reserves (including the supergiant Majnoon) but oil is also of vital economic importance for the northern region.³³ The discharge of industrial wastewater (particularly from the oil industry), alongside sewage and agricultural drainage into water streams forces residents in the southern provinces to purchase water for drinking and cooking.³⁴ While the oil industry contributes to water pollution, water quantity and quality also affect the energy (oil) sector. In 2018, operations had to be discontinued at the country's largest oil refineries, because salinity of the water was four-times higher than operable limits.³⁵

Water is also essential to sustain the agricultural practices that are the main source of income for many citizens across Iraq's provinces. Increases in the salinity of freshwater have made it unfit to sustain agriculture (crops) and livestock, making it harder for people to secure their income.³⁶ Lower water levels in rivers and Iraq's geographical proximity to the Persian Gulf allow for seawater to encroach upon the Shat Al-Arab river.

24. The Voice of Iraq, "The water crisis in Iraq is the result of internal mismanagement and a Turkish desire to dominate the region"

25. Dockx, "Local-Level Water Related Issues."

26. Wattan News Agency, "A Struggle for Water in Southern Iraqi Provinces."

27. Alforat News, "Wasit Renewed Its Denials of Abuse of Water Quotas for Governorates."

28. Due to water decrease coming from the Tigris and Euphrates (as well as the Karun and Karkheh rivers) since 2007 Basra faces the perpetual threat of increasing saline water from the Shatt al-Arab. The increased salinity causes great concern because salt water is not suitable to maintain agriculture and livestock. Khalil, "Transnational fish lakes in Iraq exacerbate the water crisis"; Human Rights Watch, "Basra Is Thirsty: Iraq's Failure to Manage the Water Crisis"; Abdullah, *Modelling Approaches to Understand Salinity Variations in a Highly Dynamic Tidal River*.

29. Iraqi News Agency, "The Ministry of Water Resources reveals its procedures to reduce transgressions of water quotas"; Embassy of

the Republic of Iraq in The Hague, "The opening of the intensive training course for the Ministry of Water Resources employees entitled 'Tools and approaches for strategic planning for the management of water resources in Iraq.'"; Asharq Al-Awsat, "Conflict over Water Looms in Southern Iraq," 30.

30. Alkhalisi, "Iraq's Oil Boom Could Be Derailed by a Lack of Water."

31. Mehdi, "Compounding Crises: Iraq's Oil and Energy Economy."

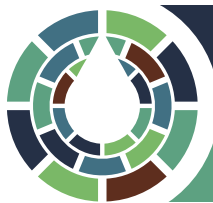
32. Index Mundi, "Iraq Economy Profile 2019."

33. Al-Furaiji et al., "Evaluation of Water Demand and Supply in the South of Iraq," 214; Hoffmann, "Wetlands International Welcomes Better International Cooperation in the Mesopotamian Marshes."

34. Human Rights Watch, "Basra Is Thirsty: Iraq's Failure to Manage the Water Crisis"; von Lossow, "More than Infrastructures: Water Challenges in Iraq."

35. International Energy Agency, "Iraq's Energy Sector: A Roadmap to a Brighter Future," 14.

36. International Energy Agency, 14.



Evaporation and changes to water flows (particularly water returning from the Tharthar reservoir to the river system) further contribute to salt contamination in both rivers.³⁷ During the peak of the crisis in 2018, salinity in the Shatt Al-Arab reached TDS levels of 22,000 ppm, about 22 times the amount of what the World Health Organisation deems acceptable for drinking.³⁸ The salinity of irrigation water deposits salt in the soil, inflicting long-term effects on the sustainability of farmlands for future use.³⁹ Farmers in the southern provinces have already reported the death of their cattle and water buffaloes due to the poor water quality. Due to its geographical location, southern Iraq is more prone to increases in water salinity, putting extra pressure on the water situation in this region, compared to the rest of the country. Dhi Qar province has particularly high levels of water salinity that is detrimental for its agricultural sector as many crops have low salt tolerance.⁴⁰

To secure income and continue the operation of water-intensive agricultural practices, farmers and businesses may illegally tap into freshwater canals.⁴¹ In several provinces, illegal fish farmers may transgress water shares to secure their income and the operation of illegal fish farms.⁴² These farms require large quantities of freshwater and may bypass official irrigation canals.⁴³ In the northern province of Kirkuk, for example, there

are a total of 41 fishing ponds that have official authorization.⁴⁴ Although since 1987 the government has not authorized any new ponds to be built due to water shortage, today there are over four hundred illegal fishing ponds in Kirkuk. These violate Kirkuk's water plans and have not been authorized by the Ministry of Agriculture.⁴⁵ Similar problems have occurred in the province of Babil, where local authorities have been criticized for being complicit with owners of the fish farms.⁴⁶ These practices may leave less water available for public treatment plants tasked with the removal of contaminants from municipal wastewater, that already face serious water shortages.⁴⁷ In some provinces, public water services are only available during certain hours of the day. This may push households to illegally tap into the piping infrastructure, further exacerbating uncontrolled water extraction in these provinces.⁴⁸

Socio-political. Competition over scarce water resources may incite or exacerbate existing ethno-religious tensions between Iraq's provinces. The south of the country is mainly inhabited by Shia Arabs; the central areas are predominantly Sunni, and a Kurdish minority lives in the north of Iraq.⁴⁹ Politics in Iraq is often sectarian and distrust between communities from different ethnic and religious groups tends to be high.⁵⁰ These existing tensions can easily mix with competing claims of provinces over scarce resources,

