The Water Crisis in Syria and Iraq

A Tool for Terror

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INTRODUCTION AND BACKGROUND

As water resources become more limited, drought prone societies will experience considerable resource stress and increased violence; a trend which is increasingly being seen in the Middle East. The outcomes of the ongoing conflicts in Syria and Iraq will depend partly on the role of regional state actors to regain complete control of water sources and infrastructure from the Islamic State of Iraq and the Levant (ISIL). The severe drought, which destabilized the region in 2006, is a central topic of conversation for resource conflict experts, who label water scarcity a leading factor in socio-economic strain, state failure, and the rise and growth of violent extremism.[1] The populations of both states respond to the lack of adequate water with tension, societal conflict, and continuous migration from rural areas to urban centers. As a result of distributional pressures, individuals look to sub-state actors to provide water resources in place of the failed state. Extremist non-state actors continue to target water sources to seize power and control local populations. Furthermore, terrorist groups seek to secure waterways to inherit public responsibilities, create societal dependency, and employ water as a weapon of war.

In its 2012 *Global Water Security: Intelligence Community Assessment,* the Office of the Director of National Intelligence (ODNI) states that terrorist and extremist groups often target water infrastructure to further objectives and establish influence over local populations.[2] The report also establishes a correlation between groundwater depletion and risks to national and global food markets. In sum, the degradation of terrorist capabilities in Syria and Iraq requires the full liberation of water sources and infrastructure. Drought is a primary variable when analyzing poverty, social tensions, environmental degradation, ineffective leadership, and fragile political institutions.[3] The prospect for a stable Middle East requires the elimination of terror groups, which often identify the water crisis as an opportunity to inherit state responsibility, manufacture societal dependence, and utilize water installation sites as strategic weapons of war.

Factors Contributing to the Water Crisis

Due to the natural scarcity of groundwater and lack of precipitation in the basin, Syria and Iraq rely on the Tigris and Euphrates rivers for drinking water, electricity, and irrigation via installations.[4] The rivers originate in Turkey and flow southward into Syria and Iraq, giving Turkey an upstream strategic advantage. Syria and Iraq rely on external sources for 60% and 75% of their water, respectively, and 78% of Syrian extractable groundwater is considered unsustainable.[5] Geographical placement demands that Iraq and Syria cooperate with Turkey on transnational waterway issues, or

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[1] United States. Intelligence Community Assessment. Office of the Director of National Intelligence. *Global Water Security*. ICA 2012 - 08. 2012. Accessed April 26, 2017. https://www.dni.gov/files/documents/Newsroom/Press%20Releases/ICA_Global%20Water%20Security.pdf.

[2] Ibid.

[3] Ibid.

[4] Gleick, Peter H. "Water, Drought, Climate Change, and Conflict in Syria." *Weather, Climate & Society* 6, no. 3 (July 2014): 332. *Environment Complete*, EBSCO*host* (accessed April 26, 2017).

[5] Damluji, Nadim. "Legal Analysis: Daesh control of watercourses in Syria and Iraq." *Washington International Law Journal* 25, no. 2 (April 2016): 331-363. *Legal Source*, EBSCO*host* (accessed April 26, 2017).
"Iraq Country Water Resource Assistance Strategy: Addressing Major Threats to People's Livelihoods." (2006): *AGRIS*, EBSCO*host* (accessed April 26, 2017).

resort to water manipulation, territorial claims, and/or military conflict to secure national interests.[6] After ongoing conflict, which nearly escalated into full-fledged military conflict in 1974, Syria and Iraq were able to coalesce against dominant Turkish water interest. [7]