37. International Organization for Migration and Deltares, "Water Quantity and Water Quality in Central and South Iraq: A Preliminary Assessment in the Context of Displacement," 13; Kamel, Sulaiman, and Mustafa, "Study of the Effects of Water Level Depression in Euphrates River on the Water Quality," 244; Rahi and Halihan, "Changes in the Salinity of the Euphrates River System in Iraq," 31; Adamo, Al-Ansari, and Sissakian, "How Dams Can Affect Freshwater Issues in the Euphrates-Tigris Basins," 34; Al-Ansari et al., "Water Quality and Its Environmental Implications within Tigris and Euphrates Rivers," 57.

38. Total dissolved solids (TDS) describes the amount of inorganic salts and small amounts of organic matter present in water. It is measured by evaporating the water and weighting the remaining salt. Human Rights Watch, "Basra Is Thirsty: Iraq's Failure to Manage the Water Crisis"; Organisation mondiale de la santé et al., *Guidelines for Drinking-Water Quality*.

39. Human Rights Watch, "Basra Is Thirsty: Iraq's Failure to Manage the Water Crisis," 26.

40. International Organization for Migration and Deltares, "Water Quantity and Water Quality in Central and South Iraq: A Preliminary Assessment in the Context of Displacement," 4.

41. Human Rights Watch, "Basra Is Thirsty: Iraq's Failure to Manage the Water Crisis"; Al-Furaiji et al., "Evaluation of Water Demand and

Supply in the South of Iraq"; Ewaid, Abed, and Al-Ansari, "Water Footprint of Wheat in Iraq"; Food and Agriculture Organization of the United Nations, "AQUASTAT Database"; Ewaid, Abed, and Al-Ansari, "Crop Water Requirements and Irrigation Schedules for Some Major Crops in Southern Iraq."

42. Khalil, "Overriding Fish Lakes in Iraq Exacerbate the Water Crisis."

43. Khalil, "Transnational fish lakes in Iraq exacerbate the water crisis"; Al-basaernewspaper, "Transcendent Fish Lakes in Iraq Constitute a Quarter of the Wasted Water."

44. Khalil, "Overriding Fish Lakes in Iraq Exacerbate the Water Crisis."

45. Khalil, "Transnational fish lakes in Iraq exacerbate the water crisis"; Food and Agriculture Organization of the United Nations, "Expert Meeting on the Review of Fisheries and Aquaduct Activities in the Euphrates-Tigris Basin," 111.

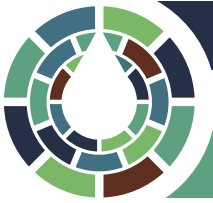
46. Khalil, "Transnational fish lakes in Iraq exacerbate the water crisis."

47. Cooke, Lahn, and Mansour, "Same Old Politics Will Not Solve Iraq Water Crisis."

48. Human Rights Watch, "Basra Is Thirsty: Iraq's Failure to Manage the Water Crisis."

49. Dockx, "Local-Level Water Related Issues."

50. Council on Foreign Relations, "Modern Sunni-Shia Tensions: 1979 – 2017."



such as water, making water-related issues in Iraq particularly contentious. For instance, recent water-related disputes between armed Huraish and Marian tribes in the Missan province resulted in the death of at least twenty-five people.⁵¹ Such conflicts erupt because actors on either side divert the flow of the river to obtain water, thereby preventing it from reaching other farms further downstream. Similarly, conflict flared up between tribes of the Muthanna and Diwaniyah provinces over water to the extent that local authorities demanded the central government intervene to prevent further escalation.⁵²

In comparison to the rest of Iraq, the upstream northern provinces receive abundant rainfall and natural groundwater recharge.⁵³ The abundant levels of water are crucial to sustaining the oil industry on which Iraq's economy relies heavily, and also impacts its economic development more broadly.⁵⁴ In theory, the northern provinces can use their advantageous geographical location and access to water as a point of leverage in political negotiations with the more water-scarce southern provinces.⁵⁵ This could lead to tensions between the Kurdish population that tends to live in water-rich provinces in the north and other ethnic populations that live in more water-scarce regions throughout Iraq.⁵⁶ While most inter-provincial disputes are solved peacefully through mediation by the federal government or lawsuits, some may erupt in violence between local actors (e.g. if the process is stalled or outcomes do not satisfy those involved or concerned by them).⁵⁷ The overall fragile governance system in Iraq and the high level of distrust in society limits the opportunity for effective conflict resolution,

making conflict more likely. Research shows that it is typically not water-related change that leads to conflict but the inability of governance systems to adapt and deal with such change.⁵⁸ Interprovincial disputes between southern and northern provinces have already shown signs of straining the cohesion of Iraqi society and provoking sectarian and ethnic conflict between provinces.⁵⁹ Provincial governments or populations that seek to secure water for themselves at the cost of water availability in other provinces may further exacerbate drivers of conflict.