Since 1990, the complexities of transnational water issues have led to attempted solutions with the construction of the Turkish Ataturk Dam in 1992 and the Southeastern Anatolia Project (GAP), an ongoing development initiated in the 1970s.[8] However, the GAP, upon completion and combined with low precipitation levels, will actually decrease the average annual flow of the Euphrates through the Syrian-Turkish border.[9] Adding further resource stress, Syria's population has grown from 3 million in 1950 to 22 million in 2012. The Arab region experienced a 43 percent population increase over the past two decades, which has produced alarming consequences.[10] Drought sparked the migration of millions of farmers from the countryside to urban centers.[11] More specifically, this relocation occurred as a result of reduced incomes, a lack of employment opportunities, and a burgeoning youth demographic, which all exacerbated resource strains.[12] Over the past four decades the per capita share of renewable water resources in the region halved.[13] According to some academics, the drought is implicated in the current Syrian conflict and terrorist groups, specifically, ISIL often seek to exploit water scarcity to spread extremism.[14]

ANALYSIS OF KEY VARIABLES

The acknowledgement of conflict-prone trends is vital for understanding the regional instability and violence in Syria and Iraq. Three variables increase the likelihood of water manipulation by terrorist groups: water crisis-induced decreases in food production, a decline in quality of life, and, state, institutional, and sectarian distributional tension concerning water resources. To unpack the rise and progression of ISIL in the context of water scarcity, each variable will be explained below.

Water Crisis-Induced Decreases in Food Production

Many experts attribute the Arab Spring uprisings to decreases in food production and spikes in grain prices.[15] Dr. Peter H. Gleick, a specialist on water issues, notes that while the origins of war in Syria are multilayered and dependent upon many political, economic, and social variables, water shortages, "contributed to the displacement of large populations from rural to urban centers, food insecurity for more than a million people, and increased unemployment—with subsequent effects on

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[6] "Iraq." AQUASTAT - FAO's Information System on Water and Agriculture. 2016. Accessed April 26, 2017. http://www.fao.org/nr/water/aquastat/countries_regions/irq/index.stm.

[7] Hipel, K, DM Kilgour, and RA Kinsara. "Strategic Investigations of Water Conflicts in the Middle East." *Group Decision And Negotiation* 23, no. 3 (n.d.): 358-359. *Social Sciences Citation Index*, EBSCO*host* (accessed April 26, 2017).
"Iraq." AQUASTAT - FAO's Information System on Water and Agriculture. 2016. Accessed April 26, 2017. http://www.fao.org/nr/water/aquastat/countries_regions/irq/index.stm.

[8] Haftendorn, Helga. "Water and International Conflict." *Third World Quarterly*, (2000): 51-68. *JSTOR Journals*, EBSCO*host* (accessed April 26, 2017).

[9] Ibid.

[10] *Managing Water under Uncertainty and Risk*. Paris: UNESCO, 2012. Accessed April 26, 2017. http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/SC/pdf/WWDR4%20Volume%201-Managing%20Water%20under%20Uncertainty%20and%20Risk.pdf.

[11] Gleick, Peter H. "Water, Drought, Climate Change, and Conflict in Syria." *Weather, Climate & Society* 6, no. 3 (July 2014): 332. *Environment Complete*, EBSCO*host* (accessed April 26, 2017).

[12] *Managing Water under Uncertainty and Risk*. Paris: UNESCO, 2012. Accessed April 26, 2017. http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/SC/pdf/WWDR4%20Volume%201-Managing%20Water%20under%20Uncertainty%20and%20Risk.pdf.

[13] Ibid.

[14] Kelley, C.P. et al. "Climate change in the Fertile Crescent and implications of the recent Syrian drought." *Proceedings Of The National Academy Of Sciences Of The United States Of America* 112, no. 11 (March 17, 2015): 3241-3246. *Scopus*®, EBSCO*host* (accessed April 26, 2017).
According to Colin P. Kelley, Sahrzad Mohtadi, Mark A. Cane, Richard Seager and Yochanan Kushnir.

[15] Rami Zurayk, "Use Your Loaf: Why Food Prices Were Crucial in the Arab Spring," *The Guardian*, July 16, 2011, accessed September 23, 2016, https://www.theguardian.com/lifeandstyle/2011/jul/17/bread-food-arab-spring.

political stability."[16] Experts describe the drought that struck the region in 2006, and lasted until 2011, as "[the] most severe set of crop failures since agricultural civilizations began in the Fertile Crescent many millennia ago."[17] During the shortage, water intensive crops declined, specifically "yields of wheat and barley dropped 47 percent and 67 percent respectively."[18] Livestock populations also suffered and 1.5 million Syrians were labeled as food insecure.[19] Cotton and grain production also plummeted.[20] While the Assad regime made efforts to subsidize water intensive crops, a lack of improvement resulted in a decayed quality of life within the state. [21]

Food and Water Insecurity and Quality of Life

Regional decreases in food production catalyzed socio-economic pressures, which sparked fluctuating food prices, unemployment, and the mass migration of millions of people to urban centers. The drought also led to inefficiencies in hydroelectric power, on which most major cities in the region rely. In 2006, the World Bank reported that poor infrastructure and the water crisis left 70% of Iraqi sewage untreated, 20% of households without drinking water and 30% of farmers without enough water to perform daily tasks.[22] High levels of salinity and pollution, resulting from poor management, rendered the Iraqi freshwater supply undrinkable.[23] Ineffectiveness in management highlights the difficulties of distribution during times of crisis. Furthermore, ISIL and other sub-state actors continue to engage in conflict to secure water sources during shortages.

Distributional Tensions

Distributional water tensions between the countries of the Tigris-Euphrates river basin are not uncommon. As mentioned earlier, Turkey, Syria and Iraq often fight over their transnational waterway rights and recorded hydro-political tensions go back centuries. Regional actors have long utilized water installations to assert dominance over waterways and deprive neighbors through aggressive diplomatic behavior. The rise of sub-state terrorist groups has further complicated environmental water tensions. Research by Marc Levy of Columbia University's Center for International Earth Science Information Network, Charles Vorosmarty of the University of New Hampshire's Water Systems Analysis Group, and Nils Petter Gleditsch of the Center for the Study of Civil War at the International Peace Research Institute (PRIO) stated in 2005 that, "at the global scale there is a highly significant relationship between rainfall deviations and the likelihood of outbreak of a high-intensity internal war. When rainfall is significantly below normal, the likelihood of conflict outbreak is significantly elevated in the subsequent year." [24] In Syria and Iraq, ISIL undermines the two failing states by exacerbating the abovementioned conflict-prone trends and manufacturing an artificial societal dependency through

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[16] Gleick, Peter H. "Water, Drought, Climate Change, and Conflict in Syria." *Weather, Climate & Society* 6, no. 3 (July 2014): 338. *Environment Complete*, EBSCO*host* (accessed April 26, 2017).

[17] Femia, Francesco, and Caitlin Werrell. "Syria: Climate Change, Drought and Social Unrest." The Center for Climate & Security. December 07, 2015. Accessed April 26, 2017. https://climateandsecurity.org/2012/02/29/syria-climate-change-drought-and-social-unrest/.

[18] Gleick, Peter H. "Water, Drought, Climate Change, and Conflict in Syria." *Weather, Climate & Society* 6, no. 3 (July 2014): 334. *Environment Complete*, EBSCO*host* (accessed April 26, 2017).

[19] Ibid, 338.

[20] United States. USAID knowledge services center. USAID. *Syrian Agriculture Historical and Environmental Context*. By Christopher Chapman. June 18, 2014. Accessed April 26, 2017. http://pdf.usaid.gov/pdf_docs/PBAAC901.pdf.
United States. USDA Foreign Agricultural Service. Global Agricultural Information Network. *Syria: Cotton and Products Annual.* By Julio Maldonad. March 30, 2010. Accessed April 26, 2017.
https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Cotton%20and%20Products%20Annual_Damascus_Syria_3-30-2010.pdf.
United States. USDA Foreign Agricultural Service. Global Agricultural Information Network. *Syria: Grain and Feed Annual.* By Julio Maldonad. Accessed April 26, 2017. https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Grain%20and%20Feed%20Annual_Damascus_Syria_2-17-2011.pdf.

[21] Ibid, 334.

[22] "Iraq Country Water Resource Assistance Strategy: Addressing Major Threats to People's Livelihoods." (2006): *AGRIS*, EBSCO*host* (accessed April 26, 2017).