Relations between provinces and their populations are strained further by displacement resulting from increasing water stress.⁶⁰ The International Organization for Migration (IOM) ranks drought and water pollution among the key drivers of displacement.⁶¹ In July 2019, IOM identified 21,314 internally displaced persons (IDPs) from the southern and central provinces who were displaced due to the lack of clean water either because of high salinity content and/or water-borne disease outbreaks.⁶² Displacement in Iraq includes populations moving from the south to the north and vice versa, from rural to urban areas, and to different locations within both rural and urban areas. These forms of displacement put substantial pressure on Iraq's cities, which are already challenged by rapid population growth.⁶³ Tensions between farmers and citizens in host cities due to class divides are also evident.⁶⁴ Existing tensions tied directly or indirectly to provincial identities may be exacerbated when citizens in these cities are already struggling to maintain their own livelihoods.⁶⁵

51. "Killing and Wounding of 25 People in a Tribal Armed Conflict in the City of Amara."

52. Al-Hurra, *Clashes break out between the Diwaniyah and Samawah clans in Iraq due to the water crisis*.

53. von Lossow, "More than Infrastructures: Water Challenges in Iraq," 5.

54. Abdulrahman, "Water Shortage in GCC Countries"; Dixit and Rzggar, "Diversification of Economy—an Insight into Economic Development with Special Reference to Kurdistan's Oil Economy and Agriculture Economy," 395; Ministry of Planning Kurdistan Regional Government, "Kurdistan Region of Iraq 2020," 21.

55. Dockx, "Sub-National Water Disputes"; Karasik and Spezia Depretto, "Climate Change Is Exacerbating Iraq's Complicated Water Politics"; Salem, "Iraq's Tangled Foreign Interests and Relations."

56. DuBois King, "Hydropolitical Trends and the Future of Iraqi Kurdistan."

57. Al-Houdoud, "In Dhi Qar Water Escapes from Irrigation Networks Do Not Meet the Need of Farmers."

58. Sasse, "Watercrisis - Oorzaak van Conflict of Bijdrage Aan Stabiliteit."

59. Lovelle, "The Natural and Artificial Causes of the Drought in Southern Iraq"; BBC, *Iraq Water Crisis* 2, 2.

60. Human Rights Watch, "Basra Is Thirsty: Iraq's Failure to Manage the Water Crisis," 19; Trew, "Iraq Water Shortages Could Force Four Million People to Flee Their Homes."

61. United Nations High Commissioner for Refugees, "Climate Change and Displacement."

62. International Organization for Migration and Deltares, "Water Quantity and Water Quality in Central and South Iraq: A Preliminary Assessment in the Context of Displacement," 6.

63. Guiu, "When Canals Run Dry, Displacement Triggered by Water Stress in the South of Iraq."

64. International Organisation for Migration, "Rural Areas in Ninewa – Legacies of Conflict on Rural Economies and Communities in Sinjar and Ninewa Plains."

65. Iraqi citizen (anonymous), Interview with Iraqi citizen on water and conflict in Iraq, interview by Dorith Kool, Skype, May 10, 2020.

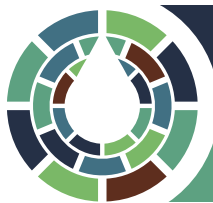
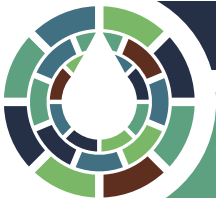


Figure 1: Map of provinces in Iraq. Source: HCSS

Integrating Multiple Levels of Analysis

Geographical, legal, economic, and socio-political factors impact water availability and security in Iraq and may create conditions for conflict at the interprovincial level. These factors impact water access from different angles and interact in complex and important ways. For instance, while water-related displacement may affect people at the most granular household level, the resultant vulnerabilities and grievances may in turn influence water politics and exacerbate tensions at the interprovincial level. The link between water and conflict is not straightforward, and ultimately culminates in the combined impact of multiple factors that warrant further analysis. For Iraq in particular, sufficient and usable water resources are indispensable for peace and development and a shortage of water

presents a precursor for conflict. The issues outlined in this working paper demonstrate that water challenges in Iraq have an interprovincial dimension that has received relatively little attention at national and international level. The quality and quantity of water in Iraq have steadily worsened to the extent that it is now undermining water security and stability and requires deeper assessment. The complexity of these challenges may lead to decision-making by provincial governments, businesses, and populations in Iraq that further undermines the quality and quantity of water in potentially destabilizing ways. This destabilization manifests at multiple levels: between provinces, between local populations and their provincial administrations, and between national actors and the provinces. For example, discord



between provinces occurs when the allocation, management, and use of water in one province reduces the quality and quantity of water available in other provinces. While some stakeholders may limit their water usage to designated quotas and support equal distribution among stakeholders, others may transgress these limits and reduce the levels of water available for other stakeholders. This may lead to different forms of conflict within and between provinces. Analysis of the relations between water and conflict at the interprovincial level, including the linkages between the provinces and local and national stakeholders is therefore an important step to address water security and stability in Iraq more holistically. The interprovincial approach considers stakeholders at all levels of Iraqi society that contribute to water security or undermine it. In doing so, it provides an integrated perspective of the possible domestic drivers of water-related conflict that in turn offer opportunities for building a more water secure and resilient Iraq.

Building Blocks to Stability

To effectively address water-related conflict in Iraq, it is critical to identify and understand the water challenges at the provincial level and to use this information to foster dialogue between stakeholders, which in turn will further inform understanding and analysis. This process must support national and regional efforts at building more informed and conflict-sensitive solutions. The Water Peace and Security partnership has developed an integrated approach over the last two years to address risk of water related conflict. This consists of three building blocks that can be adjusted and applied to the context of Iraq.