[23] Müşerref Yetim, *Negotiating International Water Rights: Resource Conflict in Turkey, Syria and Iraq (*London: I.B.Tauris, 2016), 12-13.

[24] Bencala, Karin R., and Geoffrey D. Dabelko. "WATER WARS: OBSCURING OPPORTUNITIES." *Journal Of International Affairs* 61, no. 2 (Spring/Summer2008 2008): 21-33. *Business Source Complete*, EBSCO*host* (accessed April 26, 2017)

the seizure of water sources and facilities.[25] In battle, the caliphate's forces recognize the strategic value of such installations and employ them as weapons. [26]

ANALYSIS OF TRENDS IN THE ISIL CASE

The abovementioned conflict-prone trends provide a framework for understanding the regional instability and violence in Syria and Iraq. Groups, like ISIL, exploit the trends to further their objectives and utilize the water crisis and its corresponding developments in three ways: by replacing the failed state, manufacturing societal dependence, and utilizing water sources and installations as weapons of war.

Replacing the Failed State

First, by seizing and controlling water installations, ISIL replaces the role of the failed Syrian state as the producer, provider, and distributor of food and water during times of need. Throughout the occupation of Syria and Iraq, ISIL secured agricultural sources of wheat, barley, and cotton, all of which are water intensive crops, to improve public opinion and maintain economic stability.[27] As previously mentioned, the Assad regime had also attempted this by subsidizing agriculture. After the government failed, ISIL began to control imports and exports of grain, regulate food prices, and dictate agricultural practices to farmers in spite of inefficiencies and disincentives.[28] Mass migration into urban areas produced a disaffected, angry, and desperate potential workforce for ISIL to exploit. Lastly, given the region's history of water conflict, ISIL seized installations through conquest and in doing so, refused to comply with standard regional transnational norms of negotiation and diplomacy.[29] ISIL boasts of its accomplishments of providing "food, healthcare and power generation" [30] to its subjects. The caliphate projects its legitimacy through local service organizations like the Islamic Network for Public Services, which provided electricity and transportation within Aleppo city limits.[31] ISIL recognizes and maintains the population's dependence, and is confident that its subjects will not retaliate against a group that controls its primary resources and services. Gaining legitimacy via controlling water sources is a common method employed by groups in other conflicts, specifically the Sudanese Civil War.

Manufacturing Dependency

Second, if ISIL feeds the community and employs men within its ranks, in the eyes of the alienated, it is functioning properly in comparison to the previous dysfunctional regime. ISIL uses dependence to justify the taxation of its citizenry and to prop up its unsustainable economy. In some estimates, taxation has accounted for 40% of the group's income, 10% of which derives from the taxation of agriculture.[32] However, ISIL funds social services through its taxation. The group's food allocation system provides for vulnerable segments of the population, an otherwise neglected portion of society. The food ISIL allocates fulfills the role of the government by reaching 99 percent of people

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[25] King, M.D. "The weaponization of water in Syria and Iraq." *Washington Quarterly* 38, no. 4 (October 2, 2015): 153-169. *Scopus*®, EBSCO*host* (accessed April 26, 2017).
[26] Ibid.
[27] Jaafar, Hadi H., and Eckart Woertz. "Agriculture as a funding source of ISIS: A GIS and remote sensing analysis." *Food Policy* 64, (October 1, 2016): 14-25. *ScienceDirect*, EBSCO*host* (accessed April 26, 2017).
[28] Ibid.
[29] King, M.D. "The weaponization of water in Syria and Iraq." *Washington Quarterly* 38, no. 4 (October 2, 2015): 153-169. *Scopus*®, EBSCO*host* (accessed April 26, 2017).
[30] Jaafar, Hadi H., and Eckart Woertz. "Agriculture as a funding source of ISIS: A GIS and remote sensing analysis." *Food Policy* 64, (October 1, 2016): 14-25. *ScienceDirect*, EBSCO*host* (accessed April 26, 2017).
[31] King, M.D. "The weaponization of water in Syria and Iraq." *Washington Quarterly* 38, no. 4 (October 2, 2015): 153-169. *Scopus*®, EBSCO*host* (accessed April 26, 2017).
[32] Jaafar, Hadi H., and Eckart Woertz. "Agriculture as a funding source of ISIS: A GIS and remote sensing analysis." *Food Policy* 64, (October 1, 2016): 14-25. *ScienceDirect*, EBSCO*host* (accessed April 26, 2017).

within its borders and comprises 85 percent of calories required for all people.[33] The group's legitimacy and economic resilience depend on the control of water and the production of food. In 2014, ISIL raised $200 million in barley and rye sales alone. Societal dependence on ISIL for key resources influences the process of grooming the local population into ideological commitment. This is evident in the fact that local enlistment accounts for 60-70 percent of total fighters.[34]

Water as a Weapon of War

Third, just as Saddam Hussein flooded and dried up the southern marshes of Iraq to punish Shia enemies and political opponents, ISIL has also utilized water as a weapon.[35] During varying points in time, ISIL seized key installations on both the Tigris and the Euphrates, notably the Tabqa Dam in 2013. With the dam, ISIL controlled Syria's largest city, Aleppo, and dictated the water and electricity supply to five million people.[36] The structure also irrigates one thousand square miles of farmland.[37] In 2014, ISIL captured the Fallujah Dam in Iraq, and first intentionally deprived downstream Shiite communities of water and then emptied the dam to destroy their crops and infrastructure. [38,] As ISIL seizes water installations, it imposes political coercion and military might. ISIL celebrated tactical victories in both Fallujah and Mosul by reducing and increasing water flow toward its enemies. The intentional polluting of water is also a common ISIL strategy.[39] In 2014, ISIL poisoned water sources south of Tikrit, Iraq through the dumping of crude oil.[40] In December 2016, in the midst of the battle for Mosul, fighting between Iraqi coalition forces and ISIL destroyed a pipeline that provided approximately 650,000 people in the city with water.[41] Islamic State forces utilized water and food shortages, as well as threats of execution, to draw civilians toward the city center to form a civilian human shield. [42] ISIL exploited the 2011 Syrian conflict and utilized transnational waterways and installations to develop a concept of sovereignty that spilled over into Iraq. Through waterway manipulation, ISIL can harm its armed opponents and civilian populations through strategies of total war and resource deprivation

CONCLUSION

Recent developments do not indicate a near end to the Syrian civil war. The result of the water crisis in the Middle East is contingent on the outcome of the Syrian conflict and the foreign policy

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[33] Jaafar, Hadi H., and Eckart Woertz. "Agriculture as a funding source of ISIS: A GIS and remote sensing analysis." *Food Policy* 64, (October 1, 2016): 14-25. *ScienceDirect*, EBSCO*host* (accessed April 26, 2017).

[34] King, M.D. "The weaponization of water in Syria and Iraq." *Washington Quarterly* 38, no. 4 (October 2, 2015): 153-169. *Scopus®*, EBSCO*host* (accessed April 26, 2017).

[35] Ibid, 5.

[36] Damluji, Nadim. "LEGAL ANALYSIS: DAESH CONTROL OF WATERCOURSES IN SYRIA AND IRAQ." *Washington International Law Journal* 25, no. 2 (April 2016): 331-363. *Legal Source*, EBSCO*host* (accessed April 26, 2017).

[37] Fred Pearce, "Mideast Water Wars: In Iraq, A Battle for Control of Water," *Yale Environment 360*, August 25, 2014, accessed December 08, 2016, http://e360.yale.edu/features/mideast_water_wars_in_iraq_a_battle_for_control_of_water.

[38] Damluji, Nadim. "LEGAL ANALYSIS: DAESH CONTROL OF WATERCOURSES IN SYRIA AND IRAQ." *Washington International Law Journal* 25, no. 2 (April 2016): 331-363. *Legal Source*, EBSCO*host* (accessed April 26, 2017).
Fred Pearce, "Mideast Water Wars: In Iraq, A Battle for Control of Water," *Yale Environment 360*, August 25, 2014, accessed December 08, 2016, http://e360.yale.edu/features/mideast_water_wars_in_iraq_a_battle_for_control_of_water.