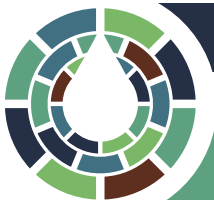
1. **Identify and understand interprovincial water challenges, how these challenges impact conflict dynamics and what conflict resolution mechanisms exist to address the issues.**
2. **Raise awareness and encourage dialogue that addresses the interplay between water and conflict.**
3. **Support activities to prevent and/or mitigate conflict risk**

1. Identify and understand interprovincial water challenges

Interprovincial water challenges in Iraq pose a risk to livelihoods, energy security, and food production. To reduce the risk of water-related security threats, these issues need to be understood by key stakeholders at the local, provincial, and national level, including government actors, civil society, private sector actors, and non-government organisations. Innovative early warning tools currently being developed by the Water Peace Security (WPS) partnership that utilize big data and remote sensing can support the identification of specific hotspot areas of risk.⁶⁶ More granular assessments can also be made that assess the impact of hydrological, social, economic, and political factors on local and regional communities. These tools use a wide range of quantitative water-related variables that can be configured into simple dashboards to help stakeholders identify changes in water availability and potential conflict hotspots. These dashboards can generate impartial information to fill knowledge gaps and also help identify issues that are not well understood and warrant further analysis and attention. The ability to continually feed information into these early warning tools ensures that it provides up-to-date analysis that accurately reflects the evolving nature of water challenges. The complex and non-linear pathways between water and conflict make it critical to assess and understand the impact of several factors and their inter-dependencies. The combined use of machine learning tools and wider knowledge platforms enables an integrated and holistic understanding of the impact of water on conflict dynamics and how they can be changed into conflict resolution opportunities.

Information tools and services that enhance understanding of water-related risks also function as an effective and non-partisan communication tool to raise awareness and

66. Water, Peace and Security Partnership, "The Growing Water Crisis Increasingly Poses a Threat To: Ecosystems, Livelihoods, and Security."



encourage constructive dialogue between stakeholders. Developing a shared understanding of the risks and providing incentives to cooperate are a first step to enable key stakeholders to define joint actions to prevent and/or mitigate security risks and related vulnerabilities.

2. Raise Awareness and Encourage Dialogue

A better and more informed understanding of water-related security risks also creates an enabling environment for raising awareness and engaging in wider dialogue processes. Water issues require multiple stakeholders who may not necessarily work together naturally to take appropriate action. Creating water-focused partnerships depends on strengthening collaboration and trust across different socio-economic and political layers. This can be done through building platforms and supporting dialogue fora where stakeholders from across society and sectors can openly and jointly address water challenges. Mediation may be required in a context of escalated conflict and elevated levels of distrust. This, however, can only be done by mediators that are neutral and trusted by all sides of a conflict and that understand their own role as mediator. Evidence-based information can encourage more neutral and constructive dialogue where exchanges of interests and trade-offs can be negotiated, and alternative actions can be explored that move beyond current 'fixed' positions. Scenario planning through modeling and serious games can further encourage groups to generate agreeable and actionable options. Presentations and informal group discussions between stakeholders can further encourage stakeholders to share their perspectives on specific water challenges and listen to others' perspectives. While raising awareness supports dialogue, dialogue between stakeholders also strengthens awareness of respective water challenges and help resolve tensions that may heighten the likelihood of conflict.

Easily accessible knowledge platforms, joint analysis, and mutual understanding pave the way for better cooperation and willingness to engage in activities to prevent and mitigate

conflict risk that in turn deepen mutual understanding and constructive relations. Often the best way to establish positive relations between stakeholders and improve water management is to undertake activities together.

3. Support activities to prevent/mitigate conflict risk:

To have a real impact, knowledge and understanding of water issues need to be turned into action. Knowledge can support action by directing efforts to fill existing gaps and harnessing support for existing and effective initiatives and practices that address these gaps.

Stakeholders equipped with knowledge (e.g. through information dashboards, analysis, scenario planning) can share expertise at the individual and community level to train others to develop the skills and capacities necessary to address water challenges. These train-the-trainer activities ensure that knowledge is passed on between stakeholders and to future generations, thus making efforts more sustainable in the long-term term. This allows trainers to act as water ambassadors that direct and shape activities on the ground at the local, community, and national level. Trainers can train community leaders, staff at local NGOs and key civil society actors responsible for preparing and implementing water-resilience building activities. The Ministry of Water Resources also has an important leadership role in bringing together trainers, organizations, and the wider community and implementing their perspectives in policy, planning, and on the ground activities. The MoWR can support the organization of workshops and serious games that bring stakeholders together in an informal and enjoyable setting. As stakeholders may not regularly engage or may have distrustful relations, informal activities that encourage positive interaction and resolve tensions may be an important first step. Addressing existing tensions at an early stage helps alleviate uncertainties and gives stakeholders time to assess initiatives and the value of investing their time, effort, and resources. It can also help prevent tensions from arising at later stages. As interactions become stronger,

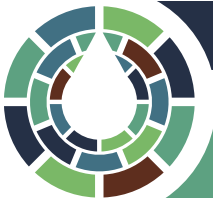


initial pilot activities can commence. These initial activities should focus on technical issues such as salination levels and pollution levels as it is often easier to find agreeable solutions between stakeholders on these issues. Small-scale activities allow stakeholders to become more comfortable with working together and creates a sense of ownership by demonstrating that jointly finding equitable solutions is in everyone's interest. Creating approachable and open-access platforms where stakeholders can share success stories can be an effective way to build on initial successes to gain support from the wider community. Successful pilot activities subsequently encourage stakeholders to engage more frequently in other activities that are more complex and require longer-term commitment. Water-related issues often involve social and ethnic disputes and finding equitable solutions may require changing perspectives or making trade-offs.

This multi-step approach is time demanding. It is also more likely to bring long-term impact however because it encourages confidence building and conflict resolution between stakeholders. It gives stakeholders time to learn through experience that positive changes can be achieved through working together. Often, a 'show, don't tell' approach is the most effective and durable way to encourage communities to work together in complex environments where water challenges are intricately tied to socio-economic and political dynamics. At a global level, stronger analysis through improved information tools also enables the global 4D community (diplomacy, defense, development, disaster-response experts) to design activities that address local needs and concerns. It also encourages authorities, donors, and other investors to provide necessary financial resources to invest in high risk regions.

REFERENCES

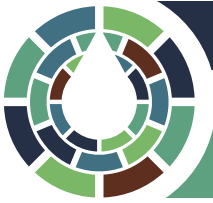
- Abdullah, Ali Dinar. *Modelling Approaches to Understand Salinity Variations in a Highly Dynamic Tidal River: The Case of the Shatt al-Arab River*. 1st ed. CRC Press, 2017. <https://doi.org/10.1201/9781315115948>.
- Abdulrahman, Salam Abdulqadir. "Water Shortage in GCC Countries: Transferring Water from Iraqi Kurdistan Region." *International Journal of Environmental Studies* 77, no. 2 (2020): 191–207. <https://doi.org/10.1080/00207233.2019.1690335>.
- Aboulenein, Ahmed, and Reade Levinson. "The Medical Crisis That's Aggravating Iraq's Unrest." *Reuters*, March 2020. <https://www.reuters.com/investigates/special-report/iraq-health/>.
- Adamo, Nasrat, Nadhir Al-Ansari, and Varoujan Sissakian. "How Dams Can Affect Freshwater Issues in the Euphrates-Tigris Basins." *Journal of Earth Sciences and Geotechnical Engineering* 10, no. 1 (2020): 15–48.
- Adelphi. "Turkey, Syria and Iraq: Conflict over the Euphrates-Tigris." ECC Library, March 19, 2015. <https://library.ecc-platform.org/conflicts/turkey-syria-and-iraq-conflict-over-euphrates-tigris>.
- Alaaldin, Ranj. "The Irresistible Resiliency of Iraq's Protesters." *Brookings* (blog), January 31, 2020. <https://www.brookings.edu/blog/order-from-chaos/2020/01/31/the-irresistible-resiliency-of-iraqs-protesters/>.
- Al-Ansari, Nadhir, Nasrat Adamo, Sven Knutsson, and Jan Laue. "Geopolitics of the Tigris and Euphrates Basins." *Journal of Earth Sciences and Geotechnical Engineering* 8, no. 3 (2018): 187–222.
- Al-Ansari, Nadhir, Sadeq Jawad, Nasrat Adamo, and Varoujan Sissakian. "Water Quality and Its Environmental Implications within Tigris and Euphrates Rivers." *Journal of Earth Sciences and Geotechnical Engineering* 9, no. 4 (2019): 57–108.
- Al-basaernewspaper. "Transcendent Fish Lakes in Iraq Constitute a Quarter of the Wasted Water." *Al-basaernews-paper*, September 30, 2018. <https://albasaernewspaper.com/news/iraq-news/40341>.
- Alforat News. "Wasit Renewed Its Denials of Abuse of Water Quotas for Governorates." *Alforat.info*, November 18, 2017. <http://www.alforat.info/index.php?page=article&id=52525>.
- Al-Furaiji, Mustafa, Usama F. A. Karim, Dionysius C. M. Augustijn, Basma Waisi, and Suzanne J. M. H. Hulscher. "Evaluation of Water Demand and Supply in the South of Iraq." *Journal of Water Reuse and Desalination* 6, no. 1 (2016): 214–26. <https://doi.org/10.2166/wrd.2015.043>.