[39] von Lossow, Tobias. "The Rebirth of Water as a Weapon: IS in Syria and Iraq." *International Spectator* 51, no. 3 (September 2016): 82-99. *Publisher Provided Full Text Searching File*, EBSCO*host* (accessed April 26, 2017).

[40] Ibid.

[41] "Almost Half of Mosul's Children Cut Off from Clean Water as Fighting Intensifies - UNICEF." *Targeted News Service (USA)*, November 30, 2016. *NewsBank*, EBSCO*host* (accessed April 26, 2017).
Isabel Coles and Saif Hameed, "Mosul food, water reserves dwindle as fighting cuts off supplies," *Reuters*, November 30, 2016, accessed April 10, 2017, http://www.reuters.com/article/us-mideast-crisis-iraq-idUSKBN13P1G8.

[42] Emma Graham-Harrison, "Fighting around Mosul Leaves Majority in Isis-held City without Water," *The Guardian*, November 29, 2016, accessed December 08, 2016, https://www.theguardian.com/world/2016/nov/29/fighting-around-mosul-isis-city-without-water-pipe-line-hit-siege-iraq.
"Almost Half of Mosul's Children Cut Off from Clean Water as Fighting Intensifies - UNICEF." *Targeted News Service (USA)*, November 30, 2016. *NewsBank*, EBSCO*host* (accessed April 26, 2017).

decisions of great and regional powers, specifically the United States, Russia, Iran, and Turkey.[43] While the analysis presented here is forward-looking in nature, it is difficult to project how the Syrian conflict will end. Additionally, there is a lack of objective primary source testimony available from the populations subject to ISIL control. Reports from individuals who understand the inner workings of ISIL would strengthen the judgments made concerning the efficacy of ISIL' seizure and management of water and food sources. The evidentiary proof of consistent primary sources would further bolster the abovementioned arguments should they become available.

In an assessment released in 2012 the ODNI stated that, "during the next 10 years, many countries…will experience water problems…that will risk instability and state failure [and] increase regional tensions."[44] In addition to recognizing the potential risk factors, the ODNI assessment asserts, with moderate confidence that states like Syria and Iraq will continue to suffer economic difficulties, and will therefore be unable to develop the technological methods necessary to mitigate water crises.[45] The ODNI predicts that the ten years following 2012 will present few water-related conflicts overall, but that over time water will "increasingly be used as leverage [and that] the use of water as a weapon or to further terrorist objectives" will increase.[46] ODNI, in consensus with prominent scholars, also declares with high confidence that patterns indicate water problems induce regional tension, conflict, and war. The report concurs with the arguments described above: water will increase as a bargaining tool and a weapon for terror over the next ten years.[47] These conflicts will arise out of food and water insecurity, but will also stem from energy issues.[48] If historic droughts continue to occur, economic output in states like Syria and Iraq will decrease substantially, further exacerbating the abovementioned risk factors. It is clear that water scarcity creates an environment fertile for internal strife and extremism. Such tension and conflict will prevent stability and allow groups like ISIL to continue to exploit water shortages to impose control in both Syria and Iraq.

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[43] Michael B. Kelley, "The Madness of the Syria Proxy War in One Chart," *Business Insider*, October 16, 2013, accessed April 10, 2017, http://www.businessinsider.com/who-is-involved-in-the-war-in-syria-2013-10.

[44] United States. Intelligence Community Assessment. Office of the Director of National Intelligence. *Global Water Security*. ICA 2012 - 08. 2012. Accessed April 26, 2017. https://www.dni.gov/files/documents/Newsroom/Press%20Releases/ICA_Global%20Water%20Security.pdf.

[45] Ibid.

[46] United States. Intelligence Community Assessment. Office of the Director of National Intelligence. *Global Water Security*. ICA 2012 - 08. 2012. Accessed April 26, 2017. https://www.dni.gov/files/documents/Newsroom/Press%20Releases/ICA_Global%20Water%20Security.pdf.

[47] Ibid

[48] Ibid.