- Al-Hasani, Alaa AJ. "Trend Analysis and Abrupt Change Detection of Streamflow Variations in the Lower Tigris River Basin, Iraq." *International Journal of River Basin Management*, 2020, 1–12. <https://doi.org/10.1080/15715124.2020.1723603>.
- Al-Hedny, Suhad M., and Ahmad S. Muhaimed. "Drought Monitoring for Northern Part of Iraq Using Temporal NDVI and Rainfall Indices." In *Environmental Remote Sensing and GIS in Iraq*, 301–331. Cham, Switzerland: Springer, 2020.
- Al-Houdoud, Murtada. "In Dhi Qar Water Escapes from Irrigation Networks Do Not Meet the Need of Farmers." *Niqash*, November 19, 2019. <http://www.niqash.org/ar/articles/economy/6022/>.
- Al-Hurra. *Clashes break out between the Diwanayah and Samawah clans in Iraq due to the water crisis*. YouTube. Iraq: Al-Hurra, 2014. <https://www.youtube.com/watch?v=fEvKwXGt850>.
- Al-Husseini, Alaa Ibrahim Mahmoud. "The Necessary Steps for the Visual Citizen to Obtain His Water Right." *Annabaa.org*, January 9, 2018. <https://annabaa.org/arabic/rights/16412>.
- Alkhalisi, Zahraa. "Iraq's Oil Boom Could Be Derailed by a Lack of Water." *CNN*, 2019. <https://www.cnn.com/2019/04/25/business/iraq-oil-water-shortage/index.html>.
- Almada Paper. "Rainfall and Transgressions Herald a Season of Thirst and Drought." *Almada Paper*, December 18, 2017. <https://almadapaper.net/view.php?cat=177706>.
- Al-Muqdadi, Sameh W., Mohammed F. Omer, Rudy Abo, and Alice Naghshineh. "Dispute over Water Resource Management—Iraq and Turkey." *Journal of Environmental Protection* 7, no. 8 (2016): 1096–1103.
- Alwash, Azzam, Harry Istepanian, and Al Luay Khatteeb. "Towards Sustainable Water Resources Management In Iraq." London: Iraq Energy Institute, August 30, 2018. https://www.researchgate.net/publication/328345505_TOWARDS_SUSTAINABLE_WATER_RESOURCES_MANAGEMENT_IN_IRAQ.
- Amnesty International. "Horrific Scenes in Iraq as Security Forces Resort to Lethal Force to Disperse Karbala Protests." Amnesty International, October 29, 2019. <https://www.amnesty.org/en/latest/news/2019/10/iraq-horrific-scenes-as-security-forces-resort-to-lethal-force-to-disperse-karbala-protests/>.
- . "Iraq: Authorities Must Immediately Rein in Security Forces." Amnesty International, October 3, 2019. <https://www.amnesty.org/en/latest/news/2019/10/iraq-authorities-must-immediately-rein-in-security-forces-and-protect-freedoms-of-assembly-and-expression/>.
- Armed Conflict Location & Event Data Project (ACLED). "Iraq's October Revolution: Six Months On." ACLED, April 10, 2020. <https://acleddata.com/2020/04/10/iraqs-october-revolution-six-months-on/>.
- Asharq Al-Awsat. "Conflict over Water Looms in Southern Iraq." *Asharq Al-Awsat*, August 28, 2018. <https://aawsat.com/english/home/article/1376031/conflict-over-water-looms-southern-iraq>.
- BBC. *Iraq Water Crisis* 2, 2018. <https://www.youtube.com/watch?v=XWdYyLa94tw&feature=youtu.be>.
- Cooke, Georgia, Glada Lahn, and Renad Mansour. "Same Old Politics Will Not Solve Iraq Water Crisis." Chatham House, April 15, 2020. <https://www.chathamhouse.org/expert/comment/same-old-politics-will-not-solve-iraq-water-crisis>.
- Council on Foreign Relations. "Modern Sunni-Shia Tensions: 1979 – 2017." Council on Foreign Relations, 2017. <https://www.cfr.org/timeline/modern-sunni-shia-tensions>.
- Dixit, Pankaj, and Ramyr Rzgar. "Diversification of Economy—an Insight into Economic Development with Special Reference to Kurdistan's Oil Economy and Agriculture Economy." *Russian Journal of Agricultural and Socio-Economic Sciences* 85, no. 1 (2019). <https://doi.org/10.18551/rjoas.2019-01.48>.
- Dockx, Pieter-Jan. "Local-Level Water Related Issues." *Water Scarcity in Iraq: From Inter-Tribal Conflict to International Disputes*. New Delhi: Institute of Peace and Conflict Studies, 2019. <https://doi.org/10.2307/resrep19601.6>.
- . "Sub-National Water Disputes," *Water Scarcity in Iraq: From Inter-Tribal Conflict to International Disputes*, 2019, 17–21. <https://doi.org/10.2307/resrep19601.7>.
- DuBois King, Marcus. "Hydropolitical Trends and the Future of Iraqi Kurdistan." *Pacific Council on International Policy*, May 2, 2018. <https://www.pacificcouncil.org/newsroom/hydropolitical-trends-and-future-iraqi-kurdistan>.
- Embassy of the Republic of Iraq in The Hague. "The opening of the intensive training course for the Ministry of Water Resources employees entitled 'Tools and approaches for strategic planning for the management of water resources in Iraq.'" Embassy of the Republic of Iraq in The Hague, October 2, 2019. <https://www.mofa.gov.iq/hague/افثكلملا-ةيبب ردتلا-ةرودلا-لامع-احاتتاف/>.
- Ewaid, Salam Hussein, Salwan Ali Abed, and Nadhir Al-Ansari. "Crop Water Requirements and Irrigation Schedules for Some Major Crops in Southern Iraq." *Water* 11, no. 4 (2019): 756. <https://doi.org/10.3390/w11040756>.
- . "Water Footprint of Wheat in Iraq." *Water* 11, no. 3 (2019): 535. <https://doi.org/10.3390/w11030535>.
- Food and Agriculture Organization of the United Nations. "AQUASTAT Database." *Aquastat*. Accessed July 29, 2020. <http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en>.
- . "Expert Meeting on the Review of Fisheries and Aquaduct Activities in the Euphrates-Tigris Basin." Erbil, Iraq: Food and Agriculture Organization of the United Nations, November 2012. <http://www.fao.org/3/a-i4217e.pdf>.



- . "Iraq Irrigation Law No.83 of 2017." Database. Food and Agriculture Organization of the United Nations, December 20, 2017. <http://www.fao.org/faolex/results/details/en/c/LEX-FAOC100214/>.
- Forsythe, David P. "Water and Politics in the Tigris–Euphrates Basin: Hope for Negative Learning?" *Water Security in the Middle East*, 2017, 167.
- Global Witness. "Enemies of the State?" London, United Kingdom: Global Witness, July 2019. <https://www.globalwitness.org/en/campaigns/environmental-activists/enemies-state/>.
- Guin, Roger. "When Canals Run Dry, Displacement Triggered by Water Stress in the South of Iraq." No Matter of Choice: Displacement in a Changing Climate. Erbil: Social Inquiry, 2020.
- Hoffmann, Frank. "Wetlands International Welcomes Better International Cooperation in the Mesopotamian Marshes." Wetlands International, 2018. <https://www.wetlands.org/news/wetlands-international-welcomes-better-international-cooperation-mesopotamian-marshes/>.
- Human Rights Watch. "Basra Is Thirsty: Iraq's Failure to Manage the Water Crisis." New York: Human Rights Watch, July 22, 2019. <https://www.hrw.org/report/2019/07/22/basra-thirsty/iraqs-failure-manage-water-crisis>.
- Index Mundi. "Iraq Economy Profile 2019." Index Mundi, 2019. https://www.indexmundi.com/iraq/economy_profile.html.
- International Energy Agency. "Iraq's Energy Sector: A Roadmap to a Brighter Future." Paris: OECD Publishing, 2019. <https://doi.org/10.1787/949e7e1e-en>.
- International Organisation for Migration. "Rural Areas in Ninewa – Legacies of Conflict on Rural Economies and Communities in Sinjar and Ninewa Plains." Baghdad: International Organization for Migration; USAID, 2019. <https://iraq.iom.int/publications/rural-areas-ninewa-legacies-conflict-rural-economies-and-communities-sinjar-and-ninewa>.
- International Organization for Migration, and Deltares. "Water Quantity and Water Quality in Central and South Iraq: A Preliminary Assessment in the Context of Displacement." Baghdad, Iraq: International Organization for Migration (IOM), 2020. <https://reliefweb.int/report/iraq/water-quantity-and-water-quality-central-and-south-iraq-preliminary-assessment-context>.
- Iraqi Council of Representatives. "Irrigation Law." Iraqi Council of Representatives, 2018. <http://extwprlegs1.fao.org/docs/pdf/irq100214a.pdf>.
- . "Irrigation Law Nr. (6) of 1962," 1962. <http://extwprlegs1.fao.org/docs/pdf/irq147232.pdf>.
- Iraqi News Agency. "The Ministry of Water Resources reveals its procedures to reduce transgressions of water quotas." *Iraqi News Agency*, December 19, 2019. <http://www.ina.iq/99251/> تازواجت-نم-دحلل-اهتاءارج-نع-فشكت-ةيئامل-دراوم ةيئامل-اصصحل.
- Kamel, Ammar Hatem, Sadeq Olewi Sulaiman, and Ayad Sulaiby Mustaffa. "Study of the Effects of Water Level Depression in Euphrates River on the Water Quality." *Journal of Civil Engineering and Architecture* 7, no. 2 (2013): 238.
- Karasik, Theodore, and Jacopo Spezia Depretto. "Climate Change Is Exacerbating Iraq's Complicated Water Politics." Fair Observer, August 6, 2019. <https://www.fairobserver.com/politics/iraq-climate-change-water-conflict-islamic-state-middle-east-news-61551/>.
- Khalil, Shatha. "Overriding Fish Lakes in Iraq Exacerbate the Water Crisis." Rawabet Center for Research and Strategic Studies, September 30, 2018. <https://rawabetcenter.com/en/?p=6602>.
- . "Transnational fish lakes in Iraq exacerbate the water crisis." Rawabet Center for Research and Strategic Studies, September 29, 2018. <https://rawabetcenter.com/archives/74648>.
- Kibaroglu, Aysegul, and Waltina Scheumann. "Evolution of Transboundary Politics in the Euphrates–Tigris River System: New Perspectives and Political Challenges." *Global Governance: A Review of Multilateralism and International Organizations* 19, no. 2 (2013): 279–305.
- Kibaroglu, Aysegul, and IH Olcay Ünver. "An Institutional Framework for Facilitating Cooperation in the Euphrates–Tigris River Basin." *International Negotiation* 5, no. 2 (2000): 311–330.
- Al-Rafidain.org. "Killing and Wounding of 25 People in a Tribal Armed Conflict in the City of Amara," October 20, 2019. <https://alrafidain.org/post/26830/> ةرامعلا-ةنديم-يف-حلسم-يئرئاشع-عازن-يف-اصخش-25-ةباصو-لقتم.
- Lovelle, Madeleine. "The Natural and Artificial Causes of the Drought in Southern Iraq." Future Directions International, May 9, 2018. <http://www.futuredirections.org.au/publication/natural-artificial-causes-drought-southern-iraq/>.
- Mehdi, Ahmed. "Compounding Crises: Iraq's Oil and Energy Economy." Oxford Energy Comment. Oxford: Oxford Institute for Energy Studies, July 2020. <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2020/07/Compounding-crises-Iraqs-oil-and-energy-economy.pdf>.
- Ministry of Foreign Affairs. "Climate Change Profile Iraq." The Hague, Netherlands: Ministry of Foreign Affairs, April 2018. <https://www.government.nl/binaries/government/documents/publications/2019/02/05/climate-change-profiles/Iraq.pdf>.



- Ministry of Planning Kurdistan Regional Government. "Kurdistan Region of Iraq 2020." Erbil, Kurdistan Region: Ministry of Planning Kurdistan Regional Government, 2020.
http://www.iraq-jccme.jp/pdf/archives/krq_2020_english.pdf.
- Organisation mondiale de la santé, World Health Organization, Anonimo, and World Health Organisation Staff. *Guidelines for Drinking-Water Quality*. 3rd ed. Vol. 1. Geneva: World Health Organization, 2004.
https://www.who.int/water_sanitation_health/dwq/GDWQ2004web.pdf?ua=1.
- Othman, Arsalan Ahmed, Ahmed F. Al-Maamar, Diary Ali Mohammed Amin Al-Manmi, Veraldo Liesenberg, Syed E. Hasan, Ahmed K. Obaid, and Ayad M. Fadhil Al-Quraishi. "GIS-Based Modeling for Selection of Dam Sites in the Kurdistan Region, Iraq." *ISPRS International Journal of Geo-Information* 9, no. 4 (2020): 244.
<https://doi.org/10.3390/ijgi9040244>.
- Oxfam. "The Case for Improved Water Resource Management in Kirkuk Governorate, Iraq." Oxfam, 2017.
<https://doi.org/10.21201/2017.9699>.
- Rahi, Khayyun A., and Todd Halihan. "Changes in the Salinity of the Euphrates River System in Iraq." *Regional Environmental Change* 10, no. 1 (2010): 27–35.
- Salem, Paul. "Iraq's Tangled Foreign Interests and Relations." Carnegie Middle East Center, December 24, 2013.
<https://carnegie-mec.org/2013/12/24/iraq-s-tangled-foreign-interests-and-relations-pub-54010>.
- Sasse, Rolien. "Watercrisis – Oorzaak van Conflict of Bijdrage Aan Stabiliteit." Netherlands Water Partnership, April 2017. https://www.netherlandswaterpartnership.com/sites/nwp_corp/files/2019-01/watercrisis_rapport_2017.pdf.
- Sulaiman, Khaled. Interprovincial Water Challenges Iraq. Interview by Dorith Kool. Skype, August 6, 2020.
- The Fund for Peace. "Iraq's Improving Trajectory." *Fragile States Index*, May 10, 2020.
<https://fragilestatesindex.org/2020/05/10/iraqs-improving-trajectory/>.
- The Voice of Iraq. "The Water Crisis in Iraq Is the Result of Internal Mismanagement and a Turkish Desire to Dominate the Region." *The Voice of Iraq*, November 24, 2017.
<https://www.sotaliraq.com/2017/11/25/س-ن-ع-ة-ج-ت-ان-ق-ار-ع-ل-ا-ي-ف-ه-ا-ي-م-ل-ا-ة-م-ز-أ-ن-و-ص-ت-خ-م/>
- Trew, Bel. "Iraq Water Shortages Could Force Four Million People to Flee Their Homes." *The Independent*, October 8, 2018. <https://www.independent.co.uk/news/world/middle-east/iraq-water-shortage-unesco-garden-of-eden-bible-four-million-people-homes-latest-a8574781.html>.
- United Nations High Commissioner for Refugees. "Climate Change and Displacement." United Nations High Commissioner for Refugees, October 15, 2019.
<https://www.unhcr.org/news/stories/2019/10/5da5e18c4/climate-change-and-displacement.html>.
- Voice of America. "Tens of Thousands of Iraqis Turn Out for Largest Day of Protests." VOA News, November 1, 2019.
<https://www.voanews.com/middle-east/tens-thousands-iraqis-turn-out-largest-day-protests>.
- Von Lossow, Tobias. "More than Infrastructure: Water Challenges in Iraq." Clingendael, 2018.
https://www.clingendael.org/sites/default/files/2018-07/PB_PSI_water_challenges_Iraq.pdf.
- Water, Peace and Security Partnership. "The Growing Water Crisis Increasingly Poses a Threat To: Ecosystems, Livelihoods, and Security." Water, Peace and Security, 2020. <https://waterpeacesecurity.org/>.
- Wattan News Agency. "A Struggle for Water in Southern Iraqi Provinces." Wattan News Agency, August 28, 2018. <https://wattanna.net/%d8%b5%d8%ad%d9%8a%d9%81%d8%a9-%d8%b5%d8%b1%d8%a7%d8%b9-%d8%b9%d9%84%d9%89-%d8%a7%d9%84%d9%85%d9%8a%d8%a7%d9%87-%d9%81%d9%8a-%d9%85%d8%ad%d8%a7%d9%81%d8%b8%d8%a7%d8%aa-%d8%a7%d9%84%d8%ac%d9%86%d9%88/>.
- Yenigun, Kasim, and Wlat A. Ibrahim. "Investigation of Drought in the Northern Iraq Region." *Meteorological Applications* 26, no. 3 (2019): 490–499.